

## Introduction

This chapter contains information about the Victorian environment and natural resources, and the impact that society may have on them. It includes information about peoples' concern for environmental problems, natural resources (such as, air, water and land), and action taken by households to help preserve the environment.

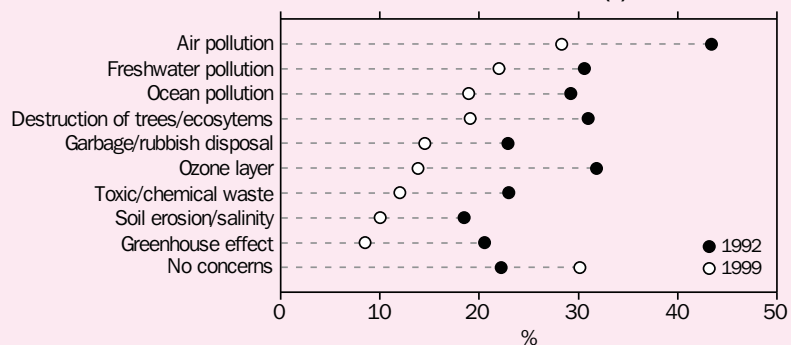
The data in this chapter is sourced from the Victorian Department of Natural Resources and Environment, Environment Protection Authority, Melbourne Water Corporation, Beverage Industry Environment Council, Bureau of Resource Sciences, Water Services Association of Australia, and from surveys conducted by the ABS.

The health of the environment not only affects the quality of life experienced by people, it also determines the availability of the basic resources; air, water and land, which are essential for life.

## Concern for environmental problems

One-third (32%) of Victorians indicated that they had no concerns about environmental problems in 1999, this was an increase over the proportion in 1992 (22%) (graph 12.1). Air pollution remains the environmental problem of greatest concern (28.3%). There have been some shifts since the 1992 survey in the order of importance for issues of concern, the most notable of which is the ozone layer. In 1992, the ozone layer was the environmental issue of second most concern, but this had slipped to sixth position in 1999.

12.1 SELECTED ENVIRONMENTAL CONCERNS(a)



(a) Proportions are of all adults aged 18 years and over.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

## Natural environment

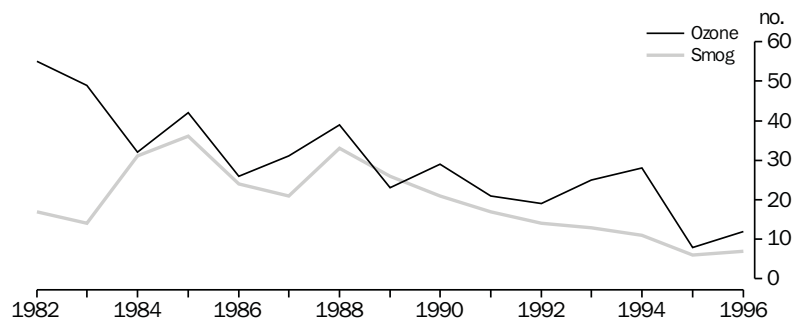
### Air pollution

Air pollution has been the greatest environmental concern to Victorians for nearly a decade (graph 12.1). Polluted air not only brings unpleasant odours and decreased visibility, but it can also cause adverse health effects. Air pollution can also cause damage to our natural environment through, for example, acid rain. The most common air pollutants are emitted directly into the air from human activities (both residential and commercial) and, to a certain extent, from natural sources.

Air quality in capital cities can be measured by the amount of smog and ozone in the air. Ozone — the main component of photochemical smog — is formed in the lower atmosphere wherever emissions of nitrogen oxides and other compounds are present to react in sunlight. Smog is one of the most serious air pollutants in terms of its adverse impact on human health. Motor vehicle emissions are a major contributor to smog.

The number of days per year which have 'high' ozone and smog levels has tended to decrease over recent years in Melbourne (graph 12.2).

**12.2 DAYS PER YEAR WITH HIGH OZONE AND SMOG LEVELS(a), Melbourne**



(a) High ozone defined as an hourly average value greater than 6 particles per hundred million. High smog defined as an hourly average value greater than 10 particles per hundred million.

Source: *Anthropogenic Influences in Australian Urban Air-sheds* (Katesstone Scientific, 1997).

