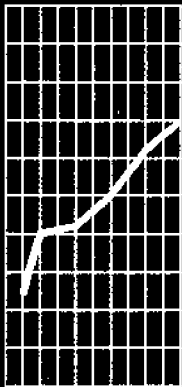


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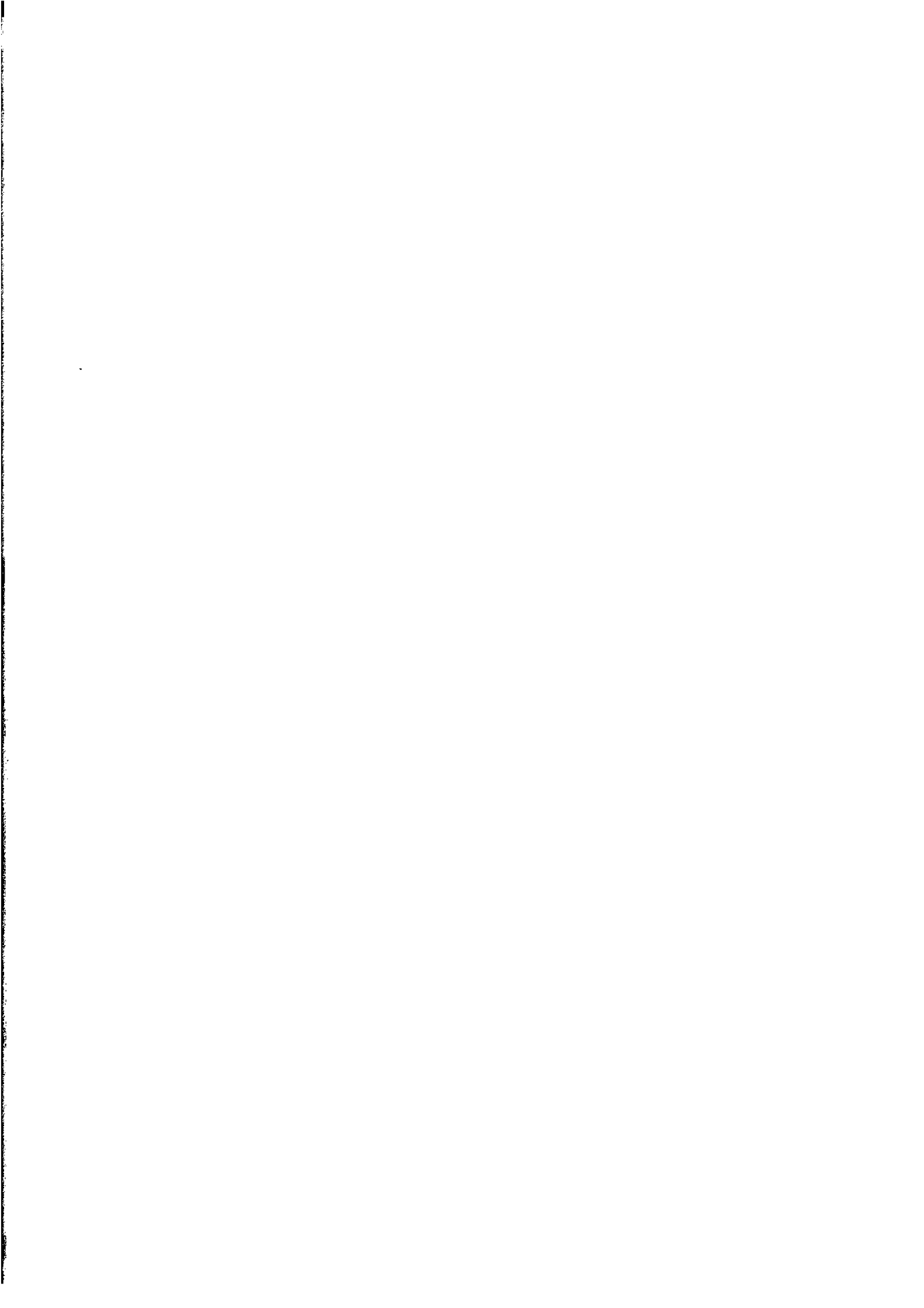
June 1994

# Environmental Issues

## People's Views and Practices



ABS Catalogue No. 4602.0



**ENVIRONMENTAL ISSUES**

**PEOPLE'S  
VIEWS AND PRACTICES  
AUSTRALIA**

**June 1994**

**W. McLennan  
Australian Statistician**

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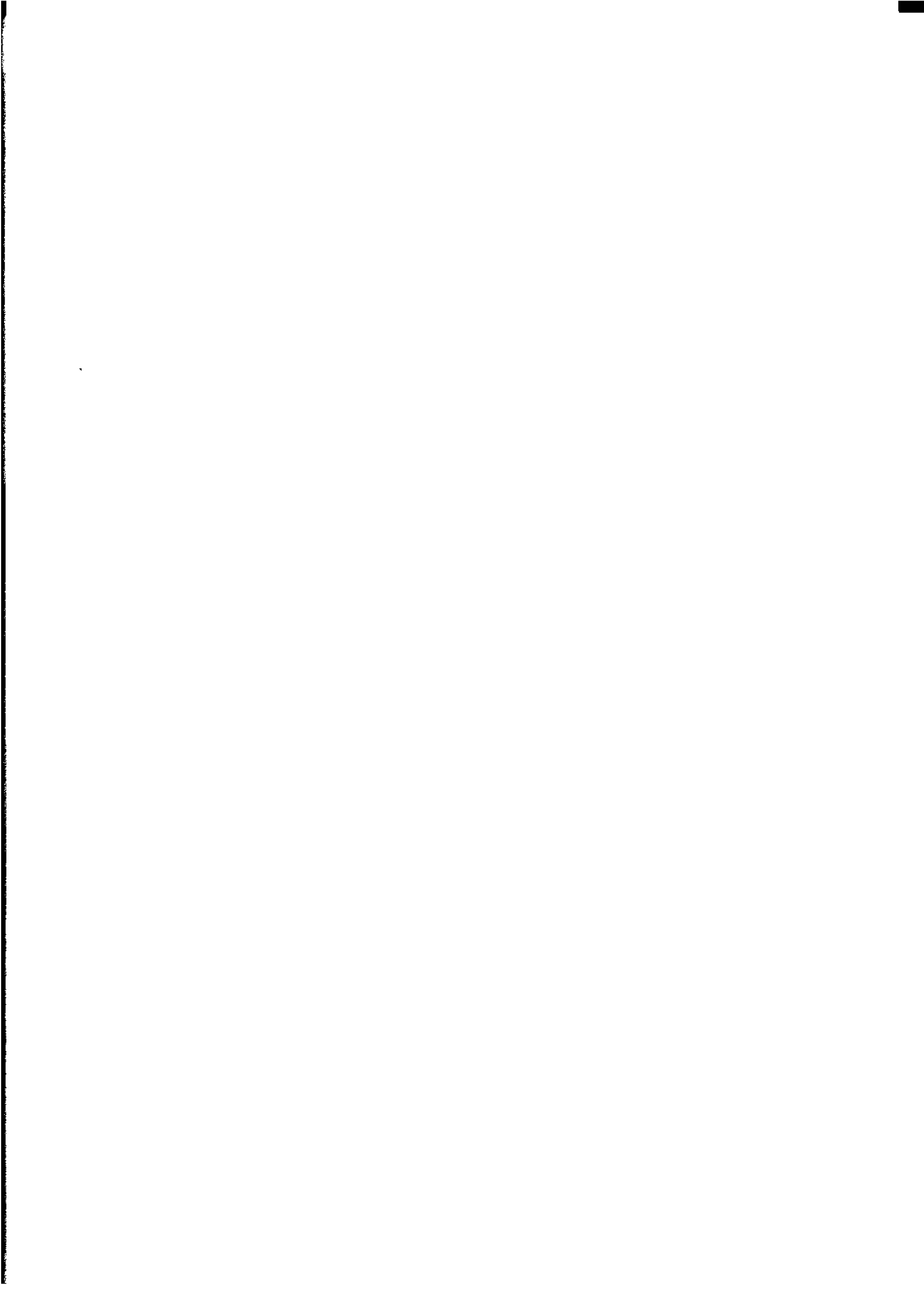
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### INQUIRIES

- *for further information about statistics in this publication and the availability of related unpublished statistics, contact Mark Nelson on (06) 252 7890 or any ABS State Office.*
  - *for information about other ABS statistics and services, please refer to the back page of this publication.*
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## PREFACE

This publication presents results from a household survey conducted in June 1994 as part of the Monthly Labour Force Supplementary Survey program. A further survey on environmental issues is being developed for 1996.

This information was collected at the request of a range of government and other bodies to assist in the development of environmental policies and programs.

The survey provides data on the measures taken by Australian households to conserve energy and water, as well as data on people's environmental concerns and views.

Topics covered in Chapter 1 (Environmental concerns and views) are similar to those covered in a May 1992 survey and the results are compared in that chapter. The questions were asked of all persons aged 18 years and over, in households selected for the survey (see Explanatory Notes at the end of the publication).

The topics in other chapters, relating to households, have not previously been covered in this detail although comparisons can in some cases be made at a broad level with other similar surveys conducted in the past, which are referred to as appropriate.

A summary of main findings is provided at the beginning of each chapter and more detailed commentary accompanies each group of tables.

At various points in the publication, information boxes provide general background on the issue addressed in the particular chapter.

Comments on the statistics presented in this publication and suggestions for future improvements would be welcomed. These should be forwarded to the Director, Environment Statistics, P.O. Box 10, BELCONNEN ACT 2616.

**W. McLennan**  
**Australian Statistician**

Australian Bureau of Statistics  
Belconnen ACT 2616

August 1995

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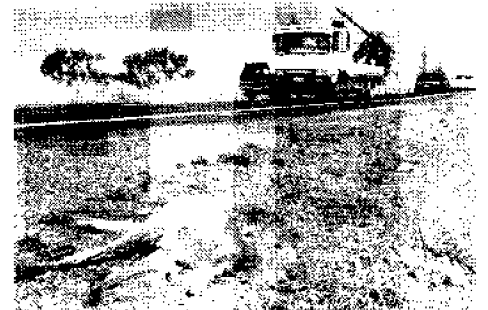
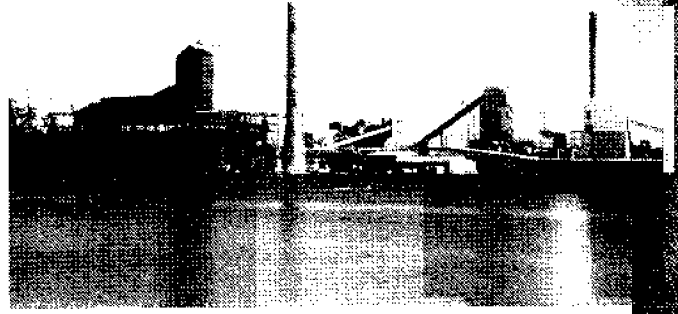
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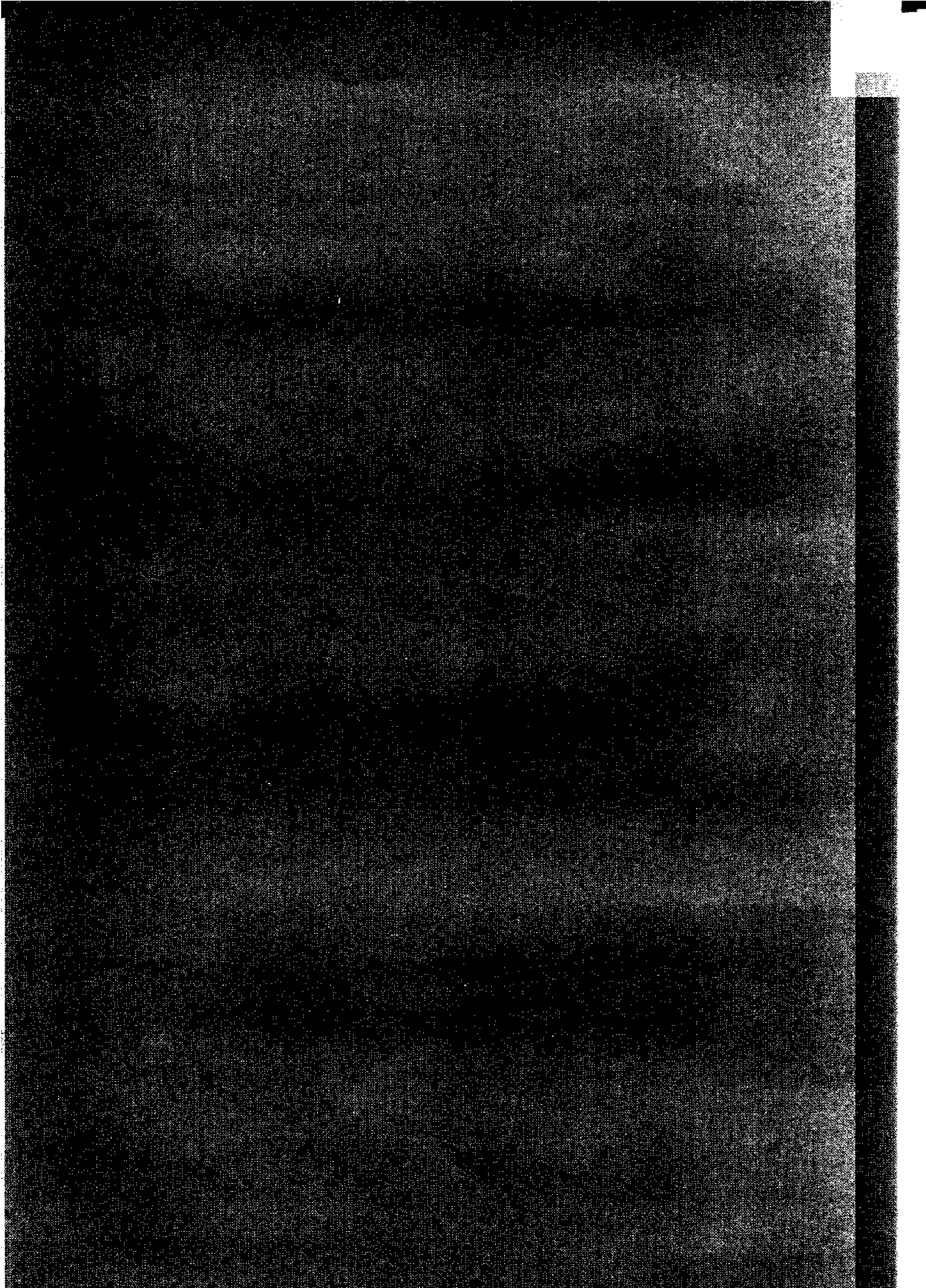
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# CHAPTER 1

## ENVIRONMENTAL CONCERNS AND VIEWS





## CHAPTER 1

### ENVIRONMENTAL CONCERNS AND VIEWS

The survey questions relating to this chapter were asked of all persons aged 18 years and above in households selected for the survey. People were asked about their concern for environmental problems and their views on environmental protection and economic growth.

The questions in June 1994 were similar to those asked in a May 1992 survey and comparisons are made in the tables and commentary as appropriate.

It should be borne in mind that responses are likely to be influenced by circumstances and community perceptions prevailing at the time of the surveys (June 1994 and May 1992) which may since have changed.

#### **Main Findings**

- Sixty-nine per cent of people were concerned about environmental problems in June 1994, compared with 75% in May 1992.
  
- The problem of greatest concern remains air pollution (34%), although concern for all listed problems is less than for May 1992.
  
- Seventy-one per cent of people ranked environmental protection and economic growth as being equally important, little different from the 70% recorded in May 1992. A further 18% put environmental protection as being more important than economic growth.

NOTE. Readers are advised that revisions have been made to some of the results of the 1992 survey published in *Environmental Issues - People's Views and Practices* (ABS Catalogue 4602.0) released in November 1993. However, the revisions do not relate to the issues covered in this chapter, so the comparisons shown are not involved. The revisions related to the topics of recycling and environmentally friendly products, neither of which was repeated in the 1994 survey. Proportions were only marginally affected. Details of the revisions may be obtained by contacting the Environment Statistics Unit, P.O. Box 10, Belconnen ACT, 2616.

## Environmental Concern: States and Territories

In June 1994, there was a decrease of nearly 6 percentage points in the number of persons aged 18 years and over who indicated that they were concerned about environmental problems compared with May 1992. Tasmania and the Australian Capital Territory recorded the largest decrease, with over 9 percentage points each, while South Australia had the lowest change with a drop of 4 percentage points.

The major environmental concern was air pollution (34% of the population in 1994 and 40% in 1992). This was followed by ocean pollution, then destruction of trees and ecosystems and freshwater pollution.

The three environmental problems to show the greatest decline in concern since the 1992 survey were the ozone layer (-11.5 percentage points), toxic chemical waste (-9.4 percentage points), and the greenhouse effect (-8.4 percentage points).

**TABLE 1.1 CONCERN ABOUT ENVIRONMENTAL PROBLEMS, STATES AND TERRITORIES, JUNE 1994 AND MAY 1992: NUMBER AND PERCENTAGE OF PERSONS**

<i>Concern about environmental problems</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
JUNE 1994									
—'000—									
Yes	3,011.5	2,180.5	1,547.5	784.9	837.3	209.6	64.6	155.1	8,791.0
No	1,210.5	989.6	656.0	275.0	323.6	126.4	22.6	52.0	3,655.7
Don't know	127.7	72.8	54.1	15.9	33.8	5.7	2.2	2.0	314.2
<b>Total persons</b>	<b>4,349.8</b>	<b>3,242.9</b>	<b>2,257.6</b>	<b>1,075.8</b>	<b>1,194.7</b>	<b>341.7</b>	<b>89.4</b>	<b>209.0</b>	<b>12,760.9</b>
JUNE 1994									
- per cent—									
Yes	69.2	67.2	68.5	73.0	70.1	61.3	72.2	74.2	68.9
No	27.8	30.5	29.1	25.6	27.1	37.0	25.3	24.9	28.6
Don't know	2.9	2.2	2.4	1.5	2.8	1.7	2.5	0.9	2.5
MAY 1992									
—per cent—									
Yes	73.6	75.2	74.0	77.0	76.0	70.7	79.6	83.5	74.8
No	24.1	22.2	24.0	21.4	21.8	28.2	17.7	14.4	23.0
Don't know	2.3	2.6	1.9	1.5	2.2	1.1	2.7	2.1	2.2
DIFFERENCE: MAY 1992 TO JUNE 1994									
—percentage point change—									
Yes	-4.4	-8.0	-5.5	-4.0	-5.9	-9.4	-7.4	-9.3	-5.9
No	3.7	8.3	5.1	4.2	5.3	8.8	7.6	10.5	5.6
Don't know	0.6	-0.4	0.5	0.0	0.6	0.6	-0.2	-1.2	0.3

TABLE 1.2 ENVIRONMENTAL CONCERNS, STATES AND TERRITORIES, JUNE 1994 AND MAY 1992: NUMBER AND PERCENTAGE OF PERSONS

<i>Environmental problem</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
JUNE 1994									
—'000—									
Air pollution	1,716.7	1,106.7	658.2	334.4	352.3	92.3	29.9	57.8	4,348.3
Ocean pollution	1,388.2	740.0	581.0	311.5	230.6	89.8	22.4	43.3	3,406.8
Destruction of trees/ecosystems	1,136.9	727.2	661.3	264.4	314.6	73.9	30.7	55.8	3,264.7
Freshwater pollution	1,312.5	707.1	508.3	317.0	251.7	83.9	24.2	52.1	3,256.8
Ozone layer	688.4	607.5	352.2	222.6	211.6	44.6	18.2	39.1	2,184.1
Garbage disposal	698.6	518.2	330.8	203.4	160.7	42.5	11.9	35.0	2,001.1
Extinction of species	686.2	363.5	337.4	116.3	123.8	33.9	18.1	24.3	1,703.5
Toxic chemical waste	521.8	394.3	299.1	129.4	113.7	34.9	8.0	12.4	1,513.6
Land degradation	449.7	283.3	222.8	112.5	93.9	28.3	12.2	22.5	1,225.1
Other pollution	473.4	224.9	219.7	114.7	71.6	27.1	9.1	24.8	1,165.3
Greenhouse effect	409.4	314.6	156.0	115.9	73.3	21.2	7.4	20.7	1,118.5
Resource conservation	376.1	272.2	212.2	78.1	79.9	31.8	11.5	17.9	1,079.9
Overpopulation	412.8	206.2	196.4	59.1	75.9	21.2	10.1	15.3	997.0
Use of pesticides	356.0	206.3	178.9	58.0	55.6	18.5	8.5	8.3	890.1
Nuclear tests/weapons	341.2	229.5	144.9	54.7	51.0	20.1	7.1	5.5	854.1
Use of uranium	161.5	125.0	85.7	34.5	35.8	10.0	5.3	4.0	461.9
Sand mining	107.3	41.0	73.9	13.9	10.9	3.0	1.4	1.4	253.0
Other	238.7	155.5	157.8	59.1	78.2	13.8	2.7	19.0	724.9
No concerns or don't know	1,338.3	1,062.4	710.1	290.9	357.4	132.1	24.8	53.9	3,969.9
<b>Total persons(a)</b>	<b>4,349.8</b>	<b>3,242.9</b>	<b>2,257.6</b>	<b>1,075.8</b>	<b>1,194.7</b>	<b>341.7</b>	<b>89.4</b>	<b>209.0</b>	<b>12,760.9</b>
JUNE 1994									
—per cent—									
Air pollution	39.5	34.1	29.2	31.1	29.5	27.0	33.4	27.7	34.1
Ocean pollution	31.9	22.8	25.7	29.0	19.3	26.3	25.0	20.7	26.7
Destruction of trees/ecosystems	26.1	22.4	29.3	24.6	26.3	21.6	34.3	26.7	25.6
Freshwater pollution	30.2	21.8	22.5	29.5	21.1	24.6	27.0	24.9	25.5
Ozone layer	15.8	18.7	15.6	20.7	17.7	13.1	20.4	18.7	17.1
Garbage disposal	16.1	16.0	14.7	18.9	13.5	12.4	13.4	16.7	15.7
Extinction of species	15.8	11.2	14.9	10.8	10.4	9.9	20.3	11.6	13.3
Toxic chemical waste	12.0	12.2	13.3	12.0	9.5	10.2	8.9	5.9	11.9
Land degradation	10.3	8.7	9.9	10.5	7.9	8.3	13.6	10.8	9.6
Other pollution	10.9	6.9	9.7	10.7	6.0	7.9	10.2	11.8	9.1
Greenhouse effect	9.4	9.7	6.9	10.8	6.1	6.2	8.3	9.9	8.8
Resource conservation	8.6	8.4	9.4	7.3	6.7	9.3	12.9	8.5	8.5
Overpopulation	9.5	6.4	8.7	5.5	6.4	6.2	11.3	7.3	7.8
Use of pesticides	8.2	6.4	7.9	5.4	4.7	5.4	9.5	4.0	7.0
Nuclear tests/weapons	7.8	7.1	6.4	5.1	4.3	5.9	8.0	2.6	6.7
Use of uranium	3.7	3.9	3.8	3.2	3.0	2.9	5.9	1.9	3.6
Sand mining	2.5	1.3	3.3	1.3	0.9	0.9	1.6	0.7	2.0
Other	5.5	4.8	7.0	5.5	6.5	4.1	3.0	9.1	5.7
No concerns or don't know	30.8	32.8	31.5	27.0	29.9	38.7	27.8	25.8	31.1
MAY 1992									
—per cent—									
Air pollution	42.3	43.4	36.9	35.8	34.7	34.0	41.4	44.0	40.2
Ocean pollution	34.4	29.2	36.4	29.4	27.8	34.7	41.7	29.4	32.3
Destruction of trees/ecosystems	32.2	31.0	37.1	31.4	31.2	35.9	35.5	40.5	32.8
Freshwater pollution	29.9	30.6	31.2	29.1	25.6	30.2	29.6	31.8	29.9
Ozone layer	27.5	31.8	26.2	29.1	25.7	28.1	38.5	34.3	28.6
Garbage disposal	24.6	22.9	21.7	21.5	19.3	24.5	31.3	22.0	22.9
Extinction of species	19.3	20.6	21.3	17.1	13.2	20.0	29.4	19.8	19.3
Toxic chemical waste	21.5	23.0	21.4	18.5	17.6	22.0	31.2	18.3	21.3
Land degradation	13.4	18.5	16.3	13.8	11.7	16.5	23.4	15.5	15.3
Other pollution	15.2	12.3	15.1	13.6	12.2	16.7	15.9	13.6	14.1
Greenhouse effect	17.1	20.5	15.2	15.4	12.9	19.2	20.8	19.0	17.2
Resource conservation	14.9	16.8	15.5	13.3	10.7	16.6	19.4	15.2	15.0
Overpopulation	13.0	12.7	15.0	9.0	9.1	14.0	18.8	12.6	12.6
Use of pesticides	12.8	16.1	15.6	10.6	8.4	17.0	27.6	8.1	13.7
Nuclear tests/weapons	14.5	17.9	14.5	11.8	8.9	15.9	22.5	8.3	14.6
Use of uranium	8.4	9.9	8.3	7.7	5.9	10.5	11.8	3.9	8.5
Sand mining	4.9	5.3	5.1	2.7	2.3	5.6	4.5	1.4	4.6
Other	5.3	5.2	6.5	7.5	5.9	5.6	10.5	5.2	5.8
No concerns or don't know	26.4	24.8	26.0	23.0	24.0	29.3	20.4	16.5	25.2

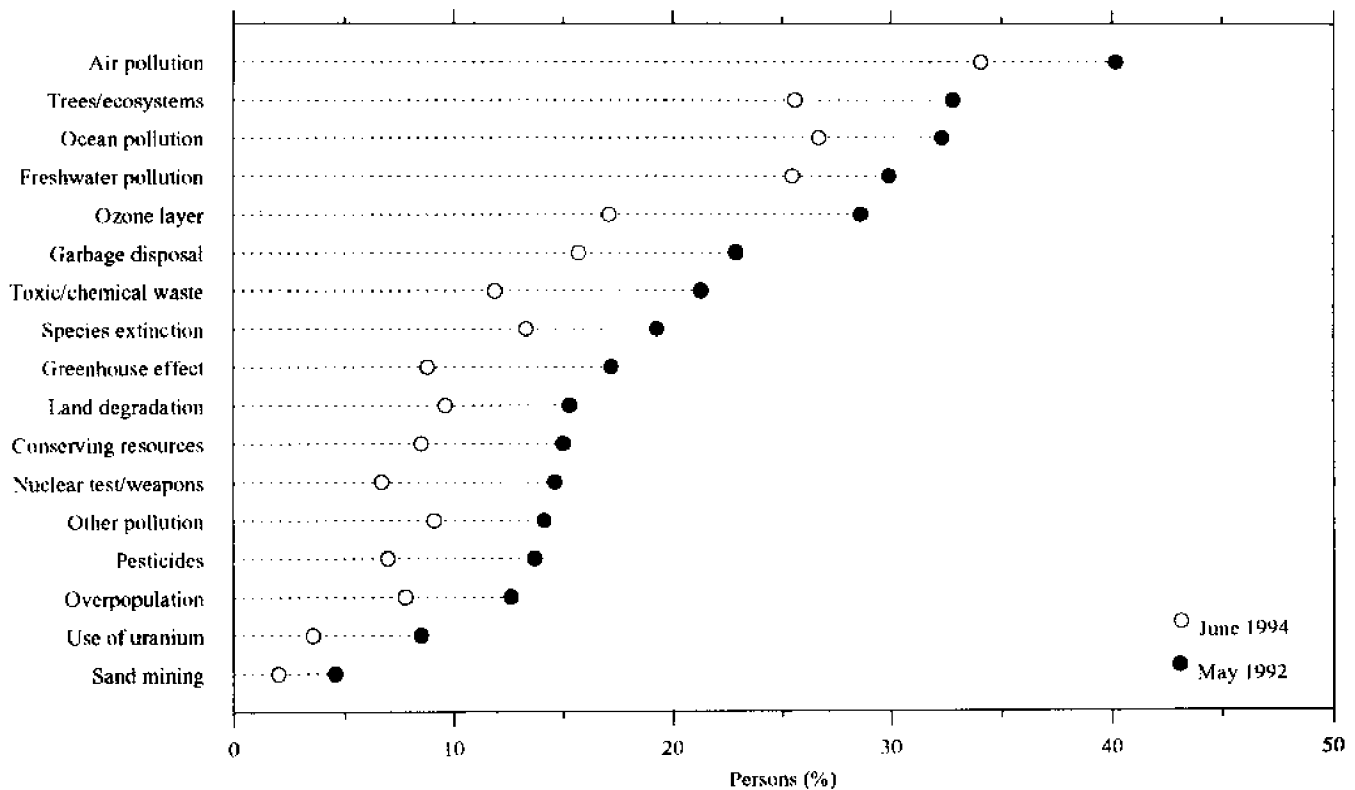
For footnotes see end of table.

TABLE 1.2 ENVIRONMENTAL CONCERNS, STATES AND TERRITORIES, JUNE 1994 AND MAY 1992: NUMBER AND PERCENTAGE OF PERSONS—continued

Environmental problem	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
DIFFERENCE: MAY 1992 TO JUNE 1994									
--percentage point change--									
Air pollution	-2.8	9.3	7.7	-4.7	-5.2	-7.0	-8.0	-16.3	6.1
Ocean pollution	-2.5	6.4	-10.7	-0.4	-8.5	-8.4	-16.7	-8.7	-5.6
Destruction of trees/ecosystems	-6.1	8.6	7.8	-6.8	-4.9	-14.3	-1.2	-13.8	-7.2
Freshwater pollution	0.3	8.8	-8.7	0.4	-4.5	-5.6	-2.6	-6.9	-4.4
Ozone layer	-11.7	13.1	10.6	-8.4	-8.0	-15.0	-18.1	-15.6	-11.5
Garbage disposal	-8.5	-6.9	-7.0	-2.6	-5.8	-12.1	17.9	5.3	-7.2
Extinction of species	3.5	-9.4	-6.4	-6.3	2.8	-10.1	9.1	8.2	-6.0
Toxic chemical waste	-9.5	-10.8	-8.1	6.5	-8.1	-11.8	-22.3	-12.4	-9.4
Land degradation	-3.1	-9.8	-6.4	3.3	-3.8	-8.2	-9.8	-4.7	-5.7
Other pollution	-4.3	5.4	5.4	-2.9	-6.2	-8.8	-5.7	-1.8	-5.0
Greenhouse effect	-7.7	-10.8	8.3	-4.6	-6.8	-13.0	12.5	-9.1	-8.4
Resource conservation	-6.3	8.4	-6.1	-6.0	-4.0	-7.3	6.5	6.7	-6.5
Overpopulation	-3.5	6.3	-6.3	-3.5	-2.7	-7.8	7.5	5.3	4.8
Use of pesticides	4.6	-9.7	-7.7	-5.2	-3.7	-11.6	-18.1	-4.1	-6.7
Nuclear tests/weapons	6.7	-10.8	-8.1	-6.7	-4.6	10.0	-14.5	-5.7	-7.9
Use of uranium	-4.7	-6.0	-4.5	4.5	-2.9	-7.6	-5.9	-2.0	-4.9
Sand mining	-2.4	-4.0	-1.8	-1.4	-1.4	-4.7	-2.9	0.7	-2.6
Other	0.2	0.4	0.5	-2.0	0.6	-1.5	-7.5	3.9	0.1
No concerns or don't know	4.4	8.0	5.5	4.0	5.9	9.4	7.4	9.3	5.9

(a) Totals do not equal the sum of environmental problems in each column because a person may report more than one concern.

FIGURE 1 ENVIRONMENTAL PROBLEMS  
JUNE 1994 AND MAY 1992  
Percentage concerned



The highest ranking concern for metropolitan populations is still air pollution by a substantial margin (38% of people), followed by ocean pollution (28%). For people in non-metropolitan areas, destruction of trees and ecosystems still ranks towards the top of the list (along with air pollution); the drop in concern for this problem and for resource conservation was less in non-metropolitan areas (- 5.3 percentage points) than in metropolitan areas (- 8.3 percentage points).

