4603.0

Australian Bureau of Statistics

Environment Protection Expenditure, Australia

1994–95 and 1995–96

Environment Protection Expenditure, Australia

1994–95 and 1995–96

W.McLennan
Australian Statistician

AUSTRALIAN BUREAU OF STATISTICS

EMBARGO: 11:30AM (CANBERRA TIME) WED 25 MAR 1998

ABS Catalogue No. 4603.0
ISSN 1325-0914

Offshore gas platform photograph courtesy of Woodside Offshore Petroleum Pty Ltd. Mining shaft photograph courtesy of the Australian Overseas Information Service. All other photographs courtesy of Mark Nelson.

Produced by the Australian Bureau of Statistics

INQUIRIES

- For information about other ABS statistics and services, please refer to the back page of this publication.
- For further information about these statistics, contact Graeme Oakley on (Canberra) (02) 6252 7369.

CONTENTS

PREFACE

This publication presents estimates of expenditures on environment protection by Australian governments, businesses and households. Environment protection includes all activities aimed at the prevention, reduction or elimination of pollution or any other degradation of the environment. The estimates cover the public sector, the agriculture, mining, manufacturing, retail, wholesale and service industries, and the household sector.

Statistics on this topic are important for at least two reasons. Firstly, they are indicative of the response of various sectors to environment protection regulations and policies. Secondly, the statistics provide some indication of the demand for goods and services provided by the environment management 'industry'.

The Australian Bureau of Statistics (ABS) is continuing development work in the area of environment protection expenditure accounting. Future industry collections have been structured to provide information in accordance with emerging international frameworks in this field. The next edition of this publication, due for release in 1999, will present data for two financial years (1995–96 and 1996–97) in a completely revised form, based on the international environmental protection accounting framework known as SERIEE.

Given the exploratory nature of this work, the ABS welcomes feedback from readers regarding the range and quality of the data and the explanations provided. Please send any comments to the Environment and Energy Statistics Section, Australian Bureau of Statistics, PO Box 10, Belconnen, ACT 2616.

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

W. McLennan
Australian Statistician

LIST OF ABBREVIATIONS AND OTHER USAGES

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industrial Classification
ASIC	Australian Standard Industrial Classification
CEPA	Classification of Environment Protection Activities
EPEA	Environment Protection Expenditure Account
GFS	Government Finance Statistics
GPC	Government Purpose Classification
OECD	Organisation for Economic Co-operation and Development
PAC	Pollution Abatement and Control
R & D	Research and Development
RSE	relative standard error
SEEA	System for Integrated Environmental and Economic Accounting
SERIEE	European System for the Collection of Economic Information on the Environment
UN	United Nations

SYMBOLS AND OTHER USAGES

billion	thousand million
n.a	not available
n.e.c.	not elsewhere classified
n.p.	not available for publication but included in totals where applicable
NO_x	Nitrous Oxides
r	revised
**	Relative Standard Error greater than 50%
. .	not applicable
—	nil or rounded to zero

CHAPTER 1 COLLECTION FRAMEWORK AND SUMMARY RESULTS

INTRODUCTION

This is the fourth in a continuing series of Australian Bureau of Statistics (ABS) publications reporting on estimates of expenditure to protect the environment by Australian governments, the private sector and households. Since the first issue of this publication, released in January 1994, the scope for the collection of these statistics has broadened considerably, and data collection methodologies and presentation have been influenced and guided by changing international frameworks for the collection of economic data on the environment.

This edition presents estimates of environment protection expenditure for the 1994–95 and 1995–96 financial years for all industries included previously (manufacturing, mining agriculture, and service industries), as well as the public and household sectors.

The ABS continues to collect and present comprehensive estimates of environment protection expenditure, by sector and industry on an annual basis for a number of reasons:

- they are indicative of the response of various sectors to environment protection regulations and policies;
- the statistics provide some indication of the demand for goods and services provided by the environment management 'industry'; and
- the data forms part of environment 'satellite' accounts designed to augment the core system of national accounts. That is, environment protection expenditure accounts provide a disaggregation of existing figures in the national accounts to separately identify expenditure which has the specific purpose of protecting or repairing the environment.

INTERNATIONAL COLLECTION FRAMEWORKS

Work on estimating environment expenditures was initially guided by the Organisation for Economic Co-operation and Development (OECD) Pollution Abatement and Control (PAC) framework. This framework was discussed in detail in the first two editions of this publication, titled *Cost of Environment Protection, Australia, Selected Industries, 1990–91* and *1991–92*. Much of the data collected from the private sector up to 1994–95 reflects the terms and definitions as specified by this framework. In particular, the OECD defined PAC as '...all purposeful activities directly aimed at the prevention, reduction and elimination of pollution or nuisances arising as a residual from production processes or from the consumption of goods and services' (OECD 1995).

From 1995–96, the ABS has moved towards collecting and presenting estimates on environment protection expenditure in accord with the United Nations' (UN) System for Integrated Environmental and Economic Accounting (SEEA). SEEA contains a number of environmental accounts, one of which relates to environment protection expenditure. The environment protection account of SEEA has been developed considerably by the European statistical agency, Eurostat, in the European System for the Collection of Economic Information on the Environment (SERIEE).

INTERNATIONAL COLLECTION FRAMEWORKS *continued*

SERIEE has a broader scope than the OECD PAC framework, since it covers all environment protection expenditures, not just those relating to pollution abatement and control. In SERIEE, environment protection '...groups together all actions and activities that are aimed at the prevention, reduction and elimination of pollution as well as any other degradation of the environment.' (Eurostat 1994). Thus the environment protection expenditure account of SERIEE includes expenditures on activities such as protection of biological diversity, soils and water, in addition to the traditional environment protection activities such as management of waste and abatement of air and water pollution.

This edition follows a similar format to the previous edition, *Environment Protection Expenditure, Australia, 1992–93 and 1993–94*. The presentation of estimates incorporates the approach inherent in SERIEE of estimating a broader range of expenditures beyond the narrower costs of abating and controlling pollution. Where possible, data have been presented according to the classification system developed in SEEA and underpinning SERIEE, namely the Classification of Environmental Protection Activities (CEPA). CEPA classifies activities according to the type of environmental pollution and the environmental media affected, and the type of activity performed (prevention, reduction, measurement, control).

However, use of the SERIEE framework to measure environment protection expenditure in Australia is currently limited by constraints in the availability of data. It has therefore not been possible to adopt SERIEE as the basis for all the data presented in this publication. Rather, where data has been available SERIEE has been used to guide data collection and presentation. Otherwise the OECD PAC framework has continued to be used.

The approach to data collection in all sectors has been to focus collection efforts on that expenditure considered to be most significant, with the remaining gaps being left unfilled for the time being. Although the resultant estimates may therefore be partial, they are conceptually in accord with emerging international practice for estimating environment expenditure, and are considered to capture the most significant expenditure in each sector.

The implementation of the SERIEE framework for the collection of environment protection data from 1995–96 onwards has made it possible for the first time to compile the estimates for this publication in line with the sub-accounts and environment accounting concepts provided within SERIEE. The next edition of this publication will be compiled wholly on a SERIEE basis. It will cover the financial years 1995–96 and 1996–97, and provide more detailed and comprehensive estimates of environment protection expenditure across the public, private and household sectors.

SERIEE FRAMEWORK

SERIEE currently comprises two accounts: the Environment Protection Expenditure Account (EPEA) and the Resource Use and Management Account. Of these, the EPEA is more developed. The objective of the EPEA is to answer the following questions:

- how much a nation spends on environment protection expenditure;
- how and by which units the expenditure is financed; and
- which economic activities are induced by environment protection activities.

SERIEE FRAMEWORK *continued*

A detailed explanation of the SERIEE accounts was provided in the second edition of this publication (*Cost of Environment Protection, Australia, Selected Industries, 1991–92*). In summary, the EPEA is drawn up by aggregation of sub-accounts. The sub-accounts provided within SERIEE are:

- ambient air and climate protection account;
- waste water management account;
- waste management account;
- protection of soil and groundwater account;
- noise and vibration abatement account;
- protection of biodiversity and landscape account; and
- other environment protection activities account.

SERIEE also indicates that a range of more detailed sub-accounts can be developed to suit individual countries' requirements and data availability situations. See the Appendix for a detailed listing of the Single European Standard Statistical Classification of Environmental Protection Activities and Facilities. General definitions and terms used in this classification system are described in the Explanatory Notes.

SERIEE has addressed a number of methodological issues associated with estimating environment protection expenditures. It is much more detailed in its data requirements than the OECD PAC framework, and its implementation in Australia is in its infancy. The ABS will continue to monitor, explore and contribute to such international developments in the emerging area of environment protection statistics.

METHODOLOGY FOR ESTIMATING ENVIRONMENT PROTECTION EXPENDITURES

Two separate streams of activity were undertaken to estimate environment protection expenditure for Australia for 1994–95 and 1995–96. The first and major activity related to the collection and compilation of environment protection expenditure using data collected from existing ABS collections in a number of industry sectors, as well as extraction of data from ABS public finance records.

As with previous editions of this publication, the collection of data through existing ABS surveys was largely influenced by the OECD work on estimating pollution abatement and control expenditure, as described earlier. This OECD framework includes the collection of both capital and current expenditure incurred for pollution abatement activities by both the private and public sectors. However, in 1995–96 the collection framework was changed from the OECD PAC framework to SERIEE. This resulted in more detailed data being collected that relates to a broader, more comprehensive range of environment protection activities than was collected in previous years.

The 1995–96 data is nonetheless comparable to that presented for 1994–95. Where the categories of expenditure differed between the 1994–95 and 1995–96 collections, adjustments have been made to the 1995–96 data to ensure it is comparable with the 1994–95 data and thereby maintain the time series.

METHODOLOGY FOR ESTIMATING ENVIRONMENT PROTECTION EXPENDITURES *continued*

The second stream of activity undertaken to compile the estimates presented in this publication involved researching a range of non-ABS sources for information on environment protection expenditure by the public and household sectors. Sources for this research included Commonwealth and State budget papers, annual reports of departments and public authorities, and contacts in local councils. This research, using sources external to the ABS, provided the estimate in table 1.1 related to 'other environment protection expenditure' by the public sector, as well as the estimate of environment protection expenditure by the household sector. Most of the items specified by SERIEE were covered in the data compilation for the public and household sectors, although the form in which the data were available did not always make it possible to provide a detailed disaggregation.

Both the OECD and SERIEE frameworks suggest collection of data which identifies flows between the private and public sectors, including fees and charges paid by the private sector to the public sector, and grants and subsidies paid by the public sector to the private sector. These adjustments in theory make it possible to identify which sector is carrying the 'financial burden' of the pollution abatement activities, and ensures that expenditure is not 'double-counted' in both the public and private sectors. The estimates achieved by taking account of such flows are described as the 'financer principle' by the OECD model, and support the objective of SERIEE to account for how, and by which units, environment protection expenditure is financed.

DATA QUALITY

A number of data quality issues affect the estimates in table 1.1. As indicated above, although there are a number of points at which coverage has not been complete, the approach for all sectors has been to target the expenditure and activities considered most significant. Areas of data quality concern are:

- Difficulty in assessing the environment protection expenditures associated with change-in-production (or integrated) technologies. These technologies have the dual aim of abating pollution and protecting the environment while providing technical and commercial improvements in the way a business operates. The difficulty is establishing what proportion of the total cost should be allocated to environment protection, given that there could be other reasons for the acquisition of the new equipment including increasing production capacity and efficiency. The approach taken by the ABS to this issue has been to ask respondents to include costs of equipment intended primarily for environment protection purposes (including complying with environment legislation and regulations). This approach will not include a proportion of expenditure for 'clean technology' equipment which may have the effect of protecting the environment, but which were purchased for other (non-environmental) reasons.
- The public sector data have partly been compiled using data classified according to the Government Purpose Classification (GPC). Due to revision of the GPC, the categories of activities relevant to environment protection have changed. For previous publications, a breakdown of public sector expenditures was provided on household garbage, other sanitation, sewerage, urban stormwater drainage and other environment protection. For 1994–95 and 1995–96 these categories have been collapsed into a single classification for 'sanitation and protection of the environment'.
- Another influence on the quality of the public sector data is that some relevant expenditures on environment protection are not able to be separately identified. In addition to outlays on 'sanitation and protection of the environment' relevant environment protection outlays exist under a variety of other GPCs (e.g. agricultural land management, forests, etc.) but it is not possible to separate out the environmental component on the basis of the present classification. Estimates of these expenditures have therefore been derived from Commonwealth and State budget papers, as well as the annual reports of public sector departments. Efforts have been made to categorise these 'other environment protection expenditure' according to SERIEE. However, the structure of government budget papers and annual reports means that it is not always possible to separate out the environmental from the non-environmental expenditures in relation to some programs and activities. In such cases, a conservative approach has been taken, by including only that expenditure which could be specifically identified as environment protection. As a result, the estimates of public sector environment protection expenditures are likely to be underestimates.
- One measure of the data quality of a sample is the relative standard error (RSE). Small sample sizes in some cases have led to high RSEs in relation to some private sector industry estimates.
- In some areas of chapter 7 'Household Sector' estimation was required to fill data gaps.

1994–95 AND 1995–96 RESULTS

Table 1.1 provides an estimate for expenditure on environment protection for Australia of $6,989.7 million in 1994–95 and $7,875.6 million in 1995–96. This represented 1.5% and 1.6% of gross domestic product. Both public and private sector protection expenditures increased, with the private sector expenditure increasing by 18% between 1994–95 and 1995–96. This increase was spread fairly evenly across industries.

An additional factor to be taken into consideration when interpreting the estimates provided in table 1.1 is that changes in the level of expenditure on pollution abatement and control and other environment protection measures do not by themselves provide an indicator of environment protection outcomes. A decrease in environment protection expenditure between financial years in a particular industry, for example, may indicate a reduction in activity to abate pollution and reduce environmental impact by that industry. Alternatively, it may indicate a reduced need for environment protection expenditure following investment in an earlier financial year in cleaner production processes or technologies which reduce pollution outputs. For an analysis of the outcomes of environment protection expenditure by governments, businesses and households, the financial estimates presented in this publication would need to be evaluated alongside other indicators, such as physical measures of changes over time in the quality or quantity of environmental assets or ecosystems affected by socioeconomic activity.

1.1 ESTIMATES OF ENVIRONMENT PROTECTION EXPENDITURE

	ENVIRONMENT PROTECTION EXPENDITURE			
	1992–93	*1993–94*	*1994–95*	*1995–96*
Industry	$m	$m	$m	$m
PUBLIC SECTOR				
Sanitation and protection of the environment(a)				
Capital	1 106.0	1 008.0	1 275.0	1 210.0
Current	774.0	761.0	827.0	1 089.0
Total	*1 880.0*	*1 769.0*	*2 102.0*	*2 299.0*
Other identified environment protection costs(b)	*1 073.5*	*1 172.1*	*1 237.5*	*1 298.9*
Gas and electricity				
Capital	80.9	56.9	77.4	71.7
Current	86.8	79.7	76.7	86.4
Total	*167.7*	*136.6*	*154.2*	*158.1*
Total	*3 121.2*	*3 077.7*	*3 493.7*	*3 756.0*
PRIVATE SECTOR				
Agriculture(c)	*96.3*	*112.1*	*177.5*	*191.5*
Mining				
Capital	48.3	57.1	73.5	99.8
Current	95.7	128.8	127.4	150.8
Total	*144.0*	*185.9*	*200.9*	*250.7*
Manufacturing				
Capital	421.6	227.8	154.0	432.0
Current	574.2	473.7	359.4	393.9
Total	*995.7*	*701.5*	*513.4*	*825.9*
Service and other industries(d)				
Current	*348.6*	*451.1*	*646.0*	*726.4*
Household sector(e)	*r1 926.2*	*1 978.0*	*1 958.2*	*2 125.1*
Total	*3 510.8*	*3 428.6*	*3 496.0*	*4 119.6*
ALL SECTORS				
Total	**6 632.0**	**6 506.3**	**6 989.7**	**7 875.6**
Percentage of GDP	**1.6**	**1.5**	**1.5**	**1.6**

(a) Refers to outlays supplied by ABS Government Finance Statistics.

(b) Expenditure derived from Commonwealth, State and Territory budget papers, and departmental annual reports. Combined capital and current figure.