Motor vehicles are a significant contributor to air pollution and greenhouse gas emissions. Nearly 8 out of 10 Victorians drove a car, truck or van to work or study in March 2000 (table 12.3). Only about 13% used the public transport system as their main form of transport to work or study. Figures reported for March 2000 have decreased across all modes of transport when compared to those in 1996, although the change may be partially due to a modification to the questions asked of respondents. In March 2000, households were asked for the main form of transport to work or study, whereas in 1996, they were asked for the usual forms of transport.

12.3 PERSONS WHO TRAVEL TO WORK/STUDY, Transport(a)		
	April 1996	March 2000
	%	%
Train	9.4	8.4
Bus	4.4	2.1
Tram/Light rail	n.c.	2.2
Car/truck/van as driver	80.4	76.9
Car/truck/van as passenger	5.5	3.7
Motorbike or motor scooter	0.9	*0.5
Bicycle	2.9	*0.9
Walk	6.2	4.9
Other	4.1	*0.3

(a) Proportions are of all adults aged 18 years and over.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

### Greenhouse gases

The major greenhouse gases include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and the perfluorocarbons CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub>, which act to trap the heat from the sun in the atmosphere. Over the past 100 years, human activities, particularly the burning of fossil fuels (coal, oil and natural gas) and land clearing, have increased the concentrations of these gases, creating the prospect of global warming. Potential impacts of global warming include: effect on the distribution of plants and animals; frequency of floods and storms; and the spread of weeds, pests and diseases, which in turn may influence agriculture and human health. Global warming may also affect the growth of coral reefs and the circulation of ocean currents.

Greenhouse gas inventories present data on emissions of a range of greenhouse gases, and on removal of these gases from the atmosphere by 'carbon sinks' (growing plants absorb CO<sub>2</sub> during photosynthesis, resulting in its removal from the atmosphere. Human activities that contribute to carbon sinks include tree planting and pasture improvement in agriculture). These inventories can assist in identifying priorities for emission reduction actions and in assessing the effectiveness of those actions. Victorian inventories are currently prepared every five years. In 1995, Victoria contributed 26% of Australia's total emissions excluding emissions from land clearing, and 22% including emissions from land clearing.

Victoria's total greenhouse emissions (excluding emissions from land clearing) increased by 4.1% from 1990 to 1995 (table 12.4). Stationary energy is the largest single source of Victoria's greenhouse gas emissions, comprising 61% of net emissions in 1995. It also was a significant contributor to growth of emissions in Victoria between 1990 and 1995 — with emissions increasing by 6.3% over this period. The transport and agricultural sectors also constitute significant sources of Victoria's greenhouse gas emissions, contributing 16% and 15% respectively to the State's net emissions. These sectors also contributed to the total growth in emissions between 1990 and 1995, increasing by 4.5% and 5.3% respectively.

**12.4 NET GREENHOUSE GAS EMISSIONS BY SECTOR(a)**

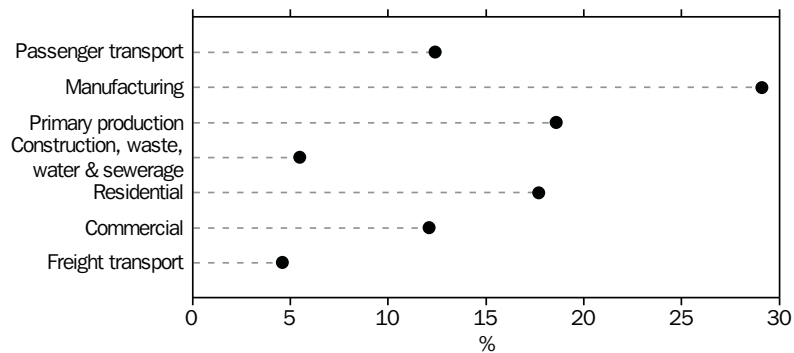
	1990	1995	Change
	Mt	Mt	Mt
Energy			
Stationary(b)	60.5	64.3	3.8
Transport(c)	15.7	16.4	0.7
Fugitive(d)	3.1	2.2	-0.9
Total	79.3	82.9	3.6
Industrial processes(e)	3.5	1.8	-1.7
Agriculture(f)	15.0	15.8	0.8
Forestry and other(g)	-0.4	0.8	1.2
Waste(h)	3.9	4.2	0.3
<b>Total</b>	<b>101.3</b>	<b>105.5</b>	<b>4.2</b>