TABLE 1.3 ENVIRONMENTAL CONCERNS BY METROPOLITAN/NON METROPOLITAN AREAS, JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS(a)

<i>Environmental problem</i>	<i>Metropolitan</i>	<i>Non-metropolitan</i>	<i>Total</i>
JUNE 1994			
—per cent—			
Air pollution	38.0	27.6	34.1
Ocean pollution	27.9	24.7	26.7
Destruction of trees/ecosystems	24.1	28.1	25.6
Freshwater pollution	25.7	25.2	25.5
Ozone layer	16.8	17.6	17.1
Garbage disposal	15.3	16.3	15.7
Extinction of species	11.8	15.9	13.3
Toxic chemical waste	10.9	13.5	11.9
Land degradation	6.5	14.9	9.6
Other pollution	9.0	9.3	9.1
Greenhouse effect	8.2	9.7	8.8
Resource conservation	7.0	10.9	8.5
Overpopulation	6.5	10.1	7.8
Use of pesticides	5.3	9.8	7.0
Nuclear tests/weapons	5.4	8.9	6.7
Use of uranium	3.0	4.7	3.6
Sand mining	1.5	2.9	2.0
Other			
No concerns or don't know	29.7	33.4	31.1
MAY 1992			
—per cent—			
Air pollution	43.6	34.5	40.2
Ocean pollution	33.3	30.6	32.3
Destruction of trees/ecosystems	32.4	33.4	32.8
Freshwater pollution	29.9	29.8	29.9
Ozone layer	28.5	28.8	28.6
Garbage disposal	22.7	23.2	22.9
Extinction of species	18.1	21.4	19.3
Toxic chemical waste	20.3	22.8	21.3
Land degradation	11.8	20.9	15.3
Other pollution	14.5	13.4	14.1
Greenhouse effect	17.5	16.8	17.2
Resource conservation	14.4	16.0	15.0
Overpopulation	12.1	13.4	12.6
Use of pesticides	12.0	16.3	13.7
Nuclear tests/weapons	14.2	15.3	14.6
Use of uranium	8.0	9.2	8.5
Sand mining	4.2	5.1	4.6
Other	5.9	5.5	5.8
No concerns or don't know	24.8	25.9	25.2
DIFFERENCE: MAY 1992 TO JUNE 1994			
percentage point change—			
Air pollution	-5.6	6.9	-6.1
Ocean pollution	-5.4	-5.9	5.6
Destruction of trees/ecosystems	-8.3	-5.3	-7.2
Freshwater pollution	4.2	4.6	-4.4
Ozone layer	-11.7	11.2	-11.5
Garbage disposal	-7.4	-6.9	-7.2
Extinction of species	-6.3	-5.5	6.0
Toxic chemical waste	-9.4	-9.3	9.4
Land degradation	-5.3	-6.0	5.7
Other pollution	-5.5	-4.1	5.0
Greenhouse effect	-9.3	-7.1	-8.4
Resource conservation	-7.4	-5.1	-6.5
Overpopulation	-5.6	-3.3	-4.8
Use of pesticides	6.7	-6.5	-6.7
Nuclear tests/weapons	-8.8	-6.4	-7.9
Use of uranium	-5.0	4.5	-4.9
Sand mining	-2.7	2.2	-2.6
Other	0.1	0.0	-0.1
No concerns or don't know	4.9	7.5	5.9

(a) Totals do not equal the sum of environmental problems in each column because a person may report more than one concern.

## Environmental concern: Age and sex distributions

The numbers of people expressing concern about environmental problems has dropped across all age groups, with those in the 65 and over age group showing the largest decrease of 9.6 percentage points between May 1992 and June 1994. Those aged between 35 and 44 recorded the lowest decrease of 3.5 percentage points.

Air pollution remains the environmental problem for which all age groups express the most concern, varying between 39% of those aged between 35 and 44 to 22% for those aged 65 and over. While 25% of 18-24 year olds are concerned about the ozone layer, a higher percentage than any other age group, this has fallen by 15 percentage points since 1992.

**TABLE 1.4 CONCERN ABOUT ENVIRONMENTAL PROBLEMS BY AGE GROUP, JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS**

<i>Concern about environmental problems</i>	<i>18-24</i>	<i>25-34</i>	<i>35-44</i>	<i>45-54</i>	<i>55-64</i>	<i>65 and over</i>	<i>Total</i>
JUNE 1994							
—'000—							
Yes	1,397.4	2,019.9	2,003.6	1,504.8	916.7	948.6	8,791.0
No	466.9	666.7	591.6	563.8	496.1	870.6	3,655.7
Don't know	35.2	63.6	47.6	34.3	42.5	91.1	314.2
<b>Total</b>	<b>1,899.6</b>	<b>2,750.2</b>	<b>2,642.8</b>	<b>2,102.8</b>	<b>1,455.3</b>	<b>1,910.3</b>	<b>12,760.9</b>
JUNE 1994							
per cent—							
Yes	73.6	73.4	75.8	71.6	63.0	49.7	68.9
No	24.6	24.2	22.4	26.8	34.1	45.6	28.6
Don't know	1.9	2.3	1.8	1.6	2.9	4.8	2.5
MAY 1992							
per cent—							
Yes	78.9	79.8	79.3	76.2	68.7	59.3	74.8
No	18.8	18.2	19.2	21.9	28.9	37.0	23.0
Don't know	2.3	2.1	1.5	1.8	2.4	3.7	2.2
DIFFERENCE: MAY 1992 TO JUNE 1994							
percentage point change—							
Yes	-5.3	6.4	-3.5	-4.6	-5.7	9.6	-5.9
No	5.8	6.0	3.2	4.9	5.2	8.6	5.6
Don't know	-0.4	0.2	0.3	-0.2	0.5	1.1	0.3



Environmental Concerns and Views

TABLE 1.5 ENVIRONMENTAL CONCERNS BY AGE GROUP, JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS(a)

<i>Environmental problem</i>	18-24	25-34	35-44	45-54	55-64	65 and over	Total
JUNE 1994							
—per cent—							
Air pollution	36.2	37.2	39.2	35.6	29.0	22.5	34.1
Ocean pollution	33.4	30.1	31.5	25.7	21.4	13.7	26.7
Destruction of trees/ecosystems	30.2	26.6	29.2	25.9	22.6	16.5	25.6
Freshwater pollution	25.9	27.3	30.2	27.4	24.4	15.0	25.5
Ozone layer	25.0	22.5	19.9	13.6	11.4	5.9	17.1
Garbage disposal	16.1	20.0	18.2	14.8	13.1	8.5	15.7
Extinction of species	18.1	14.7	15.5	11.6	10.6	7.8	13.3
Toxic chemical waste	12.5	12.4	14.3	13.7	9.3	6.9	11.9
Land degradation	9.0	9.1	12.5	10.4	9.3	6.1	9.6
Other pollution	9.0	10.1	10.5	10.1	8.3	5.6	9.1
Greenhouse effect	12.4	11.0	9.7	8.1	5.4	3.9	8.8
Resource conservation	8.2	9.1	10.3	8.4	7.8	5.7	8.5
Overpopulation	7.0	8.0	9.5	8.0	7.5	5.9	7.8
Use of pesticides	5.3	6.9	8.1	8.5	7.0	5.5	7.0
Nuclear tests/weapons	8.0	7.2	7.8	6.5	5.8	4.0	6.7
Use of uranium	5.2	3.8	4.0	3.5	3.0	1.9	3.6
Sand mining	2.1	2.1	2.5	1.8	1.7	1.3	2.0
Other	4.4	5.2	5.9	6.9	7.1	4.9	5.7
No concerns or don't know	26.4	26.6	24.2	28.4	37.0	50.3	31.1
MAY 1992							
—per cent—							
Air pollution	41.2	44.6	46.6	39.6	35.3	27.3	40.2
Ocean pollution	35.2	38.5	38.0	32.2	25.2	17.1	32.3
Destruction of trees/ecosystems	36.3	38.4	36.1	30.8	26.3	22.9	32.8
Freshwater pollution	28.9	34.8	34.4	30.0	26.7	19.1	29.9
Ozone layer	40.3	35.5	32.3	25.0	18.2	12.1	28.6
Garbage disposal	22.7	30.0	27.6	21.6	15.0	13.2	22.9
Extinction of species	22.1	25.0	22.3	16.8	13.6	10.6	19.3
Toxic chemical waste	20.0	26.8	27.3	21.4	14.6	10.7	21.3
Land degradation	11.8	17.5	19.8	15.4	13.6	10.2	15.3
Other pollution	14.7	16.2	16.5	13.7	11.8	8.7	14.1
Greenhouse effect	21.4	22.0	20.9	14.8	10.7	8.1	17.2
Resource conservation	14.1	18.4	18.0	14.6	12.1	9.2	15.0
Overpopulation	11.4	14.6	15.8	12.6	9.8	8.4	12.6
Use of pesticides	10.2	16.8	18.0	14.7	10.4	7.8	13.7
Nuclear tests/weapons	16.0	17.9	17.8	14.7	9.5	7.5	14.6
Use of uranium	8.2	11.3	10.5	8.2	5.6	3.9	8.5
Sand mining	4.0	5.9	6.3	4.5	2.5	2.2	4.6
Other	3.8	4.9	8.0	7.6	4.9	4.5	5.8
No concerns or don't know	21.1	20.2	20.7	23.8	31.3	40.7	25.2
DIFFERENCE: MAY 1992 TO JUNE 1994							
—percentage point change—							
Air pollution	-5.0	-7.4	-7.4	-4.0	-6.3	-4.8	-6.1
Ocean pollution	-1.8	8.4	-6.5	-6.5	-3.8	3.4	5.6
Destruction of trees/ecosystems	6.1	-11.8	-6.9	-4.9	3.7	-6.4	-7.2
Freshwater pollution	3.0	-7.5	-4.2	-2.6	2.3	-4.1	-4.4
Ozone layer	-15.3	-13.0	12.4	-11.4	-6.8	-6.2	-11.5
Garbage disposal	-6.6	10.0	-9.4	-6.8	-1.9	-4.7	-7.2
Extinction of species	4.0	-10.3	-6.8	-5.2	-3.0	-2.8	-6.0
Toxic chemical waste	7.5	-14.4	-13.0	-7.7	-5.3	-3.8	9.4
Land degradation	2.8	-8.4	-7.3	-5.0	-4.3	-4.1	-5.7
Other pollution	5.7	-6.1	-6.0	-3.6	-3.5	-3.1	-5.0
Greenhouse effect	-9.0	-11.0	-11.2	-6.7	-5.3	-4.2	-8.4
Resource conservation	-5.9	-9.3	-7.7	-6.2	-4.3	-3.5	-6.5
Overpopulation	-4.4	-6.6	6.3	-4.6	-2.3	-2.5	-4.8
Use of pesticides	-4.9	-9.9	9.9	-6.2	-3.4	-2.3	-6.7
Nuclear tests/weapons	-8.0	-10.7	-10.0	-8.2	-3.7	-3.5	-7.9
Use of uranium	-3.0	-7.5	-6.5	-4.7	-2.6	-2.0	-4.9
Sand mining	-1.9	3.8	3.8	-2.7	-0.8	-0.9	-2.6
Other	0.6	0.3	-2.1	-0.7	2.2	0.4	-0.1
No concerns or don't know	5.3	6.4	3.5	4.6	5.7	9.6	5.9

(a) Totals do not equal the sum of environmental problems in each column because a person may report more than one concern.

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In 1994, females showed a slightly higher level of concern about environmental problems compared with males for all age groups except 65 years and over. Males showed more of a decline in concern overall between 1992 and 1994.

**TABLE 1.6 CONCERN ABOUT ENVIRONMENTAL PROBLEMS BY SEX, JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS**

<i>Concern about environmental problems</i>	<i>Males</i>	<i>Females</i>	<i>Total</i>
JUNE 1994			
—per cent—			
Yes	67.7	70.0	68.9
No	29.8	27.5	28.6
Don't know	2.5	2.5	2.5
MAY 1992			
—per cent—			
Yes	75.3	74.2	74.8
No	22.8	23.2	23.0
Don't know	1.9	2.5	2.2
DIFFERENCE: MAY 1994 TO JUNE 1994			
—percentage point change—			
Yes	-7.6	-4.2	-5.9
No	7.0	4.3	5.6
Don't know	0.6	0.0	0.3

**TABLE 1.7 CONCERN ABOUT ENVIRONMENTAL PROBLEMS BY AGE AND SEX, JUNE 1994: PERCENTAGE OF PERSONS**

<i>Concern about environmental problems</i>	<i>18-24</i>	<i>25-34</i>	<i>35-44</i>	<i>45-54</i>	<i>55-64</i>	<i>65 and over</i>	<i>Total</i>
MALES							
per cent---							
Yes	70.8	71.6	75.2	70.5	59.6	50.1	67.7
No	27.3	26.2	22.9	28.0	36.1	46.1	29.8
Don't know	1.9	2.2	2.0	1.5	4.3	3.8	2.5
FEMALES							
---per cent---							
Yes	76.3	75.2	76.5	72.7	66.4	49.3	70.0
No	21.8	22.3	21.9	25.6	32.1	45.2	27.5
Don't know	1.8	2.4	1.6	1.7	1.5	5.5	2.5
TOTAL PERSONS							
—per cent—							
Yes	73.6	73.4	75.8	71.6	63.0	49.7	68.9
No	24.6	24.2	22.4	26.8	34.1	45.6	28.6
Don't know	1.9	2.3	1.8	1.6	2.9	4.8	2.5

## Environmental Concern: Labour Force Status

TABLE 1.8 CONCERN ABOUT ENVIRONMENTAL PROBLEMS, BY LABOUR FORCE STATUS, JUNE 1994 AND MAY 1992  
PERCENTAGE OF PERSONS

<i>Concern about environmental problems</i>	<i>Employed</i>	<i>Unemployed</i>	<i>Not in the Labour Force</i>	<i>Total</i>
JUNE 1994				
—'000—				
Yes	5,937.1	469.3	2,384.7	8,791.0
No	1,931.5	166.0	1,558.2	3,655.7
Don't know	138.1	25.0	151.0	314.2
<b>Total</b>	<b>8,006.7</b>	<b>660.3</b>	<b>4,093.9</b>	<b>12,760.9</b>
JUNE 1994				
—per cent—				
Yes	74.2	71.1	58.2	68.9
No	24.1	25.1	38.1	28.6
Don't know	1.7	3.8	3.7	2.5
MAY 1992				
—per cent—				
Yes	79.4	76.7	66.6	74.8
No	18.9	21.1	30.2	23.0
Don't know	1.6	2.2	3.2	2.2
DIFFERENCE: MAY 1992 TO JUNE 1994				
percentage point change				
Yes	-5.2	-5.6	-8.4	-5.9
No	5.2	4.0	7.9	5.6
Don't know	0.1	1.6	0.5	0.3

## Views on environmental protection and economic growth: States and Territories

In June 1994, 71 per cent of people ranked environmental protection and economic growth as being equally important, with a further 18 per cent ranking environmental protection as more important.

Over the two years between surveys, the change in ranking of the two objectives was barely significant overall. If anything, there was a marginal shift away from priority for the environment in a number of States.

As the questions were necessarily cast in somewhat simplified terms, the responses can only be regarded as indicative of general attitudes rather than of fully formed views.

TABLE 1.9 RANKING OF ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH, STATES AND TERRITORIES, JUNE 1994 AND MAY 1992: NUMBER AND PERCENTAGE OF PERSONS

	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
JUNE 1994									
—'000—									
Environment protection is <b>more important</b> than economic growth	776.3	535.2	428.2	200.8	237.7	44.2	18.0	46.5	2,286.8
Environment protection and economic growth are <b>equally important</b>	3,012.4	2,316.3	1,609.9	793.1	865.1	259.1	65.3	144.5	9,065.7
Environment protection is <b>less important</b> than economic growth	338.4	245.6	147.4	57.9	53.7	26.2	4.9	14.1	888.3
Cannot decide / no opinion	222.7	145.8	72.1	24.0	38.2	12.2	1.2	3.9	520.1
<b>Total persons</b>	<b>4,349.8</b>	<b>3,242.9</b>	<b>2,257.6</b>	<b>1,075.8</b>	<b>1,194.7</b>	<b>341.7</b>	<b>89.4</b>	<b>209.0</b>	<b>12,760.9</b>
JUNE 1994									
—per cent—									
Environment protection is <b>more important</b> than economic growth	17.8	16.5	19.0	18.7	19.9	12.9	20.1	22.2	17.9
Environment protection and economic growth are <b>equally important</b>	69.3	71.4	71.3	73.7	72.4	75.8	73.1	69.1	71.0
Environment protection is <b>less important</b> than economic growth	7.8	7.6	6.5	5.4	4.5	7.7	5.5	6.8	7.0
Cannot decide / no opinion	5.1	4.5	3.2	2.2	3.2	3.6	1.3	1.9	4.1
MAY 1992									
—per cent—									
Environment protection is <b>more important</b> than economic growth	19.5	17.5	18.2	20.9	19.3	13.4	19.4	24.4	18.8
Environment protection and economic growth are <b>equally important</b>	68.8	69.7	71.0	70.5	73.4	76.8	71.9	70.0	70.3
Environment protection is <b>less important</b> than economic growth	6.7	7.6	6.8	4.6	4.9	6.5	5.9	3.6	6.6
Cannot decide / no opinion	5.0	5.2	3.9	4.0	2.4	3.2	2.8	2.0	4.4

TABLE 1.9 RANKING OF ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH, STATES AND TERRITORIES, JUNE 1994 AND MAY 1992: NUMBER AND PERCENTAGE OF PERSONS—continued

DIFFERENCE: MAY 1992 TO JUNE 1994									
—percentage point change—									
Environment protection is <b>more important</b> than economic growth	-1.7	-1.0	0.8	-2.2	0.6	0.5	0.7	-2.2	-0.9
Environment protection and economic growth are <b>equally important</b>	0.5	1.7	0.3	3.2	-1.0	1.0	1.2	-0.9	0.7
Environment protection is <b>less important</b> than economic growth	1.1	0.0	0.3	0.8	-0.4	1.2	-0.4	3.2	0.4
Cannot decide / no opinion	0.1	0.7	-0.7	-1.8	0.8	0.4	-1.5	-0.1	-0.3

### Views on environmental protection and economic growth: Age and sex distributions

Between May 1992 and June 1994, the 18-24 year old age group showed the most noticeable shift from the category of those who believe that environmental protection is more important than economic growth, to those who place equal importance on both environmental protection and economic growth.

The number of people who put the economy ahead of protecting the environment showed a barely significant increase across most age groups.

TABLE 1.10 RANKING OF ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH BY AGE GROUP, JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS

	18-24	25-34	35-44	45-54	55-64	65 and over	Total
JUNE 1994							
—'000—							
Environment protection is <b>more important</b> than economic growth	424.1	538.6	497.3	297.4	204.5	324.9	2,286.8
Environment protection and economic growth are <b>equally important</b>	1,313.3	2,020.4	1,922.4	1,553.0	1,037.3	1,219.3	9,065.7
Environment protection is <b>less important</b> than economic growth	100.8	117.6	162.3	181.2	143.0	183.4	888.3
Cannot decide / no opinion	61.4	73.6	60.7	71.2	70.6	182.6	520.1
<b>Total</b>	<b>1,899.6</b>	<b>2,750.2</b>	<b>2,642.8</b>	<b>2,102.8</b>	<b>1,455.3</b>	<b>1,910.3</b>	<b>12,760.9</b>
JUNE 1994							
per cent							
Environment protection is <b>more important</b> than economic growth	22.3	19.6	18.8	14.1	14.0	17.0	17.9
Environment protection and economic growth are <b>equally important</b>	69.1	73.5	72.7	73.9	71.3	63.8	71.0
Environment protection is <b>less important</b> than economic growth	5.3	4.3	6.1	8.6	9.8	9.6	7.0
Cannot decide / no opinion	3.2	2.7	2.3	3.4	4.9	9.6	4.1

**TABLE 1.10 RANKING OF ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH BY AGE GROUP,  
JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS—continued**

	MAY 1992						
	—per cent—						
Environment protection is <b>more important</b> than economic growth	27.0	20.3	17.8	17.0	13.6	15.0	18.8
Environment protection and economic growth are <b>equally important</b>	65.7	72.9	74.0	72.1	71.4	62.8	70.3
Environment protection is <b>less important</b> than economic growth	4.7	4.1	5.2	7.1	9.7	11.3	6.6
Cannot decide / no opinion	2.7	2.7	3.0	3.9	5.3	10.9	4.4
	DIFFERENCE: MAY 1992 TO JUNE 1994						
	—percentage point change						
Environment protection is <b>more important</b> than economic growth	-4.7	0.7	1.0	-2.9	0.4	2.0	0.9
Environment protection and economic growth are <b>equally important</b>	3.4	0.6	-1.3	1.8	0.1	1.0	0.7
Environment protection is <b>less important</b> than economic growth	0.6	0.2	0.9	1.5	0.1	-1.7	0.4
Cannot decide / no opinion	0.5	0.0	0.7	-0.5	-0.4	-1.3	0.3

Between 1992 and 1994, females showed a small increase in the percentage of those ranking environmental protection and economic growth as equally important (from 70.5% to 72.8%).

TABLE 1.11 RANKING OF ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH BY SEX, JUNE 1994 AND MAY 1992: PERCENTAGE OF PERSONS

	<i>Males</i>	<i>Females</i>	<i>Total</i>
JUNE 1994			
—per cent			
Environment protection is <b>more important</b> than economic growth	18.2	17.7	17.9
Environment protection and economic growth are <b>equally important</b>	69.2	72.8	71.0
Environment protection is <b>less important</b> than economic growth	8.6	5.4	7.0
Cannot decide / no opinion	4.0	4.2	4.1
MAY 1992			
—per cent—			
Environment protection is <b>more important</b> than economic growth	18.1	19.4	18.8
Environment protection and economic growth are <b>equally important</b>	70.0	70.5	70.3
Environment protection is <b>less important</b> than economic growth	7.9	5.2	6.6
Cannot decide / no opinion	4.0	4.8	4.4
DIFFERENCE: MAY 1992 TO JUNE 1994			
—percentage point change			
Environment protection is <b>more important</b> than economic growth	0.1	1.7	-0.9
Environment protection and economic growth are <b>equally important</b>	-0.8	2.3	0.7
Environment protection is <b>less important</b> than economic growth	0.7	0.2	0.4
Cannot decide / no opinion	0.0	0.6	-0.3

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**TABLE 1.12 RANKING OF ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH BY AGE GROUP AND SEX, JUNE 1994: PERCENTAGE OF PERSONS**

	18-24	25-34	35-44	45-54	55-64	65 and over	Total
MALES							
—per cent—							
Environment protection is <b>more important</b> than economic growth	23.6	20.2	19.8	14.0	14.0	15.3	18.2
Environment protection and economic growth are <b>equally important</b>	65.7	71.9	69.4	72.9	66.9	66.0	69.2
Environment protection is <b>less important</b> than economic growth	7.2	5.1	8.3	10.1	12.9	10.8	8.6
Cannot decide / no opinion	3.4	2.9	2.6	3.0	6.2	8.0	4.0
FEMALES							
—per cent—							
Environment protection is <b>more important</b> than economic growth	21.0	19.0	17.9	14.3	14.1	18.4	17.7
Environment protection and economic growth are <b>equally important</b>	72.6	75.0	76.0	74.8	75.7	62.1	72.8
Environment protection is <b>less important</b> than economic growth	3.4	3.5	4.1	7.1	6.7	8.7	5.4
Cannot decide / no opinion	3.0	2.5	2.0	3.8	3.5	10.8	4.2
TOTAL PERSONS							
—per cent—							
Environment protection is <b>more important</b> than economic growth	22.3	19.6	18.8	14.1	14.0	17.0	17.9
Environment protection and economic growth are <b>equally important</b>	69.1	73.5	72.7	73.9	71.3	63.8	71.0
Environment protection is <b>less important</b> than economic growth	5.3	4.3	6.1	8.6	9.8	9.6	7.0
Cannot decide / no opinion	3.2	2.7	2.3	3.4	4.9	9.6	4.1



## International comparison

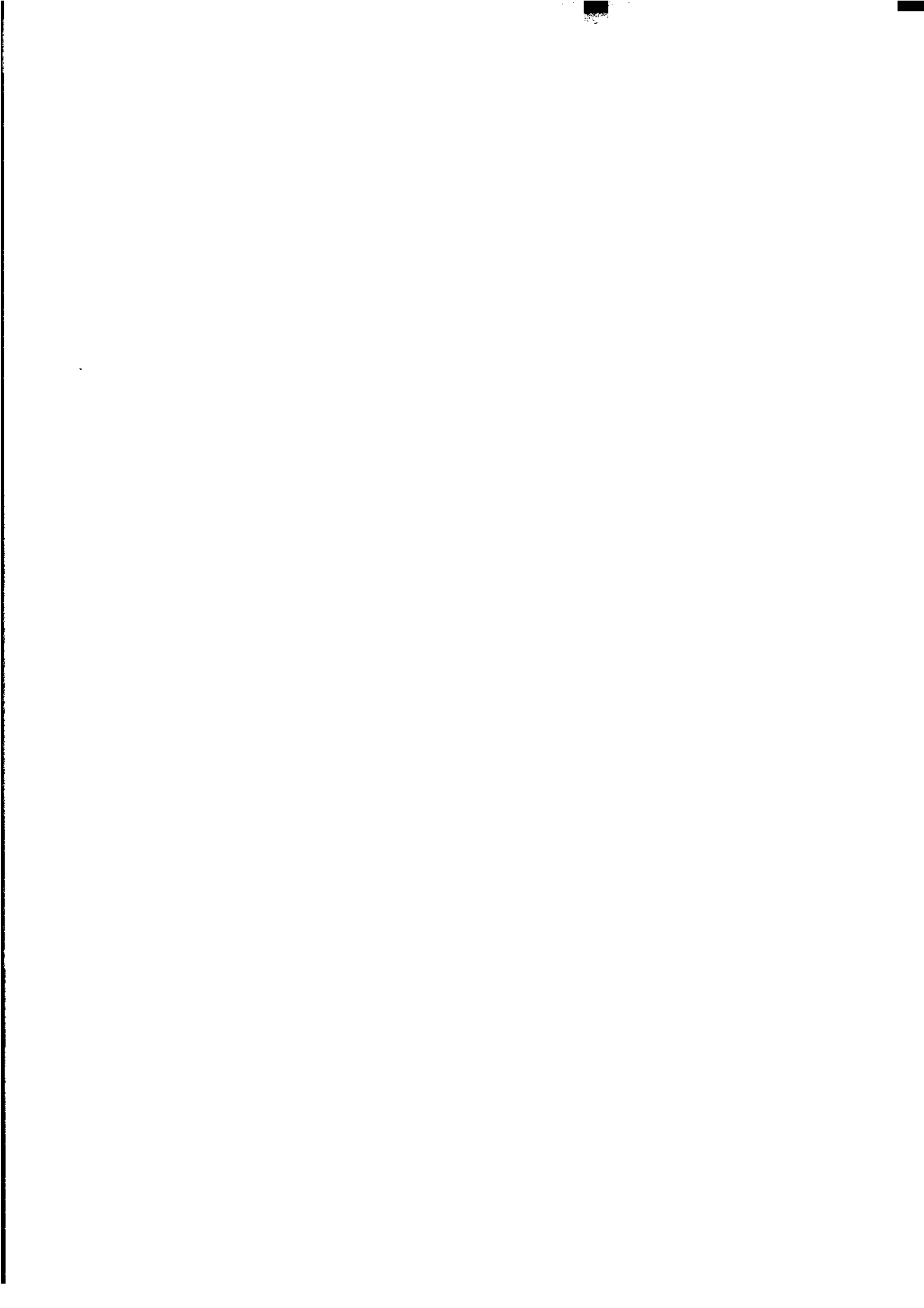
In the following table the results from the May 1992 and June 1994 surveys are compared with results from public opinion surveys carried out in Japan, the USA, Finland, Norway and European Community countries as compiled by the OECD. The survey design and the style and wording of questions varied from country to country, so this comparison is, at best, indicative. The data are expressed in percentages of the total number of persons interviewed.

TABLE 1.13 PUBLIC OPINION : ENVIRONMENT PROTECTION VS ECONOMIC GROWTH TRADEOFF

	Year	Number of Interviews	Priority to Environmental Protection(%)	Both are possible(%)	Priority to Economic Growth(%)	Don't know(%)	Total (%)
Australia	1994	13 412	18	71	7	4	100
Australia	1992	14 425	19	70	7	4	100
USA	1990	1 223	71	n.a.	19	10	100
Japan	1990	3 753	36	43	8	13	100
Finland	1989	1 985	63	26	6	5	100
Iceland	1992	1 000	73	..	20	7	100
Norway	1990	1 506	48	49	1	2	100
Belgium	1992	1 000	23	67	5	5	100
Denmark	1992	1 000	34	61	2	4	100
France	1992	1 000	13	79	5	4	100
Germany	1992	2 000	29	66	3	2	100
Greece	1992	1 000	21	71	6	3	100
Ireland	1992	1 000	15	59	12	14	100
Italy	1992	1 000	18	71	4	6	100
Luxembourg	1992	500	28	59	6	7	100
Netherlands	1992	1 000	31	65	2	2	100
Portugal	1992	1 000	18	62	9	11	100
Spain	1992	1 000	19	69	6	6	100
United Kingdom	1992	1 300	25	66	5	5	100

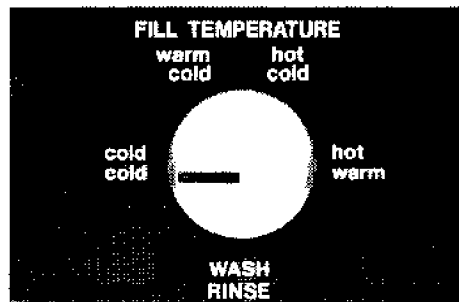
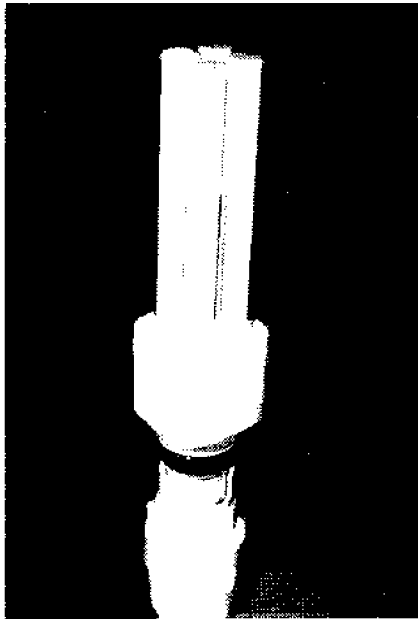
n.a. - not asked.

(Source: OECD Environmental Data Compendium 1993, *Environmental Issues-People's Views and Practices*, ABS Catalogue Number 4602.0)

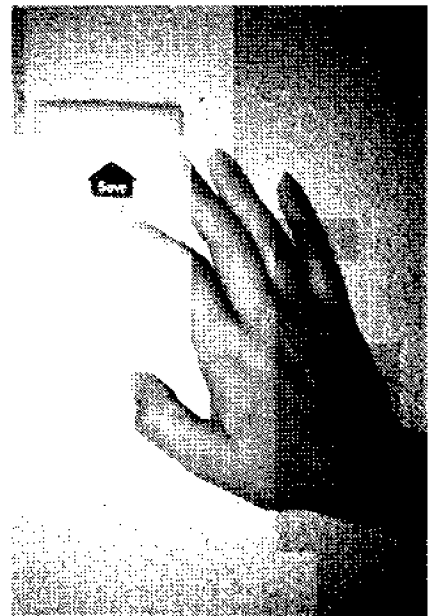
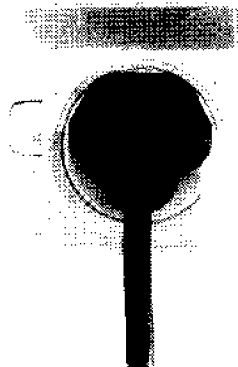


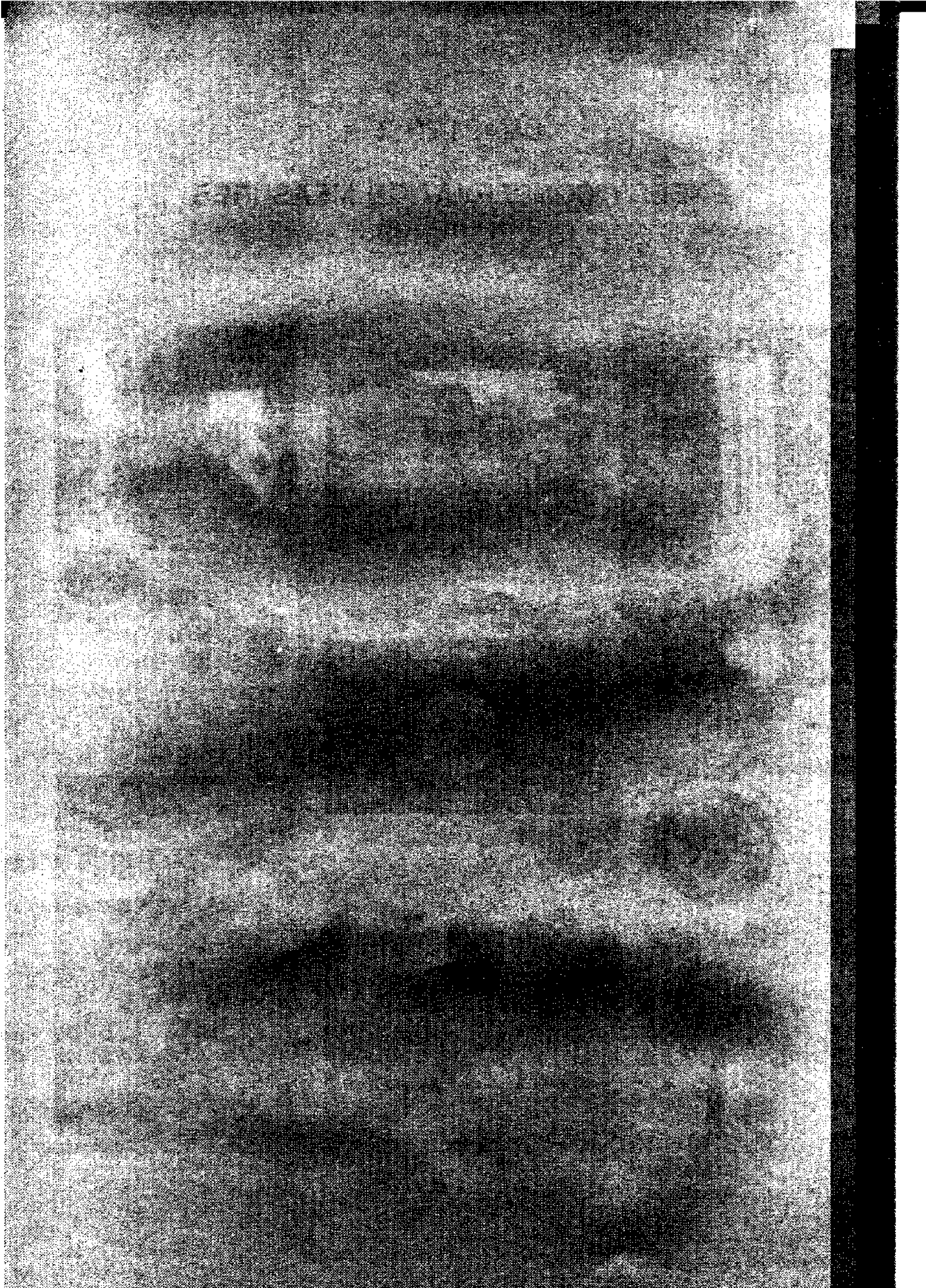
## CHAPTER 2

# ENERGY CONSERVATION MEASURES



TIME





## CHAPTER 2

### ENERGY CONSERVATION MEASURES

In the June 1994 survey, questions were asked relating to housing features that affect the energy consumption of households such as insulation, window treatments and solar exposure.