(c) Capital/current split not available.

(d) Current expenditure only collected.

(e) In line with national accounts standards, all household expenditure is treated as current expenditure.

Note: Estimates for 1992–93 and 1993–94 are from the previous edition of this publication *Environment Protection Expenditure, Australia, 1992–93 and 1993–94.*

CHAPTER 2 PUBLIC SECTOR AND UTILITIES

INTRODUCTION

This chapter examines environment protection expenditure by the public sector and by utilities for 1994–95 and 1995–96. As in previous publications, these expenditures are identified through a number of sources and cover government departments and agencies that deliver traditional public services (general government enterprises), as well as government trading and financial enterprises.

Included in this chapter are:

- outlays by general government and public trading enterprises on sanitation and protection of the environment provided by ABS Government Finance Statistics (GFS);
- other budget sector environment protection expenditures, not separately identified from the ABS GFS statistical framework; and
- pollution abatement and control expenditures by electricity and gas utilities, as identified from the ABS Survey of Utilities.

These expenditures reflect partial estimates of environment protection expenditure by the public sector. Efforts continue to coordinate a more complete collection of these costs by the Commonwealth Government, State, Territory and local governments.

OVERVIEW OF RESULTS

Table 2.1 provides an overview of partial expenditure on environment protection by the public sector. These estimates indicate environment protection expenditure by the public sector was $3.494 billion in 1994–95 and $3.756 billion in 1995–96.

2.1 PUBLIC SECTOR ENVIRONMENT PROTECTION EXPENDITURE(a)

	1994–95	*1995–96*
	$m	$m
Sanitation and protection of the environment(b)	2 102.0	2 299.0
Other environment protection expenditures(c)	1 237.5	1 298.9
Gas and electricity(d)	154.2	158.1
Total(a)	**3 493.7**	**3 756.0**

(a) Partial estimate only, as component items are underestimates. See footnotes (b) and (c).

(b) Refers to outlays provided by ABS GFS. Includes Commonwealth, State and local government outlays on selected environment protection activities as well as outlays by public trading enterprises.

(c) Derived from Commonwealth and State budget papers, and departmental annual reports. These estimates are additional to outlays reported in (b). However, some double-counting may occur with estimates supplied by GFS which is unavoidable given current GPCs and the variable formats of government budget papers.

(d) Refers to expenditures provided by the ABS Survey of Utilities. These estimates may include some utilities which are now privately owned but which were public sector utilities at the time of collection.

SANITATION AND PROTECTION OF THE ENVIRONMENT

Tables 2.3, 2.4 and 2.5 present data obtained from the ABS GFS collection. The GFS are categorised using a classification system known as the Government Purpose Classification (GPC), which is based on the UN Classification of the Functions of Government. The GPC related to environment protection outlays by governments is described in table 2.2. Since the last edition of this publication, the GPC has been revised to better accommodate the information needs of the Commonwealth Government, State and Territory Governments. As part of this revision, the GPC for 'Sanitation and Protection of the Environment', which formerly contained five distinct subcategories, is now a single category, GPC 273, as shown in table 2.2.

2.2 SANITATION AND PROTECTION OF THE ENVIRONMENT

GPC(a) code	*Former GPC(a) code*	*Activity*	*Description*
273	731	Household garbage	Administration, regulation and support of household garbage, collection and disposal services.
	723	Other sanitation	Administration, regulation and support of sanitary services other than household garbage such as the disposal of industrial waste and radioactive waste and cleaning of streets and gutters.
	733	Sewerage	Administration, regulation and support of sewerage collection, treatment and disposal operations. Includes assistance for development, expansion and operation of effluent drainage systems and deep main town systems.
	734	Urban stormwater drainage	Regulation, support and operation of urban stormwater drainage services such as the linking or lining of creeks and provision of open or deep draining systems.
	739	Protection of the environment n.e.c.	Administration, regulation and support of specific activities which the other detailed level project codes do not cover. These activities include the development and operation of monitoring equipment for measuring air and noise quality. This category should be treated as a non-specific category.

(a) Government Purpose Classification.

The figures in tables 2.3, 2.4 and 2.5 represent consolidated outlays for 1994–95 and 1995–96 of general government and public trading enterprises at all levels of government in Australia on activities classified as sanitation and protection of the environment (GPC 273) in the ABS GFS collection. The figures include capital and current outlays of general government, and capital outlays and income transfer payments of public trading enterprises.

SANITATION AND PROTECTION OF THE ENVIRONMENT *continued*

Table 2.3 presents outlays on sanitation and protection of the environment by the level of government financing the activity. Specifically, this means data shown for any level of government represent expenditure of their own funds, including funds passed on in the form of specific-purpose grants or transfers to other levels of government. An exception is untied Commonwealth grants that have been passed on to State or local governments and expended on environment protection activities. Since these expenditures are for unspecified purposes and cannot be separately identified, they have been assigned to the level of government at which they were spent, rather than the level of government which provided the untied grant.

Total outlays reported by all levels of government on sanitation and protection of the environment amounted to $2,102 million in 1994–95 and $2,299 million in 1995–96. The 9.4% increase is mainly attributed to an increase in total outlays of $203 million by the New South Wales State Government, which more than offset decreases in outlays over the same period by South Australia, Western Australia and the Northern Territory.

State Governments financed the largest share of outlays on sanitation and protection of the environment, contributing 62% of total public sector outlays in 1994–95 ($1,311 million) and 55% in 1994–95 ($1,253 million). Most of the remainder was outlaid by local government, which was responsible for $768 million or 37% of total outlays in 1994–95 and $1,009 million or 44% in 1995–96.

2.3 OUTLAYS ON SANITATION AND PROTECTION OF THE ENVIRONMENT

	1994–95	*1995–96*
Outlays	$m	$m
Commonwealth		
Current	22.0	36.0
Capital	1.0	1.0
Total	*23.0*	*37.0*
State		
Current	427.0	441.0
Capital	884.0	812.0
Total	*1 311.0*	*1 253.0*
Local		
Current	378.0	612.0
Capital	390.0	397.0
Total	*768.0*	*1 009.0*
All levels		
Current	827.0	1 089.0
Capital	1 275.0	1 210.0
Total	**2 102.0**	**2 299.0**

SANITATION AND PROTECTION OF THE ENVIRONMENT *continued*

Tables 2.4 and 2.5 present outlays on sanitation and protection of the environment by the State and Territories. Figures include a breakdown into State Government and local government outlays for each State, plus a combined total of State outlays.

The most populous State, New South Wales, had the highest total outlays on sanitation and protection of the environment of any State or Territory in both 1994–95 ($905 million) and 1995–96 ($1,108 million), accounting on its own for 44% and 49% of total State and Territory outlays for these years, respectively. The next most populous State, Victoria, made the second highest outlays ($460 million in 1994–95 and $462 million in 1995–96).

Average per capita outlays on sanitation and protection of the environment for all States and Territories were $115 in 1994–95 and $124 in 1995–96. Per capita outlays were above the average for the Australian Capital Territory ($194 in 1994–95 and $182 in 1995–96), New South Wales ($148 in 1994–95 and $179 in 1995–96) and Western Australia ($122 in 1994–95). The lowest per capita outlays were by the Northern Territory ($23 in 1994–95 and $17 in 1995–96), which represented a significant drop from the per capita outlays of $82 by the Northern Territory in 1993–94. This drop was the result of some significant urban enhancement programs related to sanitation and protection of the environment being completed in 1993–94.

Total current outlays on environment protection by the States and Territories increased by 31% between 1994–95 and 1995–96 from $805 million to $1,053 million. This was primarily due to an increase in current outlays on sanitation and protection of the environment of $237 million by New South Wales and of $15 million by Queensland between 1994–95 and 1995–96, which together offset minor decreases in current outlays by most other States and Territories, except Victoria and Tasmania. The increase in current outlays in New South Wales was predominantly by local government (from $130 million in 1994–95 to $352 million in 1995–96). Investigations into the cause of this increase revealed a change in the accounting for local government waste management outlays in that State. In 1995–96, the NSW Department of Local Government required councils to change from charging an annual levy for domestic waste management based on the number of services to a levy based on the value of the property. This change had the effect of increasing the outlays reported by local government for sanitation and protection of the environment.

During the same period, total capital outlays by the States and Territories declined by 5% from $1,274 million in 1994–95 to $1,209 million in 1995–96. This primarily reflected minor decreases in capital outlays by New South Wales, Victoria and Western Australia, which outweighed minor increases in capital outlays in Queensland and Tasmania.

SANITATION AND PROTECTION OF THE ENVIRONMENT *continued*

The breakdown in outlays in tables 2.4 and 2.5 between State Government and local government reveals differences between States regarding the level of government which incurs the most responsibility for outlays on sanitation and protection of the environment. In Queensland and Tasmania, the majority of outlays on sanitation and protection of the environment were made by local government in both 1994–95 and 1995–96. In Queensland, local government accounted for 91% of total outlays by that State in 1994–95 and 86% in 1995–96, and in Tasmania 86% and 90% of outlays for 1994–95 and 1995–96, respectively, were made by local government. In the remaining States and the Northern Territory, outlays on sanitation and protection of the environment were predominantly made by the State or Territory Government. The largest proportion of outlays by the State Government vis-a-vis local government was in Western Australia, where the State Government made 86% of outlays in 1994–95 and 91% in 1995–96.

As explained previously, these outlays are partial estimates only of environment protection expenditures by the public sector. They predominantly comprise activities and related expenditure on the SERIEE categories waste water management and waste management (GPC 273). Other environment protection expenditures, on such activities as protection of soil and groundwater, biodiversity and landscape, have been identified through other sources.

2.4 ENVIRONMENT PROTECTION OUTLAYS, State—1994–95

	GOVERNMENT PURPOSE CLASSIFICATION 273			
	State Government	*Local government*	*Total*	*Per capita*
State and Territory outlays	$m	$m	$m	$
New South Wales				
Current	265.0	130.0	395.0	n.a.
Capital	395.0	115.0	510.0	n.a.
Total	*660.0*	*245.0*	*905.0*	*147.8*
Victoria				
Current	26.0	134.0	160.0	n.a.
Capital	261.0	39.0	300.0	n.a.
Total	*287.0*	*173.0*	*460.0*	*101.9*
Queensland				
Current	21.0	42.0	63.0	n.a.
Capital	2.0	178.0	180.0	n.a.
Total	*23.0*	*220.0*	*243.0*	*74.5*
South Australia				
Current	40.0	39.0	79.0	n.a.
Capital	51.0	31.0	82.0	n.a.
Total	*91.0*	*70.0*	*161.0*	*109.6*
Western Australia				
Current	42.0	24.0	66.0	n.a.
Capital	140.0	5.0	145.0	n.a.
Total	*182.0*	*29.0*	*211.0*	*121.7*
Tasmania				
Current	5.0	8.0	13.0	n.a.
Capital	0.0	22.0	22.0	n.a.
Total	*5.0*	*30.0*	*35.0*	*73.9*
Northern Territory				
Current	3.0	1.0	4.0	n.a.
Capital	1.0	0.0	1.0	n.a.
Total	*3.0*	*1.0*	*4.0*	*22.5*
Australian Capital Territory				
Current	25.0	n.a.	25.0	n.a.
Capital	34.0	n.a.	34.0	n.a.
Total	*59.0*	*n.a.*	*59.0*	*193.7*
Total States and Territories(a)				
Current	427.0	378.0	805.0	n.a.
Capital	884.0	390.0	1 274.0	n.a.
Total	**1 311.0**	**768.0**	**2 079.0**	**115.1**

(a) These totals do not include Commonwealth outlays shown in table 2.2.

2.5 ENVIRONMENT PROTECTION OUTLAYS, State—1995–96

GOVERNMENT PURPOSE CLASSIFICATION 273

State and Territory outlays	State Government $m	Local government $m	Total $m	Per capita $
New South Wales				
Current	280.0	352.0	632.0	n.a.
Capital	350.0	126.0	476.0	n.a.
Total	*630.0*	*478.0*	*1 108.0*	*178.6*
Victoria				
Current	18.0	156.0	174.0	n.a.
Capital	265.0	23.0	288.0	n.a.
Total	*283.0*	*179.0*	*462.0*	*101.3*
Queensland				
Current	32.0	46.0	78.0	n.a.
Capital	5.0	182.0	187.0	n.a.
Total	*37.0*	*228.0*	*265.0*	*79.4*
South Australia				
Current	33.0	41.0	74.0	n.a.
Capital	50.0	32.0	82.0	n.a.
Total	*83.0*	*73.0*	*156.0*	*105.8*
Western Australia				
Current	50.0	6.0	56.0	n.a.
Capital	108.0	9.0	117.0	n.a.
Total	*158.0*	*15.0*	*173.0*	*98.0*
Tasmania				
Current	4.0	10.0	14.0	n.a.
Capital	0.0	25.0	25.0	n.a.
Total	*4.0*	*35.0*	*39.0*	*82.2*
Northern Territory				
Current	2.0	1.0	3.0	n.a.
Capital	0.0	0.0	0.0	n.a.
Total	*2.0*	*1.0*	*3.0*	*16.5*
Australian Capital Territory				
Current	22.0	n.a.	22.0	n.a.
Capital	34.0	n.a.	34.0	n.a.
Total	*56.0*	*n.a.*	*56.0*	*181.8*
Total States and Territories(a)				
Current	441.0	612.0	1 053.0	n.a.
Capital	812.0	397.0	1 209.0	n.a.
Total	**1 253.0**	**1 009.0**	**2 262.0**	**123.5**

(a) These totals do not include Commonwealth outlays shown in table 2.2.

OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES

In addition to the predominantly sewage and waste outlays on environment protection provided by the ABS GFS, other public sector environment protection expenditures, such as protection of soil and groundwater, and biodiversity and landscape protection, have been identified through other sources.

Tables 2.6 and 2.7 have been compiled from Commonwealth, State and Territory budget papers and, in some instances, departmental annual reports. Complete coverage would require inclusion of local governments and public sector non-budget agencies. In order to comply with an internationally recognised framework for the collection and presentation of economic information on the environment (SERIEE), the expenditures derived through this process have, where possible, been categorised according to the classification system underpinning this framework —CEPA. However, due to the varying presentations of expenditures in budget papers across States and Territories, identification of such expenditures is difficult and incomplete. In some instances it was not possible to separate environment protection expenditures into the seven CEPA categories which appear in tables 2.6 and 2.7. In such cases, expenditures were usually placed under the 'other' category. Some relevant environment protection expenditures have also been excluded because it was not possible to separate them from program or administrative expenditures related to non-environment protection activities.

In compiling tables 2.6 and 2.7 efforts have been made to avoid double-counting expenditures which are covered by the GFS and presented in tables 2.4 and 2.5. The GFS collection primarily captures government outlays on household and business waste disposal, and provision of sewage and stormwater services. As far as possible, these outlays are excluded from the expenditures drawn from budget papers. However, it is likely that there is some unavoidable overlap between GFS outlays on sanitation and protection of the environment belonging to the 'other' sub-category (as shown in table 2.2), and the environment protection expenditures drawn from government budget papers and annual reports as presented in tables 2.6 and 2.7.

These expenditures are not directly comparable to the budget paper derived environment protection expenditures collected and presented for the 1991–92 financial year due to the differing frameworks used to classify the environmental expenditures identified. However, the same methodology for compiling these tables has been used as for the previous edition of this publication, providing comparable data between the years from 1992–93 to 1995–96.

Total environment protection expenditures identified through this process amounted to $1,238 million for 1994–95 and $1,287 million for 1995–96. As for previous years, protection of biodiversity and landscape accounted for the highest proportion of these expenditures (55.0% and 54.0% in 1994–95 and 1995–96, respectively). The next largest expenditure fell in the 'other environment protection' category, with 29% of total expenditures in 1994–95 ($365 million) and 32% ($407 million) in 1995–96. The majority of these expenditures relate to activities not able to be separately identified and allocated to one or more of the other categories.

OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES *continued*

National expenditure per capita on these identified environment protection activities was $69 per head in 1994–95 and $70 per head in 1995–96. Per capita expenditures varied widely across the States and Territories, with the Northern Territory ($219 in 1994–95 and $162 in 1995–96), and Tasmania ($120 and $103 in 1994–95 and 1995–96, respectively) recording the highest rates. Per capita expenditures increased in Queensland ($55 in 1994–95 to $57 in 1995–96), South Australia ($35 in 1994–95 to $40 in 1995–96) and the Australian Capital Territory ($60 in 1994–95 to $78 in 1995–96). New South Wales maintained expenditure at around $75 per head, while per capita expenditures dropped in the remaining States and the Northern Territory.

As budget papers and annual reports vary according to the level of detail at which expenditure data are presented, environment protection expenditures by State and expenditure category are a preliminary and partial estimate only and should be viewed with this in mind.

2.6 OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES(a)—1994–95

State and Territory expenditure	Wastewater management/ water protection $m	Non-hazardous and hazardous waste management $m	Protection of soil and ground water $m	Protection of biodiversity and landscape $m	Protection of ambient air and climate $m	Noise and vibration abatement $m	Other environment protection $m	Total $m	Per capita $
New South Wales									
Current	24.9	21.9	43.2	120.9	—	—	156.3	367.0	n.a.
Capital	—	25.2	6.8	48.7	—	—	11.1	91.8	n.a.
Total	*24.9*	*47.1*	*50.0*	*169.5*	—	—	*167.4*	*458.9*	*75.0*
Victoria									
Current	—	—	—	79.0	—	—	27.7	106.7	n.a.
Capital	26.8	—	—	14.0	—	—	1.5	42.3	n.a.
Total	*26.8*	—	—	*93.0*	—	—	*29.2*	*149.0*	*33.0*
Queensland									
Current	—	—	—	138.1	—	—	21.8	159.9	n.a.
Capital	0.3	0.2	2.0	15.2	—	—	2.1	19.8	n.a.
Total	*0.3*	*0.2*	*2.0*	*153.3*	—	—	*23.9*	*179.7*	*55.1*
South Australia									
Current	4.0	1.0	—	35.8	—	—	8.8	49.7	n.a.
Capital	—	—	—	1.3	—	—	0.9	2.1	n.a.
Total	*4.0*	*1.0*	—	*37.1*	—	—	*9.6*	*51.7*	*35.2*
Western Australia									
Current	7.5	2.3	1.3	46.5	—	—	10.9	68.5	n.a.
Capital	—	0.4	—	6.5	—	—	5.9	12.8	n.a.
Total	*7.5*	*2.7*	*1.3*	*53.0*	—	—	*16.8*	*81.3*	*46.9*
Tasmania									
Current	—	—	8.8	30.8	—	—	9.0	48.6	n.a.
Capital	—	—	0.1	4.1	—	—	3.8	8.0	n.a.
Total	—	—	*8.9*	*34.9*	—	—	*12.8*	*56.7*	*119.6*
Northern Territory									
Total	—	—	*4.4*	*34.6*	—	—	—	*39.0*	*219.4*
Australian Capital Territory									
Current	—	—	—	14.9	—	—	3.0	18.0	n.a.
Capital	—	—	—	—	—	—	0.4	0.4	n.a.
Total	—	—	—	*14.9*	—	—	*3.4*	*18.4*	*60.4*
Commonwealth									
Current	—	1.5	4.0	83.2	0.7	—	101.8	191.2	n.a.
Capital	—	—	5.9	5.8	—	—	—	11.7	n.a.
Total	—	*1.5*	*9.9*	*88.9*	*0.7*	—	*101.8*	*202.9*	*11.2*
Australia	**63.5**	**52.5**	**76.5**	**679.3**	**0.7**	—	**365.0**	**1 237.5**	**68.5**

(a) Partial estimates only. Figures have been compiled from Commonwealth, State and Territory budget papers, and departmental annual reports. Where possible, attempts have been made to avoid double-counting with figures provided by ABS GFS (tables 2.3–2.5). As such, these figures represent additional expenditures to protect the environment.

Note: Where figures have been rounded, discrepancies may occur between totals and the sum of the component items.

2.7 OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES(a)—1995–96

	EXPENDITURE CLASSIFICATION								
	Wastewater management/ water protection	*Non-hazardous and hazardous waste management*	*Protection of soil and ground water*	*Protection of biodiversity and landscape*	*Protection of ambient air and climate*	*Noise and vibration abatement*	*Other environment protection*	*Total*	*Per capita*
State and Territory expenditure	$m	$m	$m	$m	$m	$m	$m	$m	$
New South Wales									
Current	21.0	11.7	32.9	146.8	14.9	—	150.8	378.2	n.a.
Capital	—	29.9	0.3	48.7	1.0	—	11.4	91.2	n.a.
Total	*21.0*	*41.7*	*33.2*	*195.5*	*15.9*	—	*162.2*	*469.5*	*75.7*
Victoria									
Current	—	—	—	77.2	—	—	27.6	104.8	n.a.
Capital	27.5	—	—	8.8	—	—	2.6	39.0	n.a.
Total	*27.5*	—	—	*86.0*	—	—	*30.2*	*143.7*	*31.5*
Queensland									
Current	—	—	—	134.4	—	—	29.8	164.2	n.a.
Capital	0.6	—	2.0	19.0	—	—	4.8	26.5	n.a.
Total	*0.6*	—	*2.0*	*153.4*	—	—	*34.6*	*190.7*	*57.1*
South Australia									
Current	4.7	1.0	—	37.9	—	—	13.3	56.9	n.a.
Capital	—	0.1	—	1.5	—	—	0.4	2.0	n.a.
Total	*4.7*	*1.1*	—	*39.4*	—	—	*13.7*	58.9	*40.0*
Western Australia									
Current	7.3	2.7	—	46.8	—	—	10.9	67.7	n.a.
Capital	—	—	—	5.4	—	—	4.4	9.7	n.a.
Total	*7.3*	*2.7*	—	*52.2*	—	—	*15.2*	*77.4*	*43.9*
Tasmania									
Current	—	—	7.2	27.1	—	—	10.2	44.5	n.a.
Capital	—	—	0.1	2.9	—	—	1.6	4.5	n.a.
Total	—	—	*7.3*	*30.0*	—	—	*11.7*	*49.0*	*103.2*
Northern Territory									
Total	—	—	*3.2*	*23.8*	—	—	*2.4*	*29.4*	*161.6*
Australian Capital Territory									
Current	—	—	—	—	—	—	23.6	23.6	n.a.
Capital	—	—	—	—	—	—	0.2	0.2	n.a.
Total	—	—	—	—	—	—	*23.9*	*23.9*	*77.5*
Commonwealth									
Current	—	1.3	4.7	110.4	2.2	—	113.4	232.0	n.a.
Capital	—	—	7.8	4.6	—	—	—	12.4	n.a.
Total	—	*1.3*	*12.5*	*114.9*	*2.2*	—	*113.4*	*244.4*	*13.3*
Australia	**61.2**	**46.8**	**58.3**	**695.2**	**18.1**	**—**	**407.3**	**1 286.9**	**70.3**

(a) Partial estimates only. Figures have been compiled from Commonwealth, State and Territory budget papers, and departmental annual reports. Where possible, attempts have been made to avoid double-counting with figures provided by ABS GFS (tables 2.3–2.5). As such, these figures represent additional expenditures to protect the environment.

Note: Where figures have been rounded, discrepancies may occur between totals and the sum of the component items.

ELECTRICITY AND GAS UTILITIES

In 1994–95 and 1995–96, electricity and gas utilities were asked to indicate capital and current environment protection expenditures. This data was collected through the ABS Survey of Utilities, and represents additional public sector expenditure on environment protection measures not identified through ABS finance statistics or budget papers.

Total expenditure on current and capital environment protection measures amounted to $154 million in 1994–95 and $158 million in 1995–96 (table 2.8). The majority of these expenditures were by electricity utilities (99.5% in 1994–95 and 88% in 1995–96).

Both current and capital expenditure on environment protection decreased for electricity utilities, with current expenditures dropping from $76.4 million in 1994–95 to $67.6 million in 1995–96, and capital expenditures dropping from $77.1 million in 1994–95 to $71.1 million in 1995–96. Meanwhile, current expenditures by gas utilities increased substantially over the two–year period, from $0.4 million in 1994–95 to $18.9 million in 1995–96. Capital expenditure by gas utilities also increased over this period from $0.3 million in 1994–95 to $0.6 million in 1995–96.

2.8 ELECTRICITY AND GAS ENVIRONMENT PROTECTION EXPENDITURES

Industry	*Current* $m	*Capital* $m	*Total* $m
	1994–95		
Electricity	76.4	77.1	153.5
Gas	0.4	0.3	0.7
Total	**76.7**	**77.4**	**154.2**
	1995–96		
Electricity	67.6	71.1	138.7
Gas	18.8	0.6	19.4
Total	**86.4**	**71.7**	**158.1**

Note: Where figures have been rounded, discrepancies may occur between totals and the sum of the component items.

Table 2.9 provides a breakdown of current expenditure by electricity and gas utilities into its various components. The table shows that payments by these utilities to government agencies for fees, charges and taxes related to environment protection increased (from $2.2 million in 1994–95 to $8.5 million in 1995–96). At the same time, purchases of environment protection services increased significantly (from $13.7 million in 1994–95 to $38 million in 1995–96), while research and development expenditures dropped markedly. The majority of current expenditure on environment protection fell into the 'other' category (53% of total current expenditure on environment protection in 1994–95 and 46% in 1993–94). This includes estimates for labour, materials, electricity and fuels used for environment protection activities.

2.9 COMPONENTS OF ENVIRONMENT PROTECTION CURRENT EXPENDITURE

	Government fees, charges and taxes	*Purchased services*	*Intramural R&D*	*Extramural R&D*	*Other*	*Total*
Electricity and gas	$m	$m	$m	$m	$m	$m
			1994–95			
Total	2.2	13.7	5.9	14.0	40.9	76.7
			1995–96			
Total	8.5	36.0	1.5	1.0	39.4	86.4

Note: Where figures have been rounded, discrepancies may occur between totals and the sum of the component items.

Table 2.10 gives a breakdown of capital expenditures on environment protection by electricity and gas utilities into either 'end-of -line' or 'change-in-production' technologies and processes. End-of-line expenditures refers to expenditures on equipment or processes which are added to production processes to treat wastes or emissions after they have been produced, but before they are released into the environment. Change-in-production expenditures refer to expenditures incurred in altering production equipment or processes to minimise or mitigate the production of wastes and emissions in the first place. The largest component of capital expenditure by electricity and gas utilities for both years was on end-of-line activities and technologies (65% of total capital expenditures in 1994–95 and 92% in 1995–96) (table 2.10). Capital expenditures on change-in-production technologies fell markedly during this period.

2.10 COMPONENTS OF ENVIRONMENT PROTECTION CAPITAL EXPENDITURE

	End-of-line	*Change-in-production*	*Total*
Electricity and gas	$m	$m	$m
	1994–95		
Total	50.5	27.0	77.4
	1995–96		
Total	65.9	5.8	71.7

Note: Where figures have been rounded, discrepancies may occur between totals and the sum of the component items.

ELECTRICITY AND GAS UTILITIES *continued*

Table 2.11 shows a summary of capital, current and total expenditure by the electricity and gas utilities in average 1989–90 prices for the years 1991–92 to 1995–96. The estimates are characterised by considerable fluctuation in both capital and current expenditures on environment protection by these utilities over time.

2.11 ELECTRICITY AND GAS EXPENDITURES(a)

ANZSIC code	Industry	*1991–92* $m	*1992–93* $m	*1993–94* $m	*1994–95* $m	*1995–96* $m
		CAPITAL				
361	Electricity	66.8	86.9	59.8	77.8	72.8
362	Gas	0.3	0.5	0.0	0.3	0.6
	Total	*67.1*	*87.3*	*59.8*	*78.1*	*73.4*
		CURRENT				
361	Electricity	46.7	92.3	67.8	77.1	69.2
362	Gas	0.0	1.4	15.9	0.4	19.3
	Total	*46.7*	*93.7*	*83.7*	*77.4*	*88.5*
		TOTAL				
361	Electricity	113.4	179.2	127.7	154.9	142.0
362	Gas	0.3	1.9	15.9	0.7	19.9
	Total	**113.9**	**181.1**	**143.5**	**155.6**	**161.9**

(a) At average 1989–90 prices.

CHAPTER 3 AGRICULTURE INDUSTRY

INTRODUCTION

Environment protection expenditure estimates for the agriculture industry were compiled from a sample of farm businesses for the 1994–95 and 1995–96 financial years. As a result the estimates are subject to sampling variability with, in some cases, high relative standard errors. Changes were made to the collection form between 1994–95 and 1995–96. The 1995–96 survey collected similar expenditures to 1994–95 but in greater detail. To provide continuity in the time series, the more detailed estimates from 1995–96 have been aggregated to match the data available for 1994–95.

OVERVIEW OF RESULTS

Table 3.1 provides an overview of the environment protection expenditure of the agriculture industry. Taking into account some grants and subsidies to farm businesses, the known environment protection expenditures by the agriculture industry were $177.5 million for 1994–95 and $191.5 million for 1995–96.

3.1 AGRICULTURE INDUSTRY ENVIRONMENT PROTECTION EXPENDITURE

	1994–95	*1995–96*
	$m	$m
Control/prevention of soil and land degradation, protection of waterways from contamination, protection of native plants, animals and habitat, and eradication of plant growth, animals or insects affecting sustainable land use	188.7	196.6
Less environmental grants and subsidies received(a)	11.2	5.1
Total	**177.5**	**191.5**

(a) This figure is deducted to ensure there is no double-counting in the final estimates for expenditures for all Australian industry and government. The figure is included on the public sector side of the equation.

LAND DEGRADATION EXPENDITURE

Table 3.2 shows the amounts reported by farm businesses on specific measures to prevent/control land degradation in Australia for 1994–95 and 1995–96. The total expenditure for these activities was $188.7 million for 1994–95 and $196.6 million for 1995–96, representing 0.8% and 0.7% of agriculture industry turnover for 1994–95 and 1995–96, respectively.

The larger component of expenditure for most States and for Australia overall was for the control/prevention of soil and land degradation, protection of waterways from contamination, and protection of native plants, animals and habitat. This includes the establishment or protection of trees or shrubs to control or prevent soil and land degradation, dams or earthworks to prevent run-off to waterways and fencing to exclude livestock from areas of remnant vegetation, wetlands or other natural habitats for the

LAND DEGRADATION EXPENDITURE *continued*

protection of native species. Other expenditure was for the eradication of plant growth, animals or insects affecting sustainable land use ($84.3 million in 1994–95 and $78.4 million in 1995–96).

In 1994–95, Queensland spent the most in absolute terms on environment protection. In 1995–96 New South Wales had the greatest expenditure. In terms of environment protection expenditure as a percentage of total agricultural turnover, Queensland ranked highest in 1994–95 (1.2%) and in 1995–96 (0.9%) with New South Wales also expending 0.9% of the sector's turnover in 1995–96 on environment protection.

In previous years costs incurred to prepare farm plans and expenses for self-education have been collected. This data is unavailable for 1994–95 and 1995–96.

3.2 ENVIRONMENT PROTECTION EXPENDITURE, State

	NSW	*Vic.*	*Qld.*	*SA*	*WA*	*Tas.*	*Aust.(a)*
	$m	$m	$m	$m	$m	$m	$m
	1994–95						
Control/prevention of soil and land degradation, protection of waterways from contamination, protection of native plants, animals and habitat	28.7	19.6	25.2	6.2	23.3	0.5	104.4
Eradication of plant growth, animals or insects affecting sustainable land use	22.1	9.5	45.1	2.9	3.3	0.8	84.3
Total	**50.8**	**29.1**	**70.3**	**9.1**	**26.6**	**1.3**	**188.7**
	1995–96						
Control/prevention of soil and land degradation, protection of waterways from contamination, protection of native plants, animals and habitat	42.2	15.3	22.2	5.1	32.1	1.2	118.2
Eradication of plant growth, animals or insects affecting sustainable land use	21.3	13.6	34.0	3.9	3.7	1.4	78.4
Total	**63.5**	**28.9**	**56.2**	**9.0**	**35.8**	**2.6**	**196.6**

(a) Australian total includes figures for the Northern Territory and the Australian Capital Territory.