(a) Excludes land clearing. (b) Electricity generation, petroleum refining, and direct use of fuels (e.g. gas). (c) Motor vehicles, rail, aviation, and shipping. (d) Coal mining, exploration, processing and distribution of oil and natural gas. (e) Production of iron and steel, aluminium, non-metallic mineral products, and food and beverages. (f) Emissions from livestock, the application of nitrogenous fertilisers, and the burning of grasslands and agricultural residues. (g) Emissions of CO<sub>2</sub> and other greenhouse gases due to forest harvesting, prescribed burning and wildfires, and removal of CO<sub>2</sub> from the atmosphere due to forest growth and pasture improvement. (h) Emissions from landfills and wastewater treatment.

Source: Victorian Greenhouse Strategy discussion paper, 2000, Victorian Department of Natural Resources and Environment.

An alternative method for considering greenhouse gas emissions is to look at the amount contributed by the end use activity. When considered this way, electricity emissions and the emissions associated with the production and distribution of petroleum fuels and natural gas are allocated to end users. The manufacturing sector accounted for the greatest proportion of Victoria's greenhouse gas emissions in 1995, contributing 29.1% (graph 12.5). This was followed by primary production (agriculture, forestry, fishing and mining) with 18.6% and households producing 17.7%. The transport sector accounted for 17% of emissions, the bulk of which (73%) is from passenger transport.

**12.5 SHARE OF EMISSIONS BY END USE ACTIVITY — 1995**



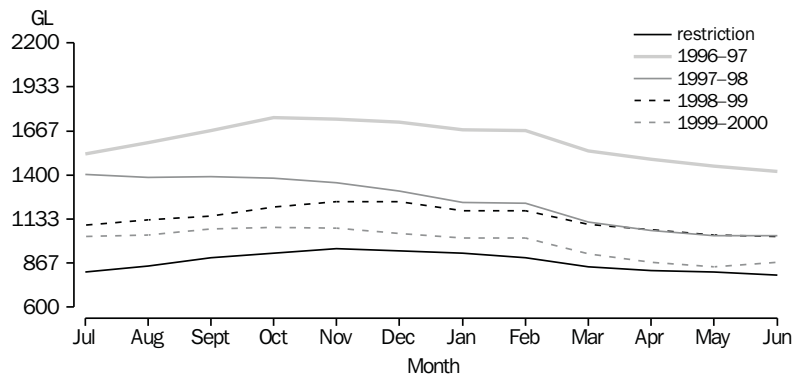
Source: Victorian Greenhouse Strategy discussion paper, 2000, Victorian Department of Natural Resources and Environment.

**Inland water**

Fresh water resources are of major environmental and biological importance because water is a basic life support system for man and ecosystems. Wise and efficient management of water resources is vital in terms of the quantity and quality of available water.

Melbourne’s water storage system, managed by Melbourne Water, was in June 2000, only 48.3% full (holding 863,272 megalitres or 863.2 GL). This compares unfavourably with 57.4% full at the same time in 1999. The level of Melbourne’s water storage has been steadily decreasing since 1996–97 (graph 12.6), and in May 2000 fell to a level that almost necessitated the imposition of Melbourne-wide restrictions on water use (the imposition of water restrictions is based on existing levels of water in the catchments, the amount of rainfall, weather conditions and customer demand).

**12.6 WATER STORAGE, Melbourne**



Source: Melbourne Water Corporation.

Changes in levels of compliance to bacteriological and physico-chemical quality standards over time is one way of measuring the quality of mains water. Bacteriological standards are concerned with the concentration of potentially harmful bacteria found in the water and provide an indication of the risk posed to human health. Physico-chemical properties of water are more concerned with quality as measured by properties such as turbidity (cloudiness), colour and pH. Melbourne Water’s level of compliance with bacteriological quality standards increased by 0.6% between 1993–94 and 1997–98 (table 12.7). Their level of compliance with physico-chemical quality standards rose 0.7% over the same period. This is indicative of an increase in the already high quality of water (as measured by the indicators presented) delivered to Melbourne homes.

**12.7 COMPLIANCE WITH SELECTED WATER QUALITY STANDARDS, Melbourne Water**

	Bacteriological quality	Physico-chemical quality
	%	%
1993–94	98.8	—
1997–98	99.4	—

Source: Water Services Association of Australia 1998.

