



Australian Government

Department of Sustainability, Environment,
Water, Population and Communities

SCEW
COAG Standing Council
on Environment and Water

National Waste Policy: Less Waste, More Resources

IMPLEMENTATION REPORT 2011



Standing Council on Environment and Water 2012

This work is copyright. It may be reproduced in part subject to the inclusion of acknowledgement of the source and no commercial sale.

FOREWORD

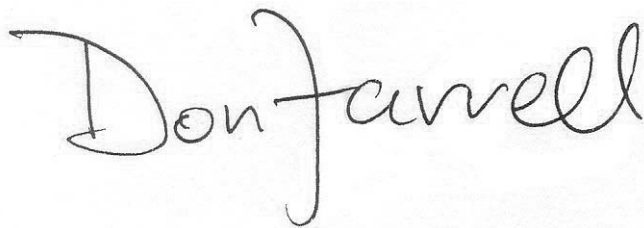
The Australian Government has long been committed to working with states and territories to deal responsibly with Australia's waste. The 1992 National Strategy for Ecologically Sustainable Development, agreed by the Council of Australian Governments (COAG), committed Australia to improving the efficiency with which resources are used, reducing the impact on the environment of waste disposal, and improving the management of hazardous wastes. This commitment still stands and has underpinned a collaborative approach by governments on national waste issues up to this day.

The 2009 *National Waste Policy: Less waste, more resources* builds on these earlier commitments and sets a clear direction for Australia for the decade to 2020. It provides an integrated policy and regulatory framework for waste management and resource recovery in today's Australia. The overarching aims are to generate less waste, to reduce the amount of waste for disposal, to manage waste as a resource, and to ensure safe and environmentally sound waste treatment, disposal, recovery and reuse.

The National Waste Policy provides the basis for strong collaboration among stakeholders to deliver effective approaches to national waste issues. Implementing this policy will mean that all wastes, including hazardous wastes, will be managed in a way that is consistent with Australia's international obligations and the protection of human health and the environment.

Since the policy was launched, much has been achieved. This report provides a snapshot of progress so far against the 2010 National Waste Policy Implementation Plan. The results showcase the clear benefits of a collaborative approach across government and industry.

This report was made possible by the efforts of state and territory governments, local governments, industry and other stakeholders who worked with the Department of Sustainability, Environment, Water, Population and Communities to provide information. I thank them all for their contribution and I commend this report to you.

A handwritten signature in black ink that reads "Don Farrell". The signature is written in a cursive, flowing style with a large initial 'D' and 'F'.

Senator the Hon. Don Farrell
Parliamentary Secretary for Sustainability and Urban Water

TABLE OF CONTENTS

INTRODUCTION.....	5
Overview	5
The National Waste Policy.....	5
The National Waste Policy Implementation Plan	6
Roles and responsibilities.....	6
Highlights for 2010 and 2011	7
IMPLEMENTING THE NATIONAL WASTE POLICY	9
TAKING RESPONSIBILITY.....	9
Product Stewardship.....	9
Sustainable Procurement	13
Packaging	15
IMPROVING THE MARKET.....	17
Definition and Classification System.....	17
Principles, specifications, best practice guidelines and standards	17
Knowledge exchange	20
PURSUING SUSTAINABILITY	21
Reduced biodegradable material to landfill	21
Management of health and safety risks from landfill gas emissions.....	23
Measures to address emissions from disposal of waste to landfill.....	24
Commercial and industrial waste	26
Construction and demolition waste.....	29
REDUCING HAZARD AND RISK.....	31
Hazardous waste management	31
TAILORING SOLUTIONS	35
Regional and remote waste and resource recovery	35
Audit of waste infrastructure in remote Indigenous communities	37
PROVIDING THE EVIDENCE	37
Data and reporting.....	37
ACRONYMS	40
APPENDIX A: WORKING GROUPS	41
APPENDIX B: MORE INFORMATION.....	42
APPENDIX C: TABLE OF RESOURCES	43

STATE AND TERRITORY HIGHLIGHTS

New South Wales.....	10
Queensland.....	16
Western Australia.....	18
Northern Territory.....	22
Australian Capital Territory.....	24
South Australia.....	26
Victoria.....	28
Tasmania.....	32

CASE STUDIES

Ramping up our Persistent Organic Pollutants (POPs) Monitoring Role.....	34
Hamilton Island Waste Management and Recycling Project.....	36
National Food Waste Assessment.....	38

INTRODUCTION

Overview

This is a report on progress to date towards implementing Australia's national policy on waste management and resource recovery. The policy was presented in the November 2009 statement *National Waste Policy: Less waste, more resources*¹ (National Waste Policy). In July 2010 the *National Waste Policy Implementation Plan*² (Implementation Plan) was released, setting out governance arrangements and identifying priority initiatives and key milestones for the first five years of the 10-year policy.