INDUSTRY EXPENDITURE

Table 3.3 shows expenditure on environment protection by industry class. The highest expenditure on environment protection was reported by the beef cattle farming industry in 1994–95 ($44.2 million or 23.4% of total) and by the grain growing industry in 1995–96 ($47.5 million, or 24.2% of total). Another major contributor to environment protection expenditure was grain–sheep, grain–beef cattle farming ($39.7 million in 1994–95 and $39.0 million in 1995–96). Grain–sheep, grain–beef cattle farming accounted for 21% of environment protection expenditure by the agriculture industry in 1994–95 and 19.8% in 1995–96. Severe drought conditions in some States in 1994–95 impacted on land degradation protection or prevention expenditure for the grain growing industry, which increased significantly in 1995–96 following the breaking of the drought (Australian Bureau of Statistics (forthcoming)).

INDUSTRY EXPENDITURE *continued*

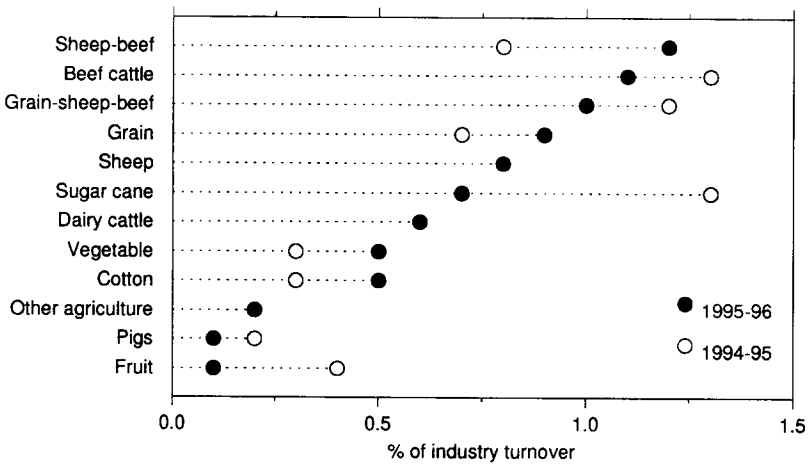
Graph 3.4 shows environment protection expenditure as a percentage of total turnover by the agricultural industry. The highest proportion of expenditure on environment protection to industry turnover for 1994–95 was in the beef cattle farming industry spending 1.4% of industry turnover. The next highest proportion was for the sugar cane growing industry with 1.3% of industry turnover being spent on environment protection.

In 1995–96 the sheep-beef cattle industry spent the highest proportion of industry turnover (1.2%) with beef cattle next highest (1.1%).

3.3 ENVIRONMENT PROTECTION EXPENDITURE, Industry

		Land degradation protection or prevention.....	
ANZSIC code	*Industry*	$m	% of total industry turnover
	1994–95		
0114–0119	Fruit growing	6.7	0.4
0113	Vegetable growing	4.6	0.3
0121	Grain growing	20.0	0.7
0122	Grain–sheep, grain–beef cattle farming	39.7	1.2
0123	Sheep–beef cattle farming	17.2	0.9
0124	Sheep farming	12.8	0.8
0125	Beef cattle farming	44.2	1.4
0130	Dairy cattle farming	16.7	0.6
0151	Pig farming	1.3	0.2
0161	Sugar cane growing	18.1	1.3
0162	Cotton growing	2.7	0.3
0141,0142, 0152,0153, 0159,0169	Other agriculture	4.8	0.3
	All industries	**188.7**	**0.8**
	1995–96		
0114–0119	Fruit growing	2.5	0.1
0113	Vegetable growing	8.6	0.5
0121	Grain growing	47.5	0.9
0122	Grain–sheep, grain–beef cattle farming	39.0	1.0
0123	Sheep–beef cattle farming	18.1	1.2
0124	Sheep farming	12.1	0.8
0125	Beef cattle farming	32.7	1.1
0130	Dairy cattle farming	15.9	0.6
0151	Pig farming	0.8	0.1
0161	Sugar cane growing	9.0	0.7
0162	Cotton growing	5.7	0.5
0141,0142, 0152,0153, 0159,0169	Other agriculture	4.7	0.3
	All industries	**196.6**	**0.7**

3.4 ENVIRONMENT PROTECTION EXPENDITURE, Per cent of Industry



GRANTS AND SUBSIDIES

The survey estimates in table 3.5 are subject to comparatively high standard errors and the following comments should be interpreted in this light.

In 1994–95, New South Wales' farm businesses received 50% ($5.6 million) of the total soil conservation grants/subsidies reported by farm businesses. This amounted to 11.0% of total expenditure by the agriculture industry in New South Wales. Victoria ($1.6 million) and Western Australia ($1.6 million) received the next highest total of grants for soil conservation, with these amounts comprising 5.5% and 6.0% respectively of expenditure on environment protection activities by the agriculture industry in each of these States.

In 1995–96, Queensland farm businesses received 39.2% ($2.0 million) of the total soil conservation grants/subsidies reported. New South Wales ($0.9 million), Victoria ($0.9 million) and South Australia ($0.8 million) received the next most significant grants for soil conservation, with these amounts comprising 1.4%, 3.1% and 8.9% respectively of expenditure on environment protection activities by the agriculture industry in each of these States.

3.5 GRANTS AND SUBSIDIES RECEIVED

	NSW	*Vic.*	*Qld.*	*SA*	*WA*	*Tas.*	*Aust.(a)*
	$m	$m	$m	$m	$m	$m	$m
1994–95							
Soil conservation grants and subsidies	5.6	1.6	1.5	0.9	1.6	0.0	11.2
1995–96							
Soil conservation grants and subsidies	0.9	0.9	2.0	0.8	0.3	0.2	5.1

(a) Australian total includes figures for the Northern Territory and the Australian Capital Territory.

GRANTS AND SUBSIDIES *continued*

Table 3.6 provides a comparison in total expenditure by the agricultural sector to protect the environment from 1992–93 to 1995–96. Expenditure by the industry on environment protection has more than doubled in real terms between 1992–93 and 1995–96.

3.6 AGRICULTURE INDUSTRY ENVIRONMENT PROTECTION EXPENDITURE(a)

	1992–93	*1993–94*	*1994–95*	*1995–96*
	$m	$m	$m	$m
Total	78.5	95.4	151.1	163.0

(a) At average 1989–90 prices.

CHAPTER 4 MINING INDUSTRY

INTRODUCTION

For the 1994–95 financial year, mining businesses were asked questions on their total expenditure on pollution abatement and control measures. These included: capital and current expenditure on environment protection, and research and development expenditure on environment protection.

Capital expenditure on environment protection in the mining industry was defined as: expenditure on any element of the production processes specifically concerned with protecting the environment by reduction or elimination of pollutants and wastes. This could be either by remedial (end-of-line) or by preventative (change-in-production) measures. The former refers to the cost of treating pollutants after they have been produced by installing distinct abatement and control facilities; expenses to remove and dispose of wastes; construction of civil works and/or facilities to recreate ecosystems by ripping compacted surfaces or revegetation. Change-in-production, on the other hand, reduces or eliminates the production of pollution by preventing its occurrence. This can be achieved by improved mining techniques or equipment alteration including equipment converted to use fuels that generate less pollutants.

Capital expenditure on environment protection has been sought over a number of domains. These domains are protection of water, non-hazardous waste, hazardous waste, protection of air, noise abatement, land rehabilitation and other pollution abatement.

Current expenditure on environment protection in the mining industry was defined as: expenditure to operate or maintain plant and equipment to abate pollution; payments to contractors to remove and dispose of waste; costs associated with wind and water erosion; on-going site rehabilitation; regular sampling tests; and related research and development expenditure.

In the 1995–96 financial year, the framework used to collect mining data was changed from the OECD PAC framework to SERIEE, (for details see chapter 1). Also, a new collection form was used instead of questions being embedded in the Mining Census form. However, the data for both years have been made comparable.

OVERVIEW OF RESULTS

In 1994–95, total pollution abatement and control expenditure by the mining industry was $200.9 million (table 4.1). Current expenditure accounted for 63.4% ($127.4 million) of total pollution abatement expenditure. The proportion of environment protection expenditure to total mining turnover was 0.7%. Capital expenditure on the environment formed 0.3% of total turnover for mining. Current expenditure on the environment formed 0.4% of total turnover mining. For the 1995–96 financial year, total pollution abatement and control expenditure in the mining industry was $250.7 million, of which current expenditure accounted for 60.2% ($150.8 million). The proportion of environment protection expenditure to total mining turnover was 0.8%. Capital expenditure on the environment formed 0.3% of total turnover for mining.

OVERVIEW OF RESULTS *continued*

Current expenditure on the environment formed 0.5% of total current mining expenditure. More detailed data are presented throughout the remainder of this chapter.

4.1 POLLUTION ABATEMENT AND CONTROL EXPENDITURES

	1994–95	*1995–96*
Expenditure type	$m	$m
Capital	73.5	99.8
Current	127.4	150.8
Total	**200.9**	**250.7**

POLLUTION ABATEMENT AND CONTROL

By industry

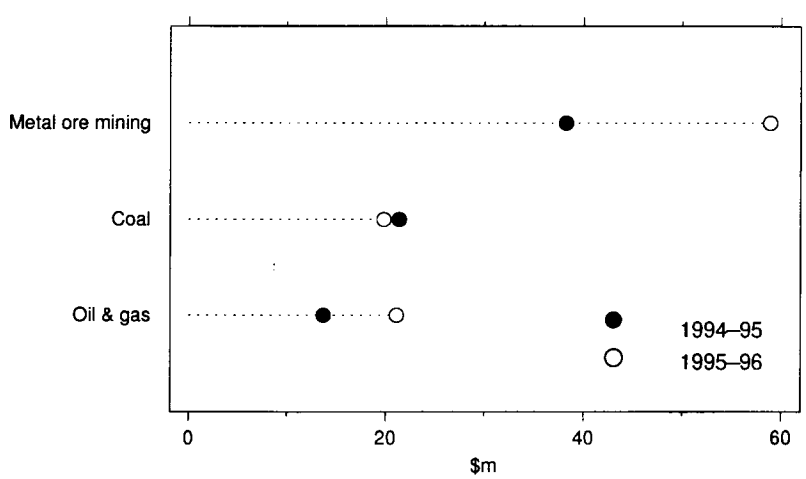
Table 4.2 shows environment protection expenditures by the different mining industries. Highest total pollution abatement and control expenditure was recorded by the non-ferrous metals ($93.6 million in 1994–95 and $134.8 million in 1995–96) and coal mining ($57.4 million in 1994–95 and $65.6 million in 1995–96) industries. Within the non-ferrous metals category (Australian and New Zealand Standard Industrial Classification (ANZSIC) codes 1312–1319), the gold ore mining industry expended the most on environment protection ($49.4 million) in 1994–95, while in 1995–96 the mineral sand mining industry expended the most ($46.8 million).

Graphs 4.3 and 4.4 present a breakdown of capital and current expenditure by industry groups. Graph 4.3 shows that there was a considerable increase in capital expenditure on environment protection in metal ore mining and a slight drop in capital expenditure by coal mining between 1994–95 and 1995–96. With regards to current expenditure, graph 4.4 shows a sizeable increase in the oil and gas industry between 1994–95 and 1995–96, while current expenditure by the metal ore mining industry remained steady over the same period.

4.2 ENVIRONMENT PROTECTION EXPENDITURE, Mining Industry

ANZSIC code	Industry	Capital..... no.	Capital..... $m	Current..... no.	Current..... $m	Total..... no.	Total..... $m
		1994–95					
110	Coal mining	*27*	*21.4*	*58*	*36.0*	*120*	*57.4*
120	Oil and gas extraction	*5*	*13.7*	*10*	*5.5*	*39*	*19.2*
131	Metal ore mining						
1311	Iron ore mining (ferrous metals)	5	17.7	7	13.1	18	30.7
1312	Bauxite mining	1	2.3	2	4.1	5	6.4
1313	Copper ore mining	3	1.3	8	4.1	13	5.4
1314	Gold ore mining	24	13.2	67	36.2	137	49.4
1315	Mineral sand mining	3	0.2	10	14.5	11	14.7
1316	Nickel ore mining	1	1.0	2	4.8	5	5.8
1317	Silver-lead-zinc ore mining	8	1.8	12	6.2	14	8.0
1319	Metal ore mining n.e.c.	3	0.8	4	3.1	11	3.9
	Total	*48*	*38.3*	*112*	*86.0*	*214*	*124.3*
	Total	**80**	**73.5**	**180**	**127.4**	**373**	**200.9**
		1995–96					
110	Coal mining	*23*	*19.8*	*47*	*45.8*	*111*	*65.6*
120	Oil and gas extraction	*8*	*21.1*	*13*	*19.6*	*40*	*40.7*
131	Metal ore mining						
1311	Iron ore mining (ferrous metals)	2	n.p.	5	n.p.	17	9.6
1312	Bauxite mining	2	n.p.	1	n.p.	2	n.p.
1313	Copper ore mining	8	17.5	7	7.7	15	25.2
1314	Gold ore mining	21	6.5	74	25.8	132	32.4
1315	Mineral sand mining	4	n.p.	5	n.p.	10	46.8
1316	Nickel ore mining	1	n.p.	2	n.p.	3	n.p.
1317	Silver-lead-zinc ore mining	4	2.4	8	3.5	9	5.8
1319	Metal ore mining n.e.c.	5	n.p.	8	n.p.	13	18.6
	Total	*47*	*58.9*	*110*	*85.5*	*201*	*144.4*
	Total	**78**	**99.8**	**222**	**150.8**	**352**	**250.7**

4.3 MINING INDUSTRY ENVIRONMENT PROTECTION, Capital Expenditure



4.4 MINING INDUSTRY ENVIRONMENT PROTECTION, Current Expenditure

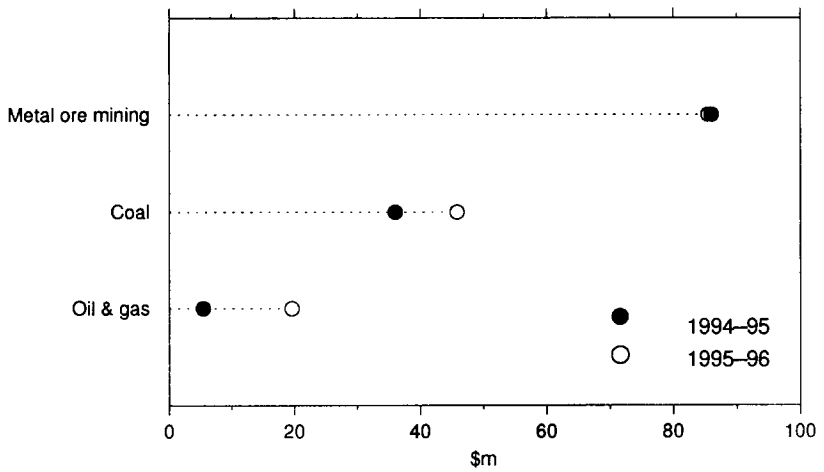


Table 4.5 gives a breakdown of the components of current expenditure on environment protection by industry group. This table indicates the mining industry predominantly uses private contractors to provide waste management and environment protection services ($31.2 million in 1994–95 and $58.2 million in 1995–96), much more than government services ($19.9 million in 1994–95 and $5.1 million in 1995–96). This table also indicates that there is a change from 1994–95 to 1995–96 in the propensity of mining businesses to do their own research and development on pollution abatement and environment protection measures, as there was a marked increase in expenditures on research and development by external providers (from $0.7 million in 1994–95 to $6.2 million in 1995-96).

4.5 COMPONENTS OF CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry

		Payments to governments		*Payments to non-governments*		*Other costs*		*Intramural R&D*		*Extramural R&D*		*Total*
ANZSIC code	*Industry*	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m	$m
					1994–95							
110	Coal mining	4	6.8	23	5.0	44	23.4	5	n.p.	5	n.p.	36.0
120	Oil and gas extraction	5	0.4	5	2.3	8	2.6	5	n.p.	2	n.p.	5.5
131	Metal ore mining	33	12.7	34	24.0	85	44.9	20	4.1	14	0.4	86.0
	Total	**42**	**19.9**	**62**	**31.2**	**137**	**70.9**	**30**	**4.7**	**21**	**0.7**	**127.4**
					1995–96							
110	Coal mining	34	2.3	43	14.9	35	24.6	15	2.0	13	1.9	45.8
120	Oil and gas extraction	8	0.5	10	12.9	9	5.6	5	0.3	4	0.2	19.6
131	Metal ore mining	77	2.3	100	30.4	133	42.9	39	5.8	29	4.1	85.5
	Total	**119**	**5.1**	**153**	**58.2**	**177**	**73.1**	**59**	**8.1**	**46**	**6.2**	**150.8**

Note: Where figures have been rounded, discrepancies may occur between totals and sums of component items.