Victorians used 6,687 GL of water, accounting for just under one-third of Australia's net water consumption in 1996–97 (table 12.8). Compared to net water use in 1993–94 (5,036 GL), this amounts to a 32.8 % increase in use. The agriculture sector was the largest net user of water in Victoria, accounting for 61% of net water use, and over a quarter of all water used by that sector in Australia. In comparison, Victorian households used approximately one-tenth of the volume of water used by agriculture in the same period.

#### 12.8 NET WATER CONSUMPTION BY SECTOR — 1996–97

	Victoria		Australia	
	GL	% of total	GL	Victoria as % of Australia
Agriculture and forestry	4 054	60.6	15 522	26.1
Mining	35	0.5	570	6.1
Manufacturing	153	2.3	728	21.0
Electricity and gas(a)	1 193	17.8	1 308	91.2
Water supply, sewerage and drainage(b)	770	11.5	1 707	45.1
Other business services	62	0.9	523	11.9
Household	419	6.3	1 829	22.9
<b>Total(c)</b>	<b>6 687</b>	<b>100</b>	<b>22 186</b>	<b>30.1</b>

(a) Victoria appears to have a higher net use of water for this sector than elsewhere in Australia because data on the power sector was more comprehensive than in other states. (b) Includes losses due to environmental flows and seepages, as well as water used by the water supply, sewerage and drainage services industry. (c) Sum of components may not equal total due to rounding.

Source: *Water Account for Australia, 1993–94 to 1996–97* (Cat. no. 4610.0).

Despite a decline of 6.9% in the amount of water used per household between 1994–95 and 1995–96, average water use by households has increased by 5.8% between 1994–95 and 1996–97 (table 12.9).

#### 12.9 HOUSEHOLD WATER USE

	Total water use	Water use
	ML	kL/household(a)
1994–95	385 295	231.1
1995–96	360 742	215.1
1996–97	419 203	244.6

(a) Based on estimated resident households at end of period.

Source: *Water Account for Australia* (Cat. no. 4610.0); *Australian Demographic Statistics* (Cat. no. 3101.0).

## Biodiversity

Biodiversity (biological diversity) refers to the variety of life forms on earth — the different plants, animals, and micro-organisms, the genes they contain, and the ecosystems of which they form a part. Biodiversity underpins human well-being in many ways. Biological resources provide all of our foods, many of our medicines and many of our industrial products. Moreover, they provide us with recreation, inspiration and a cultural identity, and create economic opportunities, such as tourism and agriculture.

One measure of biodiversity is the number of species in an area, but the range of different life forms is also important. Australia is one of the world's 12 'megadiverse' regions, with a high proportion of endemic species (those that are found nowhere else in the world). Victoria's land area supports a wider range of broad ecosystems than any area of similar size in Australia, and includes a variety of ecosystems such as the alps, mallee, grasslands, grassy woodlands, forests, inland waters, wetlands and coasts. It's marine environment is also diverse, including intertidal rocky shores, seagrass beds and beaches. Approximately 15% of Australia's vascular plant species (plants containing water and food conducting tissues), 70% of bird species, and 35% of terrestrial mammals have been recorded in Victoria. Victoria has over 300 species of native orchids (about 25% of the total Australian orchid flora).

Victoria's biodiversity is characterised by 3,140 native species of vascular plant, 111 mammals, 477 birds, 46 freshwater and 600 marine fish, 133 reptiles and 33 amphibians (table 12.10). In addition, 900 lichens, 750 mosses and liverworts, and an untold number of invertebrates, fungi and algae occur within hundreds of ecological communities.

The arrival of Europeans in the 19th century and the subsequent urban development, and the extensive clearing for agriculture and forestry, has decreased and/or altered the area of habitat available for native species in Victoria. For example, 37% of the natural wetlands have been either totally or partially drained. Other processes which threaten biodiversity include the effects of past (and possible future) introduced species such as rabbits, foxes and blackberries, and inappropriate fire or drainage/watering regimes.

Biodiversity in Victoria has declined since European settlement, with 56 species (59% of which are vascular plants) recorded as being extinct by 1997. A further 759 (nearly 17%) of native species of vascular plants and vertebrates have been identified as being threatened with extinction in Victoria. Nearly one-third of native amphibian species are considered endangered, one-fifth critically. Around 20% of mammals, reptiles and vascular plants are also endangered. Over half (61%) of these mammals are critically endangered.