#### Main Findings

- Just over half of Australian dwellings have some form of insulation.
- Achieving comfort is the main reason for insulation having been installed.
- Cost is the main factor discouraging people from installing insulation.
- Outside awnings or shutters are the principal form of window treatment.
- The rooms which receive the most winter sunlight are the lounge, living and bedrooms.

## Insulation: States and Territories

Almost half of the households surveyed have dwellings with no insulation. Queensland has the most non-insulated dwellings (72%), and the Australian Capital Territory the least (21%). Of those homes with insulation, the main locations of insulation are the roof and ceiling (51%), and walls (13%). Floor and other forms of insulation are rare.

Table 2.2 relates to households that have themselves installed the insulation in their present dwelling and are therefore able to provide reasons for so doing. The majority of such households have installed insulation mainly to achieve interior comfort (76%), followed distantly by cost savings (16%). In the Northern Territory, a very high 94% of these households indicated that interior comfort was their main objective.

The cost of buying and installing insulation was indicated as the major reason why owner households do not have insulation in their homes (33%). However, in both the Northern Territory and Queensland, 29% of these households indicated that insulation was not needed because of the climate. Nearly 19 percent indicated that they had not considered or were not interested in the issue of insulation.

**TABLE 2.1 INSULATION INSTALLED, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

<i>Whether/where installed</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
	—'000—								
Roof/ceiling	927.5	1,100.7	298.6	398.8	314.6	109.4	19.9	79.8	3,249.3
Walls	250.5	306.8	83.9	100.4	20.3	29.9	4.9	25.8	822.4
Floor	6.6	8.4	2.3	1.1	**	1.1	0.4	1.1	20.9
Other	3.0	1.2	1.3	1.7	1.9	0.3	**	0.3	9.7
Dwelling not insulated	1,197.5	489.7	817.5	157.5	293.1	67.0	25.9	21.3	3,069.6
<b>Total dwellings(a)</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
	per cent								
Roof/ceiling	43.0	68.5	26.1	70.3	51.5	60.8	43.1	77.1	50.7
Walls	11.6	19.1	7.3	17.7	3.3	16.6	10.5	24.9	12.8
Floor	0.3	0.5	0.2	0.2	**	0.6	0.8	1.0	0.3
Other	0.1	0.1	0.1	0.3	0.3	0.2	**	0.3	0.2
Dwelling not insulated	55.5	30.5	71.5	27.8	48.0	37.3	56.1	20.5	47.9

(a) Totals do not equal the sum of insulation locations in each column as more than one location may be specified.

**TABLE 2.2 DWELLINGS WITH INSULATION INSTALLED BY PRESENT HOUSEHOLD : MAIN REASON INSTALLED, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

<i>Main reason</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
	—'000—								
Achieve comfort	485.7	427.6	179.8	157.9	159.4	48.8	5.8	23.9	1,488.9
Save on energy bills	72.8	165.6	9.3	32.4	19.0	11.0	0.2	8.1	318.4
Reduce energy use	24.3	43.2	7.9	8.2	2.9	3.8	**	4.9	95.1
Other	15.3	11.5	11.8	2.3	3.7	0.5	0.2	0.8	46.0
<b>Total dwellings</b>	<b>598.1</b>	<b>647.9</b>	<b>208.8</b>	<b>200.8</b>	<b>185.1</b>	<b>64.0</b>	<b>6.2</b>	<b>37.7</b>	<b>1,948.5</b>
	— per cent—								
Achieve comfort	81.2	66.0	86.1	78.6	86.2	76.2	94.3	63.5	76.4
Save on energy bills	12.2	25.6	4.5	16.2	10.3	17.1	3.0	21.6	16.3
Reduce energy use	4.1	6.7	3.8	4.1	1.6	5.9	**	12.9	4.9
Other	2.6	1.8	5.6	1.1	2.0	0.8	2.6	2.1	2.4

**TABLE 2.3 DWELLINGS WITHOUT INSULATION : MAIN REASON DWELLING NOT INSULATED, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

Main reason	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
	---'000---								
Cost	171.4	66.4	141.4	14.1	64.3	13.3	1.1	1.1	473.0
Not interested	120.6	35.0	78.5	5.1	19.0	6.9	1.5	0.5	267.1
Not needed (climate)	73.7	8.0	130.5	8.1	21.9	2.1	2.0	**	246.3
Haven't got around to it	85.1	36.2	34.3	11.0	15.6	7.2	0.4	0.8	190.6
Dwelling construction	51.6	13.3	25.4	2.7	7.6	2.3	1.4	0.2	104.5
Other	48.6	14.4	28.3	4.6	19.7	3.8	0.3	**	119.5
Not home owner	8.2	1.8	8.1	1.0	2.2	0.3	**	**	21.6
<b>Total dwellings</b>	<b>559.1</b>	<b>175.0</b>	<b>446.4</b>	<b>46.7</b>	<b>150.3</b>	<b>36.0</b>	<b>6.7</b>	<b>2.5</b>	<b>1,422.6</b>
	per cent								
Cost	30.6	37.9	31.7	30.1	42.8	37.1	16.6	42.3	33.2
Not interested	21.6	20.0	17.6	11.0	12.7	19.2	22.4	20.2	18.8
Not needed (climate)	13.2	4.6	29.2	17.5	14.6	5.8	29.6	**	17.3
Haven't got around to it	15.2	20.7	7.7	23.6	10.4	20.0	6.6	31.3	13.4
Dwelling construction	9.2	7.6	5.7	5.9	5.0	6.5	20.8	6.1	7.3
Other	8.7	8.2	6.3	9.8	13.1	10.5	4.1	**	8.4
Not home owner	1.5	1.0	1.8	2.2	1.5	0.9	**	**	1.5

**TABLE 2.4 DWELLINGS INSULATED, BY STATISTICAL REGION WITHIN STATE, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

Dwelling insulated	New South Wales							Victoria					
	Sydney	Hunter	Illa-warra	Rich-mond-Tweed-Mid-North Coast	Nth-Nth Western-Far West	South Eastern	Murray-Murrumbidgee	Mel-bourne	Barwon-Western District	Central High-lands-Wimmera	Loddon-Mallee-Campaspe	Goul-burn-Ovens-Murray	All Gipps-land
	'000												
Yes	540.5	94.5	59.0	53.1	94.2	55.3	63.5	772.9	90.5	52.3	69.9	66.5	64.5
No	560.6	71.9	59.6	72.3	55.8	13.0	17.0	192.6	29.0	14.3	16.3	10.1	10.7
Don't know	224.9	35.7	17.1	30.5	22.9	3.7	12.5	160.8	10.1	8.2	14.0	14.0	9.6
<b>Total dwellings</b>	<b>1,326.0</b>	<b>202.1</b>	<b>135.8</b>	<b>155.9</b>	<b>172.9</b>	<b>72.0</b>	<b>93.0</b>	<b>1,126.3</b>	<b>129.6</b>	<b>74.8</b>	<b>100.2</b>	<b>90.6</b>	<b>84.9</b>
	per cent												
Yes	40.8	46.8	43.5	34.1	54.5	76.9	68.3	68.6	69.8	69.9	69.8	73.4	76.0
No	42.3	35.6	43.9	46.4	32.3	18.0	18.3	17.1	22.4	19.1	16.2	11.2	12.7
Don't know	17.0	17.6	12.6	19.5	13.2	5.1	13.4	14.3	7.8	11.0	14.0	15.4	11.3

Dwelling insulated	Queensland					South Australia					
	Brisbane	South and East Moreton	North and West Moreton	Wide Bay-Burnett	Mackay-Fitzroy-Central West	Darling Downs-South West	Northern-north West	Far North	Adelaide	South and Eastern SA	North and Western SA
	---'000---										
Yes	150.1	33.5	36.9	19.2	30.7	25.6	14.3	15.0	306.1	68.7	35.0
No	272.1	54.7	48.1	53.8	54.3	43.3	46.7	40.0	62.6	14.7	11.9
Don't know	93.5	25.3	18.3	11.5	19.6	15.1	7.6	13.6	52.7	9.0	6.5
<b>Total dwellings</b>	<b>515.7</b>	<b>113.4</b>	<b>103.3</b>	<b>84.5</b>	<b>104.6</b>	<b>83.9</b>	<b>68.6</b>	<b>68.7</b>	<b>421.5</b>	<b>92.4</b>	<b>53.4</b>
	per cent---										
Yes	29.1	29.5	35.7	22.7	29.3	30.5	20.8	21.9	72.6	74.3	65.6
No	52.8	48.2	46.6	63.7	51.9	51.6	68.1	58.2	14.9	15.9	22.4
Don't know	18.1	22.3	17.7	13.6	18.7	18.0	11.1	19.9	12.5	9.7	12.1

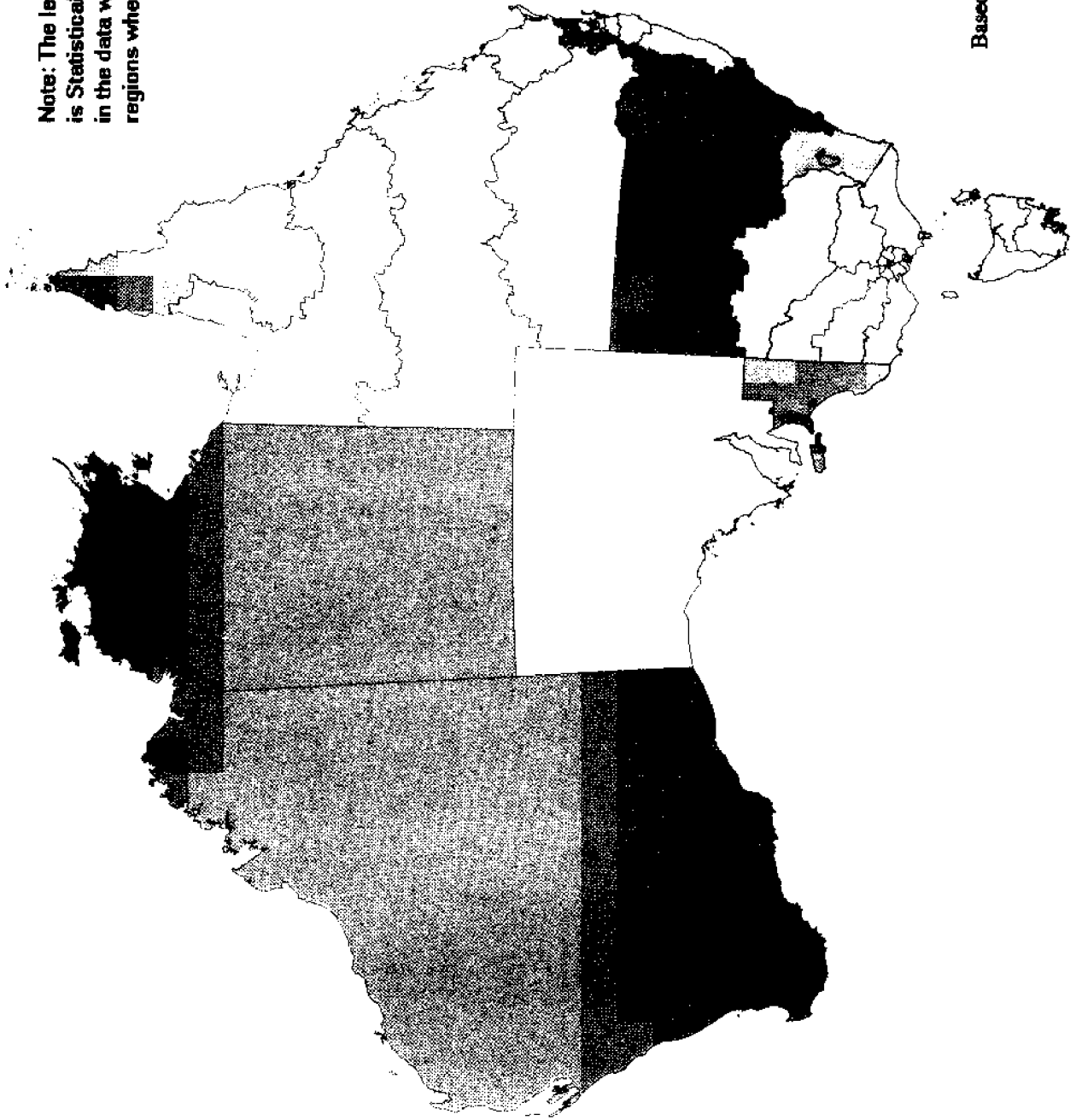
**TABLE 2.4 DWELLINGS INSULATED, BY STATISTICAL REGION WITHIN STATE, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS - continued**

Dwelling insulated	Western Australia			Tasmania			Mersey-Lyell	Northern Territory	Australian Capital Territory	Australia
	Perth	Lower Western WA	Balance WA	Greater Hobart	Southern	Northern				
	— '000 —									
Yes	248.1	37.2	32.2	44.2	8.2	34.3	26.2	20.3	82.3	3,344.9
No	156.1	36.9	31.2	20.6	6.4	15.8	9.1	13.1	10.0	2,124.8
Don't know	51.0	6.5	11.4	8.2	0.2	3.7	3.2	12.8	11.2	944.7
<b>Total dwellings</b>	<b>455.2</b>	<b>80.6</b>	<b>74.9</b>	<b>72.9</b>	<b>14.7</b>	<b>53.8</b>	<b>38.5</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
	— per cent —									
Yes	54.5	46.2	43.0	60.6	55.5	63.8	68.1	43.9	79.5	52.1
No	34.3	45.8	41.7	28.2	43.5	29.4	23.6	28.4	9.7	33.1
Don't know	11.2	8.0	15.2	11.2	1.1	6.8	8.3	27.6	10.8	14.7



# Dwellings with insulation

Statistical Region, June 1994



Note: The level of geographic resolution is Statistical Region. There will be variations in the data within regions, and areas within regions where the data does not apply.

Dwellings (%)  
More than 70  
55 to 70  
35 to 55  
Less than 35

Based on 1991 Statistical Region Boundaries

© Commonwealth of Australia, 1995

## Insulation: Household Type

Single person households gave highest ranking (82%) to achieving comfort as the major consideration regarding installation of insulation in their dwellings. Households consisting of a couple with dependent child(ren) were the group with most concern about reducing costs (19%).

Over twice as many one-parent families have not insulated their homes because of the cost (54%), compared with couples (26%). One-person households were the group most frequently reporting design limitations, perhaps reflecting their occupancy of units.

**TABLE 2.5 OCCUPIED DWELLINGS WITH INSULATION INSTALLED BY PRESENT HOUSEHOLD : MAIN REASON INSTALLED BY HOUSEHOLD TYPE, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

Main reason	One person	Couple only	Other households with all members over 15	Couple, dependent child(ren)	One parent, dependent child(ren)	All other households	Total
—'000—							
Achieve comfort	231.1	444.7	278.7	415.7	31.9	86.9	1,488.9
Save on energy costs	33.8	87.4	61.8	111.3	5.8	18.3	318.4
Reduce energy use	7.1	27.2	14.3	40.8	2.2	3.6	95.1
Other	8.8	12.7	6.8	10.8	1.3	5.5	46.0
<b>Total dwellings</b>	<b>280.7</b>	<b>572.0</b>	<b>361.7</b>	<b>578.7</b>	<b>41.1</b>	<b>114.3</b>	<b>1,948.5</b>
—per cent—							
Achieve comfort	82.3	77.7	77.1	71.8	77.5	76.0	76.4
Save on energy costs	12.0	15.3	17.1	19.2	14.1	16.0	16.3
Reduce energy use	2.5	4.8	3.9	7.1	5.3	3.1	4.9
Other	3.1	2.2	1.9	1.9	3.0	4.8	2.4

**TABLE 2.6 OCCUPIED DWELLINGS WITHOUT INSULATION : MAIN REASON DWELLING NOT INSULATED BY HOUSEHOLD TYPE, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

Main reason	One person	Couple only	Other households with all members over 15	Couple, dependent child(ren)	One parent, dependent child(ren)	All other households	Total
—'000—							
Cost	98.2	95.2	70.8	152.0	15.7	41.2	473.0
Not interested	79.3	72.6	40.7	44.6	3.8	26.2	267.1
Not needed (climate)	56.3	89.1	35.0	46.3	0.8	18.9	246.3
Haven't got around to it	38.4	50.8	31.1	51.5	3.1	15.7	190.6
Dwelling construction	46.2	18.6	10.0	19.7	2.4	7.6	104.5
Other	27.1	38.2	22.2	25.6	1.0	5.5	119.5
Not home owner							
<b>Total dwellings</b>	<b>353.1</b>	<b>367.3</b>	<b>211.6</b>	<b>342.2</b>	<b>29.1</b>	<b>119.4</b>	<b>1,422.6</b>
—per cent—							
Cost	27.8	25.9	33.4	44.4	53.9	34.5	33.2
Not interested	22.5	19.8	19.2	13.0	12.9	21.9	18.8
Not needed (climate)	15.9	24.3	16.5	13.5	2.9	15.8	17.3
Haven't got around to it	10.9	13.8	14.7	15.0	10.7	13.1	13.4
Dwelling construction	13.1	5.1	4.7	5.8	8.4	6.3	7.3
Other	7.7	10.4	10.5	7.5	3.4	4.6	8.4
Not home owner	2.2	0.8	0.9	0.8	7.8	3.7	1.5

## Insulation: Dwelling type

Separate houses have the highest incidence of roof and ceiling insulation (57%), followed by single storey semi-detached, terrace and townhouses (39%). Apart from non-categorised dwellings, separate houses also have the highest percentage of wall insulation.

Over the decade to 1994 there has been a 7 percentage point increase in the proportion of dwellings with roof and ceiling insulation, whereas there has been only a marginal increase in the use of wall insulation. South Australia and Tasmania have shown the largest proportional increase in the use of roof and ceiling insulation.

TABLE 2.7 INSULATION INSTALLED BY TYPE OF DWELLING, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS(a)

Whether/where installed	Semi-detached/terrace/ town house				Other flat/unit/apartment in a block				Total
	Separate house	1 storey	2 or more storeys	Flat attached to house	1 or 2 storeys	3 storeys	4 or more storeys	Other	
—'000—									
Roof/ceiling	2,953.4	131.6	34.6	9.3	82.4	13.3	6.0	18.7	3,249.3
Walls	770.6	17.7	5.1	1.5	11.1	1.9	3.4	11.1	822.4
Floor	18.5	0.7	**	**	0.4	0.2	**	1.1	20.9
Other	7.2	1.0	**	**	0.7	0.7	**	**	9.7
Dwelling not insulated	2,147.1	204.1	78.3	22.4	353.0	185.3	49.5	29.9	3,069.6
<b>Total dwellings</b>	<b>5,182.0</b>	<b>339.2</b>	<b>113.4</b>	<b>31.6</b>	<b>441.1</b>	<b>200.5</b>	<b>56.9</b>	<b>49.8</b>	<b>6,414.5</b>
per cent									
Roof/ceiling	57.0	38.8	30.5	29.3	18.7	6.6	10.6	37.5	50.7
Walls	14.9	5.2	4.5	4.7	2.5	1.0	6.0	22.3	12.8
Floor	0.4	0.2	**	**	0.1	0.1	**	2.3	0.3
Other	0.1	0.3	**	**	0.2	0.4	**	**	0.2
Dwelling not insulated	41.4	60.2	69.1	70.7	80.0	92.4	87.0	59.9	47.9

(a) Totals do not equal the sum of insulation locations in each column as more than one location may be specified.

TABLE 2.8 DWELLINGS WITH INSULATION INSTALLED BY PRESENT HOUSEHOLD: MAIN REASON INSTALLED BY TYPE OF DWELLING, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS

Whether/where installed	Semi-detached/terrace/ town house				Other flat/unit/apartment in a block				Total
	Separate house	1 storey	2 or more storeys	Flat attached to house	1 or 2 storeys	3 storeys	4 or more storeys	Other	
—'000—									
Achieve comfort	1,411.8	41.6	6.0	1.8	19.7	2.3	**	5.7	1,488.9
Save on energy costs	302.8	9.6	1.5	**	3.4	**	0.7	0.5	318.4
Reduce energy use	92.6	0.4	**	**	1.2	**	0.9	**	95.1
Other	41.6	0.5	0.5	1.3	1.2	**	0.5	0.5	46.0
<b>Total dwellings</b>	<b>1,848.8</b>	<b>52.1</b>	<b>8.0</b>	<b>3.1</b>	<b>25.5</b>	<b>2.3</b>	<b>2.1</b>	<b>6.7</b>	<b>1,948.5</b>
—per cent—									
Achieve comfort	76.4	79.9	75.2	57.3	77.3	100.0	**	85.5	76.4
Save on energy costs	16.4	18.3	18.8	**	13.2	**	34.3	7.6	16.3
Reduce energy use	5.0	0.8	**	**	4.7	**	42.2	**	4.9
Other	2.2	0.9	6.1	42.7	4.8	**	23.5	6.9	2.4

TABLE 2.9 DWELLINGS : LOCATION OF INSULATION, STATES AND TERRITORIES: JUNE 1994 AND 1983  
PERCENTAGE OF DWELLINGS WITH INSULATION

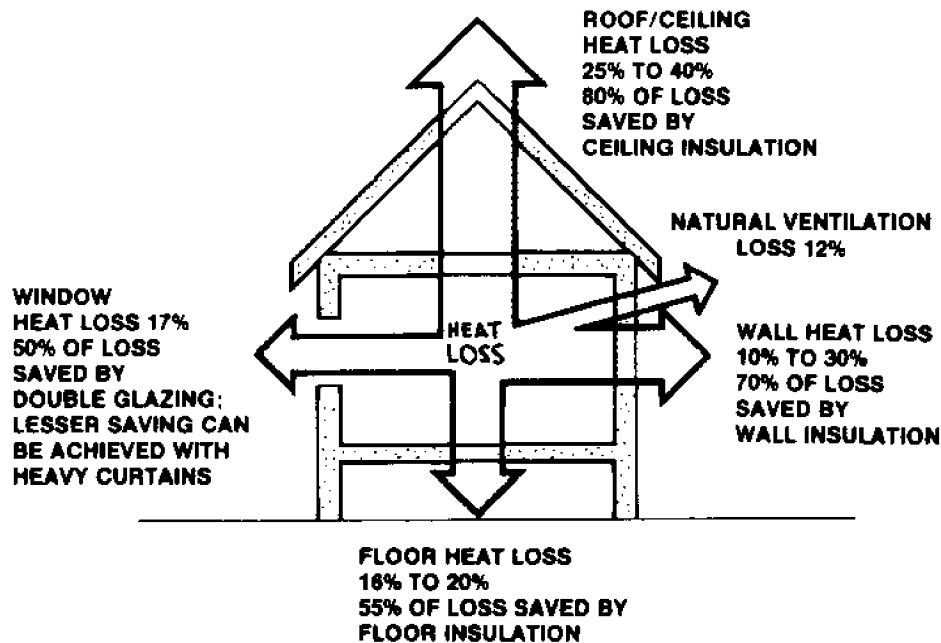
<i>Insulation location</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
JUNE 1994									
—per cent—									
Roof/ceiling	43.0	68.5	26.1	70.3	51.5	60.8	43.4	77.1	50.7
Wall	11.6	19.1	7.3	17.7	3.3	16.6	10.5	24.9	12.8
JUNE 1983									
—per cent—									
Roof/ceiling	41.1	59.4	16.6	55.6	39.2	40.0	39.8	73.6	43.7
Wall	11.2	18.1	9.4	9.2	4.6	15.0	10.4	15.6	12.1

(Source: National Energy Survey, ABS Cat. No. 8212.0, and Environmental Issues, June 1994, ABS Cat. No. 4602.0).

## Insulation

Insulation is a means of reducing the rate of transfer of heat from the interior to the exterior of a house in the winter and from the exterior to the interior in summer by creating a thermal barrier. Generally, given that hot air rises, the maximum benefit occurs with the ceiling being insulated first, followed by the walls, and then the floors. The savings can be approximately 20% of summer cooling and 25% of winter heating energy costs. This will vary depending on the type of insulation chosen, where it is located, and the materials of which the house is constructed, the glass to wall space ratio and any shading of the dwelling.

The following diagram shows how much heat can be lost through the various parts of a house and how insulation can help prevent some of that rate of loss.



(Source: reprinted from CHOICE July 1989 with the permission of the Australian Consumers' Association (ACA))

Insulation's resistance to heat flow is described by R-values. The higher the rating, the better the thermal performance. In Australia, the R-values normally required for ceilings range from 1 to 4. Standards Australia's AS 2627 Part 1 recommends R1.5 for Perth and Sydney; R2 for Adelaide and Brisbane; R2.5 for Melbourne; and R3.5 for Canberra and Hobart.

Insulation comes in a number of different forms. The fibreglass type is made from molten glass spun into fibres and can be either loose, which is blown or pumped into the roof space, or in batts which are small blocks of fibreglass bound together with resin. Rockwool is derived from molten basalt rock which is spun into a mat of fine fibres. Fibreglass and rockwool are sometimes collectively referred to as mineral wool. Cellulose fibre is manufactured from waste paper and is another loose product which is blown into the ceiling. Sisalation, or reflective foil laminates, are either a single or double sided aluminium foil roll on a base material (normally paper). Foam type insulation comes in two varieties, urea formaldehyde and polyurethane. Some local government councils prohibit the use of foam in walls as it can completely fill the cavity and transmit moisture. Polystyrene sheets are lightweight and possess a high R-value relative to their thickness. Polystyrene can be most suitable in situations where space is limited, for example, metal decking roofs and cathedral ceilings.

(Source: New South Wales Department of Energy (1988) *Home Energy Guide: an energy saving guide for domestic consumers*. Choice (1989) Australian Consumers' Association, July)

## Window Treatments: States and Territories

Fifty five percent of households in Australia have not used any of the window treatments listed in the survey. Outside awnings or shutters are used by 28% of households, and 19.5% have boxed pelmets on curtains or blinds. Residents in the hotter climates (Queensland, Western Australia and the Northern Territory) make greater use of tinted and solar guarded windows.

TABLE 2.10 WINDOW TREATMENTS, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS(a)

<i>Window feature</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
	— '000 —								
Outside awnings or shutters	512.9	553.6	326.1	213.1	129.9	13.7	10.2	25.2	1,784.6
Boxed pelmets on curtains or blinds	365.7	431.8	159.7	122.3	107.6	45.5	5.0	21.4	1,250.1
Tinted glass/solar guarding	121.2	48.8	159.2	45.8	85.1	4.8	8.1	4.6	477.6
Double glazing	26.9	21.1	7.2	3.7	7.6	2.5	0.6	1.2	70.7
None of the above	1,315.2	775.4	621.1	262.2	346.9	120.7	26.6	60.8	3,528.9
<b>Total dwellings</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
	—per cent—								
Outside awnings or shutters	23.8	34.5	28.5	37.6	21.3	7.6	22.0	24.3	27.8
Boxed pelmets on curtains or blinds	17.0	26.9	13.2	21.6	17.6	25.3	10.8	20.7	19.5
Tinted glass/solar guarding	5.6	3.0	13.9	8.1	13.9	2.7	17.5	4.5	7.4
Double glazing	1.2	1.3	0.6	0.7	1.3	1.4	1.4	1.1	1.1
None of the above	61.0	48.3	54.4	46.2	56.8	67.1	57.6	58.7	55.0

(a) Totals do not equal the sum of window features in each column as more than one may be specified.

## Windows

A factor affecting a dwelling's energy consumption is the location and size of its windows. Windows can account for 10 per cent to 25 per cent of household heat loss. They also lose a great deal more heat in winter than well insulated walls. For example, a square metre of standard wood frame wall with 85mm of insulation will lose approximately 0.586 watts per hour when the temperature outside is 0°C and 20°C inside. A square metre of single pane glass, with the same outdoor and indoor temperatures, will lose approximately 12.6 watts per hour or 21 times more energy. In addition, windows let in approximately ten times more heat than an average wall of the same area.

One method of preventing excessive heat loss through glass is to hang heavy curtains in front of them. To increase their effectiveness, a pelmet should be installed on the wall just above the curtain rod. A pelmet is a closed box which reduces air flow at the top of the curtain. Without a pelmet, when the warm air in a room rises, it meets the ceiling and proceeds down the walls. If this air passes over a window, the heat will escape through the glass and the cooled air will descend to the floor and create a draught. A pelmet will prevent the warm air from within the house getting behind the curtain and creating the circulation which results in heat transferring out through the window.

Another alternative is to install windows which consist of two panes of glass with a layer of dry air in between them. This type of window is commonly referred to as double glazing or insulating glass units. Because air is a natural insulator, the design reduces heat loss in winter and heat gain in summer. If a reflective coating is applied to the air space surface of the inner and outer glass, the insulating properties of these types of windows can be increased.

Better energy conservation can also be created by the outside shading of windows to keep the sun off the glass during the summer. This can be achieved by planting deciduous trees in front of them, protecting them by overhanging eaves or awnings, or applying reflective coating. One of the most effective glazing materials under development is variable transmission glazing or "smart windows". Smart windows can change their light transmission properties depending on the amount of incoming light or heat. Some can automatically darken in response to strong sunlight as the salt crystals used in their construction react to the sunlight intensity. Others can dim in response to an electrical signal being passed through them generated and controlled by the space air conditioning system.

*(Source: New South Wales Department of Energy (1988) Home Energy Guide: an energy saving guide for domestic consumers.)*

## Solar exposure: States and Territories

The rooms indicated as receiving winter sun are the lounge, living, or family room (56%), followed closely by the bedroom(s) (55%). Eleven percent of dwellings have windows which receive no direct sunlight during the winter months. (It is, of course, inevitable that in most houses, some windows (for example on the south side) will receive no sun). In general, the data indicate that those States and Territories which experience a more severe winter climate have dwellings which have been designed to include more windows with exposure to sunlight during the winter months, in particular Tasmania and the ACT.

Of those dwellings whose windows do not receive sunlight in winter due to shading, the design of the dwelling (including aspect) and the presence of a verandah or pergola are the predominant causes. Not unexpectedly, the Northern Territory has the highest percentage of dwellings which contain verandahs and pergolas, are shaded by trees and shrubs, or are shaded as a result of the design of the dwelling.

TABLE 2.11 ROOMS RECEIVING WINTER SUNLIGHT, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF DWELLINGS(a)

<i>Solar access</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
—'000—									
Rooms in sunlight									
Lounge/living/family	1,235.7	972.9	585.9	278.0	310.8	138.1	19.8	79.3	3,620.3
Bedroom(s)	1,263.4	846.7	676.2	255.8	296.6	124.0	21.6	69.0	3,553.3
Kitchen/dining	822.7	601.6	393.8	178.0	171.6	113.2	13.5	47.9	2,342.3
Laundry/bathroom	268.7	132.2	128.5	41.7	50.8	32.8	4.3	16.6	675.6
Other	101.6	40.4	57.1	17.7	18.3	7.7	0.5	3.0	246.2
No winter sunlight	216.9	141.1	125.4	103.1	97.1	4.8	11.4	4.0	703.7
Don't know if sunlight in windows	46.1	31.6	15.3	11.6	9.4	1.5	2.1	1.0	118.6
<b>Total dwellings</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
—per cent—									
Rooms in sunlight									
Lounge/living/family	57.3	60.6	51.3	49.0	50.9	76.7	42.8	76.6	56.4
Bedroom(s)	58.6	52.7	59.2	45.1	48.6	68.9	46.6	66.6	55.4
Kitchen/dining	38.1	37.4	34.5	31.4	28.1	62.9	29.2	46.2	36.5
Laundry/bathroom	12.5	8.2	11.2	7.4	8.3	18.3	9.2	16.1	10.5
Other	4.7	2.5	5.0	3.1	3.0	4.3	1.0	2.9	3.8
No winter sunlight	10.1	8.8	11.0	18.2	15.9	2.7	24.6	3.8	11.0
Don't know if sunlight in windows	2.1	2.0	1.3	2.0	1.5	0.8	4.6	0.9	1.8

(a) Totals do not equal the sum of rooms receiving sunlight in each column as more than one may be specified.