POLLUTION ABATEMENT AND CONTROL

By industry *continued*

A substantial portion of current expenditure (55.6% in 1994–95 and 48.5% in 1995–96) shown in table 4.5 is in the 'other' category. This category includes the cost of salaries, wages and materials related to mine site rehabilitation, which is a significant environmental remediation measure undertaken by mining businesses.

The data in table 4.5 for the 1994–95 financial year differ from those produced in Australian Bureau of Statistics (1997a). This is because this publication includes research and development as a component of current expenditure, while the 1994–95 mining publication does not. However, research and development has been included in reported current environment protection expenditures in the 1995–96 edition of Australian Bureau of Statistics (1997).

By technique

Table 4.6 separates total capital expenditure on pollution abatement and control into two elements: end-of-line and change-in-production. End-of-line techniques accounted for 80.3% (1994–95) and 78.5% (1995–96) of capital expenditure. This is probably due to the fact that end-of-line measures to protect the environment are generally more appropriate for mining activity. The ability to accurately report expenditures on change-in-production measures/equipment specifically attributable to environmental protection is problematic as this kind of expenditure may be undertaken for other reasons, including cost savings.

4.6 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Technique

ANZSIC code	*Industry*	*End-of-line* $m	*Change-in-production* $m	*Total* $m
	1994–95			
110	Coal mining	18.3	3.1	21.4
120	Oil and gas extraction	3.3	10.4	13.7
131	Metal ore mining	37.4	1.0	38.3
	Total	**59.0**	**14.5**	**73.5**
	1995–96			
110	Coal mining	n.p.	n.p.	19.8
120	Oil and gas extraction	n.p.	n.p.	21.1
131	Metal ore mining	44.3	14.6	58.9
	Total	**78.3**	**21.6**	**99.8**

Note: Where figures have been rounded, discrepancies may occur within totals.

By environmental domain

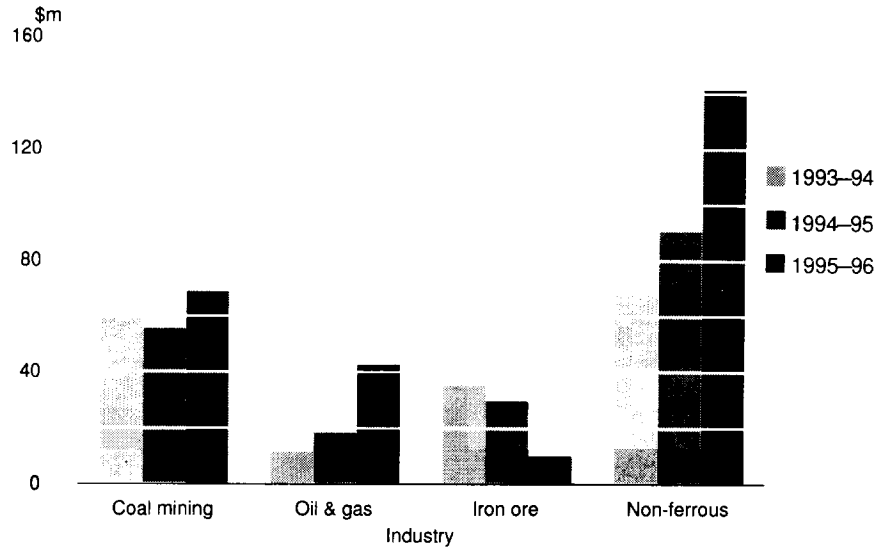
In table 4.7, capital expenditures are broken down according to the type of environment protection activity for which the expenditure was made. Measures to abate water pollution accounted for 37.1% ($27.3 million) of capital expenditure for the 1994–95 year compared to 43.2% ($43.1 million) in 1995–96. In 1995–96, spending on air protection accounted for 20.4% ($20.4 million) compared with 25.2% ($18.5 million) in the previous financial year. For the 1995–96 financial year, measures for land rehabilitation amounted to 15.7% ($15.7 million) of total capital expenditure and measures for solid hazardous waste accounted for 13.5% ($13.3 million). The changes between 1994–95 and 1995–96 reflect an increase in water protection activity by the mining industry, typically characterised by the construction of tailings dams to handle waste water arising from mining activities.

4.7 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Environmental Domain

		Land rehabilitation.		*Water protection.*		*Solid non-hazardous waste.....*		*Solid hazardous waste.....*		*Air protection..*		*Noise abatement.*		*Total*
ANZSIC code	*Industry*	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m	$m
						1994–95								
110	Coal mining	9	6.3	23	14.4	4	0.2	2	0.0	8	0.5	7	0.1	21.4
120	Oil and gas extraction	3	1.4	4	2.9	2	0.4	3	0.3	4	8.6	0	—	13.7
131	Metal ore mining	16	15.0	26	10.0	11	0.8	13	3.0	17	9.4	5	0.1	38.3
	Total	**28**	**22.7**	**53**	**27.3**	**17**	**1.4**	**18**	**3.3**	**29**	**18.5**	**12**	**0.3**	**73.5**
						1995–96								
110	Coal mining	9	2.4	20	10.6	9	1.2	2	0.2	9	3.4	12	2.0	19.8
120	Oil and gas extraction	4	8.7	5	5.1	3	0.5	4	4.5	3	1.1	4	1.3	21.1
131	Metal ore mining	21	4.6	35	27.4	8	1.2	14	8.7	16	16.0	15	1.0	58.9
	Total	**34**	**15.7**	**60**	**43.1**	**20**	**2.9**	**20**	**13.3**	**28**	**20.4**	**31**	**4.3**	**99.8**

Note: Where figures have been rounded, discrepancies may occur between totals and sums of component items.

4.8 ENVIRONMENT PROTECTION EXPENDITURE(a)



(a) At average 1989–90 prices.

COMPARISON OF 1991–96 DATA

Table 4.9 compares mining industry environment protection expenditure over the period 1991–92 to 1995–96 at constant prices. An overall increase of 77.7% on pollution abatement and control expenditure has occurred between 1991–92 and 1995–96. The constant price index for the mining sector (base period 1989–90) was used to produce the constant price estimates of environment protection expenditure. The constant prices for the mining sector can be found in Australian Bureau of Statistics (1997b).

The constant price estimates shown in graph 4.8 for the period 1993–94 to 1994–95 represent a 10.5% increase in expenditure, whereas for the period 1994–95 to 1995–96 there was an increase of 35.3%.

4.9 ENVIRONMENT PROTECTION EXPENDITURE(a)

ASIC/ANZSIC code	Industry	1991–92r	1992–93r	1993–94r	1994–95	1995–96
		$m	$m	$m	$m	$m
		CAPITAL				
110	Coal mining	14.6	17.4	15.2	20.7	20.8
120	Oil and gas extraction	9.5	7.7	5.3	13.3	22.2
1311	Iron ore mining (ferrous metals)	3.7	3.5	15.6	17.1	2.2
1312–1319	Total non-ferrous metals	24.4	19.2	18.1	20.0	59.6
11–13	*Total mining*	*52.1*	*47.7*	*54.1*	*71.2*	*104.8*
		CURRENT				
110	Coal mining	28.7	40.1	45.8	34.9	48.1
120	Oil and gas extraction	9.4	5.4	6.4	5.3	20.6
1311	Iron ore mining (ferrous metals)	1.8	2.5	19.8	12.7	7.9
1312–1319	Total non-ferrous metals	56.0	46.5	49.9	70.6	81.9
11–13	*Total mining*	*96.0*	*94.5*	*122.0*	*123.4*	*158.3*
		TOTAL				
110	Coal mining	43.3	57.5	61.0	55.6	68.9
120	Oil and gas extraction	18.8	13.2	11.7	18.6	42.7
1311	Iron ore mining (ferrous metals)	5.5	5.9	35.4	29.7	10.1
1312–1319	Total non-ferrous metals	80.5	65.7	67.9	90.7	141.5
11–13	**Total mining**	**148.1**	**142.2**	**176.1**	**194.6**	**263.2**

(a) At average 1989–90 prices.

CHAPTER 5 MANUFACTURING INDUSTRIES

INTRODUCTION

For the 1994–95 and 1995–96 financial years, manufacturing businesses were asked questions on their total expenditures on waste management and environment protection measures. These included capital and current expenditure on these measures.

Capital expenditure on environment protection in the manufacturing sector was defined as 'expenditure on any element of production processes specifically attributable to protecting the environment by the prevention, reduction or elimination of wastes, pollutants or any other degradation of the environment'. This could be either by remedial (end-of-line) or by preventative (change-in-production) measures. End-of-line expenditures refer to the cost of installing distinct pollution abatement equipment designed to reduce the level of emissions to the environment by treating waste prior to release. These measures treat wastes and pollutants after they have been produced and do not irreversibly affect the original production process. Change-in-production measures, by contrast, reduce or eliminate the production of wastes or pollutants by altering the equipment or techniques used in the manufacturing process to prevent the occurrence of wastes or pollution in the first place. This can be achieved by material substitution, modified production processes, or equipment alteration.

Current expenditure on environment protection was defined as any payments to government agencies or non-government contractors related to waste management and environment protection services or activities. This included payments made to government for environmental taxes, licences, levies; payments to government agencies for waste removal, sewage services and other environmental protection services; payments to private contractors to remove or dispose of waste or provide other environmental protection services, such as environmental impact assessments or monitoring pollution levels; and expenditures on research and development related to managing waste, reducing pollution or other environment protection activities.

In 1995–96, the questions used to collect expenditures on environment protection by manufacturing industries were moved to a separate collection form. Also, in line with environmental accounting guidelines in SERIEE, the 1995–96 survey form contained more detailed questions about businesses' capital and current expenditures on environment protection than in previous years. However, the 1994–95 and 1995–96 data has been made comparable.

OVERVIEW OF RESULTS

In 1994–95 total expenditure by the manufacturing sector on environment protection amounted to $513.4 million. This represented 0.3% of total turnover by manufacturing industries for 1994–95. In 1995–96 total expenditure on environment protection by the manufacturing industries was $822.7 million or 0.4% of total manufacturing turnover.

5.1 MANUFACTURING INDUSTRY ENVIRONMENT PROTECTION EXPENDITURE

	1994–95	1995–96
Expenditure type	$m	$m
Capital	154.0	432.0
Current	359.4	393.9
Total	*513.4*	*825.9*
Less environmental grants and subsidies(a)	*(b)*	*3.2*
Total(c)	**513.4**	**822.7**

(a) This figure is deducted, where known, to ensure there is no double-counting in the final estimates for expenditure for all Australian industry and government.

(b) Data not collected.

(c) Expenditure by manufacturing businesses on environment protection not related to pollution abatement and control have yet to be investigated.

Table 5.2 presents a summary of expenditure on environment protection by industry for the financial years 1994–95 and 1995–96. The metal product manufacturing industry accounted for the largest proportion of total environment protection expenditure, with 45% ($230.6 million) in 1994–95 and 21% ($174.4 million) in 1995–96. The second largest contributor to total expenditure was the food, beverage and tobacco industry in 1994–95, accounting for 22% ($110.4 million) and the machinery and equipment industry in 1995–96, accounting for around 18% ($153.8 million).

Overall, there was a substantial (61%) increase in total expenditure to protect the environment between 1994–95 and 1995–96. Most of the increase can be attributed to a substantial increase in total capital expenditure in 1995–96 (from $154 million in 1994–95 to $432 million in 1995–96), most notably in the wood and paper product industry ($12.6 million in 1994–95 and $69.6 million in 1995–96), and the machinery and equipment industry ($3.6 million in 1994–95 and $113.6 million in 1995–96).

The increase in total environment protection expenditure in 1995–96 compared to 1994–95 can also be attributed to the relatively low level of total expenditure in 1994–95 compared with previous years. As shown in table 5.7, total expenditure on environment protection in 1989–90 dollars was $1,055.1 million in 1992–93, $763.2 million in 1993–94 and only $581.9 million in 1994–95. The 1995–96 total of $973.4 million (in 1989–90 dollars) is comparable with these earlier years and suggests that the 1994–95 total expenditure was unusually low.

Changes in the survey methodology used to collect data may also have contributed to a higher estimate of total expenditure for 1995–96, as the 1995–96 survey contained more detailed questions than for earlier years on businesses' environment protection

OVERVIEW OF RESULTS *continued*

expenditures. This may have resulted in expenditures being included which were not previously seen by respondents as being relevant, thereby producing a more comprehensive estimate in 1995–96 than was possible in 1994–95.

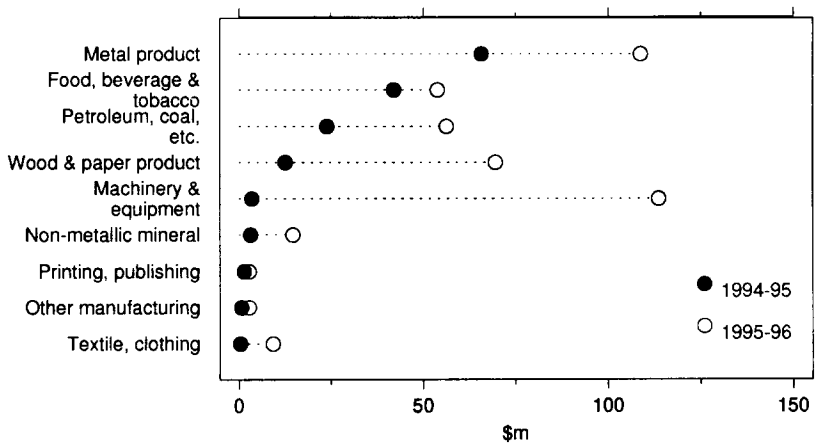
5.2 ENVIRONMENT PROTECTION EXPENDITURE, By Industry

ANZSIC	Industry	Capital expenditure $m	Current expenditure $m	Total $m
	1994–95			
21	Food, beverage and tobacco	42.1	68.3	110.4
22	Textile, clothing, footwear and leather	0.5	5.7	6.2
23	Wood and paper product	12.6	13.2	25.8
24	Printing, publishing and recorded media	1.5	10.5	12.0
25	Petroleum, coal, chemical and associated product	24.0	59.2	83.2
26	Non-metallic mineral product	3.3	16.8	20.1
27	Metal product	65.7	164.9	230.6
28	Machinery and equipment	3.6	18.9	22.5
29	Other manufacturing	0.7	1.9	2.6
21–29	**Total manufacturing**	**154.0**	**359.4**	**513.4**
	1995–96			
21	Food, beverage and tobacco	53.9	86.1	140.0
22	Textile, clothing, footwear and leather	9.4	23.1	32.5
23	Wood and paper product	69.6	45.0	114.6
24	Printing, publishing and recorded media	2.8	20.0	22.8
25	Petroleum, coal, chemical and associated product	56.4	58.2	114.6
26	Non-metallic mineral product	14.7	28.8	43.5
27	Metal product	108.8	65.6	174.4
28	Machinery and equipment	113.6	40.2	153.8
29	Other manufacturing	2.8	26.9	29.7
21–29	**Total manufacturing**	**432.0**	**393.9**	**825.9**

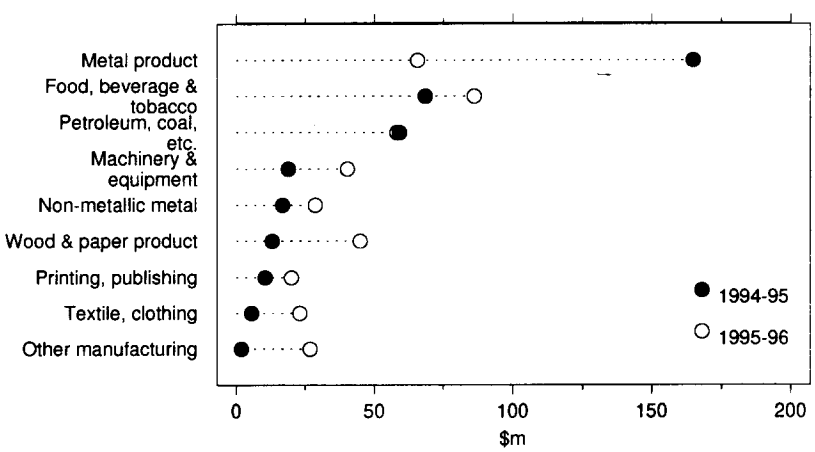
Graphs 5.3 and 5.4 present capital and current expenditures by ANZSIC industry. As shown in Graph 5.3, the highest levels of capital expenditure to protect the environment occurred in the metal product industry in 1994–95 (with $65.7 million or 43% of total capital expenditure), and in the machinery and equipment industry in 1995–96 (with $113.6 million or 26.3% of the total). Next highest in 1994–95 was the food, beverage and tobacco industry (with $42.1 million or 27%), with the second highest capital expenditure in 1995–96 being made by the metal product industry ($108.8 million or 25.2%). The marked increase in capital expenditure in the machinery and equipment industry (from $3.6 million in 1994–95 to $113.6 million in 1995–96) is the result of significant one-off capital investments in change-in-production equipment by a number of companies (see table 5.5).