12.10 NATIVE SPECIES — 1997

	Extinct(a)	Threatened			Native species
		Critically endangered	Vulnerable	Total threatened	
	no.	no.	no.	no.	no.
Vascular plants	33	204	403	607	3 140
Mammals	20	14	9	23	111
Birds	1	42	32	74	477
Reptiles	1	16	11	27	133
Amphibians	—	7	3	10	33
Fish	1	9	9	18	646
<b>Total</b>	<b>56</b>	<b>292</b>	<b>467</b>	<b>759</b>	<b>4 510</b>

(a) Known extinct species since records were kept.

Source: Victorian Department of Natural Resources and Environment.

## Land use

Land is a vital element of the environment. It provides the base for food production, homes, industrial and commercial developments, and a range of other social and recreational activities. Land-use practices are important in maintaining and improving the quality of the environment whilst also meeting the economic and social needs of the community. Deforestation and agricultural practices can have a significant impact on the environment, contributing to soil salinity, erosion, and turbidity (cloudiness) in our waterways.

Agriculture and horticulture comprise approximately 56% of total land use. The clearing of native vegetation, whether for agriculture or forestry, is a significant environmental issue because the loss of trees can lead to declines in the abundance of wildlife, and increased levels of land degradation. The growth of agriculture has been a key reason for tree clearing. In 1788, Victoria was estimated to have 18,513 million hectares of forest, by 1997, there were just 7,285 million hectares. This amounts to a 61% reduction in just over 200 years.

Agricultural land is generally divided into cropped land, land sown to pastures and grasses, and a broad balance comprising grazing land and land lying idle or under fallow. In 1999, a total of 12.8 million hectares were devoted to agriculture in Victoria, a slight increase (0.8%) on the 1998 figure (table 12.11). This represented 56.2% of Victoria's land mass, yet Victoria contributes just 2.8% of all Australia's agricultural land. The proportion of agricultural land devoted to crops increased from 20% to 22% between 1993 and 1996, and that devoted to sown pasture and grasses from 31% to 37%.

**12.11 LAND MANAGEMENT — Year ended 31 March**

	1997	1998	1999
	'000 ha	'000 ha	'000 ha
Agricultural land(a)			
Crops(b)	2 552	2 565	2 749
Sown pastures and grasses	3 945	4 639	4 739
Other(c)	6 248	5 487	5 302
Total	12 745	12 691	12 790
Non-agricultural land(d)	9 997	10 051	9 952

(a) Total area of establishments with an EVAO of \$5,000 or more. (b) Excludes crops harvested for hay and seed. (c) Grazing land, land lying idle or under fallow. (d) Comprises conserved land, forestry, urban, unused land, and establishments not included in the Agricultural Census/Commodity Survey.

Source: *Agriculture, Australia* (Cat. no. 7113.0).

Irrigated pasture land use occurs mainly in the North of the State in the Torrumbarry, Campaspe and Shepparton irrigation areas. Horticulture (fruit and vegetable growing) occurs in an number of localised areas across the state that have suitable climate, soils and access to irrigation water.



National and State Parks account for 14% of Victorian land. Major parks include the Sunset Country and Big Desert Parks in the northwest of the state and the Alpine National Park in the east of the State. Forestry plantations are a significant land use in localised areas in the southwest, northeast and in the Strzelecki Ranges. Conservation and wood production are just two of a variety of purposes for which forests are managed. The amount of forests in conservation reserves varies greatly between State and Territories. The area of forests in conservation reserves in Victoria is approximately 37% of the total forest estate. This compares with the national average of just over 11%.

## Forests

Forests are an important sustainable natural resource, providing a wide range of essential products and benefits to the community. Farm forestry is becoming increasingly important as a commercial source of timber, with a broad range of programs operated by government and private agencies to promote landcare and reforestation on Australian farms. In June 1998, there were 269,500 hectares of plantation in Victoria. This comprised 40,870 hectares of hardwood plantation, and 228,680 hectares of softwood plantation. The area used for new plantations in Victoria has increased since 1994–95, when there was 2,040 hectares planted, compared to 10,554 hectares in 1997–98. At June 1997, almost 94% of Victoria’s 7.3 million hectares of native forest comprised eucalypt species (table 12.12).