TABLE 2.12 INHIBITORS TO DIRECT WINTER SUNLIGHT, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF DWELLINGS(a)

Inhibitor	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Dwelling shaded by:									
Design of the dwelling	92.9	54.3	56.8	41.2	40.8	2.3	5.9	2.7	296.8
Verandah/ pergola	60.6	51.3	46.7	54.5	52.5	1.0	6.3	1.2	274.0
Own trees or shrubs	39.2	41.6	39.7	26.3	27.2	1.4	5.7	0.3	181.4
Buildings	55.5	24.3	14.0	7.7	4.8	1.0	0.3	0.2	107.8
Neighbour's trees or shrubs	34.7	26.0	19.5	12.9	10.6	0.7	0.9	0.2	105.4
Slope of the land	14.1	5.1	6.2	3.7	3.1	1.0	**	0.2	33.4
Other	9.4	2.3	3.3	3.6	4.3	0.3	**	0.3	23.6
Don't know if sunlight in windows	46.1	31.6	15.3	11.6	9.4	1.5	2.1	1.0	118.6
Windows not shaded in winter	1,894.7	1,434.2	1,002.0	452.7	504.1	173.6	32.7	98.6	5,592.7
<b>Total</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
—per cent—									
Dwelling shaded by:									
Design of the dwelling	4.3	3.4	5.0	7.3	6.7	1.3	12.7	2.6	4.6
Verandah/ pergola	2.8	3.2	4.1	9.6	8.6	0.6	13.6	1.1	4.3
Own trees or shrubs	1.8	2.6	3.5	4.6	4.5	0.8	12.2	0.3	2.8
Buildings	2.6	1.5	1.2	1.4	0.8	0.5	0.7	0.2	1.7
Neighbour's trees or shrubs	1.6	1.6	1.7	2.3	1.7	0.4	1.9	0.2	1.6
Slope of the land	0.7	0.3	0.5	0.6	0.5	0.5	**	0.1	0.5
Other	0.4	0.1	0.3	0.6	0.7	0.2	**	0.3	0.4
Don't know if sunlight in windows	2.1	2.0	1.3	2.0	1.5	0.8	4.6	0.9	1.8
Windows not shaded in winter	87.8	89.3	87.7	79.8	82.6	96.5	70.8	95.2	87.2

(a) Totals do not equal the sum of reasons for shade in each column as more than one may be specified.

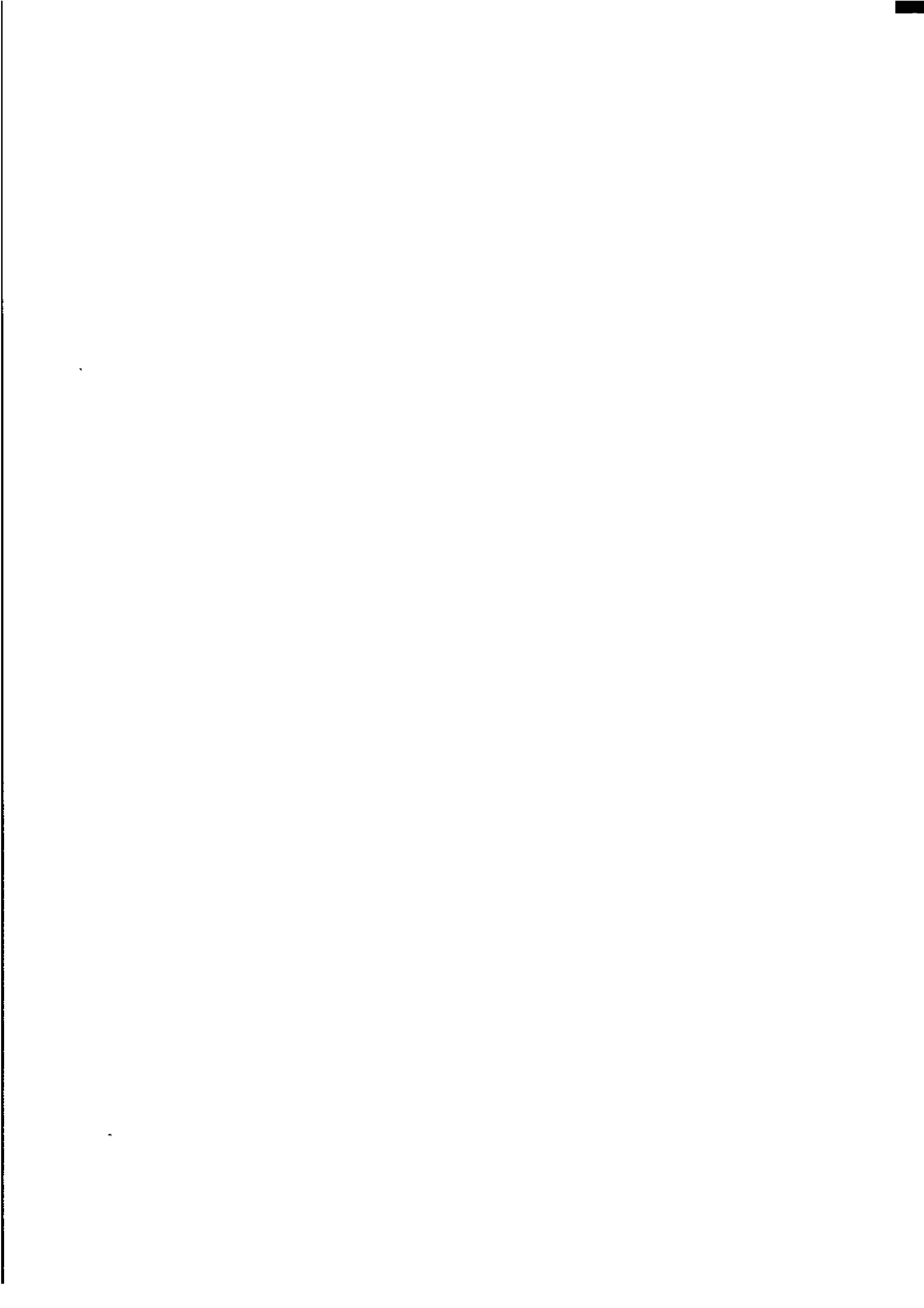
### Dwelling orientation

The amount of direct sunlight available to a house will vary depending on numerous factors including climate, orientation, shape, shading, etc. The more direct sunlight that is allowed to enter and is trapped by a dwelling, the less conventional energy will be required for space heating. Houses which are oriented to the north can capture the most sunlight throughout the day, particularly in winter when the angle of the sun is lower in the sky. An off north configuration that approximates south east/north west is suited to offices and commercial buildings which require most of their heating in the morning. The heat from lighting, office equipment, and occupants can sometimes be sufficient to maintain adequate comfort throughout the afternoon.

The optimum shape of a building is one which gains the maximum amount of natural heat in winter and minimises the entry of heat in summer. This is generally one with the main living areas sited on the north side of the house for maximum heat gain during the winter months. The north side of a building receives nearly 3 times as much solar radiation in winter as the east and west sides of the building (Mazria 1979).

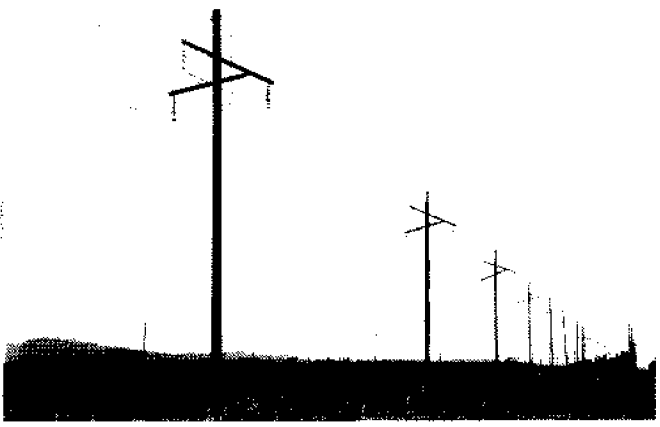
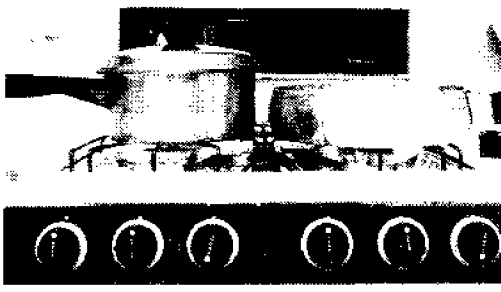
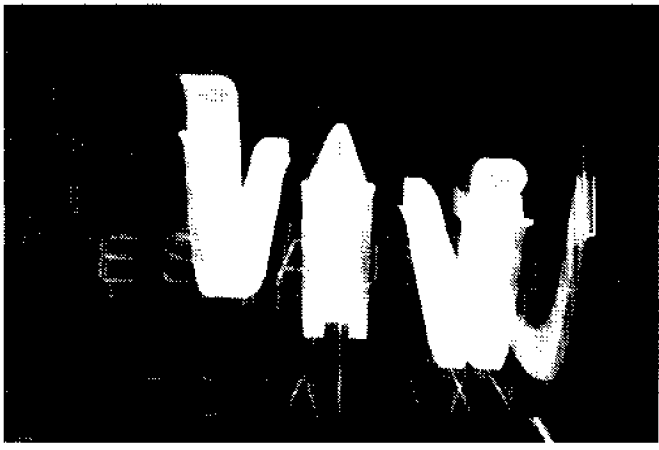
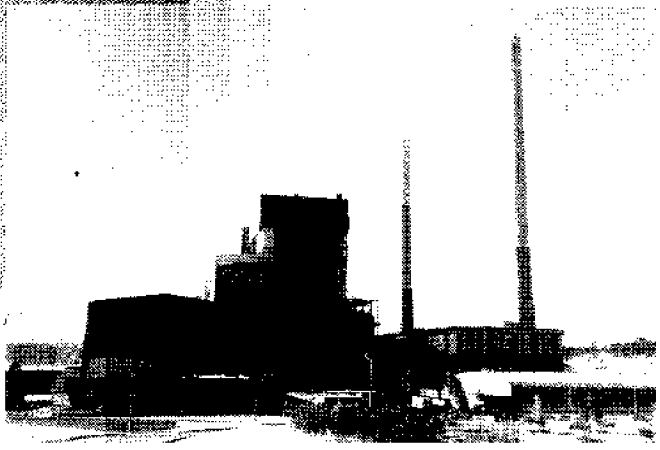
Along with the shape of the building, the configuration of indoor spaces plays a significant role in a home's ability to efficiently use sunlight for its lighting and heating requirements. Rooms which have a high requirement for sunlight should ideally be placed on the northeast, north, and northwest areas of a building. Those spaces which have minimal heating and lighting requirements such as corridors, storage cupboards, and laundries should be placed on the south side. These inner and southern rooms can often be sufficiently illuminated by a sloping skylight.

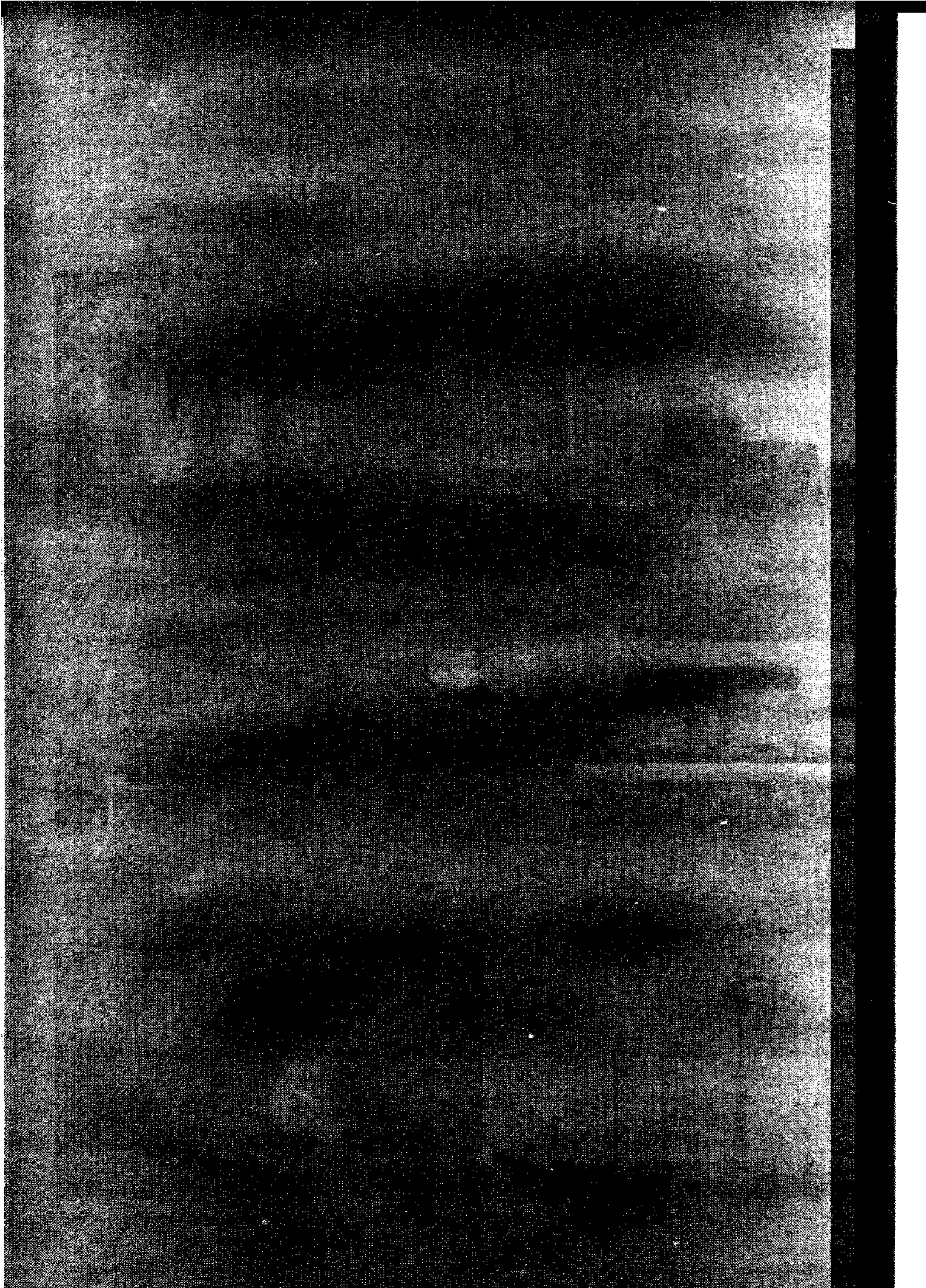
(Source: Bush, S., Holmes, L., and Ho Trieu, L. (1995) *Australian Energy Consumption and Production*, ABARE Research Report 95.1, Canberra. Department of Primary Industries and Energy (1990) *National Energy Management*, Australian Government Publishing Service, Canberra. Mazria, E. (1979) *The Passive Solar Energy Book*, Rodale Press, Pennsylvania.)



# CHAPTER 3

## ENERGY SOURCES AND USE





## CHAPTER 3

### ENERGY SOURCES AND USE

The June 1994 survey asked questions relating to the energy sources for space heating and hot water, and information on heating appliances.

#### **Main Findings**

- Gas and electricity are of almost equal importance as sources of energy for space heating (32 and 30 per cent of all households respectively).
- Almost half (48%) of dwellings have only a single heater.
- Electricity (62% of households) is clearly the main hot water energy source.
- The Northern Territory and Western Australia have the highest proportion of hot water systems using solar energy (58% and 21%).
- Of those households without mains gas, 19% have it accessible for connection.

## Heating: States and Territories

Gas was the main energy source for space heating in Australia, being reported in the survey as the principal source by 32% of households, closely followed by electric space heating with 30%. However, there were larger variations between States. Victoria led in the use of gas (principal source for 71% of dwellings), followed by the ACT with 46%. NSW recorded the highest use of electricity for space heating (46%). Wood was the main source in only one State, namely Tasmania (61% of dwellings), nearly twice the rate of the next highest State which was Western Australia with 32%. Oil was the principal source in 3% of households.

Reflecting their distinctive climates, the Northern Territory and Queensland recorded the highest percentage of households without heating, with 82% and 55% respectively, whereas in Tasmania, the Australian Capital Territory and Victoria only 0.2%, 0.4% and 0.6% of households respectively were without some form of space heating.

Of the dwellings in Australia which have heating, most have one heater (48% of all households), with the majority of heaters less than ten years old. The ACT and Tasmania have a high percentage of households with more than one heater.

For Australia as a whole the main hot water energy source is electricity (62%), followed by gas with 34%. Solar energy used to heat water accounted for only 5% of households overall but was a significant source in the Northern Territory and Western Australia. As a source for hot water systems, electricity was highest in Tasmania (96%). Victoria rated highest for the use of gas with 61%.

TABLE 3.1 PRINCIPAL FORM OF HEATING IN DWELLING, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF DWELLINGS

<i>Principal form of heating</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
---'000---									
Gas									
Bottled	101.4	43.0	21.4	20.5	18.6	9.0	2.2	1.2	217.4
Mains	318.9	1,097.5	12.7	167.9	177.1	0.3	0.3	46.6	1,821.3
Source unknown	4.4	**	**	0.7	0.4	**	**	**	5.6
<i>Total gas</i>	<i>424.7</i>	<i>1,140.5</i>	<i>34.1</i>	<i>189.1</i>	<i>196.1</i>	<i>9.3</i>	<i>2.5</i>	<i>47.8</i>	<i>2,044.3</i>
Electric	998.4	200.2	303.8	204.5	104.5	51.7	4.1	39.2	1,906.4
Wood	369.2	225.5	115.5	107.6	192.7	108.8	0.6	10.6	1,130.4
Oil	74.9	20.9	42.7	24.0	23.5	8.6	0.7	4.7	200.0
Solar	1.5	**	0.5	0.8	0.7	0.2	0.2	**	3.8
Other/varies	36.0	9.6	22.8	7.7	12.3	0.9	0.4	0.9	90.6
No heating in dwelling	252.9	9.7	623.4	33.7	80.8	0.4	37.8	0.4	1,039.1
<b>Total dwellings</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
---per cent---									
Gas									
Bottled	4.7	2.7	1.9	3.6	3.0	5.0	4.7	1.2	3.4
Mains	14.8	68.3	1.1	29.6	29.0	0.2	0.7	45.0	28.4
Source unknown	0.2	**	**	0.1	0.1	**	**	**	0.1
<i>Total gas</i>	<i>19.7</i>	<i>71.0</i>	<i>3.0</i>	<i>33.3</i>	<i>32.1</i>	<i>5.2</i>	<i>5.4</i>	<i>46.2</i>	<i>31.9</i>
Electric	46.3	12.5	26.6	36.0	17.1	28.8	8.8	37.8	29.7
Wood	17.1	14.0	10.1	19.0	31.6	60.5	1.2	10.2	17.6
Oil	3.5	1.3	3.7	4.2	3.9	4.8	1.5	4.5	3.1
Solar	0.1	**	**	0.1	0.1	0.1	0.4	**	0.1
Other/varies	1.7	0.6	2.0	1.4	2.0	0.5	0.9	0.9	1.4
No heating in dwelling	11.7	0.6	54.6	5.9	13.2	0.2	81.8	0.4	16.2

**TABLE 3.2 NUMBER AND AGE OF HEATERS IN DWELLINGS, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF DWELLINGS**

Heaters	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
'000									
<b>Number of heaters</b>									
One	1,059.4	977.7	337.2	254.2	315.8	62.7	5.6	34.2	3,046.7
Two	564.8	420.8	126.4	167.8	154.7	56.1	2.3	27.4	1,520.2
Three or more	280.6	198.2	55.8	111.6	59.4	60.8	0.6	41.5	808.4
<b>Age of main heater</b>									
Less than 1 year	162.2	100.8	39.7	33.2	46.7	13.9	1.9	11.0	409.3
1 to less than 5 years	658.7	385.2	192.3	134.4	177.8	55.1	3.1	35.2	1,641.8
5 to less than 10 years	526.5	422.2	145.6	125.9	137.4	51.6	2.0	22.8	1,434.2
10 or more years	468.6	578.4	121.2	215.1	140.1	51.5	1.4	29.6	1,605.8
Don't know	88.8	110.0	20.6	25.0	27.7	7.5	**	4.6	284.2
No heating in dwelling	252.9	9.7	623.4	33.7	80.8	0.4	37.8	0.4	1,039.1
<b>Total dwellings</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
per cent									
<b>Number of heaters</b>									
One	49.1	60.9	29.5	44.8	51.7	34.8	12.1	33.0	47.5
Two	26.2	26.2	11.1	29.6	25.3	31.2	4.9	26.5	23.7
Three or more	13.0	12.3	4.9	19.7	9.7	33.8	1.3	40.1	12.6
<b>Age of main heater</b>									
Less than 1 year	7.5	6.3	3.5	5.9	7.7	7.7	4.1	10.6	6.4
1 to less than 5 years	30.5	24.0	16.8	23.7	29.1	30.6	6.7	33.9	25.6
5 to less than 10 years	24.4	26.3	12.7	22.2	22.5	28.7	4.4	22.0	22.4
10 or more years	21.7	36.0	10.6	37.9	22.9	28.6	3.1	28.5	25.0
Don't know	4.1	6.8	1.8	4.4	4.5	4.2	**	4.4	4.4
No heating in dwelling	11.7	0.6	54.6	5.9	13.2	0.2	81.8	0.4	16.2

**TABLE 3.3 TYPES OF HOT WATER SYSTEMS IN DWELLINGS, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF DWELLINGS(a)**

Hot water system	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
<b>Gas</b>									
Bottled	21.4	30.2	66.7	15.3	42.6	1.2	0.9	**	178.2
Mains	406.8	949.5	84.8	261.0	248.1	0.5	0.2	20.8	1,971.7
Unknown source	**	0.6	2.2	0.7	0.3	**	**	**	3.9
<b>Total gas</b>	<b>428.2</b>	<b>980.3</b>	<b>153.7</b>	<b>277.0</b>	<b>291.0</b>	<b>1.7</b>	<b>1.1</b>	<b>20.8</b>	<b>2,153.8</b>
<b>Electricity</b>	<b>1,676.6</b>	<b>610.3</b>	<b>936.7</b>	<b>277.2</b>	<b>223.3</b>	<b>172.6</b>	<b>20.8</b>	<b>81.9</b>	<b>3,999.3</b>
Solar energy	74.6	12.6	55.2	18.8	125.1	1.0	26.6	3.2	317.1
Other	41.7	30.4	21.9	3.5	35.5	6.7	2.0	0.2	141.9
<b>Total dwellings</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
per cent—									
<b>Gas</b>									
Bottled	1.0	1.9	5.8	2.7	7.0	0.7	1.9	**	2.8
Mains	18.9	59.1	7.4	46.0	40.6	0.3	0.4	20.1	30.7
Unknown source	**	**	0.2	0.1	0.1	**	**	**	0.1
<b>Total gas</b>	<b>19.9</b>	<b>61.0</b>	<b>13.4</b>	<b>48.8</b>	<b>47.7</b>	<b>1.0</b>	<b>2.3</b>	<b>20.1</b>	<b>33.6</b>
<b>Electricity</b>	<b>77.7</b>	<b>38.0</b>	<b>82.0</b>	<b>48.9</b>	<b>36.6</b>	<b>95.9</b>	<b>44.9</b>	<b>79.1</b>	<b>62.3</b>
Solar energy	3.5	0.8	4.8	3.3	20.5	0.6	57.5	3.1	4.9
Other	1.9	1.9	1.9	0.6	5.8	3.7	4.3	0.2	2.2

(a) Totals do not equal the sum of energy sources in each column as more than one combination may be specified.

Between June 1983 and June 1994 the use of gas and wood/solid fuel as the main energy source for space heating has risen. The use of electricity and oil as the main energy source for space heating has declined.

The use of gas for heating water has risen between 1983 and 1994, whereas the use of electricity has fallen slightly. For Australia as a whole there has been a very small rise in the proportion of households who heat their water using solar energy, but the Northern Territory shows a substantial increase in the use of solar energy.

**TABLE 3.4 DWELLINGS : MAIN SPACE HEATING ENERGY SOURCE, STATES AND TERRITORIES, JUNE 1994 AND 1983: PERCENTAGE OF DWELLINGS WITH SPACE HEATING**

<i>Energy source</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
JUNE 1994									
—per cent—									
Electricity	52.4	12.5	58.5	38.3	19.7	28.8	48.8	38.0	35.5
Gas	22.3	71.4	6.6	35.4	37.0	5.2	29.8	46.3	38.0
Oil	3.9	1.3	8.2	4.5	4.4	4.8	8.3	4.6	3.7
Wood	19.4	14.1	22.2	20.2	36.3	60.6	7.1	10.3	21.0
Other	2.0	0.6	4.5	1.6	2.5	0.6	7.1	0.9	1.8
JUNE 1983									
—per cent—									
Electricity	64.1	22.9	71.0	43.3	32.9	35.3	46.8	64.1	47.8
Gas	10.3	55.7	1.9	24.8	16.5	5.2	*	5.7	23.7
Oil	7.6	7.4	3.3	10.3	14.0	15.0	27.7	17.0	8.2
Wood	11.4	11.7	7.0	16.6	23.0	43.2	19.1	10.5	13.4
Other	6.6	2.3	16.8	5.0	13.6	1.3	6.4	2.7	6.9
PERCENTAGE POINT CHANGE									
—per cent—									
Electricity	-11.7	-10.4	-12.5	-5.0	-13.2	-6.5	2.0	-26.1	12.3
Gas	12.0	15.7	4.7	10.6	20.5	0.0	*	40.6	14.3
Oil	-3.7	-6.1	4.9	-5.8	-9.6	-10.2	-19.4	-12.4	-4.5
Wood	8.0	2.4	15.2	3.6	13.3	17.4	-12.0	0.2	7.6
Other	4.6	-1.7	-12.3	-3.4	11.1	-0.7	0.7	-1.8	-5.1

(Source: *National Energy Survey*, ABS Cat. No. 8212.0, and *Environmental Issues, June 1994*, ABS Cat. No. 4602.0).



## Heating: Dwelling type

Gas use is highest for separate houses. For other housing types electricity is the most used form of heating. The use of wood fires is significantly higher for separate houses (21%) than for the other dwelling types. Separate houses also have the lowest figure for dwellings without any form of space heating (14%).

TABLE 3.5 PRINCIPAL FORM OF HEATING IN DWELLING BY TYPE OF DWELLING, JUNE 1994:  
NUMBER AND PERCENTAGE OF DWELLINGS

Principal form of heating	Semi-detached/terrace/ town house				Other flat/unit/apartment in a block				Total
	Separate house	1 storey	2 or more storeys	Flat attached to house	1 or 2 storeys	3 storeys	4 or more storeys	Other	
—'000—									
Gas									
Mains	1,585.7	101.7	22.5	5.5	86.8	15.3	2.2	1.7	1,821.3
Bottled	201.1	5.7	1.1	2.1	3.9	**	**	3.5	217.4
Source unknown	5.1	**	**	**	0.4	**	**	**	5.6
<b>Total gas</b>	<b>1,791.9</b>	<b>107.4</b>	<b>23.6</b>	<b>7.6</b>	<b>91.1</b>	<b>15.3</b>	<b>2.2</b>	<b>5.2</b>	<b>2,044.3</b>
Electric	1,318.7	140.4	59.6	13.8	209.5	119.0	28.5	17.0	1,906.4
Wood	1,106.0	14.6	0.6	0.2	2.4	0.7	**	5.9	1,130.4
Oil	183.6	7.2	0.7	1.0	3.2	2.6	**	1.6	200.0
Other/varies	70.3	5.0	2.6	**	4.8	2.2	4.2	1.5	90.6
Solar	3.8	**	**	**	**	**	**	**	3.8
No heating in dwelling	707.7	64.6	26.3	9.0	130.0	60.8	22.0	18.6	1,039.1
<b>Total dwellings</b>	<b>5,182.0</b>	<b>339.2</b>	<b>113.4</b>	<b>31.6</b>	<b>441.1</b>	<b>200.5</b>	<b>56.9</b>	<b>49.8</b>	<b>6,414.5</b>
—per cent									
Gas									
Mains	30.6	30.0	19.8	17.5	19.7	7.6	3.8	3.4	28.4
Bottled	3.9	1.7	0.9	6.7	0.9	**	**	7.0	3.4
Source unknown	0.1	**	**	**	0.1	**	**	**	0.1
<b>Total gas</b>	<b>34.6</b>	<b>31.7</b>	<b>20.7</b>	<b>24.2</b>	<b>20.7</b>	<b>7.6</b>	<b>3.8</b>	<b>10.4</b>	<b>31.9</b>
Electric	25.4	41.4	52.6	43.6	47.5	59.3	50.1	34.0	29.7
Wood	21.3	4.3	0.5	0.5	0.6	0.3	**	11.9	17.6
Oil	3.5	2.1	0.6	3.1	0.7	1.3	**	3.3	3.1
Other/varies	1.4	1.5	2.3	**	1.1	1.1	7.4	3.1	1.4
Solar	0.1	**	**	**	**	**	**	**	0.1
No heating in dwelling	13.7	19.1	23.2	28.6	29.5	30.3	38.7	37.4	16.2

## Gas Supply: States and Territories

For those households that were not using mains gas at the time of the survey, 19% indicated that it was available for connection to their dwelling. The ACT, with 76%, had the highest accessibility to the mains gas supply, while the Northern Territory and Tasmania reported the greatest proportion of dwellings that were unable to access mains gas supply, or were uncertain about access.

The majority of gas users have mains supply (80%), with the Australian Capital Territory and Victoria ranking highest. Of those households which use bottled gas the Northern Territory is highest (97%). Gas can be used for space heating, hot water heating or cooking.

**TABLE 3.6 DWELLINGS WITHOUT MAINS GAS : ACCESS TO MAINS GAS FOR CONNECTION, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

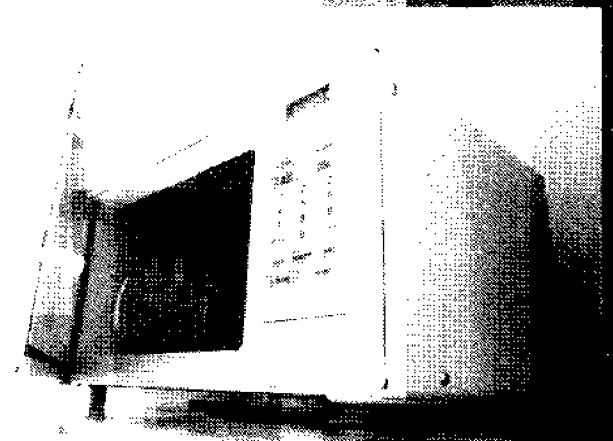
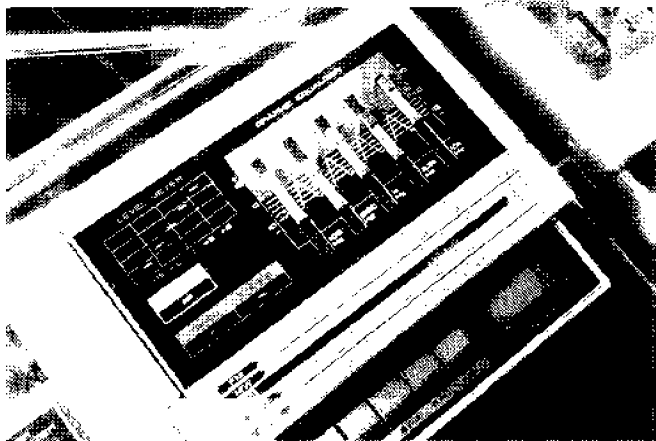
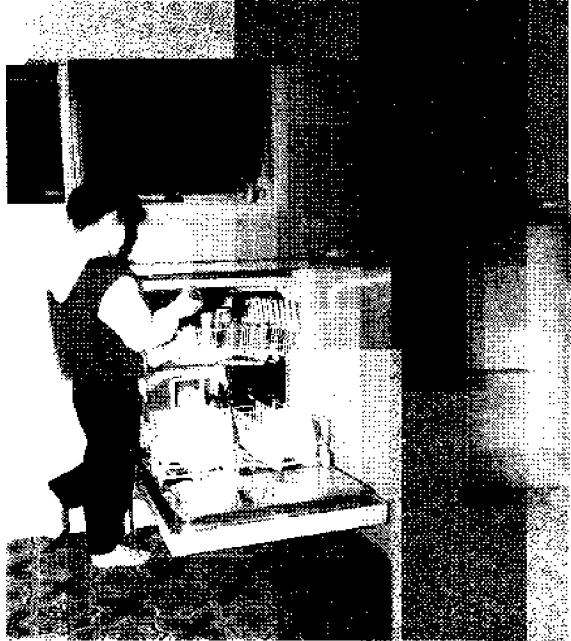
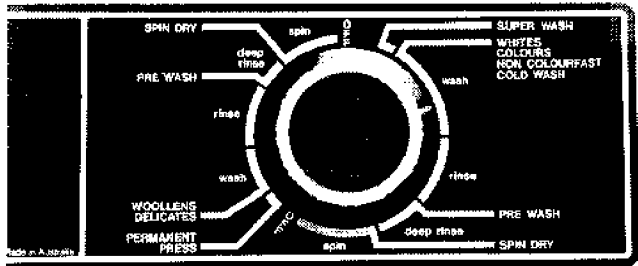
<i>Mains gas connection available</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
	---'000---								
Yes	337.0	90.2	78.6	67.9	94.8	3.5	**	39.3	711.3
No	907.9	276.3	724.4	159.7	156.7	162.3	41.7	4.6	2,433.6
Don't know	301.7	31.4	218.2	35.9	43.4	13.0	4.0	8.0	655.6
<b>Total dwellings</b>	<b>1,546.6</b>	<b>397.9</b>	<b>1,021.2</b>	<b>263.4</b>	<b>294.8</b>	<b>178.8</b>	<b>45.7</b>	<b>51.9</b>	<b>3,800.4</b>
	---per cent---								
Yes	21.8	22.7	7.7	25.8	32.1	2.0	**	75.8	18.7
No	58.7	69.4	70.9	60.6	53.1	90.8	91.3	8.8	64.0
Don't know	19.5	7.9	21.4	13.6	14.7	7.3	8.7	15.4	17.2

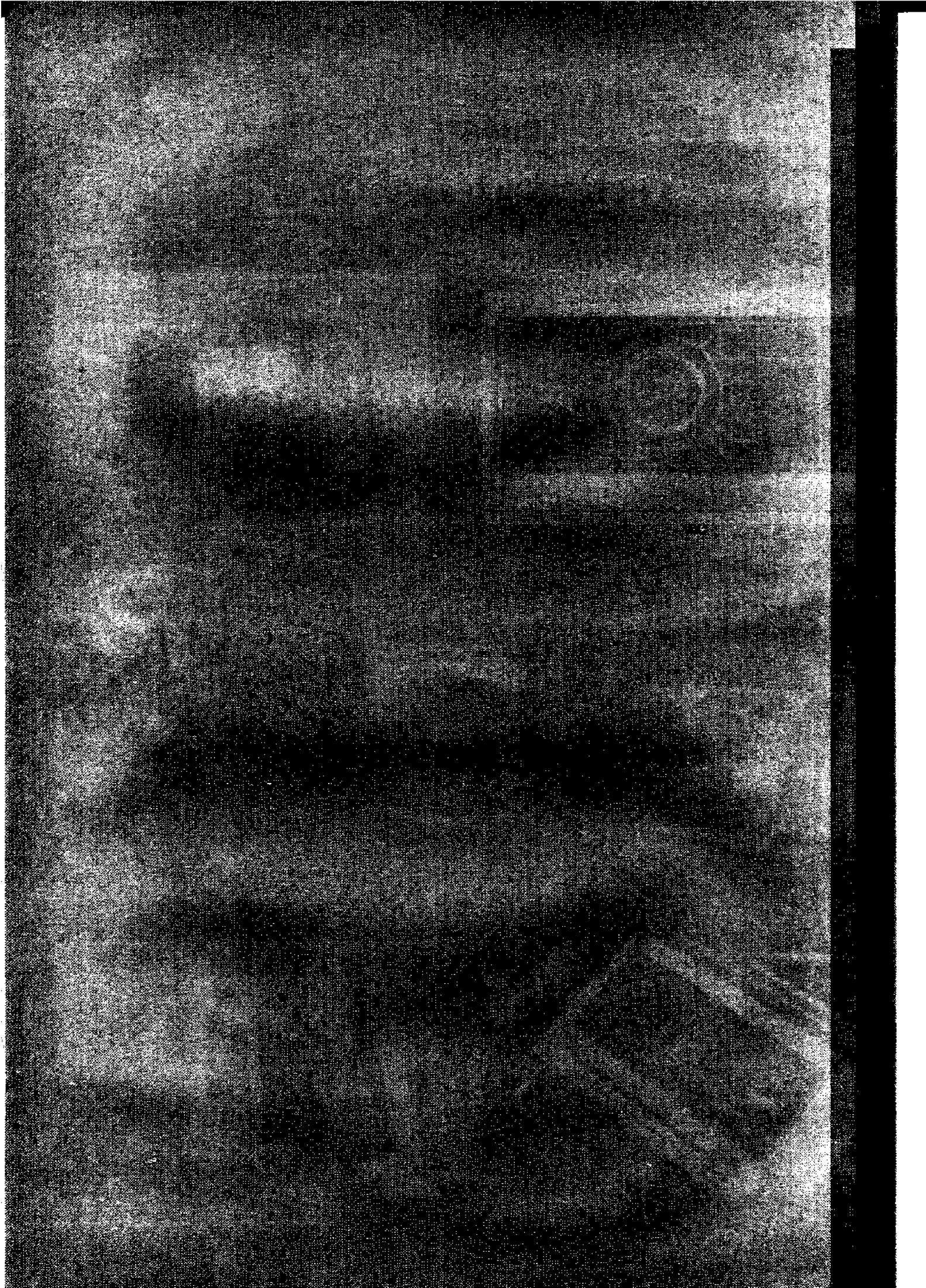
**TABLE 3.7 HOUSEHOLDS USING GAS : SOURCE OF GAS, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF DWELLINGS**

<i>Source</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
	---'000---								
Gas									
Mains	611.0	1,208.5	121.5	303.9	315.8	1.2	0.5	51.7	2,614.1
Bottled	186.4	106.0	168.5	49.9	105.4	17.2	16.6	1.7	651.8
Source unknown	4.4	0.6	2.2	0.7	0.8	**	**	**	8.7
<b>Total dwellings</b>	<b>801.9</b>	<b>1,315.1</b>	<b>292.2</b>	<b>354.4</b>	<b>422.0</b>	<b>18.4</b>	<b>17.1</b>	<b>53.4</b>	<b>3,274.5</b>
	per cent								
Gas									
Mains	76.2	91.9	41.6	85.7	74.8	6.4	3.1	96.8	79.8
Bottled	23.2	8.1	57.7	14.1	25.0	93.6	96.9	3.2	19.9
Source unknown	0.6	**	0.8	0.2	0.2	**	**	**	0.3

# CHAPTER 4

## HOUSEHOLD APPLIANCES





## CHAPTER 4

### HOUSEHOLD APPLIANCES

The June 1994 survey asked questions about household appliances operated, their type and age, and factors considered when appliances were replaced.