Graph 5.4 shows changes in current expenditure on environment protection. In 1994–95, metal product industries incurred the most current expenditure to protect the environment, spending 46% of total current expenditure ($164.9 million) on these measures. In 1995–96, the food, beverage and tobacco industry incurred the highest current expenditure, with 21.9% ($86.1 million) of the total.

5.3 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry



5.4 CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry



CAPITAL EXPENDITURE

Table 5.5 separates capital expenditure on environment protection into two elements: end-of-line and change-in-production. Total expenditure on end-of-line technologies or equipment to protect the environment was $100.3 million in 1994–95 and $214.0 million in 1995–96. The largest proportion of end-of-line expenditure in both years was made by the metal product industry with 54% ($54.3 million) being spent in 1994–95, and 33% ($71.2 million) in 1995–96. The food, beverage and tobacco industry accounted for the second highest end-of-line expenditure, spending $22.6 million (or 22%) in 1994–95 and $42.7 million (or 20%) in 1995–96.

CAPITAL EXPENDITURE *continued*

Change-in-production expenditure primarily for the purpose of protecting the environment amounted to $53.7 million in 1994–95 and $217.8 million in 1995–96. In 1994–95 the food, beverage and tobacco industry spent the most on integrated technologies to protect the environment, investing $19.5 million or 36% of total change-in-production expenditure in 1994–95. The petroleum, coal, chemical and associated product industry was the next largest investor in 1994–95, spending $15.3 million on change-in-production. In 1995–96, the machinery and equipment industry incurred 45% of total change-in-production expenditure ($97.2 million), a figure boosted significantly by some large one-off investments by a number of companies in this industry in 1995–96. The next largest investment was by the wood and paper product industry, which contributed 18.5% ($40.4 million) of total manufacturing industry expenditure on such integrated technology in 1995–96.

5.5 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry

ANZSIC	Industry	*End-of-line* $m	*Change-in-production* $m	*Total* $m
	1994–95			
21	Food, beverage and tobacco	22.6	19.5	42.1
22	Textile, clothing, footwear and leather	0.4	0.1	0.5
23	Wood and paper product	7.9	4.7	12.6
24	Printing, publishing and recorded media	1.4	0.1	1.5
25	Petroleum, coal, chemical and associated product	8.7	15.3	24.0
26	Non-metallic mineral product	2.7	0.5	3.3
27	Metal product	54.3	11.4	65.7
28	Machinery and equipment	2.0	1.6	3.6
29	Other manufacturing	0.3	0.4	0.7
21–29	**Total manufacturing**	**100.3**	**53.7**	**154.0**
	1995–96			
21	Food, beverage and tobacco	42.7	11.1	53.9
22	Textile, clothing, footwear and leather	7.8	1.6	9.4
23	Wood and paper product	29.2	40.4	69.6
24	Printing, publishing and recorded media	2.0	0.8	2.8
25	Petroleum, coal, chemical and associated product	31.1	25.3	56.4
26	Non-metallic mineral product	12.1	2.6	14.7
27	Metal product	71.2	37.6	108.8
28	Machinery and equipment	16.4	97.2	113.6
29	Other manufacturing	1.5	1.2	2.8
21–29	**Total manufacturing**	**214.0**	**217.8**	**432.0**

CURRENT EXPENDITURE

Table 5.6 presents a break–down of current expenditure on environment protection by manufacturing industries into the component items: payments to government agencies and payments to the private sector. Expenditures cover operational costs related to a range of services and activities including waste collection and disposal, sewage and drainage services, pollution monitoring, environmental impact assessments, research and development, and specific charges by government agencies for environment protection related purposes such as pollution licences.

CURRENT EXPENDITURE *continued*

Total current expenditure by the manufacturing sector on protecting the environment amounted to $359.3 million in 1994–95 and $326.6 million in 1995–96. Payments to the private sector for environment protection services accounted for the majority of current expenditure on environment protection in both years, amounting to 80% of current expenditure ($288.0 million) in 1994–95, and 74% ($240.2 million) in 1995–96. Payments to private businesses for environment protection services were highest for the metal product industry in 1994–95, with 54% ($155.7 million) of total non-government expenses being spent by this group, followed by the food, beverage and tobacco industry (16% or $46.8 million). In 1995–96 the food, beverage and tobacco industry was the largest spender on non-government environment protection services (18% or $44.3 million), the next largest in 1995–96 being the metal product industry (with 17% or $39.6 million).

Environment protection expenses paid to government by manufacturers, either for environment protection services or as environment protection-related fees and charges, increased slightly from 20% of total current expenditure in 1994–95 ($71.4 million) to 26.5% ($86.4 million) in 1995–96. Expenditure on government services and fees for environment protection was highest by the petroleum, coal, chemical and associated product industry in 1994–95 ($23.6 million or 33% of total payments to government) and by the food, beverage and tobacco industry in 1995–96 ($25.4 million or 29% of total payments to government).

5.6 CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry

ANZSIC code	Industry	Payments to government $m	Payments to non-government $m	Total $m
	1994–95			
21	Food, beverage and tobacco	21.5	46.8	68.3
22	Textile, clothing, footwear and leather	0.7	5.0	5.7
23	Wood and paper product	2.9	10.2	13.2
24	Printing, publishing and recorded media	2.1	8.4	10.5
25	Petroleum, coal, chemical and associated product	23.6	35.6	59.2
26	Non-metallic mineral product	3.1	13.7	16.8
27	Metal product	9.2	155.7	164.9
28	Machinery and equipment	7.7	11.2	18.9
29	Other manufacturing	0.5	1.4	1.9
21–29	**Total manufacturing**	**71.3**	**288.0**	**359.3**
	1995–96			
21	Food, beverage and tobacco	25.4	44.3	69.7
22	Textile, clothing, footwear and leather	8.4	11.1	19.5
23	Wood and paper product	14.8	24.2	39.0
24	Printing, publishing and recorded media	4.6	12.6	17.2
25	Petroleum, coal, chemical and associated product	6.7	38.1	44.8
26	Non-metallic mineral product	3.0	20.3	23.3
27	Metal product	15.2	39.6	54.8
28	Machinery and equipment	6.3	25.9	32.2
29	Other manufacturing	2.0	24.1	26.1
21–29	**Total manufacturing**	**86.4**	**240.2**	**326.6**

COMPARISON OF RESULTS 1992–93 TO 1995–96

Table 5.7 provides a comparison in constant prices of expenditure to protect the environment by manufacturing industries from 1992–93 to 1995–96. Changes in the collection methodology which have occurred during these years may account for some of the variation in the figures and mean that direct comparisons have to be made with caution. In general, average expenditure by the manufacturing sector on environment protection was approximately $760 million per year (in 1989–90 dollars) between 1992–93 and 1995–96. Capital expenditure declined from $446.7 million in 1992–93 to $174.5 million in 1994–95, but returned to 1992–93 levels in 1995–96 (at $509.1 million). Current expenditure has been gradually declining (from $608.2 million in 1992–93 to a low of $407.3 million in 1994–95 and back to $464.2 million in 1995–96).

5.7 ENVIRONMENT PROTECTION EXPENDITURE(a)

ASIC/ANZSIC code	Industry	1992–93 $m	1993–94 $m	1994–95 $m	1995–96 $m
	CAPITAL				
21	Food, beverage and tobacco	31.2	49.1	47.7	63.5
22	Textile, clothing, footwear and leather	5.6	2.9	0.6	11.1
23	Wood and paper product	38.0	46.1	14.3	82.0
24	Printing, publishing and recorded media	3.0	3.7	1.7	3.3
25	Petroleum, coal, chemical and associated product	115.2	37.4	27.2	66.5
26	Non-metallic mineral product	20.1	11.3	3.7	17.3
27	Metal product	222.6	79.7	74.5	128.2
28	Machinery and equipment	10.2	16.9	4.1	133.9
29	Other manufacturing	0.8	0.5	0.8	3.3
21–29	*Total manufacturing*	*446.7*	*247.7*	*174.5*	*509.1*
	CURRENT				
21	Food, beverage and tobacco	92.8	86.1	77.4	101.5
22	Textile, clothing, footwear and leather	25.3	17.1	6.5	27.2
23	Wood and paper product	40.6	20.1	15.0	53.0
24	Printing, publishing and recorded media	10.0	9.5	11.9	23.6
25	Petroleum, coal, chemical and associated product	100.7	114.5	67.1	68.6
26	Non-metallic mineral product	26.0	26.6	19.0	33.9
27	Metal product	253.4	187.2	186.9	77.3
28	Machinery and equipment	51.2	47.8	21.4	47.4
29	Other manufacturing	8.4	6.2	2.2	31.7
21–29	*Total manufacturing*	*608.2*	*515.1*	*407.3*	*464.2*
	TOTAL				
21	Food, beverage and tobacco	124.0	135.3	125.1	165.0
22	Textile, clothing, footwear and leather	31.0	20.1	7.0	38.3
23	Wood and paper product	78.6	66.4	29.2	135.1
24	Printing, publishing and recorded media	12.9	13.2	13.6	26.9
25	Petroleum, coal, chemical and associated product	215.8	152.1	94.3	135.1
26	Non-metallic mineral product	46.1	38.0	22.8	51.3
27	Metal product	476.1	266.9	261.4	205.5
28	Machinery and equipment	61.4	64.6	25.5	181.3
29	Other manufacturing	9.1	6.7	2.9	35.0
21–29	**Total manufacturing**	**1 055.1**	**763.2**	**581.9**	**973.4**

(a) At average 1989–90 prices.

CHAPTER 6 SERVICE AND OTHER INDUSTRIES

INTRODUCTION

Waste handling expenses were identified as the major environment protection expenditure incurred by construction, wholesale, retail and services industry subdivisions. Data collected by the ABS Economic Activity Survey separately identified waste handling expenses paid by businesses in these industries to government and private contractors. Payments to government agencies for waste removal and/or disposal include direct charges, such as fees, levies and other payments to local government, government contractors or agencies for such activities as incineration, specific sewerage charges and tip fees. Payments to private contractors include payments or fees to subcontractors, site cleaners and expenditure on the transportation and/or disposal of waste.

The results are presented in tables 6.1 and 6.2. Standard errors are, in some cases, very high. This should be kept in mind when comparing data. In addition, there were changes in methodology between the two reference periods, relating to underlying framework, sample design and the way questions were presented. In 1995–96 the environment protection expenditure questions were on a separate collection form, whereas in 1994–95 they were embedded in a questionnaire seeking detailed financial and balance sheet data.

OVERVIEW OF RESULTS

Total expenditure on waste handling expenses amounted to $646.0 million in 1994–95 and $726.4 million in 1995–96. The majority of these expenses were paid to private contractors (84% of total waste handling expenses in 1994–95 and 71% in 1995–96).

6.1 SELECTED SERVICE INDUSTRIES WASTE REMOVAL EXPENSES, By Industry—1994–95

ANZSIC code	Industry	Waste handling expenses paid to government		Waste handling expenses paid to private contractors		Total waste handling expenses	
		$m	% of total waste handling expenses	$m	% of total waste handling expenses	$m	% of total waste handling expenses
	Agriculture, forestry and fishing						
2	Services to agriculture	**0.1	0.0	0.7	0.1	0.7	0.1
3	Forestry and logging	**0.1	0.0	0.1	0.0	0.2	0.0
4	Commercial fishing	0.1	0.0	0.1	0.0	0.2	0.0
	Mining						
14	Other mining	0.1	0.0	1.9	0.3	2.0	0.3
15	Services to mining	**0.2	0.0	0.5	0.0	0.8	0.1
	Construction						
41	General construction	5.8	0.9	21.7	3.4	27.5	4.3
42	Construction trade services	9.9	1.5	36.4	5.6	46.4	7.2
	Wholesale trade						
45	Basic material wholesaling	2.8	0.4	**91.1	14.1	**93.8	14.5
46	Machinery and motor vehicle wholesaling	4.4	0.7	41.7	6.5	46.1	7.1
47	Personal and household good wholesaling	1.8	0.3	18.7	2.9	20.5	3.2
	Retail trade						
51	Food retailing	12.4	1.9	24.4	3.8	36.9	5.7
52	Personal and household good retailing	2.0	0.3	18.4	2.8	20.4	3.2
53	Motor vehicle retailing and services	3.8	0.6	41.3	6.4	45.1	7.0
57	**Accommodation, cafes and restaurants**	9.1	1.4	24.8	3.8	34.0	5.3
	Transport and storage						
61	Road transport	4.0	0.6	13.7	2.1	17.7	2.7
62	Rail transport	0.2	0.0	2.0	0.3	2.2	0.3
63	Water transport	0.0	0.0	2.5	0.4	2.5	0.4
64,65	Air, space and other transport	0.0	0.0	3.9	0.6	3.9	0.6
66	Services to transport	**1.1	0.2	12.8	2.0	13.9	2.2
67	Storage	4.1	0.6	2.1	0.3	6.3	1.0
71	**Communication services**	0.0	0.0	**58.1	9.0	**58.1	9.0
	Finance and insurance						
75	Services to finance and insurance	0.0	0.0	2.0	0.3	2.0	0.3
	Property and business services						
77	Property services	2.3	0.4	18.6	2.9	20.9	3.2
78	Business services	0.9	0.1	39.6	6.1	40.5	6.3
84	**Education**	0.6	0.1	**14.0	2.2	**14.6	2.3
	Health and community services						
86	Health services	**5.0	0.8	14.9	2.3	19.9	3.1
87	Community services	1.3	0.2	**15.2	2.3	**16.5	2.6
	Cultural and recreational services						
91	Motion picture, radio and television	**0.1	0.0	1.3	0.2	1.4	0.2
92	Libraries, museums and the arts	0.2	0.0	0.9	0.1	1.0	0.2
93	Sport and recreation	0.0	0.0	0.0	0.0	0.0	0.0
	Personal and other services						
95	Personal services	5.1	0.8	7.5	1.2	12.6	2.0
96	Other services	23.0	3.6	14.5	2.2	37.5	5.8
	Total	**100.7**	**15.6**	**545.3**	**84.4**	**646.0**	**100.0**