**12.12 NATIVE FOREST AREAS, By Forest Type — 30 June 1997**

Victoria	
Dominant canopy species	'000 ha
Eucalypt	6 845
Acacia	17
Melaleuca	18
Rainforest	3
Mangrove	5
Callitiris	37
Other	360
<b>Total</b>	<b>7 285</b>

Source: Bureau of Resource Sciences.

## Environment protection activity

### Government

Local government plays an important part in managing Victoria’s environment and natural resources. Expenditure and revenue related to environment protection and natural resource management activities is one way of measuring the level of activity carried out by various governments.

Environment protection expenditures and revenues cover activities that prevent, reduce or eliminate pressures on the environment arising from social and economic activities, as well as activities aimed at repairing or restoring damage after it has occurred. The dominant environmental protection activities undertaken by local government in Victoria in 1988–99 were those related to solid waste management, representing 75% of current environmental protection expenses and 83% of revenue (table 12.13). Solid waste management refers to landfill and solid operations by local government and the implementation of programs to reduce the amount of materials entering the solid waste stream. Waste water management expenditure and revenue by local government represent only a fraction of that for solid waste management as other agencies are responsible for sewage infrastructure, treatment and water protection.

Natural resource management activities include the management of natural assets (trees, land, water, minerals, biodiversity) and activities aimed at making more efficient use of these resources, as well as activities associated with the recreational use of the environment, such as management of parks, beaches and reserves. The majority of natural resource management revenue came from land management and development activities (93.5%) in 1998–99 (table 12.13). The largest expenditure also occurred on land management and development activities which accounted for 95.4% of all current expenses and 90.2% of all capital expenses. Land management and development activities include zoning of land, management of recreational parks and sporting fields, management of crown land not reserved for native biodiversity and processing of development applications and associated costs.

#### 12.13 ENVIRONMENTAL EXPENDITURE AND REVENUE, Local Government — 1998–99

	Revenue		Current expenses		Capital expenditure	
	Total	Per capita	Total	Per capita	Total	Per capita
	\$m	\$	\$m	\$	\$m	\$
Environment protection category						
Waste water management	*9.0	2.0	33.5	7.0	*15.8	3.0
Solid waste management	126.2	27.0	200.9	43.0	18.4	4.0
Protection of biodiversity & landscape	4.6	1.0	14.5	3.0	2.5	1.0
Protection of soil & groundwater	0.9	—	1.3	—	**	—
Other(a)	*12.3	3.0	19.5	4.0	*6.4	1.0
<i>Total</i>	152.9	33.0	269.7	57.0	44.3	9.0
Natural resource management category						
Inland water use & management	*0.9	—	*3.9	1.0	*1.0	—
Land management & development	30.1	6.0	122.3	26.0	23.9	5.0
Other(b)	*1.2	—	*2.0	—	*1.6	—
<i>Total</i>	32.2	6.0	128.2	27.0	26.5	5.0

(a) Includes any environmental protection activity not broken down in the above categories, ambient air and climate protection, protection of cultural heritage, noise and vibration control, education on environmental protection and measures to protect the environment from radiation. (b) Includes the quarrying to provide raw materials for council works, activities or programs aimed at developing alternative energy resources and measures to reduce energy consumption.

Source: *Environmental Expenditure, Local Government (Cat. no. 4611.0)*.

## Households and the environment

Households can reduce their impact on the environment through efforts such as using environmentally friendly products and recycling, by reducing water, energy and vehicle use, and by reducing the amount of waste produced.

Almost two-thirds of households in Victoria in 1998 used refillable containers, while half used recycled paper (table 12.14). Overall, the least used environmentally friendly product was organically grown fruit and vegetables. For those households who only sometimes used environmentally friendly products, the main products used were recycled paper and/or organically grown fruit and vegetables (approximately 23% of households).

**12.14 HOUSEHOLD USE OF ENVIRONMENTALLY FRIENDLY PRODUCTS — March 1998(a)**

	Yes	Sometimes/ depends	No	Don't know
	%	%	%	%
Unbleached paper	31.2	21.8	42.3	4.6
Recycled paper	49.9	23.4	23.7	3.1
Phosphate-free cleaning products	28.1	12.0	39.4	20.5
Refillable containers	61.1	11.7	25.7	1.5
Organically grown fruit & vegetables	19.4	22.8	54.9	3.0

(a) Proportions are of all households.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

The principle reason given by households for not using environmentally friendly products in 1998 was because they were considered to be too expensive (35.4%), followed by the products not being readily available or of inferior quality (table 12.15). Only 4.1% of households not using environmentally friendly products stated that they were not convinced that the environmental claims made about the products were correct.