#### Main Findings

- Virtually all households own a refrigerator (about a fifth have two), most (94%) own a washing machine and 25% own a dishwasher.
- Sixty one per cent of households use cold water in their washing machines.
- Cost is the major consideration when replacing or purchasing an appliance.
- The predominant type of air conditioner is one set in a wall or window and of reverse cycle operation.

## Appliances

Virtually all Australian households have a refrigerator, most (94%) own a washing machine, and 25% own a dishwasher. Tasmanians have the highest proportion of households with separate freezers (64%). A little over half of households have a clothes dryer. The Northern Territory and South Australia have by far the highest incidence of air conditioners: Queensland shows 18% of households with an air conditioner.

In general, separate houses had the highest proportion of each appliance.

TABLE 4.1 HOUSEHOLD APPLIANCES, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS WHICH HAVE APPLIANCES(a)

Appliance	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Refrigerator	2,148.1	1,605.4	1,139.8	564.8	608.4	179.4	46.2	103.5	6,395.6
Washing machine	1,998.8	1,526.1	1,085.3	536.1	577.7	175.0	40.7	100.3	6,039.7
Clothes dryer	1,136.1	920.3	564.1	278.4	252.6	98.2	10.8	56.2	3,316.6
Separate freezer	899.4	728.6	518.8	269.9	287.5	114.8	21.8	42.5	2,883.1
Air conditioner	664.7	593.5	201.2	349.1	217.0	4.3	35.3	17.3	2,082.4
Dishwasher	528.5	512.1	282.1	105.5	101.7	34.9	6.7	39.3	1,610.8
per cent—									
Refrigerator	99.6	99.9	99.7	99.6	99.6	99.7	100.0	99.9	99.7
Washing machine	92.6	95.0	95.0	94.5	94.6	97.2	88.0	96.8	94.2
Clothes dryer	52.7	57.3	49.4	49.1	41.4	54.6	23.3	54.2	51.7
Separate freezer	41.7	45.4	45.4	47.6	47.1	63.8	47.1	41.0	44.9
Air conditioner	30.8	36.9	17.6	61.5	35.5	2.4	76.4	16.7	32.5
Dishwasher	24.5	31.9	24.7	18.6	16.6	19.4	14.5	38.0	25.1

(a) Totals do not equal the sum of appliances in each column as more than one may be specified.

TABLE 4.2 HOUSEHOLD APPLIANCES BY HOUSEHOLD TYPE, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS WHICH HAVE APPLIANCES(a)

Appliance	One person	Couple only	Other households with all members over 15	Couple, dependent child(ren)	One parent, dependent child(ren)	All other households	Total
—'000—							
Refrigerator	1,331.6	1,522.1	903.6	1,647.8	292.1	698.4	6,395.6
Washing machine	1,125.2	1,475.5	891.0	1,634.1	281.5	632.4	6,039.7
Clothes dryer	370.8	782.9	543.9	1,188.4	162.8	267.7	3,316.6
Separate freezer	339.9	779.1	514.3	890.8	106.4	252.6	2,883.1
Air conditioner	337.4	540.9	338.8	600.8	70.6	193.9	2,082.4
Dishwasher	132.7	378.7	312.0	608.8	46.0	132.5	1,610.8
—per cent—							
Refrigerator	99.1	99.9	100.0	99.8	99.7	99.8	99.7
Washing machine	83.7	96.8	98.6	99.0	96.1	90.4	94.2
Clothes dryer	27.6	51.4	60.2	72.0	55.6	38.3	51.7
Separate freezer	25.3	51.1	56.9	54.0	36.3	36.1	44.9
Air conditioner	25.1	35.5	37.5	36.4	24.1	27.7	32.5
Dishwasher	9.9	24.9	34.5	36.9	15.7	18.9	25.1

(a) Totals do not equal the sum of appliances in each column as more than one may be specified.

TABLE 4.3 HOUSEHOLD APPLIANCES BY TYPE OF DWELLING, JUNE 1994 : NUMBER AND PERCENTAGE OF DWELLINGS WHICH HAVE APPLIANCES(a)

Appliance	Semi-detached/terrace/ town house				Other flat/unit/apartment in a block				Total
	Separate house	1 storey	2 or more storeys	Flat attached to house	1 or 2 storeys	3 storeys	4 or more storeys	Other	
—'000—									
Refrigerator	5,170.9	337.6	113.4	31.6	437.0	199.7	56.5	48.8	6,395.6
Washing machine	5,067.7	311.4	103.3	21.5	330.1	147.6	26.5	31.5	6,039.7
Clothes dryer	2,930.2	117.1	50.7	7.6	109.0	66.8	18.2	17.0	3,316.6
Separate freezer	2,675.9	68.2	21.9	6.4	73.9	19.3	2.4	15.2	2,883.1
Air conditioner	1,886.2	68.4	20.5	3.8	68.2	17.3	3.5	14.5	2,082.4
Dishwasher	1,479.4	36.9	36.0	2.7	26.6	18.0	6.2	4.9	1,610.8
—per cent—									
Refrigerator	99.8	99.5	100.0	100.0	99.1	99.6	99.4	97.9	99.7
Washing machine	97.8	91.8	91.1	68.1	74.8	73.6	46.5	63.3	94.2
Clothes dryer	56.5	34.5	44.7	24.1	24.7	33.3	32.0	34.2	51.7
Separate freezer	51.6	20.1	19.3	20.1	16.7	9.6	4.3	30.5	44.9
Air conditioner	36.4	20.2	18.1	11.9	15.5	8.6	6.1	29.2	32.5
Dishwasher	28.5	10.9	31.7	8.7	6.0	9.0	10.8	9.9	25.1

(a) Totals do not equal the sum of appliances in each column as more than one may be specified.

In the case of refrigerators, freezers and air conditioners, the majority of households in Australia have a single unit. Although a fifth of households in most States have 2 refrigerators, the Northern Territory and to a lesser extent South Australia stand out in terms of multiple air conditioners.

For Australia between 1983 and 1994, dishwashers and clothes dryers were the appliances showing the greatest increase in the number of households possessing them.

Of those households with a separate freezer, 53% reported owning a chest type, and 43% an upright. The Northern Territory had the highest proportion of twin door refrigerators with 7.5%.

Most air conditioners are set in a wall or window and are either reverse cycle (43% of households with air conditioners) or refrigerated (25% of such households).

Of households with a washing machine, 84% operate a top loading automatic machine.

TABLE 4.4 NUMBER OF SELECTED APPLIANCES, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF HOUSEHOLDS

Number	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
<b>Fridges</b>									
None	9.5	1.0	2.9	2.5	2.2	0.5	**	0.1	18.8
One	1,663.8	1,268.3	781.7	434.9	451.0	148.1	31.3	82.4	4,861.5
Two	440.0	307.1	333.0	120.2	142.8	29.4	14.4	20.0	1,406.9
Three or more	44.3	30.0	25.1	9.7	14.6	1.9	0.6	1.1	127.3
<b>Separate Freezers</b>									
None	1,258.3	877.9	623.9	297.5	323.2	65.1	24.5	61.1	3,531.4
One	835.7	670.9	471.1	244.4	262.7	98.6	19.0	40.8	2,643.3
Two	56.6	52.0	42.0	22.2	24.1	14.5	2.5	1.6	215.4
Three or more	7.1	5.6	5.8	3.2	0.7	1.7	0.2	**	24.3
<b>Air conditioners</b>									
None	1,492.9	1,012.9	941.5	218.2	393.7	175.7	10.9	86.3	4,332.1
One	572.4	522.5	138.3	292.3	180.2	4.3	19.7	15.7	1,745.4
Two	71.7	60.1	38.8	48.4	23.6	**	9.5	1.2	253.4
Three or more	20.6	10.9	24.1	8.4	13.2	**	6.2	0.4	83.7
per cent—									
<b>Fridges</b>									
None	0.4	0.1	0.3	0.4	0.4	0.3	**	0.1	0.3
One	77.1	79.0	68.4	76.7	73.8	82.3	67.7	79.5	75.8
Two	20.4	19.1	29.1	21.2	23.4	16.3	31.0	19.3	21.9
Three or more	2.1	1.9	2.2	1.7	2.4	1.0	1.3	1.1	2.0
<b>Separate Freezers</b>									
None	58.3	54.6	54.6	52.4	52.9	36.2	52.9	59.0	55.1
One	38.7	41.8	41.2	43.1	43.0	54.8	41.2	39.4	41.2
Two	2.6	3.2	3.7	3.9	3.9	8.0	5.5	1.6	3.4
Three or more	0.3	0.3	0.5	0.6	0.1	1.0	0.4	**	0.4
<b>Air conditioners</b>									
None	69.2	63.1	82.4	38.5	64.5	97.6	23.6	83.3	67.5
One	26.5	32.5	12.1	51.5	29.5	2.4	42.5	15.1	27.2
Two	3.3	3.7	3.4	8.5	3.9	**	20.5	1.2	3.9
Three or more	1.0	0.7	2.1	1.5	2.2	**	13.3	0.4	1.3

TABLE 4.5 PERCENTAGE OF HOUSEHOLDS WITH APPLIANCES : STATES AND TERRITORIES, JUNE 1994 AND 1983

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
JUNE 1994									
—per cent—									
Refrigerator	99.6	99.9	99.7	99.6	99.6	99.7	100.0	99.9	99.7
Freezer	41.7	45.4	45.4	47.6	47.1	63.8	47.1	41.0	44.9
Dishwasher	24.5	31.9	24.7	18.6	16.6	19.4	14.5	38.0	25.1
Clothes dryer	52.7	57.3	49.4	49.1	41.4	54.6	23.3	54.2	51.7
Air conditioner	30.8	36.9	17.6	61.5	35.5	2.4	76.4	16.7	32.5
Washing machine	92.6	95.0	95.0	94.5	94.6	97.2	88.0	96.8	94.2
JUNE 1983									
—per cent—									
Refrigerator	99.5	99.6	99.7	99.8	99.7	99.7	99.1	99.9	99.6
Freezer	44.0	42.9	49.1	51.5	46.4	61.0	58.6	43.9	46.0
Dishwasher	17.5	19.1	18.2	11.6	13.1	13.5	17.7	29.3	17.1
Clothes dryer	47.3	49.1	40.7	44.3	30.1	55.9	32.7	51.9	45.2
Air conditioner	29.4	36.5	16.0	62.8	37.1	0.9	59.2	23.9	32.3
Washing machine	91.0	90.0	93.6	94.0	92.1	97.2	94.6	94.2	92.9

(Source: National Energy Survey, ABS Cat. No. 8212.0, and Environmental Issues, June 1994, ABS Cat. No. 4602.0)



TABLE 4.6 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH SEPARATE FREEZERS : TYPE OF FREEZER, STATES AND TERRITORIES, JUNE 1994

Type	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
	—'000								
Chest	445.6	380.8	313.2	140.3	131.7	76.8	12.3	21.0	1,521.7
Upright	399.4	311.5	191.6	120.4	140.7	32.8	7.8	20.5	1,224.7
Twin door on fridge	53.8	35.8	13.6	8.6	13.6	4.8	1.6	0.9	132.7
Other	0.7	0.5	0.4	0.7	1.5	0.3	**	**	4.0
<b>Total households</b>	<b>899.4</b>	<b>728.6</b>	<b>518.8</b>	<b>269.9</b>	<b>287.5</b>	<b>114.8</b>	<b>21.8</b>	<b>42.5</b>	<b>2,883.1</b>
	—per cent—								
Chest	49.5	52.3	60.4	52.0	45.8	66.9	56.6	49.5	52.8
Upright	44.4	42.8	36.9	44.6	49.0	28.6	35.9	48.3	42.5
Twin door on fridge	6.0	4.9	2.6	3.2	4.7	4.2	7.5	2.2	4.6
Other	0.1	0.1	0.1	0.2	0.5	0.3	**	**	0.1

TABLE 4.7 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH SEPARATE FREEZERS : TYPE OF FREEZER BY HOUSEHOLD TYPE, JUNE 1994

Type	One person	Couple only	Other households with all members over 15	Couple, dependent child(ren)	One parent, dependent child(ren)	All other households	Total
	—'000						
Chest	189.6	405.8	269.0	458.9	61.0	137.5	1,521.7
Upright	127.3	341.7	222.5	391.8	40.5	100.9	1,224.7
Twin door on fridge	22.2	31.3	22.3	38.5	4.9	13.5	132.7
Other	0.8	0.3	0.5	1.7	**	0.7	4.0
<b>Total households</b>	<b>339.9</b>	<b>779.1</b>	<b>514.3</b>	<b>890.8</b>	<b>106.4</b>	<b>252.6</b>	<b>2,883.1</b>
	per cent—						
Chest	55.8	52.1	52.3	51.5	57.3	54.4	52.8
Upright	37.4	43.9	43.3	44.0	38.1	40.0	42.5
Twin door on fridge	6.5	4.0	4.3	4.3	4.6	5.3	4.6
Other	0.2	**	0.1	0.2	**	0.3	0.1

TABLE 4.8 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH AIR CONDITIONERS : TYPE OF AIR CONDITIONER AND POSITION, STATES AND TERRITORIES, JUNE 1994

Type of air conditioner and position	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
	'000								
Set in wall/window, reverse cycle	376.5	219.4	63.2	154.9	62.4	1.5	4.5	6.6	889.1
Set in wall/window, refrigerated	78.6	200.4	75.6	78.1	59.8	0.2	20.7	1.9	515.3
Set in wall/window, evaporative	16.7	29.4	9.2	10.0	10.4	**	1.8	0.6	78.1
Ducted, evaporative	59.5	37.3	4.3	57.9	44.9	**	5.2	0.7	209.7
Ducted, reverse cycle	68.8	21.7	8.1	28.9	8.9	0.7	0.8	2.1	140.1
Ducted, refrigerated	4.3	11.3	0.9	1.3	10.0	0.2	1.5	0.2	29.7
Portable, evaporative	30.7	33.2	24.4	12.7	10.6	1.3	**	4.7	117.7
Portable, refrigerated	11.3	6.4	2.3	2.4	2.6	**	0.2	0.3	25.4
Portable, reverse cycle	3.6	5.7	2.3	0.7	0.7	**	**	**	13.0
Don't know type of air conditioner	14.7	28.6	10.9	2.2	6.7	0.4	0.6	0.2	64.2
<b>Total households</b>	<b>664.7</b>	<b>593.5</b>	<b>201.2</b>	<b>349.1</b>	<b>217.0</b>	<b>4.3</b>	<b>35.3</b>	<b>17.3</b>	<b>2,082.4</b>
	—per cent—								
Set in wall/window, reverse cycle	56.6	37.0	31.4	44.4	28.8	35.2	12.7	38.4	42.7
Set in wall/window, refrigerated	11.8	33.8	37.6	22.4	27.6	4.3	58.6	10.7	24.7
Set in wall/window, evaporative	2.5	5.0	4.6	2.9	4.8	**	5.1	3.3	3.8
Ducted, evaporative	8.9	6.3	2.1	16.6	20.7	**	14.8	3.9	10.1
Ducted, reverse cycle	10.4	3.7	4.0	8.3	4.1	16.4	2.4	12.3	6.7
Ducted, refrigerated	0.6	1.9	0.4	0.4	4.6	4.6	4.2	1.0	1.4
Portable, evaporative	4.6	5.6	12.1	3.6	4.9	31.2	**	27.3	5.7
Portable, refrigerated	1.7	1.1	1.1	0.7	1.2	**	0.5	1.9	1.2
Portable, reverse cycle	0.5	1.0	1.1	0.2	0.3	**	**	**	0.6
Don't know type of air conditioner	2.2	4.8	5.4	0.6	3.1	8.4	1.7	1.1	3.1

**TABLE 4.9 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH WASHING MACHINES : TYPE OF WASHING MACHINE, STATES AND TERRITORIES, JUNE 1994**

Type of washing machine	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
'000									
Top loading automatic	1,712.2	1,338.6	893.8	406.3	474.5	145.4	36.5	88.0	5,095.3
Front loading automatic	114.5	82.3	40.3	27.1	26.5	5.8	2.1	9.4	307.9
Twin tub	155.1	82.2	142.5	93.6	72.3	20.9	2.1	2.3	571.1
Wringer	10.8	9.0	4.6	6.9	3.4	0.6	**	0.2	35.4
Other	6.1	13.9	4.0	2.2	1.0	2.3	**	0.4	30.0
<b>Total households</b>	<b>1,998.8</b>	<b>1,526.1</b>	<b>1,085.3</b>	<b>536.1</b>	<b>577.7</b>	<b>175.0</b>	<b>40.7</b>	<b>100.3</b>	<b>6,039.7</b>
per cent									
Top loading automatic	85.7	87.7	82.4	75.8	82.1	83.1	89.8	87.8	84.4
Front loading automatic	5.7	5.4	3.7	5.1	4.6	3.3	5.1	9.3	5.1
Twin tub	7.8	5.4	13.1	17.5	12.5	11.9	5.1	2.3	9.5
Wringer	0.5	0.6	0.4	1.3	0.6	0.4	**	0.2	0.6
Other	0.3	0.9	0.4	0.4	0.2	1.3	**	0.4	0.5
—per cent—									
Washing machines with suds saver feature									
Yes	49.3	43.2	50.7	59.3	47.2	51.5	49.2	51.7	48.6
No	42.8	47.1	42.4	37.0	46.3	43.8	44.2	42.3	43.8
Don't know	7.9	9.7	6.9	3.7	6.5	4.7	6.6	6.0	7.6

### ENERGY EFFICIENCY OF APPLIANCES

In 1993-94, the household sector (defined as billed customers with a metered supply in private dwellings) accounted for 8.4 per cent of energy consumption (Bush et al. 1995). Since Australia generates 80% of its electricity from coal, improvements in the efficiency of domestic appliances can lead to environmental gains by reducing the amount of greenhouse gases emitted to the atmosphere due to power generation.

#### Star Rating

Energy rating labels contain two pieces of information: how energy efficient the appliance is and how much energy the appliance is likely to consume in a year under the conditions found in an average home. The stars indicate the efficiency of the product, with a higher number of stars indicating a more energy efficient appliance for its type, by taking into account the energy consumption per unit of capacity. The stars need to be considered in conjunction with the purchaser's size requirements, because if two appliances consume the same energy, the one with the larger capacity will be rated the most stars. It may not necessarily be the most energy efficient choice if, for example, it is too large a refrigerator for the household's needs.

The amount of energy an appliance is likely to consume in a year is determined by testing it according to Australian Standard 2575. The test aims to simulate real life conditions and means that all of the appliances of any one type are tested in the same way. Actual energy consumption and running costs will vary depending on where the householder lives, how the appliance is used, and the cost of electricity. The star rating system is used in Queensland, South Australia, and Victoria for air conditioners, dishwashers, washers, dryers, fridges and freezers. New South Wales presently requires them for air conditioners, dishwashers, fridges and freezers.

(Source: Bush, S., Holmes, L., and Ho Trieu, L. (1995) *Australian Energy Consumption and Production*, ABARE Research Report 95.1, Canberra. New South Wales Department of Energy (1988) *Home Energy Guide: an energy saving guide for domestic consumers*.)

### Refrigerators and Freezers

Refrigerators impact on the environment not only in terms of their energy requirements but also in the composition of their materials. The foam insulation in the door and cabinet can be blown in during manufacture with the help of chlorofluorocarbons (CFCs), and refrigerant gases also contain CFCs. Upon disposal, the CFCs can be released into the atmosphere.

From August 1994, all new fridges are free of CFCs as a refrigerant gas and from December 31 1994 they disappeared from the insulation. Instead, fridges use hydrofluorocarbons (HFCs) which do not damage the ozone layer, or hydrochlorofluorocarbons (HCFCs) which are only 5 per cent as damaging as CFCs. However, there is still a concern because of the longevity of CFCs and the large number of CFC-containing refrigerators still in service.

Another environmental effect of refrigerators is their level of energy usage. Maximum efficiency can be achieved by carefully considering the capacity of a refrigerator relative to the household's needs. Refrigerators need to be between two-thirds to three-quarters full for maximum efficiency. Loading and unloading as quickly as possible reduces the amount of air that escapes. If warm food is allowed to cool before refrigeration it will prevent unnecessary frost build up which can affect efficiency. A refrigerator will also be more efficient if it is placed in a well ventilated location, well away from sources of heat.

### Dishwashers

The average dishwasher used 35 litres of water per normal cycle in 1989 (Melbourne Water, 1992). A recent evaluation of twelve dishwashers found that all but one used less than 30 litres (Choice 1993a). This represents approximately 10 litres per meal and can compare favourably with manual washing of dishes, where the average amount of water used is estimated to be between 12 and 15 litres per time.

A dishwasher uses both water and electricity. A machine with an effective range of programs can reduce both. Many have an economy programme that eliminates the pre-wash, shortens the washing time, lowers the wash or rinse temperature and omits the heater in the drying cycle. If a hot water connection is employed it enables the use of solar, off-peak, or gas heating.

### Washing Machines

The environmental impacts of washing machines are water and energy consumption as well as detergent effluent. Front loaders, due to their design, use less water, detergent, and electricity. They are also much better at removing water from clothes and this means further energy savings if a clothes drier is used (Choice 1993b).

### Clothes Dryers

An advantage in wet weather, clothes dryers use a significant amount of electricity. It is generally not economical to use a drier less than 70% full.

*(Source: Choice (1993a) Australian Consumers' Association, February. Choice (1993b) Australian Consumers' Association, September. Melbourne Water (1992) The Melbourne Water Resources Review: Interim Report.)*

### Air Conditioners

Air conditioners come in two forms: evaporative and refrigerative. Evaporative air conditioners are designed for areas which are relatively hot and dry. They cool the air in the house by blowing air through a wet filter pad or spray. For the water to evaporate to water vapour heat is required, which is taken from the air inside the house. The energy used by air conditioners varies considerably and has declined in the last few years as technology has improved.

A refrigerative air conditioner is effective for homes in areas where summer humidity can exceed 70%, such as the eastern coastal strip and far north of Australia. These are also referred to as heat pumps or reverse cycle air conditioners. They work in a similar manner to a refrigerator, using a compressor for heating as well as cooling. Each heat pump contains two heat exchangers, one inside and one outside the home. In winter, heat gathered by the outdoor exchanger is transferred by a refrigerant, through a compressor, to the indoor exchanger where the heat is released at a higher temperature. In summer, the process is reversed and the pump extracts heat from the indoor air through evaporation of a liquid and the air is then recirculated to the room. A condenser turns the vapour back into a liquid and returns heat to the outside exchanger. The two main components of a heat pump are the compressor and the refrigerant. The former compresses the refrigerant and moves it through the system. The latter boils at temperatures well below freezing, changing from liquid to gas at different times in its cycle, either to absorb or reject heat.

In terms of the electricity consumed relative to the heat energy produced, the heat pump is a very efficient appliance. For every kilowatt of electricity that goes in, 2 kilowatts of heat can be produced.

The following table contains comparative efficiency ratings for a range of heating appliances.

<i>Fuel</i>	<i>Appliances</i>	<i>Efficiency (%)</i>
Natural gas	Portable heater	90
	Fixed heater with flue	75
Wood	Airtight slow combustion stove	60
	Non-airtight	30
	Open fire	25
Electricity	Storage space heating	100
	Reverse cycle air conditioning	200
	Portable heater	100
Kerosene	Portable heater	95
Heating oil	Fixed heater with flue	75
LPG	Portable heater	90
	Fixed heater with flue	75
Coke/coal	Airtight combustion stove	60
	Non-airtight stove	30
	Open fire	25

(Source: NSW Department of Energy, 1988)

(Source: New South Wales Department of Energy (1988) *Home Energy Guide: an energy saving guide for domestic consumers.*)

## Appliance Age: States and Territories

TABLE 4.10 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH REFRIGERATORS : AGE OF FRIDGE, STATES AND TERRITORIES, JUNE 1994

Age	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Less than 1 year	151.7	102.9	82.2	30.4	41.8	12.9	3.9	9.4	435.3
1 to less than 5 years	586.6	381.7	328.4	132.7	163.1	44.2	17.0	23.8	1,677.6
5 to less than 10 years	648.1	434.9	348.9	152.6	203.1	54.6	14.8	31.1	1,888.0
10 or more years	734.9	674.0	357.2	242.7	186.4	65.2	9.3	37.6	2,307.4
Don't know	26.8	11.8	23.0	6.4	14.0	2.5	1.3	1.5	87.4
<b>Total households</b>	<b>2,148.1</b>	<b>1,605.4</b>	<b>1,139.8</b>	<b>564.8</b>	<b>608.4</b>	<b>179.4</b>	<b>46.2</b>	<b>103.5</b>	<b>6,395.6</b>
per cent—									
Less than 1 year	7.1	6.4	7.2	5.4	6.9	7.2	8.4	9.1	6.8
1 to less than 5 years	27.3	23.8	28.8	23.5	26.8	24.7	36.8	23.0	26.2
5 to less than 10 years	30.2	27.1	30.6	27.0	33.4	30.4	31.9	30.0	29.5
10 or more years	34.2	42.0	31.3	43.0	30.6	36.3	20.1	36.3	36.1
Don't know	1.2	0.7	2.0	1.1	2.3	1.4	2.8	1.5	1.4

TABLE 4.11 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH SEPARATE FREEZERS : AGE OF FREEZER, STATES AND TERRITORIES, JUNE 1994

Age	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Less than 1 year	36.4	22.2	26.9	9.3	12.3	4.1	2.0	1.9	115.1
1 to less than 5 years	168.4	137.5	118.5	42.9	64.5	21.0	4.5	6.2	563.7
5 to less than 10 years	276.5	188.8	147.6	77.2	95.5	36.0	8.6	15.1	845.2
10 or more years	407.6	370.0	222.4	136.9	111.7	52.7	6.2	19.3	1,326.9
Don't know	10.5	10.0	3.4	3.6	3.5	0.9	0.4	**	32.2
<b>Total households</b>	<b>899.4</b>	<b>728.6</b>	<b>518.8</b>	<b>269.9</b>	<b>287.5</b>	<b>114.8</b>	<b>21.8</b>	<b>42.5</b>	<b>2,883.1</b>
per cent—									
Less than 1 year	4.0	3.1	5.2	3.4	4.3	3.6	9.4	4.4	4.0
1 to less than 5 years	18.7	18.9	22.8	15.9	22.4	18.3	20.8	14.5	19.6
5 to less than 10 years	30.7	25.9	28.5	28.6	33.2	31.4	39.3	35.5	29.3
10 or more years	45.3	50.8	42.9	50.7	38.9	45.9	28.7	45.6	46.0
Don't know	1.2	1.4	0.6	1.3	1.2	0.8	1.9	**	1.1

TABLE 4.12 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH DISHWASHERS : AGE OF DISHWASHER, STATES AND TERRITORIES, JUNE 1994

Age	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Less than 1 year	35.4	33.9	24.9	9.0	8.7	2.4	0.4	3.8	118.4
1 to less than 5 years	172.3	158.0	96.9	32.2	31.3	11.0	3.0	11.2	515.8
5 to less than 10 years	173.8	160.4	86.7	36.4	34.4	12.2	2.5	11.7	518.1
10 or more years	121.7	141.4	56.6	23.6	24.4	8.2	0.8	11.6	388.2
Don't know	25.3	18.5	17.1	4.4	2.9	1.1	**	1.0	70.2
<b>Total</b>	<b>528.5</b>	<b>512.1</b>	<b>282.1</b>	<b>105.5</b>	<b>101.7</b>	<b>34.9</b>	<b>6.7</b>	<b>39.3</b>	<b>1,610.8</b>
per cent—									
Less than 1 year	6.7	6.6	8.8	8.5	8.6	6.8	6.1	9.5	7.3
1 to less than 5 years	32.6	30.8	34.3	30.5	30.8	31.6	45.2	28.5	32.0
5 to less than 10 years	32.9	31.3	30.7	34.5	33.9	35.1	37.2	29.9	32.2
10 or more years	23.0	27.6	20.1	22.3	24.0	23.4	11.5	29.6	24.1
Don't know	4.8	3.6	6.1	4.2	2.8	3.1	**	2.4	4.4

TABLE 4.13 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH CLOTHES DRYERS : AGE OF CLOTHES DRYER, STATES AND TERRITORIES, JUNE 1994

Age	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Less than 1 year	53.9	40.3	31.9	13.1	11.7	3.5	0.4	2.8	157.7
1 to less than 5 years	276.4	216.2	138.4	55.8	62.5	18.8	3.2	15.1	786.4
5 to less than 10 years	362.5	286.1	179.4	87.1	95.0	29.3	3.2	17.0	1,059.5
10 or more years	425.3	365.9	207.6	117.9	78.8	44.1	3.8	20.9	1,264.4
Don't know	17.8	11.8	6.8	4.5	4.6	2.5	0.2	0.4	48.6
<b>Total households</b>	<b>1,136.1</b>	<b>920.3</b>	<b>564.1</b>	<b>278.4</b>	<b>252.6</b>	<b>98.2</b>	<b>10.8</b>	<b>56.2</b>	<b>3,316.6</b>
—per cent—									
Less than 1 year	4.7	4.4	5.7	4.7	4.6	3.6	3.7	5.0	4.8
1 to less than 5 years	24.3	23.5	24.5	20.0	24.8	19.2	29.3	26.9	23.7
5 to less than 10 years	31.9	31.1	31.8	31.3	37.6	29.8	29.5	30.2	31.9
10 or more years	37.4	39.8	36.8	42.3	31.2	44.9	35.7	37.2	38.1
Don't know	1.6	1.3	1.2	1.6	1.8	2.5	1.7	0.7	1.5

TABLE 4.14 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH AIR CONDITIONERS : AGE OF AIR CONDITIONER, STATES AND TERRITORIES, JUNE 1994

Age	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Less than 1 year	42.6	20.7	18.6	20.4	13.9	0.5	3.0	1.6	121.4
1 to less than 5 years	154.3	116.3	63.2	72.4	58.0	2.2	12.4	5.2	484.0
5 to less than 10 years	168.3	173.1	54.3	84.7	60.4	0.9	10.1	4.0	555.8
10 or more years	258.0	247.8	51.5	152.3	68.1	0.6	7.5	5.7	791.6
Don't know	41.5	35.6	13.7	19.4	16.5	**	2.3	0.7	129.7
<b>Total households</b>	<b>664.7</b>	<b>593.5</b>	<b>201.2</b>	<b>349.1</b>	<b>217.0</b>	<b>4.3</b>	<b>35.3</b>	<b>17.3</b>	<b>2,082.4</b>
per cent—									
Less than 1 year	6.4	3.5	9.2	5.8	6.4	12.2	8.6	9.1	5.8
1 to less than 5 years	23.2	19.6	31.4	20.7	26.8	51.6	35.0	30.2	23.2
5 to less than 10 years	25.3	29.2	27.0	24.3	27.8	21.0	28.6	23.2	26.7
10 or more years	38.8	41.7	25.6	43.6	31.4	15.2	21.4	33.2	38.0
Don't know	6.2	6.0	6.8	5.5	7.6	**	6.4	4.2	6.2

TABLE 4.15 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH WASHING MACHINES : AGE OF WASHING MACHINE, STATES AND TERRITORIES, JUNE 1994

Age	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
'000—									
Less than 1 year	179.8	117.9	95.6	33.6	43.2	16.4	5.8	9.1	501.6
1 to less than 5 years	591.3	398.8	339.3	148.7	181.6	50.1	14.1	30.4	1,754.3
5 to less than 10 years	656.9	487.7	369.3	174.7	198.0	53.1	13.8	28.7	1,982.3
10 or more years	537.3	499.1	261.3	171.2	146.0	52.3	5.7	30.2	1,703.1
Don't know	33.5	22.6	19.7	7.8	8.9	3.0	1.3	1.8	98.5
<b>Total households</b>	<b>1,998.8</b>	<b>1,526.1</b>	<b>1,085.3</b>	<b>536.1</b>	<b>577.7</b>	<b>175.0</b>	<b>40.7</b>	<b>100.3</b>	<b>6,039.7</b>
—per cent—									
Less than 1 year	9.0	7.7	8.8	6.3	7.5	9.4	14.2	9.1	8.3
1 to less than 5 years	29.6	26.1	31.3	27.7	31.4	28.6	34.6	30.3	29.0
5 to less than 10 years	32.9	32.0	34.0	32.6	34.3	30.4	34.1	28.6	32.8
10 or more years	26.9	32.7	24.1	31.9	25.3	29.9	14.0	30.1	28.2
Don't know	1.7	1.5	1.8	1.4	1.5	1.7	3.2	1.8	1.6

## Appliance Use: States and Territories

For Australia 33% of households do between 3 and 5 loads of washing per week, and a further 27% do between 6 and 10 loads. Cold water is used by 61% of households, with only 6% using entirely hot water.