6.2 SELECTED SERVICE INDUSTRIES WASTE REMOVAL EXPENSES, By Industry—1995–96

ANZSIC code	Industry	Waste handling expenses paid to government..... $m	Waste handling expenses paid to government..... % of total waste handling expenses	Waste handling expenses paid to private contractors $m	Waste handling expenses paid to private contractors % of total waste handling expenses	Total waste handling expenses..... $m	Total waste handling expenses..... % of total waste handling expenses
	Agriculture, forestry and fishing						
2	Services to agriculture	0.2	0.0	0.9	0.1	1.1	0.2
3	Forestry and logging	0.1	0.0	0.1	0.0	0.2	0.0
4	Commercial fishing	0.1	0.0	0.6	0.1	0.7	0.1
	Mining						
15	Services to mining	0.1	0.0	2.6	0.4	2.7	0.4
	Construction						
41	General construction	21.2	2.9	44.7	6.2	65.9	9.1
42	Construction trade services	24.9	3.4	38.0	5.2	62.9	8.7
	Wholesale trade						
45	Basic material wholesaling	1.7	0.2	39.7	5.5	41.4	5.7
46	Machinery and motor vehicle wholesaling	**5.4	0.7	**35.4	4.9	**40.8	5.6
47	Personal and household good wholesaling	3.9	0.5	16.9	2.3	20.8	2.9
	Retail trade						
51	Food retailing	7.7	1.1	27.0	3.7	34.7	4.8
52	Personal and household good retailing	2.9	0.4	18.0	2.5	20.9	2.9
53	Motor vehicle retailing and services	6.0	0.8	30.6	4.2	36.6	5.0
57	**Accommodation, cafes and restaurants**	**7.8	1.1	29.8	4.1	37.6	5.2
	Transport and storage						
61	Road transport	4.0	0.6	34.5	4.7	38.5	5.3
62	Rail transport	0.0	0.0	3.6	0.5	3.6	0.5
63	Water transport	0.3	0.0	6.1	0.8	6.4	0.9
64,65	Air, space and other transport	5.9	0.8	3.7	0.5	9.6	1.3
66	Services to transport	3.9	0.5	5.2	0.7	9.1	1.3
67	Storage	0.1	0.0	9.9	1.4	10.0	1.4
71	**Communication services**	0.0	0.0	1.3	0.2	1.3	0.2
	Finance and insurance						
73	Finance	0.2	0.0	4.7	0.6	4.9	0.7
74	Insurance	5.0	0.7	4.4	0.6	9.4	1.3
75	Services to finance and insurance	**0.6	0.1	1.3	0.2	1.9	0.3
	Property and business services						
77	Property services	**5.1	0.7	**21.1	2.9	**26.2	3.6
78	Business services	6.6	0.9	56.9	7.8	63.5	8.7
84	**Education**	10.8	1.5	5.8	0.8	16.6	2.3
	Health and community services						
86	Health services	2.6	0.4	19.5	2.7	22.1	3.0
87	Community services	1.0	0.1	0.7	0.1	1.7	0.2
	Cultural and recreational services						
91	Motion picture, radio and television	0.4	0.1	0.7	0.1	1.1	0.2
92	Libraries, museums and the arts	0.0	0.0	0.1	0.0	0.1	0.0
93	Sport and recreation	0.3	0.0	8.8	1.2	9.1	1.3
	Personal and other services						
95	Personal services	2.1	0.3	5.8	0.8	7.9	1.1
96	Other services	77.8	11.0	39.3	5.4	117.1	16.1
	Total	**208.7**	**28.7**	**517.7**	**71.3**	**726.4**	**100.0**

CHAPTER 7 HOUSEHOLD SECTOR

INTRODUCTION

This chapter considers expenditure in the household sector that contributes to total environment protection expenditure. The household sector undertakes activities aimed at the prevention, reduction and elimination of pollution and environmental problems. Private households can integrate more environmental aspects into their consumption decisions by:

- buying special goods and services for environment protection;
- accepting higher prices for those goods and services whose production, use or disposal is less harmful to the environment; and
- actively contributing to the reduction of environment burdens or the removal of environmentally polluting goods.

The household sector also contributes to pollution prevention activities undertaken by the public sector, through payment of charges for activities such as sewage and garbage disposal services.

The SERIEE framework, outlined in chapter 1, displays household expenditure on environment protection according to characteristic activities and the use of products which are linked to environment protection (connected products and adapted products). See the Explanatory Notes for a discussion of these terms.

SERIEE includes the extra cost of an environmentally friendly product over a normal product in environment protection expenditure. However, this approach is becoming problematic as the market competitiveness of environmental goods has increased, and as governments increasingly intervene in the market to stimulate increased purchasing of environmentally preferred alternatives. Therefore, figures which would seem to suggest a decrease in environment expenditure could actually be showing increased efficiency in environment protection. To take an extreme example, SERIEE suggests that the price differential between leaded and unleaded petrol be included in household expenditure estimates, but as a result of differences in the excise taxes applied by the Commonwealth Government from 1993, unleaded petrol is actually being sold more cheaply than leaded fuel.

OVERVIEW OF RESULTS

Table 7.1 provides a brief overview of the expenditure of the household sector on environment protection. The partial estimate indicates that, for the categories listed, this sector financed environment protection activities to the value of $1,958 million in 1994–95 and $2,125 million in 1995–96.

7.1 HOUSEHOLD ENVIRONMENT EXPENDITURE(a)

	1992–93	1993–94	1994–95	1995–96
	$m	$m	$m	$m
Transport				
Catalytic converters for vehicles	68.0	71.0	92.6	93.4
Charcoal filters for vehicles	9.0	10.0	13.2	13.3
Dwellings				
Septic systems(a)	49.0	49.0	62.0	55.5
Environmental component of local government rates	501.0	497.0	600.0	479.0
Special environmental levies(a)	110.0	113.0	102.2	44.8
Insulation(b)	202.2	206.0	215.0	222.0
Sewerage charges(a)	987.0	1 032.0	873.0	1 218.0
Total	**1 926.2**	**1 978.0**	**1 958.2**	**2 125.1**

(a) Partial estimates only.

(b) Derived from Household Expenditure Survey data.

TRANSPORT

Motor vehicles are a major source of atmospheric pollutants, contributing nearly two-thirds of the carbon monoxide, half of human-made nitrous oxides (NOx), and approximately half of the hydrocarbons in industrialised countries (World Resources Institute 1992).

Pollution abatement devices

A catalytic converter can reduce emissions of carbon monoxide by approximately 85% and NOx by about 60% (World Resources Institute 1992). Catalytic converters vary considerably in price due to the precious metals used as a coating, but after consultations with manufacturers and retailers of converters and motor vehicles, a figure of $175 was selected as an average price. Multiplying this figure by the number of new passenger vehicles registered during 1994–95 (528,923) and 1995–96 (533,497) and assuming constant price, expenditure on catalytic converters is estimated at $92.6 million in 1994–95 and $93.4 million in 1995–96.

Another mandatory pollution abatement device is a charcoal filter, which is designed to reduce emissions of fuel vapours. Investigations with producers and car retailers indicated an average cost of $25, representing a total expenditure by households of $13.2 million in 1994–95 and $13.3 million in 1995–96.

Figures for vehicles are an overestimate of the true costs to households, since a proportion of passenger vehicles will be fleet purchases by industry and government sectors. However, it has not been possible to draw out the household component of these estimates.

For environmental purposes, some States specify legal limits on exhaust emissions from motor vehicles. Cars which are not fitted with a catalytic converter must be well maintained in order to comply with these limits. No figures are available for 'tune-ups' for this purpose. The ABS Household Expenditure Survey does have an item for 'vehicle servicing', but as this covers a range of services, it would be an overestimation of any spending specifically aimed at exhaust emissions. Consequently, no estimates have been included for vehicle maintenance related to environment protection.

DWELLINGS

Private sewerage systems

The cost of private sewerage treatment systems is identified specifically by the OECD as a pollution abatement expenditure. Investigations determined an approximate cost of $4,000 in 1994–95 for a non-aerobic system, an increase of $500 per unit from the average figure in 1991–92. Aerobic systems are more expensive and account for about 10% of the market. An estimate for the number of systems approved by the relevant authorities across Australia is difficult to obtain because the authority for approval usually lies with individual local councils. However, the environmental health departments in some States provided estimates for 1994–95 and 1995–96. For the remaining States, the number of approvals was estimated using figures obtained in previous years adjusted according to the percentage change in the number of new housing approvals each year. The total estimated expenditure by the household sector on private sewage systems was $62 million in 1994–95 and $55.5 million in 1995–96. The lower estimate in 1995–96 is due to a decline in the number of approvals from 16,000 in 1994–95 to 13,500 in 1995–96.

7.2 HOUSEHOLD EXPENDITURE, Private Sewerage Facilities–Approvals(a)

	1994–95		1995–96	
State and Territory	no.	$m	no.	$m
New South Wales	2 000	8.0	2 000	8.2
Victoria	4 500	18.0	3 500	14.4
Queensland	500	2.0	500	2.1
Western Australia	4 000	16.0	3 000	12.3
South Australia	2 500	10.0	2 500	10.3
Tasmania	1 000	4.0	1 000	4.1
Northern Territory	1 000	4.0	1 000	4.1
Australia	**16 000**	**62.0**	**13 500**	**55.5**

(a) Excludes Australian Capital Territory for which estimates were not available.

Source: Various State health departments; environmental health departments; building departments/branches; plumbing inspectors; Australian Bureau of Statistics 1996.

Insulation

Insulation is required in all new dwellings in a number of States, under the Building Code of Australia Part F6. In 1993–94 the ABS Household Expenditure Survey reported that households spent an average of 60 cents per week on insulation ($206 million). Using the Consumer Price Index as it relates to 'Housing equipment and operation', this was equivalent to 61 cents per week ($215 million) in 1994–95 and 62 cents per week ($222 million) in 1995–96.

FEES AND CHARGES

Table 7.3 shows government fees and charges paid by households to State and local governments for provision of environment-related services. Relevant services include collection and disposal of household garbage and wastes; provision of sewerage and stormwater infrastructure and services; and other environment-related services, such as provision of bushland for conservation purposes.

7.3 GOVERNMENT FEES AND CHARGES FOR ENVIRONMENT PROTECTION

GPC code		1994–95 $m	1995–96 $m
0731	Household garbage	571.0	453.0
0733	Sewerage	27.0	24.0
0734	Urban stormwater drainage	2.0	2.0
	Total	**600.0**	**479.0**

Source: Australian Bureau of Statistics, Unpublished data, Public Finance Collection.

HOUSEHOLD WASTE

A significant decline in expenditure on household garbage treatment occurred from 1994–95 ($571 million) to 1995–96 ($453 million). The higher costs in 1994–95 can be attributed to abnormally high expenditure in New South Wales for that year.

The approximate cost for garbage treatment was $84 per household in 1994–95 and $66 per household in 1995–96.

SEWERAGE PROVISION

Table 7.4 shows fees paid for sewerage provision by households in 15 major water authority areas. The totals for each authority for 1995–96 were calculated by multiplying average sewerage bills by the number of properties serviced. Most of the 15 authorities charged a schedule of fixed rates, based on property value, meter size or number of pedestals. Brisbane Water is the only authority to charge a flat rate for the provision of sewerage services. Average sewerage bills were only available for 1995–96 hence these have also been used to calculate the totals for 1994–95.

7.4 EXPENDITURE ON SEWERAGE, By Major Distributors

State and Territory	Water Authority/business	1994–95 $m	1995–96 $m
New South Wales	Sydney Water Corporation	385.9	359.9
New South Wales	Hunter Water Corporation	41.6	40.1
Victoria	Barwon Water	25.4	24.0
Victoria	Central Gippsland Water	n.a.	11.7
Victoria	Central Highlands Water	n.a.	7.8
Victoria	City West Water	n.a.	59.2
Victoria	Coliban Water	11.4	10.3
Victoria	South East Water	n.a.	134.2
Victoria	Yarra Valley Water	n.a.	172.4
Queensland	Brisbane Water	52.9	52.4
Queensland	Gold Coast Water	48.2	50.3
South Australia	SA Water Corporation	117.7	108.8
Western Australia	Water Corporation	147.2	136.4
Australian Capital Territory	ACTEW	42.5	43.6
Northern Territory	Power and Water Authority	n.a.	7.0
Australia	. .	**872.8**	**1 218.1**

Source: Water Services Association of Australia 1997.

SPECIAL ENVIRONMENTAL LEVIES

A number of local governments use 'precept rating' powers to raise funds for special purposes. One example of this is the levy imposed by the Brisbane City Council. All ratepayers pay a 'bushland acquisition levy' ($24 in 1994–95, $30 in 1995–96) to raise funds for the purchase of environmentally sensitive land for permanent preservation. The amounts raised by the residential sector were approximately $6.2 million in 1994–95 and $7.8 million in 1995–96. About 1,300 hectares of bushland costing $30 million dollars have been purchased using funds collected through the levy.

A number of water corporations also collect environmental levies. In the Australian Capital Territory a charge of $40 per property, for specific environmental works, was collected in 1994–95 and 1995–96 totalling $4.5 million and $4.6 million in these years respectively. The Hunter Water Corporation in New South Wales also charges an environmental levy which was $78 in 1995–96 raising a total of $12.6 million.

The Sydney Water Board, from 1989 through to December 1994, collected $80 per property annually for a 'clean waterways program'. It is estimated that $40 per property was collected from July to December in 1994 raising $57.6 million. No levy was collected in 1995–96.

Table 7.5 provides a summary of special levies collected by major water authorities. These levies raised $95.7 million for 1994–95 and $37.3 million for 1995–96. The fall in the total amount for 1995–96 can be mainly attributed to Sydney Water Corporation not collecting a levy for its 'clean waterways program' in that year. It is important to note that these are experimental estimates only and will fall short of the total expenditures Australia-wide.

7.5 ENVIRONMENTAL LEVIES, Major Water Authorities

State and Territory	Water Authority/business	1994–95 $m	1995–96 $m
New South Wales	Sydney Water Corporation	57.6	n.a.
New South Wales	Hunter Water Corporation	13.0	12.6
Victoria	Barwon Water	8.2	7.7
Victoria	Central Gippsland Water	n.a.	1.0
South Australia	SA Water Corporation	12.4	11.4
Australian Capital Territory	ACTEW	4.5	4.6
Australia	. .	**95.7**	**37.3**

Source: Water Services Association of Australia 1997.

EXPLANATORY NOTES

ABS APPROACH TO ESTIMATING ENVIRONMENT PROTECTION EXPENDITURES

1 In compiling the data presented in chapter 1 of this publication the ABS has taken the approach of ensuring the 'bottom line' is correct, i.e. obtaining an unduplicated estimate for environment protection expenditures in Australia.

2 For the private sector, these estimates primarily represent pollution abatement and control expenditures as prescribed by the OECD pollution abatement and control framework. This was described in detail in the 1991–92 edition of this publication, *Cost of Environment Protection, Australia, Selected Industries*. Terms used in describing pollution abatement and control activities include:

- End-of-line techniques. These treat pollutants after generation in production processes, by the use of separately identifiable abatement technologies or facilities. They are installed for the purpose of abating pollutant streams, and do not affect the production process itself; and
- Change-in-production processes. These reduce or eliminate the generation of pollutants by employing material substitution, improved catalysts, re-use of water or equipment alteration. These changes may involve converting equipment to handle the use of substitute fuels that generate less pollutants.

3 Typically, industry undertakes end-of-line expenditures in the initial stages of expenditure on pollution abatement facilities, and moves to change-in-production processes as the industry's pollution abatement activity progresses, and particularly as re-equipment becomes due for other reasons.

4 Chapter 2 presents some data according to an international framework (SERIEE), which integrates pollution abatement costs with other environment protection expenditure within a single framework. This chapter presents both expenditure and outlays data on environment protection by the public sector.

5 The difference between 'gross expenditures' and 'outlays' as defined in GFS is illustrated below. Outlays indicate the final costs borne by the public sector in terms of the extent of subsidisation of a range of services provided by the public sector.

6 The estimates of inter-sectoral flows have been complicated by difficulties in collecting reliable estimates from industry for grants and subsidies received from government for pollution abatement and control.

RELATIONSHIP BETWEEN EXPENDITURE AND OUTLAYS

Current
Gross current expenditure
Less sales of goods and services(a)

Equals final consumption expenditure

Plus interest payments(b)
Plus subsidies paid to public trading enterprises(b)

Equals total current outlays

Expenditure on new fixed assets
Plus expenditure on second-hand assets

Equals gross fixed capital expenditure

Plus capital grants to public trading enterprises(c)
Plus advances paid to public trading enterprises (net)
Plus other capital outlays

Equals total capital outlays

(a) This item provides an indication of the extent of government charges levied. The charges are off-set against gross expenditure in calculating final consumption expenditure and comprise mainly sales to the private sector.

(b) Current transfer payments include payment for property rights (e.g. interest payments) and unrequited transfers for which there is no return for payment, such as subsides, personal benefit payments and current grants.

(c) Unrequited payments intended to contribute towards the cost of capital expenditure of the recipients.