**12.15 HOUSEHOLDS NOT USING PRODUCTS, Reasons Products Are Not Used(a)**

	May 1992	March 1998
	%	%
More expensive	22.4	35.4
Always buy the same brand	27.9	14.3
Inferior quality	23.7	16.8
Not convinced about environment claims	6.4	4.1
Not interested/too much effort	17.7	15.7
Grows own fruit and vegetables	n.c.	8.3
Not readily available	n.c.	17.0
Other	16.0	11.1
No reason	n.c.	17.1

(a) Proportions are of all households.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

**Recycling**

In March 2000, approximately 90% of Victorian households recycled glass, plastic bottles and paper, and approximately 85% of households recycled old clothing or rags, plastic bags and cans (table 12.16). These have remained the most common items recycled by Victorian households since 1992. A comparison of results since 1992 indicate an increase in recycling activity, as more households become involved.

**12.16 ITEMS RECYCLED BY HOUSEHOLDS(a)**

	May 1992	March 1996	March 2000
	%	%	%
Paper	67.1	76.8	89.1
Glass	70.0	74.9	90.4
Cans	53.7	61.8	84.8
Plastic	47.9	67.8	n.c.
Plastic bottles	n.c.	n.c.	89.5
Plastic bags	n.c.	n.c.	84.8
Kitchen or food waste	40.6	46.9	56.3
Garden waste	52.1	52.5	64.4
Old clothing or rags	66.8	67.4	85.3
No recycling	10.5	8.7	1.4
All items recycled	n.c.	5.7	6.6

(a) Proportions are of all households.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

The primary reason reported by households who gave a reason for not recycling all surveyed items in March 2000 was a lack of recyclable materials (79.4%) (table 12.17). The proportion of households stating this reason has also substantially increased over time. Other reasons given in March 2000 were a lack of interest by the household (12.5%) and because there were no services or facilities available (8.2%).

**12.17 HOUSEHOLDS NOT RECYCLING ALL MATERIALS, Reasons For Not Recycling(a)(b)**

	May 1992	March 1996	March 2000
	%	%	%
Not enough recyclable materials	23.7	55.1	79.4
No services or facilities provided	11.3	17.1	8.2
Not interested/too much effort	n.c.	n.c.	12.5
No storage area in dwelling/yard	3.2	7.2	6.5
Uncertain of services or facilities provided	4.7	7.5	7.0
Inadequate services or facilities	5.9	5.6	1.9
Other	12.0	24.8	5.9
No reason	n.c.	n.c.	3.6

(a) Proportions are of all households. (b) Totals do not equal the sum of items in each column because more than one reason may be specified.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

**Energy**

Greenpower uses various forms of energy from solar, wind, biomass (such as gas generated in landfills), and hydro sources, to generate electrical power. All of these sources of energy are renewable, and avoid the use of coal in power stations (an important contributor to green house gases). In March 1999, less than half of one per cent of households stated that they were connected to a greenpower electricity scheme. Of those households that were not connected, the majority (85.7%) were not aware that these schemes existed or were available to them (table 12.18). The majority of households (56.7%) stated that they were not willing to pay more for electricity generated from greenpower schemes.

**12.18 HOUSEHOLDS NOT CONNECTED TO GREENPOWER — March 1999**

	'000	%(a)
<b>Awareness</b>		
Aware of greenpower schemes	209.1	13.1
Not aware of greenpower schemes	1 364.7	85.7
Don't know	18.0	1.1
<b>Willingness to pay</b>		
Willing to pay more for greenpower schemes	359.9	22.6
Not willing to pay more for greenpower schemes	902.7	56.7
Should not have to pay more for greenpower	67.5	4.2
Don't know	261.7	16.5

(a) Proportions are of all households.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

Insulation creates a thermal barrier which reduces the rate or transfer of heat from, and into, a house. The use of insulation can reduce the amount of energy used to heat or cool a dwelling, as well as reducing power costs. Over two-thirds of Victorian households reported that their dwellings had some form of insulation (table 12.19). There was a slight increase in the proportion of dwellings which had insulation, between 1994 and 1999.