Predictably, the more people there are in a household the more loads of washing are done per week. Highest users of cold water are households with one parent and dependent child(ren) (77%).

For Australia, 42% of households that have a dishwasher use their machines at least once a week, with householders in the ACT rating highest for this usage pattern. Thirty two percent of owners use their machine every day, while 21% use them only on rare occasions. Similarly, the incidence of daily dishwasher use varies according to size and composition of the household.

For 36% of those households with clothes dryers the use of their machine depends upon the prevailing weather and season, while a similar number only use their clothes dryer on the odd occasion. Only around 24% use their dryers on an "at least once a fortnight" basis, with highest rates in Victoria and Tasmania. Usage patterns did not vary markedly by household type but unit living seemed to be associated with regular use.

**TABLE 4.16 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH WASHING MACHINES : NUMBER OF LOADS WASHED WEEKLY AND TEMPERATURE OF WATER USED, STATES AND TERRITORIES, JUNE 1994**

<i>Number of loads and temperature of water</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
	—'000—								
Less than 3 loads	588.0	472.0	252.0	170.2	183.0	44.6	7.3	27.4	1,744.4
3-5 loads	641.2	490.0	357.7	194.7	203.8	57.1	15.3	37.0	1,996.8
6-10 loads	540.0	403.2	326.7	126.9	145.3	49.9	14.0	26.8	1,632.8
More than 10 loads	229.5	160.9	148.9	44.3	45.6	23.4	4.1	9.1	665.7
Cold	1,387.3	725.4	792.2	257.8	341.6	102.6	28.6	61.3	3,696.8
Warm	435.1	582.7	220.0	198.1	160.5	56.6	8.8	30.6	1,692.4
Hot	87.7	106.6	32.8	46.9	44.1	8.5	1.5	2.5	330.6
Varies	88.7	111.4	40.2	33.3	31.4	7.3	1.8	5.9	320.0
<b>Total households</b>	<b>1,998.8</b>	<b>1,526.1</b>	<b>1,085.3</b>	<b>536.1</b>	<b>577.7</b>	<b>175.0</b>	<b>40.7</b>	<b>100.3</b>	<b>6,039.7</b>
	per cent.								
Less than 3 loads	29.4	30.9	23.2	31.7	31.7	25.5	17.9	27.3	28.9
3-5 loads	32.1	32.1	33.0	36.3	35.3	32.6	37.6	36.9	33.1
6-10 loads	27.0	26.4	30.1	23.7	25.2	28.5	34.5	26.7	27.0
More than 10 loads	11.5	10.5	13.7	8.3	7.9	13.4	10.0	9.1	11.0
Cold	69.4	47.5	73.0	48.1	59.1	58.6	70.3	61.1	61.2
Warm	21.8	38.2	20.3	37.0	27.8	32.4	21.5	30.5	28.0
Hot	4.4	7.0	3.0	8.7	7.6	4.8	3.8	2.5	5.5
Varies	4.4	7.3	3.7	6.2	5.4	4.2	4.4	5.8	5.3

**TABLE 4.17 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH WASHING MACHINES : NUMBER OF LOADS WASHED WEEKLY AND TEMPERATURE OF WATER USED BY HOUSEHOLD TYPE, JUNE 1994**

<i>Number of loads and temperature of water</i>	<i>One person</i>	<i>Couple only</i>	<i>Other households with all members over 15</i>	<i>Couple, dependent child(ren)</i>	<i>One parent, dependent child(ren)</i>	<i>All other households</i>	<i>Total</i>
—'000—							
Less than 3 loads	846.4	485.5	152.3	85.1	29.7	145.3	1,744.4
3-5 loads	236.3	712.8	335.9	376.4	87.7	247.6	1,996.8
6-10 loads	39.7	252.2	305.6	749.6	111.0	174.7	1,632.8
More than 10 loads	2.8	25.0	97.2	422.9	53.1	64.7	665.7
Cold	613.7	838.1	507.2	1,089.5	215.5	432.8	3,696.8
Warm	354.4	454.4	285.4	415.2	49.6	133.5	1,692.4
Hot	108.7	95.9	47.7	44.3	7.6	26.4	330.6
Varies	48.4	87.1	50.8	85.2	8.8	39.8	320.0
<b>Total households</b>	<b>1,125.2</b>	<b>1,475.5</b>	<b>891.0</b>	<b>1,634.1</b>	<b>281.5</b>	<b>632.4</b>	<b>6,039.7</b>
—per cent—							
Less than 3 loads	75.2	32.9	17.1	5.2	10.6	23.0	28.9
3-5 loads	21.0	48.3	37.7	23.0	31.1	39.2	33.1
6-10 loads	3.5	17.1	34.3	45.9	39.4	27.6	27.0
More than 10 loads	0.2	1.7	10.9	25.9	18.9	10.2	11.0
Cold	54.5	56.8	56.9	66.7	76.6	68.4	61.2
Warm	31.5	30.8	32.0	25.4	17.6	21.1	28.0
Hot	9.7	6.5	5.3	2.7	2.7	4.2	5.5
Varies	4.3	5.9	5.7	5.2	3.1	6.3	5.3

**TABLE 4.18 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH DISHWASHERS : NUMBER OF TIMES DISHWASHER USED, STATES AND TERRITORIES, JUNE 1994**

<i>Number of times used</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
—'000—									
Daily	158.4	170.1	104.2	27.2	25.8	13.5	2.6	12.0	513.9
At least once a week	232.9	219.1	100.1	44.5	42.9	12.0	2.0	19.7	673.2
At least once a month	22.8	28.4	15.8	5.6	5.1	1.4	0.2	2.3	81.5
Occasionally/rarely	114.4	94.5	62.1	28.2	27.8	7.9	1.9	5.4	342.2
<b>Total households</b>	<b>528.5</b>	<b>512.1</b>	<b>282.1</b>	<b>105.5</b>	<b>101.7</b>	<b>34.9</b>	<b>6.7</b>	<b>39.3</b>	<b>1,610.8</b>
—per cent—									
Daily	30.0	33.2	36.9	25.8	25.4	38.8	38.9	30.6	31.9
At least once a week	44.1	42.8	35.5	42.2	42.2	34.4	30.0	50.0	41.8
At least once a month	4.3	5.5	5.6	5.3	5.0	4.1	2.4	5.7	5.1
Occasionally/rarely	21.6	18.4	22.0	26.7	27.4	22.8	28.6	13.7	21.2



TABLE 4.19 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH DISHWASHERS : NUMBER OF TIMES DISHWASHER USED BY HOUSEHOLD TYPE, JUNE 1994

<i>Number of times used</i>	<i>One person</i>	<i>Couple only</i>	<i>Other households with all members over 15</i>	<i>Couple, dependent child(ren)</i>	<i>One parent, dependent child(ren)</i>	<i>All other households</i>	<i>Total</i>
'000-							
Daily	5.9	67.8	121.0	279.1	7.8	32.4	513.9
At least once a week	57.8	188.8	132.7	220.4	24.3	49.2	673.2
At least once a month	10.4	28.0	10.6	21.8	2.3	8.4	81.5
Occasionally/rarely	58.6	94.1	47.8	87.6	11.6	42.6	342.2
<b>Total households</b>	<b>132.7</b>	<b>378.7</b>	<b>312.0</b>	<b>608.8</b>	<b>46.0</b>	<b>132.5</b>	<b>1,610.8</b>
—per cent—							
Daily	4.4	17.9	38.8	45.8	16.9	24.5	31.9
At least once a week	43.6	49.9	42.5	36.2	52.9	37.1	41.8
At least once a month	7.9	7.4	3.4	3.6	5.0	6.3	5.1
Occasionally/rarely	44.1	24.8	15.3	14.4	25.2	32.1	21.2

TABLE 4.20 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH CLOTHES DRYERS : NUMBER OF TIMES CLOTHES DRYER USED, STATES AND TERRITORIES, JUNE 1994

<i>Number of times used</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
—'000—									
At least once a fortnight	241.8	280.3	126.1	57.4	41.8	29.0	1.6	14.3	792.3
At least once a month	60.5	43.9	18.4	8.8	5.8	3.8	0.3	4.0	145.5
Depends on weather/seasons	433.2	276.3	224.1	109.2	98.7	26.8	4.6	18.1	1,191.1
Occasionally/rarely	400.5	319.8	195.5	103.0	106.2	38.6	4.3	19.7	1,187.6
<b>Total households</b>	<b>1,136.1</b>	<b>920.3</b>	<b>564.1</b>	<b>278.4</b>	<b>252.6</b>	<b>98.2</b>	<b>10.8</b>	<b>56.2</b>	<b>3,316.6</b>
—per cent									
At least once a fortnight	21.3	30.5	22.4	20.6	16.6	29.6	14.4	25.5	23.9
At least once a month	5.3	4.8	3.3	3.2	2.3	3.8	2.9	7.2	4.4
Depends on weather/seasons	38.1	30.0	39.7	39.2	39.1	27.3	43.0	32.2	35.9
Occasionally/rarely	35.3	34.7	34.7	37.0	42.1	39.3	39.7	35.1	35.8

TABLE 4.21 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH CLOTHES DRYERS : NUMBER OF TIMES CLOTHES DRYER USED BY HOUSEHOLD TYPE, JUNE 1994

<i>Number of times used</i>	<i>One person</i>	<i>Couple only</i>	<i>Other households with all members over 15</i>	<i>Couple, dependent child(ren)</i>	<i>One parent, dependent child(ren)</i>	<i>All other households</i>	<i>Total</i>
—'000—							
At least once a fortnight	83.4	172.8	124.9	286.6	44.5	80.2	792.3
At least once a month	16.9	33.8	23.6	55.1	5.8	10.3	145.5
Depends on weather/seasons	94.9	259.9	198.5	483.1	61.3	93.5	1,191.1
Occasionally/rarely	175.6	316.4	197.0	363.7	51.3	83.6	1,187.6
<b>Total households</b>	<b>370.8</b>	<b>782.9</b>	<b>543.9</b>	<b>1,188.4</b>	<b>162.8</b>	<b>267.7</b>	<b>3,316.6</b>
per cent							
At least once a fortnight	22.5	22.1	23.0	24.1	27.3	30.0	23.9
At least once a month	4.6	4.3	4.3	4.6	3.6	3.9	4.4
Depends on weather/seasons	25.6	33.2	36.5	40.6	37.6	34.9	35.9
Occasionally/rarely	47.4	40.4	36.2	30.6	31.5	31.2	35.8

TABLE 4.22 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH CLOTHES DRYERS : NUMBER OF TIMES CLOTHES DRYER USED BY TYPE OF DWELLING, JUNE 1994

Number of times used	Semi-detached/terrace/ town house				Other flat/unit/apartment in a block				Total
	Separate house	1 storey	2 or more storeys	Flat attached to house	1 or 2 storeys	3 storeys	4 or more storeys	Other	
	—'000—								
At least once a fortnight	657.9	31.4	18.6	2.7	38.3	27.2	10.1	6.0	792.3
At least once a month	123.1	6.6	3.0	**	5.0	5.3	0.7	1.8	145.5
Depends on weather/seasons	1,085.8	33.0	15.5	2.6	32.3	16.4	1.4	4.1	1,191.1
Occasionally/rarely	1,063.3	46.1	13.5	2.2	33.4	17.9	6.0	5.1	1,187.6
<b>Total households</b>	<b>2,930.2</b>	<b>117.1</b>	<b>50.7</b>	<b>7.6</b>	<b>109.0</b>	<b>66.8</b>	<b>18.2</b>	<b>17.0</b>	<b>3,316.6</b>
	—per cent—								
At least once a fortnight	22.5	26.8	36.7	36.0	35.2	40.7	55.6	35.5	23.9
At least once a month	4.2	5.7	6.0	**	4.6	7.9	4.0	10.3	4.4
Depends on weather/seasons	37.1	28.2	30.5	34.7	29.6	24.5	7.5	24.1	35.9
Occasionally/rarely	36.3	39.3	26.7	29.3	30.6	26.8	32.8	30.1	35.8

### Appliance acquisition considerations: States and Territories

The most replaced appliances in the 12 months to June 1994 were washing machines (9.2% of households), refrigerators (8.5%), and in some States, heaters, while 75% of households had not replaced any of the appliances covered in the survey.

Of those who replaced or acquired an appliance in the 12 months prior to June 1994, the cost of replacing the appliance was considered by 50% of households to be the major factor, followed by the features of the item with 41.5%. The ACT indicated the highest percentage of those who considered the energy rating of the appliance to be an important factor with 47%. Overall the energy factor was rated as being the third most important consideration by householders in Australia.

TABLE 4.23 REPLACEMENT OR ACQUISITION OF APPLIANCES, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS(a)

Replaced or acquired appliances	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
	— '000 —								
Washing machine	194.4	134.7	125.3	46.9	52.4	19.0	7.2	10.4	590.3
Refrigerator	174.3	131.9	105.7	41.1	59.6	15.8	5.8	9.7	543.9
Heater	161.1	91.1	49.3	38.6	53.3	21.9	1.4	11.6	428.4
Clothes dryer	58.2	43.3	32.9	14.9	14.7	3.6	0.4	2.8	170.8
Separate freezer	35.9	32.1	29.6	11.8	17.6	6.2	1.7	1.9	136.7
Air conditioner	44.9	18.1	24.5	21.7	14.2	0.5	2.3	1.3	127.4
Dishwasher	36.7	33.1	24.0	10.3	9.8	2.6	0.4	2.6	119.5
None of the above	1,635.6	1,239.5	848.6	423.9	452.5	127.3	32.2	73.0	4,832.7
<b>Total households</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
	—per cent—								
Washing machine	9.0	8.4	11.0	8.3	8.6	10.6	15.6	10.1	9.2
Refrigerator	8.1	8.2	9.3	7.2	9.8	8.8	12.5	9.4	8.5
Heater	7.5	5.7	4.3	6.8	8.7	12.2	3.0	11.2	6.7
Clothes dryer	2.7	2.7	2.9	2.6	2.4	2.0	0.8	2.7	2.7
Separate freezer	1.7	2.0	2.6	2.1	2.9	3.4	3.6	1.8	2.1
Air conditioner	2.1	1.1	2.1	3.8	2.3	0.3	5.0	1.3	2.0
Dishwasher	1.7	2.1	2.1	1.8	1.6	1.4	0.9	2.5	1.9
None of the above	75.8	77.2	74.3	74.7	74.1	70.8	69.6	70.5	75.3

(a) Totals do not equal the sum of appliances in each column as more than one may be specified.

**TABLE 4.24 NUMBER AND PERCENTAGE OF HOUSEHOLDS THAT REPLACED/ACQUIRED APPLIANCES : FACTORS CONSIDERED WHEN OBTAINING APPLIANCES, STATES AND TERRITORIES, JUNE 1994(a)**

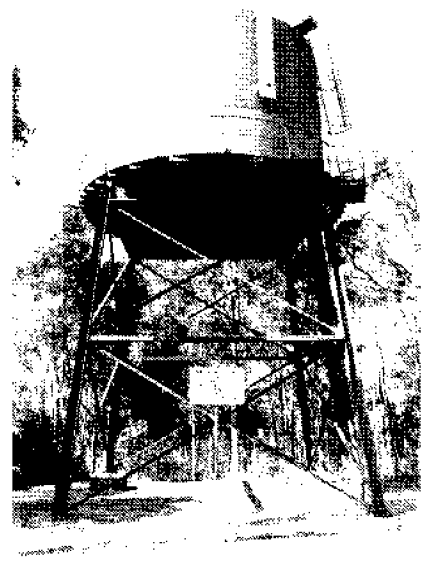
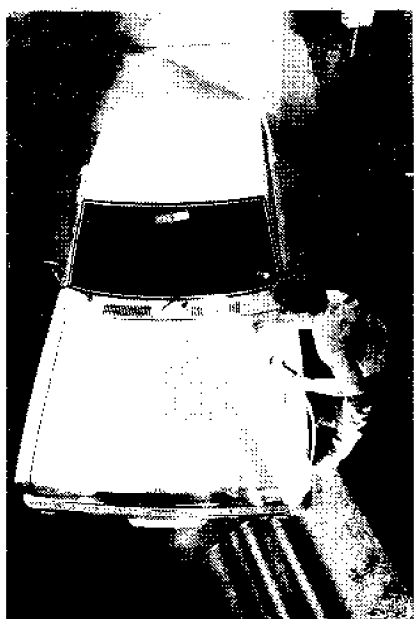
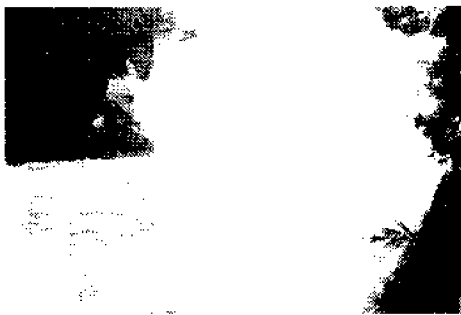
<i>Factors considered</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
—'000—									
Cost	265.8	164.3	156.5	69.6	73.1	24.9	8.0	16.3	778.5
Features	201.3	151.3	132.9	61.1	61.3	21.9	5.9	15.4	651.0
Energy	201.6	138.1	91.4	53.3	51.0	18.6	3.8	14.4	572.3
Brand	101.6	66.2	59.9	23.9	21.8	8.5	1.9	5.0	288.8
Appearance	51.5	34.3	15.8	12.3	9.4	6.2	1.5	2.3	133.4
Other	119.4	85.4	53.7	28.6	43.1	10.0	3.4	7.1	350.6
<b>Total households</b>	<b>514.6</b>	<b>366.4</b>	<b>292.0</b>	<b>141.2</b>	<b>156.3</b>	<b>52.1</b>	<b>14.1</b>	<b>30.5</b>	<b>1,567.1</b>
—per cent—									
Cost	51.7	44.8	53.6	49.3	46.8	47.7	56.9	53.6	49.7
Features	39.1	41.3	45.5	43.3	39.2	42.0	42.1	50.4	41.5
Energy	39.2	37.7	31.3	37.7	32.6	35.7	27.2	47.2	36.5
Brand	19.7	18.1	20.5	16.9	13.9	16.4	13.2	16.3	18.4
Appearance	10.0	9.4	5.4	8.7	6.0	11.8	10.9	7.6	8.5
Other	23.2	23.3	18.4	20.3	27.6	19.2	23.9	23.1	22.4

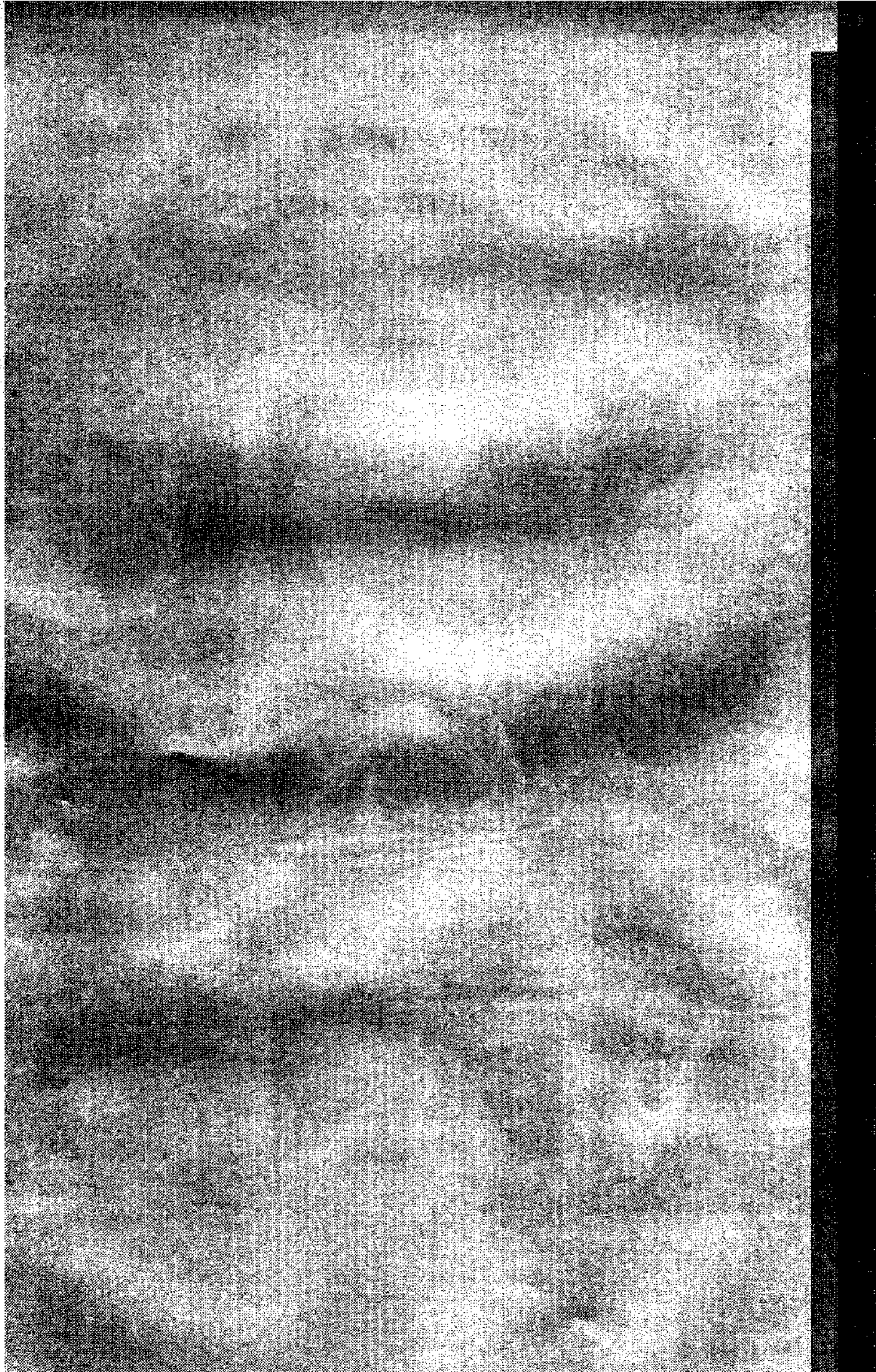
(a) Totals do not equal the sum of factors in each column as more than one may be specified.



# CHAPTER 5

## WATER SOURCES AND USE





## CHAPTER 5

### WATER SOURCES AND USE

In the June 1994 survey households were asked questions regarding sources of water, garden watering methods, rainwater tanks, swimming pools and water conservation steps that they take.

#### Main Findings

- Mains water is the major source of water for Australian households (93%).
- Almost two-thirds (64%) of Australian households are satisfied with the quality of their mains tap water.
- Fifteen per cent of households use a filter for their drinking water.
- Of those with a suds saving washing machine, 36% use the suds saving feature.
- Eighty-six per cent of households with a rainwater tank consider that their tank(s) provide a sufficient water supply.
- Cost was found to be the main inhibitor to installing a rainwater tank.
- Nine per cent of households have a swimming pool.
- Around half (54%) of households take no specific water conservation steps in their dwellings.

## Water supply: States and Territories

Mains/town water is the predominant water source for 93% of households across Australia, with Tasmania ranking lowest at 86% of households. However, State totals obscure regional differences as shown in Table 5.3. Around 15% of Australians reported using rainwater tanks as one of their sources of water, with a high 48% of South Australian households making use of water from rainwater tanks.

Mains/town water is the predominant source used for gardens, bathing and washing, and drinking. South Australia has by far the highest usage of rainwater tank and bottled water used for drinking, with 37% and 8% respectively. Around 18% of households report that they either have no garden for which they are responsible or they choose not to water it. Tasmania has the highest percentage usage of spring water for all three purposes and rainwater from tanks for garden and bathing/washing. Western Australia makes greatest use of bore water for gardening purposes with 20%, while in the Northern Territory 5% of households use bore water for bathing and washing.

**TABLE 5.1 SOURCES OF WATER, STATES AND TERRITORIES, JUNE 1994 : NUMBER AND PERCENTAGE OF HOUSEHOLDS(a)**

Source of water	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Mains/town	2,036.9	1,501.2	1,014.1	541.2	571.8	154.9	44.1	103.6	5,967.7
Rainwater tank	196.0	203.1	202.2	272.2	68.5	32.2	1.2	1.0	976.4
Spring	12.6	7.3	6.2	13.9	3.9	7.4	0.2	**	51.5
Bore	48.1	31.7	86.2	25.1	127.9	3.5	3.5	**	326.0
Bottled	54.5	21.1	24.5	52.6	21.5	1.1	0.8	1.3	177.4
Other	59.8	35.7	38.6	7.2	17.0	8.4	**	0.3	167.1
<b>Total households</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
—per cent—									
Mains/town	94.4	93.4	88.7	95.4	93.6	86.1	95.4	100.0	93.0
Rainwater tank	9.1	12.6	17.7	48.0	11.2	17.9	2.6	0.9	15.2
Spring	0.6	0.5	0.5	2.4	0.6	4.1	0.4	**	0.8
Bore	2.2	2.0	7.5	4.4	20.9	2.0	7.5	**	5.1
Bottled	2.5	1.3	2.1	9.3	3.5	0.6	1.8	1.3	2.8
Other	2.8	2.2	3.4	1.3	2.8	4.7	**	0.3	2.6

(a) Totals do not equal the sum of water sources in each column as more than one may be specified.



TABLE 5.2 SOURCES OF WATER BY USE, STATES AND TERRITORIES, JUNE 1994 : NUMBER AND PERCENTAGE OF HOUSEHOLDS

Use and source of water	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
<b>Garden</b>									
Mains/town	1,486.1	1,244.0	790.5	449.9	427.8	134.5	32.2	92.3	4,657.2
Rainwater tank	40.7	47.4	31.2	19.4	2.7	6.6	**	0.3	148.3
Spring	8.1	5.0	3.9	1.5	2.6	5.8	0.2	**	27.1
Bore	43.1	28.4	67.7	19.0	120.4	2.4	2.5	**	283.5
Other	51.5	27.7	33.6	8.1	12.2	7.8	**	**	140.8
No garden	402.3	142.8	146.4	53.4	33.9	12.5	11.2	6.9	809.3
Don't water	125.9	111.1	69.4	16.0	11.0	10.4	0.2	4.1	348.1
<b>Bathing and washing</b>									
Mains/town water	2,028.9	1,495.7	1,006.2	512.5	567.5	154.2	44.0	103.6	5,912.5
Rainwater tank	97.6	86.8	99.6	46.6	17.4	16.6	**	**	364.6
Spring	5.4	3.4	1.9	**	2.0	4.5	0.2	**	17.4
Bore	5.7	11.7	28.2	5.0	16.7	1.1	2.1	**	70.5
Other	20.1	8.8	6.8	3.2	7.0	3.5	**	**	49.4
<b>Drinking</b>									
Mains/town water	1,938.7	1,406.6	929.0	302.5	523.6	146.7	43.0	102.6	5,392.7
Rainwater tank	166.5	176.8	177.9	208.2	53.8	26.9	0.8	**	810.8
Spring	1.4	1.6	1.4	9.6	1.4	3.2	0.2	**	18.8
Bottled	41.7	11.8	18.8	45.0	17.5	0.2	0.6	0.9	136.6
Other	8.1	7.4	7.1	1.4	6.2	2.2	0.2	**	32.5
Bore	1.3	2.2	8.4	0.6	8.2	0.8	1.6	**	23.0
<b>Total households</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
—per cent—									
<b>Garden</b>									
Mains/town	68.9	77.4	69.2	79.3	70.1	74.7	69.6	89.1	72.6
Rainwater tank	1.9	3.0	2.7	3.4	0.4	3.7	**	0.3	2.3
Spring	0.4	0.3	0.3	0.3	0.4	3.2	0.4	**	0.4
Bore	2.0	1.8	5.9	3.4	19.7	1.3	5.5	**	4.4
Other	2.4	1.7	2.9	1.4	2.0	4.3	**	**	2.2
No garden	18.6	8.9	12.8	9.4	5.6	6.9	24.2	6.6	12.6
Don't water	5.8	6.9	6.1	2.8	1.8	5.8	0.4	4.0	5.4
<b>Bathing and washing</b>									
Mains/town water	94.0	93.1	88.1	90.3	92.9	85.7	95.1	100.0	92.2
Rainwater tank	4.5	5.4	8.7	8.2	2.8	9.2	**	**	5.7
Spring	0.3	0.2	0.2	**	0.3	2.5	0.4	**	0.3
Bore	0.3	0.7	2.5	0.9	2.7	0.6	4.6	**	1.1
Other	0.9	0.5	0.6	0.6	1.1	1.9	**	**	0.8
<b>Drinking</b>									
Mains/town water	89.8	87.6	81.3	53.3	85.8	81.5	92.9	99.1	84.1
Rainwater tank	7.7	11.0	15.6	36.7	8.8	14.9	1.6	**	12.6
Spring	0.1	0.1	0.1	1.7	0.2	1.8	0.4	**	0.3
Bottled	1.9	0.7	1.6	7.9	2.9	0.1	1.3	0.9	2.1
Other	0.4	0.5	0.6	0.2	1.0	1.2	0.4	**	0.5
Bore	0.1	0.1	0.7	0.1	1.3	0.4	3.4	**	0.4

TABLE 5.3 HOUSEHOLD WATER SOURCE BY STATISTICAL REGION, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS(a)

Source	New South Wales							Victoria					All Gipps-land
	Sydney	Hunter	Hllawa- rra	Richmond- Tweed- Mid- North Coast	Nth-Nth Western- Central- Far West	South Eastern	Murray- Murrum- bidgee	Mel- borne	Barwon- Western District	Central High- lands- Wimmera	Loddon- Mallee- Camp- aspe	Goulburn Ovens- Murray	
	'000—												
Mains/town	1,311.0	194.3	132.4	126.0	138.6	52.3	82.4	1,114.1	109.1	55.7	85.1	64.2	73.1
Rainwater tank	24.5	14.9	6.9	46.5	61.1	21.7	20.4	32.0	34.5	40.5	42.8	29.8	23.5
Spring	1.6	1.3	**	4.6	4.4	0.7	**	0.6	1.2	0.5	0.5	4.6	**
Bore	8.2	5.3	0.6	6.9	15.2	7.8	4.2	2.2	13.4	2.6	0.6	12.3	0.6
Bottled	48.5	**	2.3	1.6	0.8	0.7	0.6	18.1	2.4	**	**	**	0.6
Other	7.3	4.3	3.9	16.7	10.2	10.1	7.4	6.2	3.1	4.8	7.7	10.6	3.3
<b>Total households</b>	<b>1,326.0</b>	<b>202.1</b>	<b>135.8</b>	<b>155.9</b>	<b>172.9</b>	<b>72.0</b>	<b>93.0</b>	<b>1,126.3</b>	<b>129.6</b>	<b>74.8</b>	<b>100.2</b>	<b>90.6</b>	<b>84.9</b>
	per cent—												
Mains/town	98.9	96.2	97.5	80.8	80.1	72.6	88.5	98.9	84.1	74.4	85.0	70.8	86.1
Rainwater tank	1.8	7.4	5.1	29.8	35.3	30.1	21.9	2.8	26.6	54.1	42.7	32.9	27.6
Spring	0.1	0.7	**	2.9	2.5	1.0	**	**	0.9	0.6	0.5	5.0	**
Bore	0.6	2.6	0.4	4.4	8.8	10.8	4.5	0.2	10.3	3.5	0.6	13.6	0.8
Bottled	3.7	**	1.7	1.0	0.5	1.0	0.7	1.6	1.9	**	**	**	0.7
Other	0.6	2.1	2.8	10.7	5.9	14.1	7.9	0.6	2.4	6.5	7.7	11.7	3.9
	Queensland											South Australia	
Source	Brisbane	South and East Moreton	North and West Moreton	Wide Bay- Burnett	Mackay- Fitzroy- Central West	Darling Downs- South West	Northern- North West	Far North	Adelaide	South and Eastern SA	North and Western SA		
	—'000—												
Mains/town	500.3	97.6	76.3	60.4	92.7	64.9	66.2	55.7	415.6	78.0	47.7		
Rainwater tank	23.5	17.3	38.0	37.6	26.7	47.8	4.2	7.2	156.1	71.1	45.1		
Spring	0.5	1.9	**	1.5	**	**	0.5	2.0	12.0	0.4	1.5		
Bore	6.0	7.8	15.3	6.2	12.4	16.0	12.6	9.8	11.2	9.9	4.1		
Bottled	11.1	3.9	5.1	1.0	1.5	0.9	1.1	**	48.7	3.3	0.6		
Other	8.7	0.9	6.8	10.8	4.8	3.5	**	3.2	1.7	4.8	0.6		
<b>Total households</b>	<b>515.7</b>	<b>113.4</b>	<b>103.3</b>	<b>84.5</b>	<b>104.6</b>	<b>83.9</b>	<b>68.6</b>	<b>68.7</b>	<b>421.5</b>	<b>92.4</b>	<b>53.4</b>		
	—per cent—												
Mains/town	97.0	86.0	73.9	71.6	88.6	77.3	96.5	81.1	98.6	84.4	89.3		
Rainwater tank	4.6	15.2	36.7	44.5	25.6	56.9	6.1	10.5	37.0	76.9	84.4		
Spring	0.1	1.6	**	1.7	**	**	0.7	2.9	2.8	0.4	2.8		
Bore	1.2	6.9	14.8	7.3	11.9	19.1	18.4	14.3	2.6	10.7	7.6		
Bottled	2.2	3.4	4.9	1.2	1.4	1.1	1.5	**	11.5	3.6	1.2		
Other	1.7	0.8	6.6	12.7	4.6	4.1	**	4.6	0.4	5.2	1.2		

For footnotes see end of table.