INTERNATIONAL WORK ON ENVIRONMENT PROTECTION EXPENDITURE

7 In 1994, Eurostat (the statistical agency of the European Community) released the second edition of SERIEE. The scope of SERIEE is all environment protection expenditure, not just pollution abatement and control expenditure. Within this framework, environment protection is defined as 'all actions and activities that are aimed at the prevention, reduction and elimination of pollution, as well as any other degradation of the environment' (Eurostat 1994).

8 The EPEA of SERIEE aims to answer the following questions:

- how much a nation spends on environment protection expenditure;
- how and by which units the expenditure is financed; and
- which economic activities are induced by environment protection activities.

INTERNATIONAL WORK ON ENVIRONMENT PROTECTION EXPENDITURE *continued*

9 SERIEE generates three central tables which address the three issues listed above. These tables were described in detail in an earlier edition of this publication, *Cost of Environment Protection, Australia, Selected Industries, 1991–92*. Definitions of key terms used in these tables are listed below:

- Characteristic activities, services and products: activities whose purpose is environment protection. The activities so defined are specified in the CEPA (see Appendix). They may be classified according to the nature of the pollution or damage (e.g. air pollution, water pollution, wastes, degradation of biodiversity and landscape, etc), the 'type' of activity involved (e.g. pollution prevention, pollution reduction, measurement, research, training, or administrative activities, etc), or the equipment or facilities used (e.g. installation and operation of filters, dedusters, construction of settling ponds, levy banks or anti-noise walls, etc). The output from characteristic activities consists of characteristic services. Use of characteristic products contributes to environment protection. Characteristic activities may be executed as principal, secondary or ancillary activities by an organisation or company. Principal and secondary activities may be either sold on the market (market output) or at prices that are not economically significant (non-market output). Characteristic activities are also executed as ancillary activities. A producer may execute on its own and for its own use environment protection activities (reduction of emissions, treatment of pollutants) made necessary in order to limit the negative effects of its activity on the environment. An example would be a manufacturer which collected, treated and reused waste water from its production processes that would otherwise be emitted into the sewers as waste water. In this case the environment protection services produced are qualified as ancillary.
- Specialised producers: execute a characteristic activity as their principal activity. An example of a specialised producer would be a sewage treatment plant, whose primary activity is by definition an environmental protection characteristic activity. Specialised producers belonging to general government and non-profit institutions serving households are distinguished from specialised producers belonging to other sectors.
- Other producers: execute a characteristic activity as a secondary or ancillary to a principal non-characteristic activity. These producers are grouped according to non-characteristic activity. An example would be a mining company whose principal activity is extraction of a mineral ore (a non-characteristic activity in terms of environment protection), but which rehabilitates the minesite or implements pollution abatement measures (i.e. which undertakes secondary characteristic activities). This company would be identified as a non-characteristic producer of environment protection services.

INTERNATIONAL WORK ON ENVIRONMENT PROTECTION EXPENDITURE *continued*

- Connected and adapted products: These are products which are not characteristic services but whose use serves an environmental protection purpose. Connected and adapted products may be durable or non-durable products. They may be used for final or intermediate consumption or for gross capital formation. Connected products directly serve an environmental purpose but are not characteristic services (e.g. catalytic converters, septic tanks, rubbish containers). Adapted products are defined as products that are less polluting at the time of their consumption and/or scrapping than equivalent normal products (where equivalent normal products are those which furnish similar utility, irrespective of the impact on the environment). Adapted products are also more costly than equivalent normal products. Only the extra cost is considered as environment protection expenditure. Examples of adapted products might be desulphurised fuels, CFC free products, or unleaded petrol (when subsidies are not in place that make unleaded petrol less costly than its equivalent normal product, leaded petrol).

APPENDIX ENVIRONMENT CLASSIFICATIONS

CLASSIFICATION OF ENVIRONMENT PROTECTION ACTIVITIES (CEPA)

1 Protection of ambient air and climate
- 1.1 Prevention of pollution through in-process modifications
  - 1.1.1 For the protection of ambient air
  - 1.1.2 For the protection of climate and ozone layer
- 1.2 Treatment of exhaust gases and ventilation air
  - 1.2.1 For the protection of ambient air
  - 1.2.2 For the protection of climate and ozone layer
- 1.3 Measurement, control laboratories and the like
- 1.4 Other activities

2 Waste water management
- 2.1 Prevention of water pollution through in-process modifications
- 2.2 Sewerage networks
- 2.3 Waste water treatment
- 2.4 Treatment of cooling water
- 2.5 Measurement, control laboratories and the like
- 2.6 Other activities

3 Waste management
- 3.1 Prevention of waste production through in-process modifications
- 3.2 Collection and transport of waste
- 3.3 Treatment and disposal of hazardous waste
  - 3.3.1 Thermal treatment
  - 3.3.2 Landfill
  - 3.3.3 Other treatment and disposal
- 3.4 Treatment and disposal of non-hazardous waste
  - 3.4.1 Incineration
  - 3.4.2 Landfill
  - 3.4.3 Other treatment and disposal
- 3.5 Measurement, control laboratories and the like
- 3.6 Other activities

4 Protection of soil and groundwater
- 4.1 Prevention of pollutant infiltration
- 4.2 Decontamination of soils
- 4.3 Measurement, control laboratories and the like
- 4.4 Other activities

5 Noise and vibration account
- 5.1 Noise and vibration from road and rail traffic
  - 5.1.1 Preventative in-process modifications at the source
  - 5.1.2 Construction of anti-noise vibration facilities
- 5.2 Air traffic noise
  - 5.2.1 Preventative in-process modifications at the source
  - 5.2.2 Construction of anti-noise vibration facilities
- 5.3 Industrial process noise and vibration
- 5.4 Measurement, control, laboratories and the like
- 5.5 Other activities

CLASSIFICATION OF ENVIRONMENT PROTECTION ACTIVITIES (CEPA) *continued*

6 Protection of bio-diversity and landscape
- 6.1 Protection of species
- 6.2 Protection of landscapes and habitats, of which
  - 6.2.1 protection of forests
- 6.3 Rehabilitation of species, populations and landscapes
- 6.4 Restoration and cleaning of water bodies
- 6.5 Measurement, control, laboratories and the like

7 Protection against radiation (excluding nuclear power stations and military installations)
- 7.1 Protection of ambient media
- 7.2 Measurement, control laboratories and the like
- 7.3 Other activities

8 Research and development
- 8.1 Protection of ambient air and climate
  - 8.1.1 For the protection of ambient air
  - 8.1.2 For the protection of atmosphere and climate
- 8.2 Protection of ambient water
- 8.3 Waste
- 8.4 Protection of soil and groundwater
- 8.5 Abatement of noise and vibration
- 8.6 Protection of species and habitats
- 8.7 Protection against radiation
- 8.8 Other research on the environment

9 Other environmental protection activities
- 9.1 General administration of the environment
- 9.2 Education, training and information
- 9.3 Activities leading to indivisible expenditure
- 9.4 Activities not elsewhere specified

CLASSIFICATION OF ENVIRONMENT PROTECTION FACILITIES

1 Protection of ambient air and climate
- 1.1 Dedusting equipment and filters

  Industrial establishments equipped for the treatment of exhaust gases
- 1.2 Air monitoring installations (number of measurement sites by type of compound monitored; number of measurements per year; number of mobile equipment)
  - 1.2.1 Stationary sites in built up areas
  - 1.2.2 Stationary sites in open areas
  - 1.2.3 Mobile sites

CLASSIFICATION OF ENVIRONMENT PROTECTION ACTIVITIES (CEPA) *continued*

2 Water management and protection
- 2.1 Sewerage networks (in kilometres)
- 2.2 Waste water treatment installations (number; capacity in terms of population equivalents of COD)
  - 2.2.1 Mechanical treatment technology (excluding septic tanks)
  - 2.2.2 Biological treatment technology (excluding septic tanks)
  - 2.2.3 Advanced treatment technology
  - 2.2.4 Septic tanks
- 2.3 Monitoring installations (number of measurement sites; number of mobile equipments; number of measurements per year and by type of water body monitored)

3 Waste management
- 3.1 Facilities for the treatment of hazardous waste (number, capacity in terms of weight that can be treated by year, by type of waste as applicable)
  - 3.1.1 Physical/chemical treatment technology
  - 3.1.2 Thermal treatment technology
  - 3.1.3 Biological treatment technology
  - 3.1.4 Conditioning of radioactive wastes
  - 3.1.5 Other treatment technologies
- 3.2 Facilities for the treatment of other than hazardous waste (number; capacity in terms of weight that can be treated by year, by type of waste as applicable)
  - 3.2.1 Physical/chemical treatment technology
  - 3.2.2 Incineration of municipal or similar wastes
  - 3.2.3 Incineration of industrial waste
  - 3.2.4 Biological treatment technology
  - 3.2.5 Other treatment technologies
- 3.3 Facilities for the disposal of waste (number of sites)
  - 3.3.1 Landfill for all types of wastes
  - 3.3.2 Landfill exclusively for hazardous waste
  - 3.3.3 Containment/underground waste
  - 3.3.4 Other disposal installations

4 Protection of soil and groundwater
- 4.1 End-of-pipe facilities (number)
  - 4.1.1 Soil surface sealing including ditches and walls, drainage systems
  - 4.1.2 Catchments for run-offs, losses, leaks
  - 4.1.3 Improvement of underground storage and transport facilities in the interest of ground water and soil protection
  - 4.1.4 Removal of underground storage and transport facilities in the interest of ground water and soil protection
- 4.2 Reservoir liners, reinforcement of transport systems for hazardous products and other integrated facilities [number]

5 Noise abatement
- 5.1 Noise barriers: roads, railroads, airports (in kilometres)
- 5.2 Equipment for follow-up and control of noise (number of sites and measurement equipment)

Source: Eurostat 1994.

BIBLIOGRAPHY

Australian Bureau of Statistics (unpub.), Public Finance Survey.

Australian Bureau of Statistics (forthcoming), *Agriculture, Australia, 1995–96*, Cat. no. 7113.0, ABS, Canberra.

Australian Bureau of Statistics 1995, *Building Approvals, Australia, 1994*, Cat. no. 8731.0, ABS, Canberra.

Australian Bureau of Statistics 1996, *Building Approvals, Australia, 1995*, Cat. no. 8731.0, ABS, Canberra.

Australian Bureau of Statistics 1997a, *Australian Mining Industry, 1994–95*, Cat. no. 8414.0, ABS, Canberra.

Australian Bureau of Statistics 1997b, *Australian National Accounts: National Income, Expenditure and Product, 1995–96*, Cat. no. 5204.0, ABS, Canberra.

Australian Bureau of Statistics 1998, *Australian Mining Industry, 1995–96*, Cat. no. 8414.0, ABS, Canberra.

Australian Capital Territory 1995, *Program Estimates 1995–96*, Budget Paper No. 4, Vol. 2, Australian Government Publishing Service, Australian Capital Territory.

Australian Capital Territory 1996, *Budget Estimates 1996–97*, Budget Paper No. 4, Vol. 2, Australian Government Publishing Service, Australian Capital Territory.

Commonwealth of Australia 1995, *The Commonwealth Public Account 1995–96*, Budget Paper No. 2, Australian Government Publishing Service, Australian Capital Territory.

Commonwealth of Australia 1996, *The Commonwealth Public Account 1996–97*, Budget Paper No. 2, Australian Government Publishing Service, Australian Capital Territory.

CSIRO Australia 1995, *Annual Report* 1994–95, CSIRO, Melbourne.

CSIRO Australia 1996, *Annual Report* 1995–96, CSIRO, Melbourne.

Eurostat 1994, *SERIEE 1994 Version*, Luxembourg, Office for Official Publications of the European Communities.

New South Wales Government 1995a, *Budget Estimates 1995–96*, Budget Paper No. 3, Vol. 1, Government Printer, New South Wales.

New South Wales Government 1995b, *State Capital Program 1995–96*, Budget Paper No. 4, Government Printer, New South Wales.

New South Wales Government 1996, *Budget Estimates 1996–97*, Budget Paper No. 3, Vol. 1, Government Printer, New South Wales.

Northern Territory Government 1995, *1995–96 The Budget*, Budget Paper No. 2, Government Printer of the Northern Territory.

Northern Territory Government 1996, *1996–97 The Budget*, Budget Paper No. 2, Part 1, Government Printer of the Northern Territory.

OECD 1995, *OECD Environmental Data Compendium 1995*, Paris.

Queensland Government 1994, *1994–95 Capital Works*, Government Printer, Queensland.

Queensland Government 1995a, *1995–96 Capital Works Program*, Budget Paper No. 3, Government Printer, Queensland.

Queensland Government 1995b, *Budget Overview and Statements of Receipts and Expenditure 1995–96*, Government Printer, Queensland.

Queensland Government 1995c, *Capital Works 1995–96*, Government Printer, Queensland.

Queensland Government 1996a, *State Budget 1996–97 Budget Overview*, Budget Paper no. 2, Government Printer, Queensland.

Queensland Government 1996b, *State Budget 1996–97 Capital Outlays*, Budget Paper no. 3, Government Printer, Queensland.

South Australian Government 1995a, *Estimates of Receipts and Payments 1995–96*, Financial Paper no. 2, Government Printer, South Australia.

South Australian Government 1995b, *Program Estimates and Information 1995–96* , Financial Information Paper no. 1, Government Printer, South Australia.

South Australian Government 1996a, *Estimates of Receipts and Payments 1996–97*, Financial Paper no. 2, Government Printer, South Australia.

South Australian Government 1996b, *Program Estimates and Information 1996–97*, Financial Information Paper no. 1, Government Printer, South Australia.

Tasmanian Government 1995, *Operation of Government Departments, Authorities and Business Enterprises, 1995–96*, Budget Paper no. 2, Government Printer, Tasmania.

Tasmanian Government 1996, *Operation of Government Departments, 1996–97*, Budget Paper no. 2, Government Printer, Tasmania.

Victorian Government 1995, *Budget Estimates 1995–96*, Budget Paper no. 3, Government Printer, Victoria.

Victorian Government 1996, *Budget Estimates 1996–97*, Budget Paper no. 3, Government Printer, Victoria.

Water Services Association of Australia 1997, *The Australian Urban Water Industry*, Water Services Association of Australia Incorporated, Victoria.

Western Australia Government 1995a, *1995–96 Capital Works Program*, Budget Paper no. 3, Government Printer, Western Australia.

Western Australia Government 1995b, *1995–96 Program Statements*, Budget Paper no. 6, Government Printer, Western Australia.

Western Australia Government 1996a, *1996–97 Capital Works Program*, Budget Paper no. 3, Government Printer, Western Australia.

Western Australia Government 1996b, *1996–97 Program Statements* vol. 1, Budget Paper no. 6, Government Printer, Western Australia.

World Resources Institute 1992, *World Resources 1992–93*, Oxford University Press, Oxford.

For more information . . .

The ABS publishes a wide range of statistics and other information on Australia's economic and social conditions. Details of what is available in various publications and other products can be found in the ABS Catalogue of Publications and Products available from all ABS Offices.

ABS Products and Services

Many standard products are available from ABS bookshops located in each State and Territory. In addition to these products, information tailored to the needs of clients can be obtained on a wide range of media by contacting your nearest ABS Office. The ABS also provides a Subscription Service for standard products and some tailored information services.

National *Dial-a-Statistic* Line

0055 86 400

Steadycom P/L: premium rate 25c/20 secs.

This number gives 24-hour access, 365 days a year, for a range of important economic statistics including the CPI.

Internet

http://www.abs.gov.au

A wide range of ABS information is available via the Internet, with basic statistics available for each State, Territory and Australia. We also have Key National Indicators, ABS product release details and other information of general interest.

Sales and Inquiries

client.services@abs.gov.au

National Mail Order Service		(02) 6252 5249
Subscription Service		1300 366 323
	Information Inquiries	**Bookshop Sales**
CANBERRA	(06) 6252 6627	(02) 6207 0326
SYDNEY	(02) 9268 4611	(02) 9268 4620
MELBOURNE	(03) 9615 7755	(03) 9615 7755
BRISBANE	(07) 3222 6351	(07) 3222 6350
PERTH	(08) 9360 5140	(08) 9360 5307
ADELAIDE	(08) 8237 7100	(08) 8237 7582
HOBART	(03) 6222 5800	(03) 6222 5800
DARWIN	(08) 8943 2111	(08) 8943 2111

Client Services, ABS, PO Box 10, Belconnen ACT 2616