**12.19 HOUSEHOLD INSULATION INSTALLED(a)**

	June 1994	March 1999
	%	%
Roof/ceiling	68.5	70.4
Walls	19.1	22.5
Floor	0.5	*0.3
Other	0.1	—
Dwelling not insulated	30.5	28.7

(a) Proportions are of all households.

Source: *Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

**Waste management**

The generation and disposal of waste is an environmental issue of increasing importance. Some wastes can impact directly on human health if not dealt with appropriately, while all waste must be managed carefully to minimise environmental and aesthetic impacts. In Victoria, a strong emphasis is placed on avoiding the generation of, and promoting the recycling of, wastes. Local government is responsible for provision of domestic waste management services such as garbage collection, and also provides local recycling programs. Programs sponsored by the EPA, EcoRecycle Victoria, Business Victoria and Energy Efficiency Victoria are aimed at demonstrating the environmental and economic benefits of waste avoidance and recycling to industry.

The majority of solid waste is disposed at landfill sites. Solid waste is generally classified by household (municipal), commercial, industrial, building, demolition and hazardous wastes. The Landfill Levy was introduced in 1992 under the Environment Protection Act. Collection of the levy provides information about the amount of waste disposed of at landfills. The total waste disposed to landfill in Victoria in 1998-99 was 4,185 thousand tonnes, a 24% decrease on the amount disposed in 1997-98 (table 12.20). This amounts to an annual reduction of 64kg per capita of waste.

**12.20 SOLID WASTE DISPOSED OF AT LANDFILL**

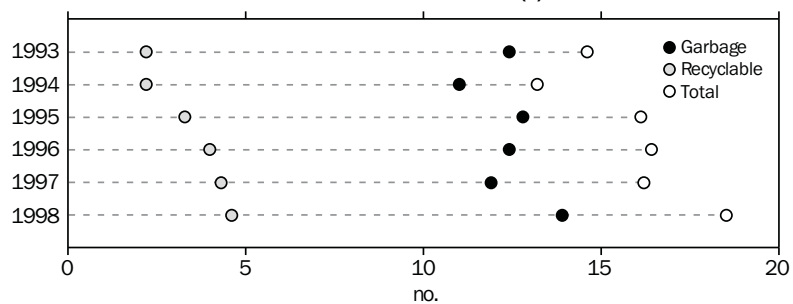
	'000 tonnes	Kg per capita
Metropolitan Melbourne and major provincial centres(a)		
1992-93	3 558	799
1993-94	3 620	809
1994-95	3 589	800
1995-96	3 508	777
1996-97	3 504	765
Victoria		
1997-98	5 532	963
1998-99	4 185	899

(a) Major provincial centres are Mornington Peninsula, Ballarat, Bendigo and Geelong.

Source: Environment Protection Authority.

In 1998, the average Victorian household generated 18.5kg of waste for collection each week, 75% of which went to landfill (graph 12.21). The average household 'put out' of waste for recycling has increased 109% between 1993 and 1998. The average garbage 'put out' (going to landfill) has shown an increase of 12% over the same period. The proportion of total waste 'put out' occupied by recyclable materials has increased from 15% in 1993 to 25% in 1998.

**12.21 HOUSEHOLD WASTE(a)**



(a) Data are for average 'put out' per presentation. Data is calculated per presentation, as garbage collection methods vary across municipalities, making weekly and fortnightly calculations of 'put out' difficult.

Source: Beverage Industry Environment Council.

## Bibliography

### ABS sources

*Australian Demographic Statistics* (Cat. no. 3101.0).

*Environmental Issues: People's Views and Practices* (Cat. no. 4602.0).

*Water Account for Australia, 1993–94 to 1996–97* (Cat. no. 4610.0).

*Environmental Expenditure, Local Government* (Cat. no. 4611.0).

*Agriculture, Australia* (Cat. no. 7113.0).

### Non-ABS sources

Anthropogenic Influences in Australian Urban Air-sheds, Katestone Scientific, 1997.

Beverage Industry Environment Council.

Bureau of Resource Sciences.

Environment Protection Authority.

Melbourne Water Corporation.

Victorian Department of Natural Resources and Environment.

Water Services Association of Australia.