TABLE 5.3 HOUSEHOLD WATER SOURCE BY STATISTICAL REGION, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS(a) *continued*

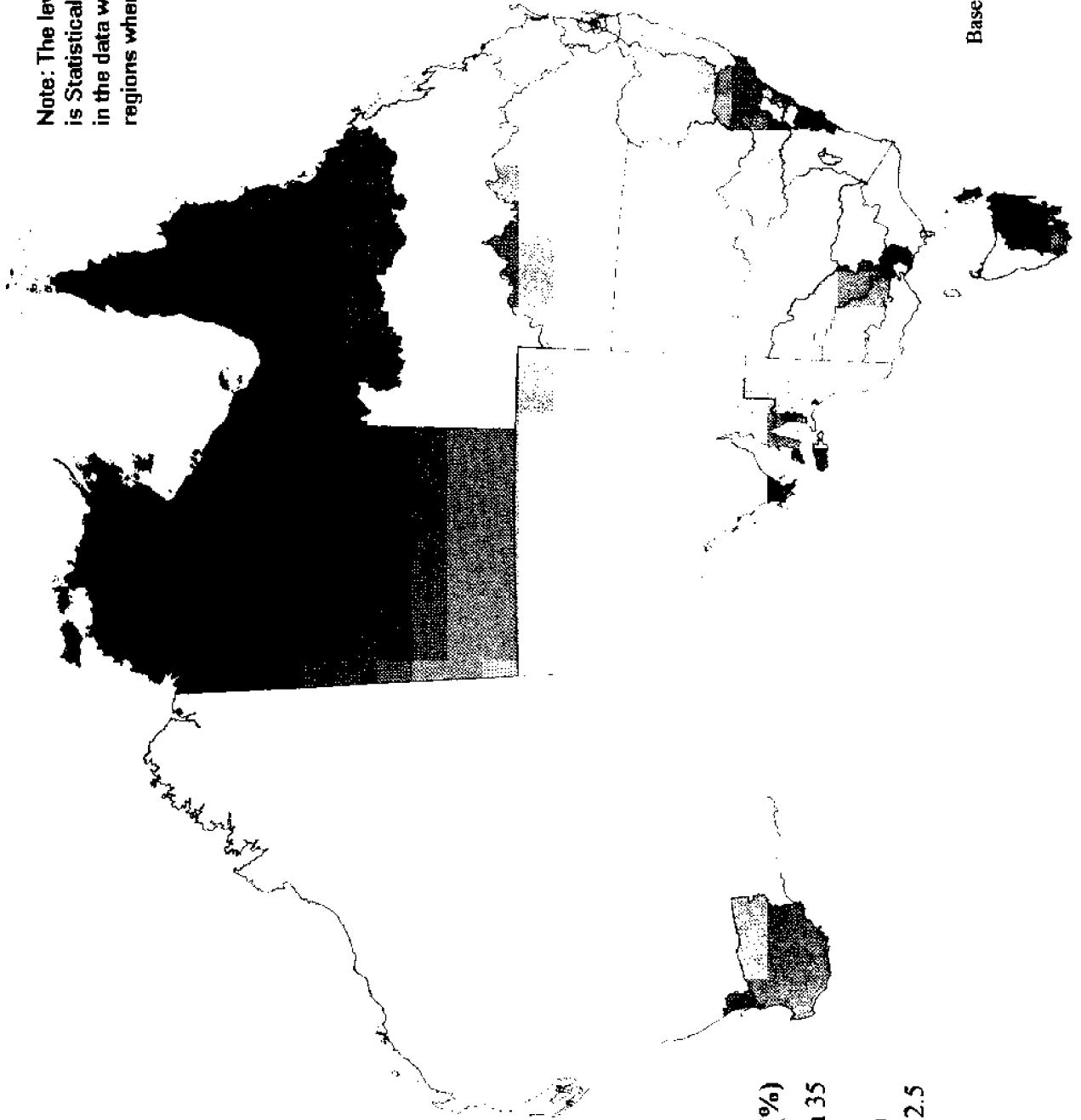
Source	Western Australia			Tasmania				Mersey-Lyell	Northern Territory	Australian Capital Territory	Australia
	Perth	Lower Western WA	Balance WA	Greater Hobart	Southern	Northern					
	—'000—										
Mains/town	447.6	63.1	61.2	69.7	6.5	47.4	31.3	44.1	103.6	5,967.7	
Rainwater tank	21.6	29.4	17.5	4.1	9.7	10.4	7.9	1.2	1.0	976.4	
Spring	1.0	1.9	1.0	0.6	1.3	2.8	2.7	0.2	**	51.5	
Bore	97.4	17.7	12.9	**	**	1.1	2.4	3.5	**	326.0	
Bottled	17.7	1.7	2.1	0.6	**	0.3	0.2	0.8	1.3	177.4	
Other	4.2	9.9	3.0	0.6	4.5	1.8	1.5	**	0.3	167.1	
<b>Total households</b>	<b>455.2</b>	<b>80.6</b>	<b>74.9</b>	<b>72.9</b>	<b>14.7</b>	<b>53.8</b>	<b>38.5</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>	
	—per cent—										
Mains/town	98.3	78.3	81.7	95.6	44.3	88.1	81.3	95.4	100.0	93.0	
Rainwater tank	4.8	36.4	23.3	5.7	66.0	19.3	20.7	2.6	0.9	15.2	
Spring	0.2	2.4	1.3	0.8	8.8	5.2	7.1	0.4	**	0.8	
Bore	21.4	21.9	17.2	**	**	2.1	6.3	7.5	**	5.1	
Bottled	3.9	2.1	2.8	0.8	**	0.6	0.4	1.8	1.3	2.8	
Other	0.9	12.2	4.0	0.8	30.5	3.3	4.0	**	0.3	2.6	

(a) Totals do not equal the sum of water sources in each column as more than one may be specified.

# Rainwater tanks, June 1994

as a source of water

Note: The level of geographic resolution is Statistical Region. There will be variations in the data within regions, and areas within regions where the data does not apply.



Households (%)

- More than 35
- 20 to 35
- 2.5 to 20
- Less than 2.5

Based on 1991 Statistical Region Boundaries

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## Quality of mains tap water: States and Territories

Of those households connected to mains/town water supply 63.5% are satisfied with the quality of the water supply for drinking purposes. Residents of South Australia showed the highest "not satisfied" rating (51%), while both the Northern Territory and the Australian Capital Territory are the most satisfied with 88% and 86% respectively.

TABLE 5.4 HOUSEHOLDS WITH MAINS WATER: QUALITY OF TAP WATER FOR DRINKING, STATES AND TERRITORIES, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS

Quality of tap water	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
—'000—									
Satisfied	1,252.1	1,040.2	657.3	254.4	342.5	115.8	38.9	88.7	3,789.9
Not satisfied	698.8	422.2	322.2	275.3	204.1	34.6	4.6	12.9	1,974.8
Depends	82.5	38.1	34.1	11.5	24.5	4.4	0.6	2.0	197.7
<b>Total households</b>	<b>2,036.9</b>	<b>1,501.2</b>	<b>1,014.1</b>	<b>541.2</b>	<b>571.8</b>	<b>154.9</b>	<b>44.1</b>	<b>103.6</b>	<b>5,967.7</b>
—per cent—									
Satisfied	61.5	69.3	64.8	47.0	59.9	74.8	88.1	85.6	63.5
Not satisfied	34.3	28.1	31.8	50.9	35.7	22.4	10.5	12.5	33.1
Depends	4.1	2.5	3.4	2.1	4.3	2.8	1.4	1.9	3.3

FIGURE 2 HOUSEHOLDS WITH MAINS TAP WATER  
SATISFACTORY TAP WATER QUALITY  
June 1994

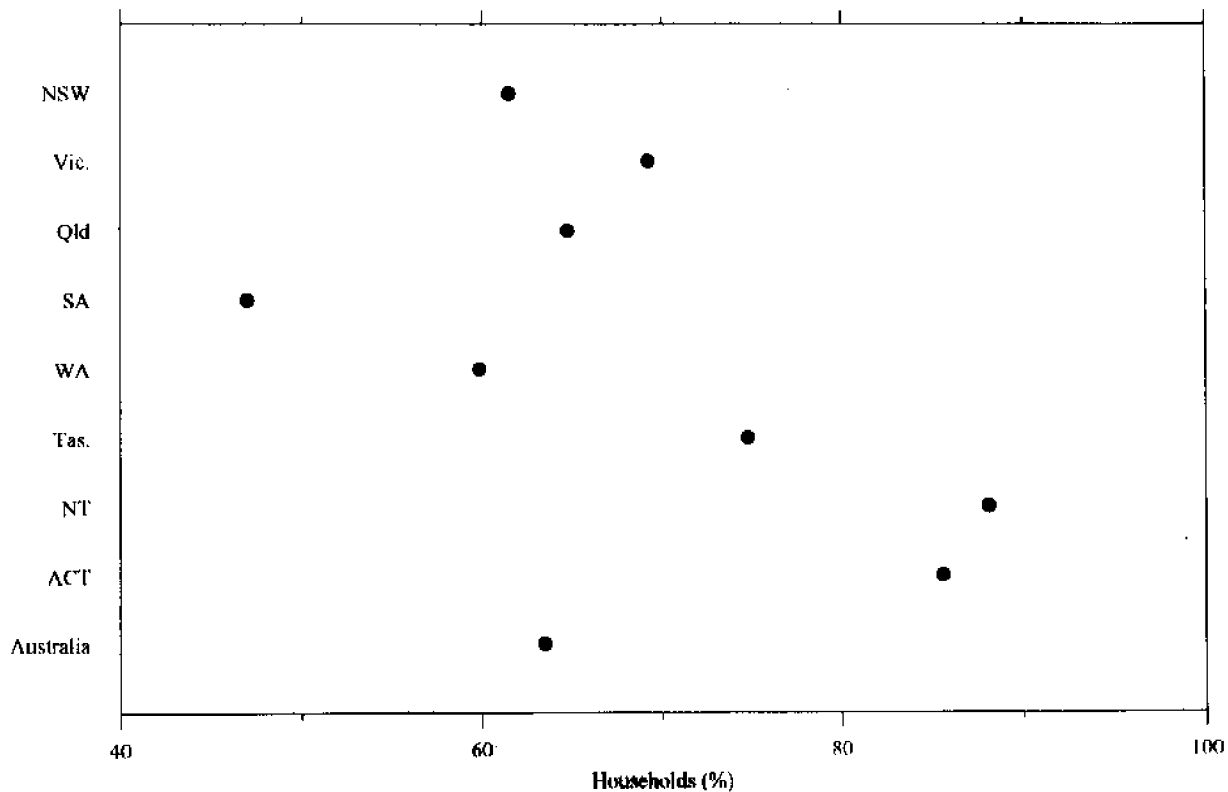


TABLE 5.5 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH MAINS WATER : QUALITY OF TAP WATER FOR DRINKING BY STATISTICAL REGION, JUNE 1994

Quality of tap water	New South Wales							Victoria					All Gippsland
	Sydney	Hunter	Illawarra	Richmond-Tweed-Mid-North Coast	Nth-Western-Central-Far West	South Eastern	Murray-Murrumbidgee	Melbourne	Barwon-Western District	Central Highlands-Wimmera	Loddon-Mallee-Campaspe	Goulburn-Ovens-Murray	
	—'000—												
Satisfied	811.5	112.8	79.6	68.7	91.3	32.4	55.7	843.9	70.6	18.8	29.8	41.1	36.0
Not satisfied	455.5	68.9	39.5	50.3	43.0	18.6	23.0	246.3	34.2	34.5	54.7	20.2	32.2
Depends	42.6	11.9	13.2	7.0	2.9	1.2	3.7	23.8	4.2	2.4	0.6	2.8	4.3
<b>Total households</b>	<b>1,311.0</b>	<b>194.3</b>	<b>132.4</b>	<b>126.0</b>	<b>138.6</b>	<b>52.3</b>	<b>82.4</b>	<b>1,114.1</b>	<b>109.1</b>	<b>55.7</b>	<b>85.1</b>	<b>64.2</b>	<b>73.1</b>
	per cent - -												
Satisfied	61.9	58.0	60.1	54.6	65.9	62.0	67.7	75.8	64.8	33.8	35.0	64.1	49.2
Not satisfied	34.7	35.4	29.9	39.9	31.1	35.6	27.9	22.1	31.4	62.0	64.3	31.5	44.1
Depends	3.2	6.1	10.0	5.5	2.1	2.4	4.5	2.1	3.9	4.2	0.7	4.4	5.8
	Queensland							South Australia					
	Brisbane	South and East Moreton	North and West Moreton	Wide Bay-Burnett	Mackay-Fitzroy-Central West	Darling Downs-South West	Northern-North West	Far North	Adelaide	South and Eastern SA	North and Western SA		
	—'000—												
Satisfied	334.5	59.6	46.2	34.3	57.4	35.2	48.9	41.2	214.4	20.5	19.6		
Not satisfied	146.9	34.5	29.0	25.2	32.9	28.1	14.8	11.0	191.5	56.6	27.2		
Depends	18.9	3.5	1.2	0.9	2.0	1.5	2.5	3.6	9.6	0.9	0.9		
<b>Total households</b>	<b>500.3</b>	<b>97.6</b>	<b>76.3</b>	<b>60.4</b>	<b>92.7</b>	<b>64.9</b>	<b>66.2</b>	<b>55.7</b>	<b>415.6</b>	<b>78.0</b>	<b>47.7</b>		
	—per cent—												
Satisfied	66.9	61.1	60.5	56.8	61.9	54.3	73.9	73.9	51.6	26.3	41.0		
Not satisfied	29.4	35.4	37.9	41.7	35.4	43.3	22.3	19.7	46.1	72.5	57.0		
Depends	3.8	3.5	1.6	1.5	2.1	2.3	3.8	6.4	2.3	1.2	2.0		
	Western Australia			Tasmania									
	Perth	Lower Western WA	Balance WA	Greater Hobart	Southern	Northern	Mersey-Lyell	Northern Territory	Australian Capital Territory	Australia			
	—'000—												
Satisfied	279.3	34.9	28.3	57.7	2.8	33.7	21.6	38.9	88.7	3,789.9			
Not satisfied	148.4	26.3	29.4	10.3	3.5	12.1	8.7	4.6	12.9	1,974.8			
Depends	19.2	1.9	3.5	1.6	0.2	1.6	1.0	0.6	2.0	197.7			
<b>Total households</b>	<b>447.6</b>	<b>63.1</b>	<b>61.2</b>	<b>69.7</b>	<b>6.5</b>	<b>47.4</b>	<b>31.3</b>	<b>44.1</b>	<b>103.6</b>	<b>5,967.7</b>			
	—per cent—												
Satisfied	62.4	55.3	46.2	82.8	43.1	71.1	69.0	88.1	85.6	63.5			
Not satisfied	33.2	41.7	48.1	14.8	54.5	25.5	27.8	10.5	12.5	33.1			
Depends	4.3	3.0	5.7	2.3	2.5	3.4	3.2	1.4	1.9	3.3			

## Water filters: States and Territories

Around 15% of households use filters for their drinking water. The same proportion filter the mains/town water, while rainwater tank water is filtered by 11% of users of tank water and spring water by 8.8% of users.

**TABLE 5.6 USE OF FILTERS FOR DRINKING WATER(a), BY SOURCE, JUNE 1994: NUMBER AND PERCENTAGE OF HOUSEHOLDS**

<i>Filtered drinking water</i>	<i>Mains/town water</i>	<i>Rainwater tank</i>	<i>Spring</i>	<i>Other</i>	<i>Total</i>
		—'000—			
Yes	48.6	75.7	1.4	5.3	913.2
No	276.7	604.4	14.1	17.5	5,364.7
<b>Total households</b>	<b>325.2</b>	<b>680.1</b>	<b>15.5</b>	<b>22.7</b>	<b>6,277.9</b>
		—per cent—			
Yes	14.9	11.1	8.8	23.1	14.5
No	85.1	88.9	91.2	76.9	85.5

(a) Excludes bottled water.

## Rainwater tanks: States and Territories

Across Australia 86% of those owning a rainwater tank consider their tank(s) sufficient to meet their household's needs. ACT tank owners rated lowest with 65% indicating that their tanks gave an insufficient supply. South Australians, apparently with the greatest need, had the most adequate supply with 92% of households reporting that their rainwater tank(s) provided enough water.

Of the twenty-eight per cent of households which have considered installing a rainwater tank, cost was the major factor for not installing a tank (11.4%). South Australia ranked highest for considering installation (56%), and for not installing a tank due to the cost (19%), and other reasons (24%).

**TABLE 5.7 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH A RAINWATER TANK: SUFFICIENCY OF RAINWATER SUPPLY, STATES AND TERRITORIES, JUNE 1994**

<i>Rainwater sufficient</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
									'000
Yes	163.4	167.7	172.6	250.3	54.8	25.3	1.0	0.3	835.4
No	32.6	35.4	29.6	21.9	13.6	6.9	0.2	0.6	141.0
<b>Total households</b>	<b>196.0</b>	<b>203.1</b>	<b>202.2</b>	<b>272.2</b>	<b>68.5</b>	<b>32.2</b>	<b>1.2</b>	<b>1.0</b>	<b>976.4</b>
									—per cent—
Yes	83.4	82.5	85.4	91.9	80.1	78.4	83.4	34.8	85.6
No	16.6	17.5	14.6	8.1	19.9	21.6	16.6	65.2	14.4

**TABLE 5.8 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITHOUT RAINWATER TANKS : REASON RAINWATER TANK NOT INSTALLED, STATES AND TERRITORIES, JUNE 1994(a)**

<i>Reason rainwater tank not installed</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
--'000--									
Not considered installing rainwater tank	986.2	809.7	458.6	78.9	267.4	86.1	20.9	45.6	2,753.4
Not allowed in district/shire	61.5	50.9	20.3	1.1	3.3	1.2	3.0	3.5	144.9
Cost	142.5	99.2	76.2	34.3	58.4	9.2	1.3	13.2	434.5
No room	40.3	18.0	15.8	13.7	16.9	1.3	**	3.2	109.3
Other	115.5	80.4	56.8	43.3	38.8	8.5	1.0	8.3	352.6
None of the above	21.2	12.9	5.9	4.1	2.8	1.1	**	0.8	48.8
Already have rainwater tank but not used	13.9	7.2	12.2	8.5	7.4	2.2	**	0.2	51.6
<b>Total households</b>	<b>1,355.7</b>	<b>1,061.6</b>	<b>632.6</b>	<b>180.2</b>	<b>385.8</b>	<b>109.6</b>	<b>26.2</b>	<b>70.7</b>	<b>3,822.4</b>
—per cent—									
Not considered installing rainwater tank	72.7	76.3	72.5	43.8	69.3	78.6	80.0	64.5	72.0
Not allowed in district/shire	4.5	4.8	3.2	0.6	0.9	1.1	11.6	5.0	3.8
Cost	10.5	9.3	12.0	19.1	15.1	8.4	5.1	18.7	11.4
No room	3.0	1.7	2.5	7.6	4.4	1.2	**	4.6	2.9
Other	8.5	7.6	9.0	24.0	10.0	7.8	3.9	11.8	9.2
None of the above	1.6	1.2	0.9	2.3	0.7	1.0	**	1.2	1.3
Already have rainwater tank but not used	1.0	0.7	1.9	4.7	1.9	2.0	**	0.3	1.3

(a) Totals do not equal the sum of reasons in each column as more than one may be specified.

## Swimming pools: States and Territories

The vast majority of Australian households (91%) do not have a swimming pool. Of those that do, the majority have a filter. Tasmania has the lowest proportion of swimming pools (3%) while the Northern Territory has the highest (18%).

**TABLE 5.9 SWIMMING POOLS, STATES AND TERRITORIES : NUMBER AND PERCENTAGE OF HOUSEHOLDS**

	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
'000									
Swimming pool, filtered	227.0	101.4	133.0	33.4	66.4	6.2	8.3	5.8	581.4
Swimming pool, not filtered	0.7	1.6	0.9	0.3	1.1	1.3	0.2	0.2	6.3
No swimming pool	1,930.0	1,503.4	1,008.9	533.6	543.2	172.4	37.8	97.6	5,826.8
<b>Total</b>	<b>2,157.7</b>	<b>1,606.4</b>	<b>1,142.7</b>	<b>567.3</b>	<b>610.6</b>	<b>179.9</b>	<b>46.2</b>	<b>103.6</b>	<b>6,414.5</b>
—per cent									
Swimming pool, filtered	10.5	6.3	11.6	5.9	10.9	3.4	17.9	5.6	9.1
Swimming pool, not filtered	**	0.1	0.1	0.1	0.2	0.7	0.3	0.2	0.1
No swimming pool	89.4	93.6	88.3	94.1	88.9	95.8	81.8	94.2	90.8



## Garden watering: States and Territories

Across Australia 74% of those households that have a garden, water by hand. The next most frequent methods are the use of moveable, and then fixed, sprinkler systems, with 40% and 24% respectively. Drip and timer systems were clearly most apparent in the drier areas: South Australia, Western Australia, the Northern Territory and the Australian Capital Territory.

TABLE 5.10 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH GARDENS : WATERING METHOD USED, STATES AND TERRITORIES, JUNE 1994(a)

Watering method	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
'000 -									
Hand watering	1,400.5	1,104.9	770.5	359.8	333.7	110.3	21.2	65.1	4,166.1
Moveable sprinkler	628.3	491.9	459.5	265.7	217.3	94.9	20.0	55.4	2,233.1
Fixed sprinkler system	250.2	369.1	195.9	158.3	303.1	35.7	14.2	29.7	1,356.3
Drip system	96.0	111.7	57.8	92.0	72.6	12.2	10.3	9.4	462.0
Timer on tap	64.6	110.0	47.9	94.4	69.6	13.2	6.7	11.7	418.0
Don't water	125.9	111.1	69.4	16.0	11.0	10.4	0.2	4.1	348.1
Other	42.6	13.7	24.8	9.2	5.2	0.9	**	0.7	97.0
<b>Total households</b>	<b>1,755.3</b>	<b>1,463.6</b>	<b>996.3</b>	<b>513.9</b>	<b>576.7</b>	<b>167.4</b>	<b>35.1</b>	<b>96.7</b>	<b>5,605.1</b>
—per cent									
Hand watering	79.8	75.5	77.3	70.0	57.9	65.9	60.5	67.3	74.3
Moveable sprinkler	35.8	33.6	46.1	51.7	37.7	56.7	57.2	57.3	39.8
Fixed sprinkler system	14.3	25.2	19.7	30.8	52.6	21.3	40.5	30.7	24.2
Drip system	5.5	7.6	5.8	17.9	12.6	7.3	29.3	9.7	8.2
Timer on tap	3.7	7.5	4.8	18.4	12.1	7.9	19.2	12.1	7.5
Don't water	7.2	7.6	7.0	3.1	1.9	6.2	0.5	4.3	6.2
Other	2.4	0.9	2.5	1.8	0.9	0.5	**	0.8	1.7

(a) Totals do not equal the sum of watering methods in each column as more than one may be specified.

## Water conservation measures: States and Territories

Thirty nine percent of households in Australia have a dual flush toilet, while 22% have a reduced flow shower head. The ACT had the greatest proportion of households with reduced flow shower heads, while Victoria had the highest incidence of dual flush toilets with 51%. Of the water conservation steps within households that were surveyed, the most prominent was turning off and repairing taps that drip (24% of households).

Of those households which contain a suds saver type of washing machine, this feature is used by 36% of households in Australia. South Australians indicated most use of this feature (50% of households). Victoria had the lowest level of use with 27%.

Around 54% of households reported taking no water conservation steps within their households.

Only 16% of households with gardens took no measures to conserve water in the garden. Of all households with gardens, 68% conserve water by watering at the cooler times of the day, particularly noticeable in the hot, drier States. Mulch is used to conserve water by 53% of households, while 38% use native shrubs and trees.

**TABLE 5.11 METHODS OF CONSERVING WATER IN THE DWELLING, STATES AND TERRITORIES, JUNE 1994:  
NUMBER AND PERCENTAGE OF HOUSEHOLDS**

<i>Conservation measure</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
			'000						
Dual flush toilet	658.9	816.3	360.3	273.6	284.6	55.8	19.2	34.4	2,503.1
Reduced flow shower head	421.2	341.0	256.6	147.8	159.4	37.1	6.7	29.6	1,399.5
Recycle/reuse water	286.5	144.0	188.3	74.9	119.3	21.5	3.6	12.7	850.8
Full loads when washing	351.6	255.7	172.9	59.8	134.9	33.2	8.8	17.4	1,034.3
Shorter showers	360.9	214.2	174.3	70.8	133.8	30.1	6.3	16.5	1,006.8
Turn off/repair dripping taps	545.6	339.5	339.4	74.5	126.7	42.3	11.3	30.5	1,509.9
Brick in toilet cistern	49.7	18.1	16.2	9.3	13.6	3.3	**	2.6	112.7
Other	191.4	91.8	122.2	40.9	65.9	9.1	2.4	15.6	539.3
Suds saver used	362.5	170.2	143.6	127.9	91.3	24.9	5.8	16.3	942.4
No water conservation methods	1,177.4	969.1	539.9	355.1	265.1	100.3	28.5	47.0	3,482.3
			- per cent -						
Dual flush toilet	30.5	50.8	31.5	48.2	46.6	31.0	41.6	33.2	39.0
Reduced flow shower head	19.5	21.2	22.5	26.1	26.1	20.6	14.6	28.6	21.8
Recycle/reuse water	13.3	9.0	16.5	13.2	19.5	11.9	7.7	12.3	13.3
Full loads when washing	16.3	15.9	15.1	10.5	22.1	18.5	19.0	16.8	16.1
Shorter showers	16.7	13.3	15.3	12.5	21.9	16.7	13.5	15.9	15.7
Turn off/repair dripping taps	25.3	21.1	29.7	13.1	20.8	23.5	24.5	29.5	23.5
Brick in toilet cistern	2.3	1.1	1.4	1.6	2.2	1.8	**	2.5	1.8
Other	8.9	5.7	10.7	7.2	10.8	5.1	5.2	15.0	8.4
Suds saver used	16.8	10.6	12.6	22.5	15.0	13.8	12.6	15.7	14.7
No water conservation methods	54.6	60.3	47.2	62.6	43.4	55.8	61.6	45.3	54.3

(a) Totals do not equal the sum of water conservation measures in each column as more than one may be specified.

**TABLE 5.12 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH SUDS SAVER WASHING MACHINES : USE OF SUDS SAVER, STATES AND TERRITORIES, JUNE 1994**

<i>Suds saver used</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
			'000—						
Yes	362.5	170.2	143.6	127.9	91.3	24.9	5.8	16.3	942.4
No	540.8	449.8	332.0	130.3	145.8	54.1	13.2	34.2	1,700.2
<b>Total households</b>	<b>903.2</b>	<b>619.9</b>	<b>475.6</b>	<b>258.1</b>	<b>237.2</b>	<b>79.0</b>	<b>19.0</b>	<b>50.5</b>	<b>2,642.6</b>
			- per cent -						
Yes	40.1	27.4	30.2	49.5	38.5	31.5	30.6	32.2	35.7
No	59.9	72.6	69.8	50.5	61.5	68.5	69.4	67.8	64.3

**TABLE 5.13 NUMBER AND PERCENTAGE OF HOUSEHOLDS WITH GARDENS : WATER CONSERVATION MEASURES, STATES AND TERRITORIES, JUNE 1994(a)**

<i>Conservation measure</i>	<i>NSW</i>	<i>Vic.</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas.</i>	<i>NT</i>	<i>ACT</i>	<i>Australia</i>
			'000—						
Plant native shrubs/trees	622.5	478.3	418.7	234.3	237.5	55.5	16.9	43.3	2,107.0
Mulch used on plants	842.2	782.7	590.0	277.0	296.6	94.3	21.2	60.7	2,964.8
Water early morning/late evening	1,113.8	951.1	669.2	386.5	487.8	103.0	30.8	76.1	3,818.3
Other	51.8	30.4	28.2	14.9	17.8	3.0	0.2	2.8	149.0
No water conservation steps	339.3	265.1	148.2	60.6	34.1	32.3	2.4	8.6	890.5
<b>Total</b>	<b>1,755.3</b>	<b>1,463.6</b>	<b>996.3</b>	<b>513.9</b>	<b>576.7</b>	<b>167.4</b>	<b>35.1</b>	<b>96.7</b>	<b>5,605.1</b>
			- per cent -						
Plant native shrubs/trees	35.5	32.7	42.0	45.6	41.2	33.1	48.3	44.8	37.6
Mulch used on plants	48.0	53.5	59.2	53.9	51.4	56.3	60.6	62.8	52.9
Water early morning/late evening	63.5	65.0	67.2	75.2	84.6	61.5	87.8	78.6	68.1
Other	2.9	2.1	2.8	2.9	3.1	1.8	0.6	2.9	2.7
No water conservation steps	19.3	18.1	14.9	11.8	5.9	19.3	6.9	8.9	15.9

(a) Totals do not equal the sum of water conservation measures in each column as more than one may be specified.

### Water

Ninety-seven percent of the world's water is salt water. Of the three percent which is fresh, two-thirds is locked away in ice caps, glaciers, in the soil or deep underground. If 100 litres represented all the water in the world, the usable supply of freshwater would be only half a teaspoon full (World Resources Institute 1992). Household consumption of water varies widely around the world. The average European uses 259 litres of water in their home per day while the average Canadian uses 340 L/day (Environment Canada 1994). The average Melbournian uses 246 L/day (Melbourne Water 1992) while the average Canberran uses 356 L/day (CSIRO 1992).

Water conservation is important not only because of limited stocks but also because the capture and storage can involve environmental impacts due to aspects such as siltation and altered river volumes. Water also requires electrical power to supply it to users, so the less water that is used the less energy consumed for pumping and treatment. Today's more water efficient appliances allow householders to use less water than was the case ten years ago. Two such appliances are the dual flush toilet and the low flow shower head.

### Toilets

Toilets use an estimated 14% of all household water. Conventional toilets use 11 litres per flush. The first dual flush toilets had capacities of 11 for a full flush and 5.5 for a reduced flush. Subsequent models have reduced the amount of water they use to 9 and 4.5 litres respectively. The latest versions are down to 6 and 3 litres. This new variety also requires a smaller pan to work effectively.

Changing from a conventional single flush toilet to a 9/4.5 litre model can reduce current domestic water consumption by around 3% while a 6/3 unit would reduce it by 7%.

### Low Flow Shower Heads

The shower is the highest user of water in the bathroom. A Perth study in 1985 attributed an average of 30.3% of internal water use to the shower (AWRC 1993).