Under the Implementation Plan, periodic reporting on progress is to be provided to Australia's environment ministers and ultimately made public. An initial status report³ against the Implementation Plan was prepared in November 2010. The present report provides updates focusing on progress from late 2010 through to the end of 2011, in some cases recapping on progress reported in the earlier status report. It is intended to be the first of a series that is both a source of information and a tool for assessing the extent to which the aims of the National Waste Policy have been achieved.

Input for this report has been received from all Australian jurisdictions. While the Implementation Plan focuses on those strategies and priority initiatives that require a national approach, the report also recognises that under the National Waste Policy additional, parallel work is also under way within individual jurisdictions. The report therefore also highlights the key achievements of states and territories.

The National Waste Policy

The National Waste Policy came into effect in November 2009 and was endorsed by the Council of Australian Governments (COAG) in October 2010. It is a collaborative policy that sets the direction for Australia's waste management and resource recovery from 2010 to 2020.

The policy provides the basis for collaboration among jurisdictions towards producing less waste for disposal and managing waste as a resource to deliver economic, environmental and social benefits. The policy encompasses a wide range of waste types, including hazardous wastes and substances. It applies to diverse waste streams, including commercial and industrial, municipal, construction and demolition waste streams. Gaseous, liquid and solid wastes are included, but radioactive waste is excluded.

The aims of the National Waste Policy are to:

- avoid the generation of waste, reduce the amount of waste (including hazardous waste) for disposal
- manage waste as a resource
- ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner; and
- contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency and the productivity of the land.

Environment ministers have agreed on six key directions for the period to 2020:

- 1. Taking responsibility:** shared responsibility for reducing the environmental, health and safety footprint of products and materials across the manufacture-supply-consumption chain and at end-of-life
- 2. Improving the market:** efficient and effective Australian markets operate for waste and recovered resources, with local technology and innovation being sought after internationally
- 3. Pursuing sustainability:** less waste and improved use of waste to achieve broader environmental, social and economic benefits
- 4. Reducing hazard and risk:** reduction of potentially hazardous content of wastes with consistent, safe and accountable waste recovery, handling and disposal
- 5. Tailoring solutions:** increased capacity in regional, remote and indigenous communities to manage waste and recover and reuse resources
- 6. Providing the evidence:** access by decision-makers to national waste and resource recovery data that is meaningful, accurate and up-to-date, and access to information to measure progress and inform community behaviour and choices

Building on these broad directions, the National Waste Policy also identifies 16 priority strategies that would benefit from a national or coordinated approach. These are intended to focus work across individual jurisdictions and provide clarity and certainty for business and the community.

The National Waste Policy Implementation Plan

In July 2010 the Environment Protection and Heritage Council (EPHC) approved the *National Waste Policy Implementation Plan* (Implementation Plan) as a measure to implement the key directions and priority strategies of the National Waste Policy. The Implementation Plan was developed by all Australian governments with input from industry, business and the community. The plan outlines the aims, key directions, priority strategies and roles and responsibilities of governments as reflected in the National Waste Policy. It also provides milestones for reporting on actions against each of the 16 strategies for the period 2010–2015.

From 2010–11 the implementation of the National Waste Policy was carried out under the auspices of the EPHC and its Standing Committee of senior officials. In 2011 new arrangements were put in place by COAG with the creation of the Standing Council on Environment and Water (SCEW). Governance arrangements under SCEW include a Senior Officials Committee and a number of Thematic Oversight Groups, including the Waste and Chemicals Thematic Oversight Group which oversees the National Waste Policy's implementation.

Roles and responsibilities

Under the 16 priority strategies of the Implementation Plan, governance is divided among seven cluster working groups. An eighth working group has provided high-level project advice to the other groups, and its role has now been assumed by the newly created Waste and Chemicals Thematic Oversight Group.

Each working group has members from Australian, state, territory and local governments, and is led by a chair or co-chair from one or more nominated governments. The working groups are dedicated to developing and managing a work program for the cluster strategies that fall within their scope of work, and are responsible for leading implementation and progress against milestones identified in the Implementation Plan.

The working groups are:

Product Stewardship: chaired by the Australian Government

Markets & Standards: co-chaired by the New South Wales Government and the Victorian Government

Landfill Management: chaired by the Victorian Government

Commercial & Industrial, Construction & Demolition & Governments: chaired by the Western Australian Government

Reducing Hazard & Risk: chaired by the Australian Government

Regional & Remote Australia: chaired by the Western Australian Government

Data: co-chaired by Australian Government and the New South Wales Government

More details about these working groups can be found at Appendix A.