Conventional shower heads have flow rates of approximately 20 litres per minute. A shower head is considered to be low flow if it uses less than 12 litres per minute. The most efficient varieties consume as little as 7 litres per minute. Flow rates lower than 5 litres per minute are generally considered insufficient for an adequate shower.

### Garden Irrigation

External domestic water use patterns vary greatly from place to place. In Canberra the estimated outdoor usage is 55% of the total water consumed by the household. In Melbourne it is 38% and in Perth it is 42% (CSIRO 1992). The variance is attributable to many factors including soil absorption capacity, plant types, and evaporation rates. A Melbourne study estimated that more efficient domestic garden water usage could save approximately 50% of current garden consumption (Melbourne Water 1992).

Unprotected soil can lose a great deal of water through evaporation, especially in summer. In areas with dry summers, such as Canberra, a 5cm. layer of mulch can cut evaporation losses by as much as 70 to 80%.

Another method for reducing garden water usage is to install a drip irrigation system. This is most appropriate when used in conjunction with certain plant types, particularly natives, which do not require large amounts of water. By eliminating the possibility of over watering, the savings can be in the vicinity of 20% of outdoor use (CSIRO 1992).

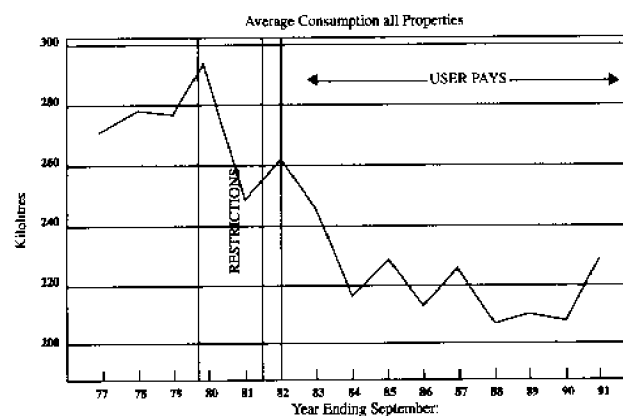
(Source: CSIRO/ASSERT Social Science Unit, (1992) The Water Future of the ACT, A community Discussion Document on the Major Issue. World Resources Institute (1992) World Resources 1992-93, Oxford University Press. Environment Canada (1994) State of the Environment Bulletin No. 94-1, February. Melbourne Water (1992) The Melbourne Water Resources Review: Interim Report. Australian Water Resources Council (1993) Guidelines for the Provision of Water Efficient Appliances and Plumbing, Australian Plumbing Industry Magazine, April/May.)

### Hunter Water Corporation - A Case Study

The Hunter Water Corporation (HWC) supplies water and sewerage to approximately 400,000 people in the Lower Hunter Region of NSW, principally around the cities of Newcastle, Lake Macquarie, Maitland, Cessnock and the Shire of Port Stephens. In 1982, the then Hunter Water Board instituted a two-part tariff for residential water consumers in order to forestall the need to construct a new dam. A number of factors are under consideration in the development of further water resources for NSW. Most districts control a significant proportion of their headwater catchment areas and additional dams on their river systems would not provide a significant amount of additional water. The Hunter region differs in that the reservoirs which serve this region control only 20 per cent of the Hunter River Basin's total flow. Even before social and environmental factors are taken into account, however, the cost per unit of yield from additional storage (in comparable \$ terms) will be significantly higher than that of the catchment's original dam (New South Wales Water Resource Council, 1993). In Newcastle's case, increasing population pressure has also meant that social factors such as dislocation and preservation have played an increasingly significant role in any future dam construction project approvals. Other reasons for avoiding the construction of a new dam include problems with salinity, siltation, and disturbance to a river's natural flow rates.

The HWC user-pays tariff involves a two tiered charge. There is a fixed-rate component based on the capacity of the service received by the consumer and a variable charge, based on the amount of water consumed and sewage generated. Since there are no meters to measure the latter, it is assessed at 50% of the water entering the residence. Before this system was introduced, HWC based their water charges on a property valuation system similar to that used by councils to charge for their services.

The following figure illustrates the effect of the Hunter Water Corporation's new system on water consumption.



(Source: Broad, P., The "User Pays" Principle, Hunter Water Corporation, 1992)

Up until 1980 water charges were based on unimproved property values. The first 350 kilolitres of water were free and the cost structure provided no effective incentive to minimise water usage. During the drought in 1980-81, restrictions were put in place and consumption decreased by 20%. Between 1982 and 1992 consumption patterns changed as the influence of user pays began to impact on the conservation attitudes and practices of consumers. When restrictions were removed in 1982 there was an increase in consumption. With the advent of user pays, consumption dropped by 10% a year for the next two years. Over the course of nine years a saving of 30% has been achieved. The Hunter Water Corporation has predicted that they can defer construction of any new major dam by 40 years (Broad 1992).

(Source: Broad, P. (1992) *The "User-Pays" Principle: How Its Introduction Can Prepare Service Providers For A Competitive Service Environment*, Hunter Water Corporation, Newcastle. Australian Water Resources Council (1993) *Guidelines for the Provision of Water Efficient Appliances and Plumbing*, Australian Plumbing Industry Magazine, April/May.)

## EXPLANATORY NOTES

**Introduction** The monthly population survey comprises the monthly labour force survey and supplementary topics. This publication contains results of a supplementary survey run in association with the June 1994 labour force survey conducted throughout Australia.

**The population survey** The population survey is based on a multi-stage sample of 40,467 households (private dwellings - houses, flats, etc., and non-private dwellings - hotels, motels, etc.) as at June 1994. The proportion of Australian dwellings selected this way is approximately 0.5 per cent. For this supplementary survey on Environmental Issues a half-cluster sample size was used, resulting in a sample size of 15,024 households. The information is obtained from the occupants of selected dwellings by carefully chosen and specially trained interviewers. The interviews are generally conducted during the two weeks beginning on the Monday between the 6th and 12th of each month. The information obtained relates to the week before the interview (i.e. the reference week).

Of the respondents to the labour force survey, those who fell within the scope of the supplementary survey were asked additional questions. For this subset of respondents, questions were asked of the household representative aged 18 years or more whose birthday was closest to the date of the interview. The information collected referred to aspects of the household's energy, appliance, and water usage, and people's views on environmental concerns.

**Scope** The scope of the survey included all persons aged 18 years and over, except:

- where a member of the household was out of scope of the survey, for questions relating to the household;
- members of the permanent defence forces;
- certain diplomatic personnel of overseas governments, customarily excluded from census and estimated populations;
- overseas residents in Australia; and
- members of non-Australian defence forces (and their dependents) stationed in Australia.

**Coverage** In the labour force survey, coverage rules are applied which aim to ensure that each person is associated with only one dwelling, and hence has only one chance of selection. The coverage rules are, necessarily, a balance between theoretical and operational considerations. Nevertheless, the chance of a person being enumerated at two separate dwellings in the survey is considered to be negligible.

**Reliability of the estimates** Two types of error are possible in an estimate based on a sample survey: sampling error and non-sampling error. The *sampling error* is a measure of the variability that occurs by chance because a sample, rather than the entire population, is surveyed. One measure of the likely difference resulting from not including all dwellings in the survey is given by the *standard error*. There are about two chances in three that a sample estimate will differ by less than one standard error from the figure that would have been obtained if all dwellings had been included in the survey, and about nineteen chances in twenty that the difference will be less than two standard errors. Standard errors may be estimated by using information in the Technical Note.

The smaller the estimate the higher is the relative standard error. Very small estimates are subject to high standard errors (relative to the size of the estimate) which detract seriously from their value for most reasonable uses. In the tables in this publication, only estimates with relative standard errors of 25 per cent or less, and percentages based on such estimates, are considered sufficiently reliable for such purposes.

The imprecision due to sampling variability, which is measured by the standard error, should not be confused with inaccuracies that may occur because of imperfections in

reporting by respondents, errors made in collection such as in recording and coding of data, and errors made in processing the data. Inaccuracies of this kind are referred to as the *non-sampling error*, and they may occur in any enumeration, whether it be a full count or a sample.

Every effort is made to reduce the non-sampling error to a minimum by careful design of questionnaires, intensive training and supervision of interviewers and efficient operation procedures.

**Related publications**

Users may also wish to refer to the following publications:

*Environmental Issues and Usage of National Parks, Australia, April 1986* (4115.0)

*Environmental Issues — People's Views and Practices, May 1992* (4602.0)

*Australia's Environment: Issues and Facts, 1992* (4140.0)

*National Energy Survey: Household Appliances, Facilities and Insulation, Australia, 1985-86* (8212.0)

*The Labour Force, Australia* (6203.0)

Current publications produced by the ABS are listed in the *Catalogue of Publications and Products, Australia* (1101.0). The ABS also issues, on Tuesdays and Fridays, a *Publication Advice* (1105.0) which lists publications to be released in the next few days. The Catalogue and the Publications Advice are available from any ABS office.

**Unpublished statistics**

As well as the statistics included in this and related publications, the ABS has a large amount of more detailed data which can be made available. Inquiries should be made to the telephone number in the Phone Inquiries section at the back of this publication.

**Symbols and other usages**

- \*\* subject to sampling variability too high for most practical uses. See the Technical Notes for more details.
- .. not applicable.

Because figures have been rounded, discrepancies may occur between totals and the sums of the component items.

## APPENDIX A

### TECHNICAL NOTE: STANDARD ERROR TABLE

Since the estimates in this publication are based on information obtained from occupants of a sample of dwellings, they are subject to sampling variability, that is, they may differ from those that would have been produced if all dwellings had been included in the survey. One measure of the likely difference is given by the *standard error*, which indicates the extent to which an estimate might have varied by chance because only a sample of dwellings was included. There are about two chances in three that a sample estimate will differ by less than one standard error from the number that would have been obtained if all dwellings had been included, and about nineteen chances in twenty that the difference will be less than two standard errors. Another measure of the likely difference is the *relative standard error*, which is obtained by expressing the standard error as a percentage of the estimate.

2. Space does not allow for the separate indication of the standard errors of all estimates in this publication. A table of standard errors for general application is given on the following pages. Since they are averages based on calculations for a limited number of past surveys over a wide range of labour force characteristics these numbers will not give a precise measure of the standard error of a particular estimate but they will provide an indication of its magnitude.

3. An example of the calculation and the use of standard errors in relation to estimates of persons is as follows. Table 1.2 shows the estimated number of persons who indicated a concern for air pollution was 4,348,300. Since this estimate is between 2,000,000 and 5,000,000, the standard error for Australia will be between 21,600 and 29,700 in the standard error table and can be approximated as 27,900 (rounded to the nearest 100). Therefore, there are about two chances in three that the value that would have been produced if all dwellings had been included in the survey will fall in the range 4,320,300 and 4,376,100, and about nineteen chances in twenty that the

value will fall within the range 4,292,400 and 4,404,000. This example is illustrated in the diagram.

4. As can be seen from the standard error table, *the smaller the estimate the higher is the relative standard error*. Very small estimates are thus subject to such high standard errors (relative to the size of the estimate) as to detract seriously from their value for most reasonable uses. In this publication, only estimates with relative standard errors less than 25 per cent are considered sufficiently reliable for most reasonable purposes. Estimates with relative standard errors larger than 25 per cent are not shown and are marked with a double asterisk (\*\*).

5. Proportions and percentages formed from the ratio of two estimates are also subject to sampling errors. The size of the error depends on the accuracy of both the numerator and the denominator. A formula to approximate the relative standard error (RSE) of a proportion is given below:

$$RSE(x/y) = \sqrt{[RSE(x)]^2 + [RSE(y)]^2}$$

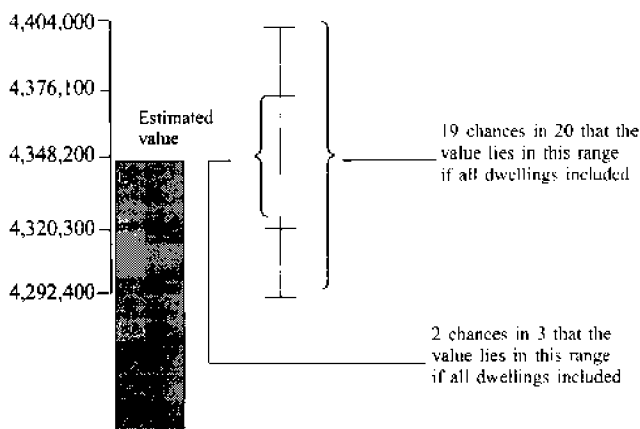
6. Considering the example above, these people as a proportion of all persons (12,760,900) is shown in Table 1.2 as 34.1 per cent. The standard error for 12,760,900 is approximately 39,900 so the relative standard error is 0.3 per cent. The relative standard error for 4,348,200 is 0.6 per cent. Applying the above formula, the relative standard error of the proportion is  $\sqrt{(0.6)^2 + (0.3)^2}$  or 0.5 per cent, giving a standard error for the proportion (34.1 per cent) of 0.2 percentage points. Therefore, there are about two chances in three that the proportion of persons who indicated a concern for the environmental problem of air pollution is between 33.9 per cent and 34.3 per cent and nineteen chances in twenty that the proportion is within the range 33.7 per cent and 34.5 per cent.

7. Published estimates may also be used to calculate the difference between two survey estimates (of numbers or percentages). Such an estimate is subject to sampling error. The sampling error of the difference between two estimates depends on their standard errors and the relationship (correlation) between them. An approximate standard error (SE) of the difference between two estimates (x-y) may be calculated by the following formula:

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

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

8. The imprecision due to sampling variability, which is measured by the standard error, should not be confused



with inaccuracies that may occur because of imperfections in reporting by interviewers and respondents and errors made in coding and processing data. Inaccuracies of this kind are referred to as the *non-sampling error*, and they may occur in any enumeration, whether it be a full count

or a sample. Every effort is made to reduce the non-sample error to a minimum by careful design of questionnaires, intensive training and supervision of interviewers and efficient operating procedures.

#### STANDARD ERROR OF ESTIMATES

Size of estimate (Persons)	NSW	Vic.	Qld	SA	WA	Tas	NT	ACT	Australia	
	number									Relative standard error (per cent)
100						120	150	120		
200						180	200	160		
300				310	350	230	240	200		
400			430	360	400	260	270	230	400	100.4
500		540	480	400	450	290	300	250	460	91.2
600		590	530	440	490	320	320	270	510	84.3
700	700	640	570	480	520	350	350	290	550	78.7
800	750	690	610	510	560	370	370	310	590	74.2
900	800	730	650	540	590	390	390	330	630	70.4
1,000	840	770	680	570	620	410	410	340	670	67.2
1,100	880	810	720	590	650	430	430	360	710	64.3
1,200	920	840	750	620	680	450	440	370	740	61.9
1,300	960	880	780	640	700	460	460	390	780	59.6
1,400	990	910	810	670	730	480	480	400	810	57.7
1,500	1,050	940	830	690	750	490	490	410	840	55.9
1,600	1,050	970	860	710	770	510	510	420	870	54.2
1,700	1,100	1,000	880	730	800	520	520	430	900	52.7
1,800	1,100	1,050	910	750	820	530	530	450	920	51.3
1,900	1,150	1,050	930	770	840	550	550	460	950	50.1
2,000	1,200	1,100	960	790	860	560	560	470	980	48.9
2,100	1,200	1,100	980	810	880	570	570	480	1,000	47.8
2,200	1,250	1,150	1,000	820	900	580	590	490	1,050	46.8
2,300	1,250	1,150	1,000	840	920	590	600	500	1,050	45.8
2,400	1,300	1,200	1,050	860	930	610	610	500	1,100	44.9
2,500	1,300	1,200	1,050	870	950	620	620	510	1,100	44.0
3,000	1,450	1,350	1,150	950	1,050	670	670	550	1,200	40.4
3,500	1,550	1,450	1,250	1,000	1,100	710	720	590	1,300	37.5
4,000	1,650	1,500	1,350	1,100	1,200	750	770	630	1,400	35.2
4,500	1,750	1,600	1,400	1,150	1,250	780	810	660	1,500	33.2
5,000	1,800	1,700	1,450	1,200	1,300	820	850	690	1,600	31.5
6,000	2,000	1,850	1,600	1,300	1,400	880	930	740	1,750	28.8
8,000	2,250	2,100	1,800	1,450	1,600	980	1,050	830	2,000	25.0
10,000	2,500	2,350	2,000	1,600	1,750	1,050	1,150	910	2,250	22.3
20,000	3,400	3,150	2,750	2,150	2,350	1,350	1,600	1,200	3,100	15.6
30,000	4,050	3,800	3,250	2,550	2,800	1,550	1,950	1,400	3,800	12.6
40,000	4,600	4,250	3,650	2,900	3,150	1,700	2,250	1,550	4,300	10.8
50,000	5,000	4,700	4,000	3,150	3,450	1,800	2,500	1,700	4,800	9.6
100,000	6,700	6,200	5,300	4,100	4,500	2,150	3,450	2,150	6,500	6.5
200,000	8,800	8,200	7,000	5,300	5,900	2,550	4,800	2,750	8,800	4.4
300,000	10,300	9,500	8,200	6,200	6,800	2,800		3,200	10,400	3.5
400,000	11,400	10,600	9,100	6,800	7,600	2,950			11,600	2.9
500,000	12,400	11,500	9,900	7,400	8,200	3,100			12,700	2.5
1,000,000	15,900	14,700	12,600	9,300	10,500				16,700	1.7
2,000,000	20,200	18,600	16,000	11,600	13,300				21,600	1.1
5,000,000	27,300	24,900	21,700						29,700	0.6
10,000,000	33,800								37,400	0.4
20,000,000									46,500	0.2



## APPENDIX B

### BIBLIOGRAPHY

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## Appendix C

### Special Data Service

The ABS offers a range of unpublished data from this survey upon request.

This section specifies the data items, categories, populations and units which are available from the survey.

#### Populations

In this publication a number of standard populations are used. Where they exist these standard populations are indicated below the data item to which they relate, and are available at either the person or household level as indicated.

#### Levels

Two levels of unit are available from the survey:

- *Person* level which contains data about each person who is in scope of the survey;
- *Household* level which contains information about the group of people who make up the household.

The following pages list the data items collected in the survey, together with the categories, populations and levels available for each data item.

Data items collected in the June 1994 survey

- |   |   |
|---|---|
| <p><b>1 STATE OF USUAL RESIDENCE</b><br/>           New South Wales<br/>           Victoria<br/>           Queensland<br/>           South Australia<br/>           Western Australia<br/>           Tasmania<br/>           Northern Territory<br/>           Australian Capital Territory</p> <p><i>All populations</i><br/> <i>Both levels</i></p> | <p>1 storey<br/>           2 or more storeys<br/>           Flat attached to a house<br/>           Other flat/unit/apartment -<br/>           1 or 2 storeys<br/>           3 storeys<br/>           4 or more storeys<br/>           Other type of dwelling</p> <p><i>All populations</i><br/> <i>Both levels</i></p>   |
| <p><b>2 AREA OF USUAL RESIDENCE</b><br/>           Metropolitan<br/>           Non-metropolitan</p> <p><i>All populations</i><br/> <i>Both levels</i></p>   | <p><b>9 HOUSEHOLD TYPE</b><br/>           One person<br/>           Couple only<br/>           Other households with all members over<br/>           15 Couple, dependent child(ren)<br/>           One parent, dependent child(ren)<br/>           All other households</p> <p><i>All populations</i><br/> <i>Household level</i></p>  |
| <p><b>3 REGION OF USUAL RESIDENCE</b><br/>           Standard labour force statistical regions</p> <p><i>All populations</i><br/> <i>Both levels</i></p>  | <p><b>10 CONCERNED ABOUT ENVIRONMENTAL PROBLEMS</b><br/>           Yes<br/>           No<br/>           Don't know</p> <p><i>All populations</i><br/> <i>Person level</i></p>   |
| <p><b>4 SEX</b><br/>           Male<br/>           Female</p> <p><i>All populations</i><br/> <i>Both levels</i></p>   | <p><b>11 ENVIRONMENTAL PROBLEM OF CONCERN</b><br/>           Destruction of trees/ecosystems<br/>           Extinction of species<br/>           Air pollution<br/>           Ocean pollution<br/>           Freshwater pollution<br/>           Other pollution<br/>           Garbage disposal<br/>           Toxic chemical waste<br/>           Ozone layer<br/>           Greenhouse effect<br/>           Land degradation<br/>           Sand mining<br/>           Use of uranium<br/>           Nuclear tests/weapons<br/>           Overpopulation<br/>           Resource conservation<br/>           Use of pesticides<br/>           Other</p> <p><i>Population: persons concerned about environmental problems</i><br/> <i>Person level</i></p> |
| <p><b>5 AGE</b><br/>           18 to 24 years<br/>           25 to 34 years<br/>           35 to 44 years<br/>           45 to 54 years<br/>           55 to 64 years<br/>           65 years and over</p> <p><i>All populations</i><br/> <i>Both levels</i></p>  | <p><b>12 ENVIRONMENTAL AND ECONOMIC ATTITUDE</b><br/>           Environment protection is more important than economic growth<br/>           Environment protection and economic growth are equally important<br/>           Environment protection is less important</p>   |
| <p><b>6 MARITAL STATUS</b><br/>           Married<br/>           De Facto<br/>           Separated<br/>           Divorced<br/>           Widowed<br/>           Never married</p> <p><i>All populations</i><br/> <i>Both levels</i></p>  |   |
| <p><b>7 LABOUR FORCE STATUS</b><br/>           Employed<br/>           Unemployed<br/>           Not in the Labour Force<br/>           All populations<br/>           Both levels</p>  |   |
| <p><b>8 DWELLING STRUCTURE</b><br/>           Separate house<br/>           Semi-detached/terrace/townhouse -</p>   |   |

- than economic growth  
Cannot decide/no opinion  
*All populations*  
*Person level*
- 13 DWELLING INSULATED**  
Yes  
No  
Don't know  
*All populations*  
*Household level*
- 14 LOCATION OF INSULATION**  
Roof/ceiling  
Walls  
Floor  
Other  
*Population: dwellings with insulation*  
*Household level*
- 15 REASON INSULATION INSTALLED**  
Cost/save on energy  
Use less energy  
For comfort  
Other  
*Population: households who installed insulation in their dwellings*  
*Household level*
- 16 REASON DWELLING NOT INSULATED**  
Cost  
Not home owner  
Haven't got around to it  
Not needed (climate)  
Not interested  
Dwelling construction  
Other  
*Population: dwellings without insulation*  
*Household level*
- 17 WINDOW FEATURES**  
Outside awnings/shutters  
Boxed pelmets on curtains or blinds  
Double glazing  
Tinted glass/solar guarding  
None of the above  
*All populations*  
*Household level*
- 18 ROOMS IN DIRECT WINTER SUNLIGHT**  
Lounge/living/family  
Kitchen/dining  
Bedroom(s)  
Laundry/bathroom  
Other  
*Population: rooms in dwelling receiving direct winter sunlight*  
*Household level*
- 19 REASON DWELLING IN SHADE**
- Buildings  
Verandah/ pergola  
Neighbour's trees or shrubs  
Own trees or shrubs  
Slope of the land  
Design of the dwelling  
Other  
*Population: dwellings in shade*  
*Household level*
- 20 HEATING USED MOST OFTEN**  
Gas  
Solar  
Electricity  
Wood  
Oil  
Other/varies  
*Population: dwellings with heating*  
*Household level*
- 21 HOT WATER SYSTEM**  
Gas  
Solar  
Electricity  
Other  
*All populations*  
*Household level*
- 22 NUMBER OF HEATERS IN HOUSEHOLD**  
One  
Two  
Three or more  
*Population: dwellings with heating*  
*Household level*
- 23 AGE OF MAIN HEATER**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years  
*Population: dwellings with heating*  
*Household level*
- 24 SOURCE OF GAS SUPPLY**  
Bottled  
Mains  
Don't know  
*Population: households using gas*  
*Household level*
- 25 AVAILABILITY OF MAINS GAS CONNECTION**  
Yes  
No  
Don't know  
*Population: households without mains gas supply*  
*Household level*
- 26 APPLIANCES IN HOUSEHOLD**  
Refrigerator  
Separate freezer

- Dishwasher  
Clothes dryer  
Air conditioner  
Washing machine  
None of the above appliances
- All populations*  
*Household level*
- 27 REPLACED OR PURCHASED APPLIANCES**  
Heater  
Refrigerator  
Separate freezer  
Dishwasher  
Clothes dryer  
Air conditioner  
Washing machine  
None
- All populations*  
*Household level*
- 28 FACTORS CONSIDERED WHEN BUYING OR REPLACING APPLIANCES**  
Cost  
Features  
Brand  
Energy  
Appearance  
Other
- Population: households who replaced appliances*  
*Household level*
- 29 NUMBER OF AIR CONDITIONERS**  
None  
One  
Two  
Three or more
- Population: households with air conditioners*  
*Household level*
- 30 AGE OF AIR CONDITIONERS**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years
- Population: households with air conditioners*  
*Household level*
- 31 TYPE AND POSITION OF AIR CONDITIONER**  
Portable, reverse cycle  
Portable, refrigerated  
Portable, evaporative  
Set in wall/window, reverse cycle  
Set in wall/window, refrigerated  
Set in wall/window, evaporative  
Ducted, reverse cycle  
Ducted, refrigerated  
Ducted, evaporative
- Population: households with air conditioners*  
*Household level*
- 32 NUMBER OF REFRIGERATORS**  
None  
One  
Two  
Three or more
- Population: households with refrigerators*  
*Household level*
- 33 AGE OF REFRIGERATOR**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years
- Population: households with refrigerators*  
*Household level*
- 34 NUMBER OF FREEZERS**  
None  
One  
Two  
Three or more
- Population: households with freezers*  
*Household level*
- 35 AGE OF FREEZER**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years
- Population: households with freezers*  
*Household level*
- 36 TYPE OF FREEZER**  
Chest  
Upright  
Twin door on fridge  
Other
- Population: households with freezers*  
*Household level*
- 37 AGE OF CLOTHES DRYER**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years
- Population: households with clothes dryers*  
*Household level*
- 38 NUMBER OF TIMES CLOTHES DRYER USED**  
At least once a fortnight  
At least once a month  
Depends on weather/seasons  
Occasionally/rarely
- Population: households with clothes dryers*  
*Household level*
- 39 AGE OF DISHWASHER**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years

- Population: households with dishwashers*  
*Household level*
- 40 NUMBER OF TIMES DISHWASHER USED**  
Daily  
At least once a week  
At least once a month  
Occasionally/rarely  
*Population: households with dishwashers*  
*Household level*
- 41 AGE OF WASHING MACHINE**  
Less than 1 year  
1 to less than 5 years  
5 to less than 10 years  
10 or more years  
*Population: households with washing machines*  
*Household level*
- 42 TYPE OF WASHING MACHINE**  
Top loading automatic  
Front loading automatic  
Twin tub  
Wringer  
Other  
*Population: households with washing machines*  
*Household level*
- 43 NUMBER OF LOADS OF WASHING PER WEEK**  
Less than 3 loads  
3-5 loads  
6-10 loads  
More than 10 loads  
*Population: households with washing machines*  
*Household level*
- 44 TEMPERATURE OF WASHING WATER**  
Cold  
Warm  
Hot  
Varies  
*Population: households with washing machines*  
*Household level*
- 45 AUTOMATIC WASHING MACHINES WITH SUDS SAVER**  
Yes  
No  
Don't know  
*Population: households with automatic washing machines*  
*Household level*
- 46 USE OF SUDS SAVER ON AUTOMATIC WASHING MACHINE**  
Yes  
No  
*Population: households with suds saver washing machines*  
*Household level*
- 47 SOURCE OF WATER FOR HOUSEHOLD**  
Mains/town  
Rainwater tank  
Spring  
Bore  
Bottled  
Other  
*All populations*  
*Household level*
- 48 MAIN SOURCE OF WATER FOR GARDEN**  
Mains/town  
Rainwater tank  
Spring  
Bore  
Other  
*Population: households with more than 1 water source, and with gardens*  
*Household level*
- 49 MAIN SOURCE OF WATER FOR BATHING AND WASHING**  
Mains/town  
Rainwater tank  
Spring  
Bore  
Other  
*Population: households with more than 1 water source*  
*Household level*
- 50 MAIN SOURCE OF WATER FOR DRINKING**  
Mains/town  
Rainwater tank  
Spring  
Bottled  
Bore  
Other  
*Population: households with more than 1 water source*  
*Household level*
- 51 USE OF WATER FILTER FOR DRINKING WATER**  
Yes  
No  
*Population: households main source of drinking water (except bottled)*  
*Household level*
- 52 REASON PREVENTING INSTALLATION OF A RAINWATER TANK**  
Not allowed in district/shire  
Cost  
No room  
Other  
None of the above  
*Population: households without rainwater tanks*  
*Household level*

**53 RAINWATER TANK MEETS HOUSEHOLD'S NEEDS**

- Yes
- No

*Population: households with a rainwater tank.  
Household level*

**54 HOUSEHOLD WATER CONSERVATION STEPS**

- Recycle/reuse water
- Full loads when washing
- Shorter showers
- Turn off/repair dripping taps
- Brick in toilet cistern
- Other

*Population: households who actively conserve water  
Household level*

**55 GARDEN WATERING METHOD**

- Hand watering
- Moveable sprinkler
- Fixed sprinkler system
- Drip system
- Timer on tap
- Don't water Other

*Population: households with gardens.  
Household level*

**56 GARDEN WATER CONSERVATION STEPS**

- Plant native shrubs/trees
- Mulch used on plants
- Water early morning/late evening
- Other

*Population: households with gardens.  
Household level*

**57 WATER CONSERVATION TECHNOLOGY**

- Dual flush toilet
- Reduced flow shower head

*All populations  
Household level*

**58 SWIMMING POOLS**

- Swimming pool, filtered
- Swimming pool, not filtered
- No swimming pool

*All populations  
Household level*

**59 SATISFACTORY QUALITY OF MAINS TAP WATER**

- Yes
- No
- Depends

*Population: households with mains or town tap water.  
Household level*





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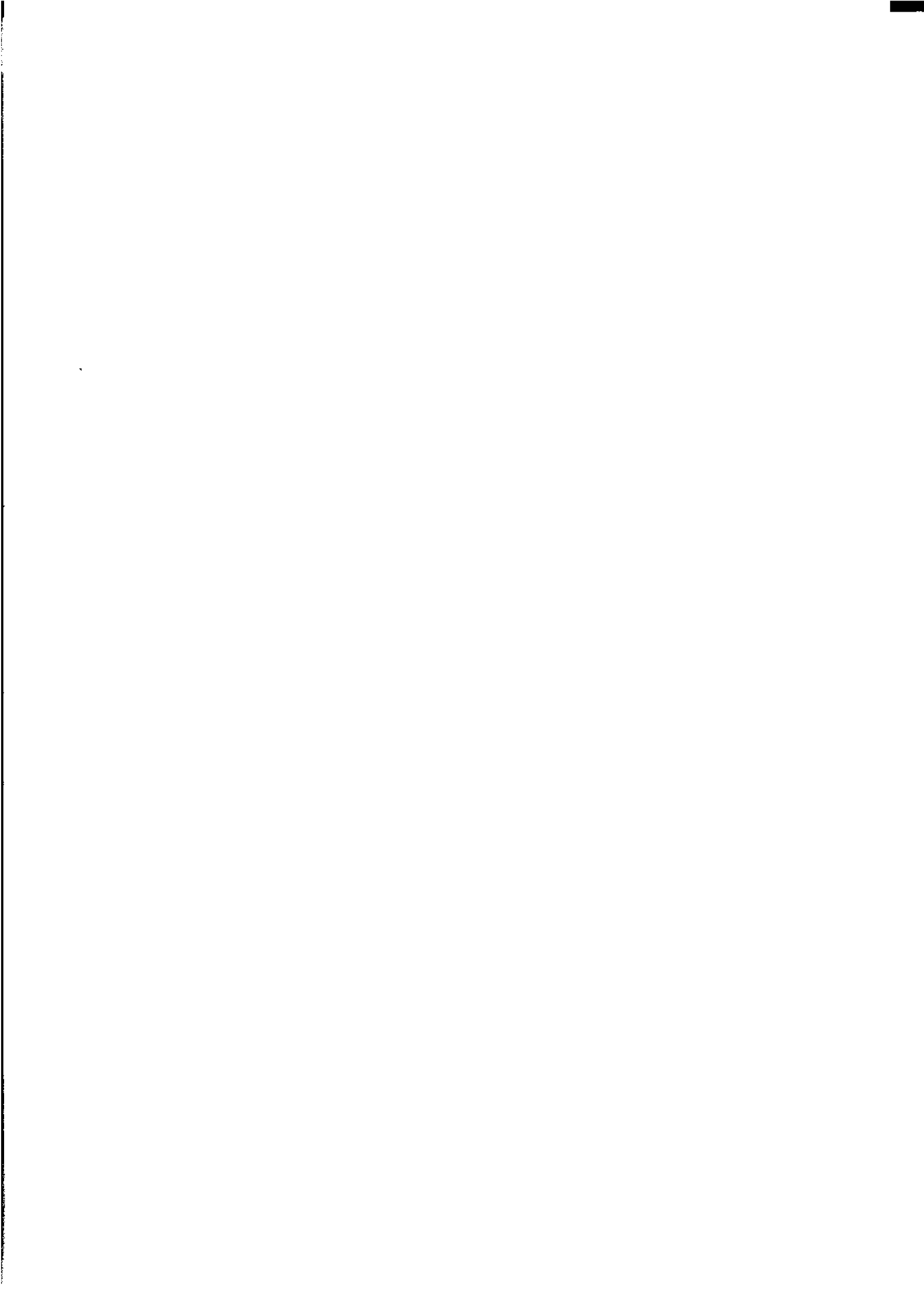
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