Highlights for 2010 and 2011

Work has commenced across all 16 strategies of the National Waste Policy, with considerable progress made. A primary focus of the first years of implementing the policy has been a suite of actions relating to product stewardship:

The *Product Stewardship Act 2011* came into effect on 8 August 2011, delivering on a key commitment by the Australian Government under the National Waste Policy. This legislation provides the framework to effectively manage the environmental, health and safety impacts of products, and impacts associated with disposal in particular. The framework includes voluntary, co-regulatory and mandatory product stewardship.

Regulations were developed for the National Television and Computer Recycling Scheme. On 8 November 2011, following an extensive public consultation process, the *Product Stewardship (Televisions and Computers) Regulations 2011* commenced. The Amendment Regulations came into effect on 29 November 2011. The regulations provide for national, industry-run arrangements for the collection and recycling of end-of-life televisions, computers and computer products, to minimise their disposal in landfill and maximise recovery of resources from these products.

A draft model for a voluntary product stewardship scheme for tyres received in-principle agreement from industry stakeholders in July 2011. This includes agreement to establish a company, *Tyre Stewardship Australia*, to administer the scheme when it is expected to commence in mid-2012. Environment ministers gave in-principle support to the model scheme at their meeting on 16 September 2011.

The voluntary national scheme *FluoroCycle* commenced on 21 July 2010. This scheme aims to increase the recycling of lamps containing mercury. The scheme's initial focus is the commercial and public lighting sectors which account for the largest consumption of mercury-containing lamps.

Other highlights include:

A consultation Regulatory Impact Statement on national measures to increase packaging recovery and decrease packaging litter was agreed to by environment ministers in July 2010 and released for public consultation in December 2011.

Australian environment ministers agreeing to the Australian Packaging Covenant on 1 July 2010. This builds on and strengthens earlier national instruments, and involves all parties in the packaging chain. Over the next five years it will target improved design, away-from-home recycling, litter and product stewardship.

The release of *Australian waste classifications–roles in decision making* in February 2011 as a first step towards developing a national system for defining and classifying waste.

Work commencing on a risk management framework for chemicals in the environment. In April 2010 COAG endorsed a proposal to establish a risk management advisory body, and in September 2011 environment ministers agreed to an integrated risk management framework, on which regulatory impact analysis has begun.

Documentation of Australian Government data systems related to waste being completed in June 2011.

A review of Australia’s international waste and recycling reporting requirements commencing in March 2011.

IMPLEMENTING THE NATIONAL WASTE POLICY

TAKING RESPONSIBILITY

Product Stewardship

Strategy 1: *To establish a national framework underpinned by legislation to support voluntary, co-regulatory and regulatory product stewardship and extended producer responsibility schemes to provide for the impact of a product being responsibly managed during and at end-of-life.*

Framework Legislation

A key priority of the National Waste Policy has been for the Australian Government to establish a national legislative framework for product stewardship. Product stewardship involves shared responsibility for reducing the environmental, health and safety impacts of manufactured goods and materials across the life of a product, from production through to disposal.

Work on product stewardship addresses a central issue in waste policy in Australia – that consumer goods have become increasingly complex, containing not only materials that can be reused, but also hazardous substances. Motor vehicles, refrigerators, televisions, home computers, mobile phones and compact fluorescent lamps have increasingly short product lives, and comprise a significant and growing component of the 21st century waste stream. When discarded they place a disproportionate burden on the general community and the environment.

The *Product Stewardship Act 2011*⁴ was passed by the Parliament of Australia on 22 June 2011, and came into effect on 8 August 2011. It establishes a national framework to support voluntary, co-regulatory and mandatory product stewardship. It is a framework in the sense that regulations will determine the products and persons to which the obligations apply. This avoids the proliferation of product-specific legislation and promotes a consistent approach to matters such as reporting, compliance and enforcement.

The new legislation delivers on a key component of the National Waste Policy, and was developed following an extensive consultation process. Following the establishment of a stakeholder reference group in May 2010, a consultation paper on the legislation was released in November 2010. A series of public meetings and meetings with key stakeholders were then held across the country. Forty-six public submissions were received and a summary of these was released in February 2011. The Product Stewardship Bill was introduced to the Senate in March 2011 and referred to the Senate Environment and Communications Legislation Committee. Public hearings were held in April 2011, and a further 25 submissions were received. The committee's report, presented to the Senate in May 2011, recommended passing the Bill with minor changes and on 22 June 2011 the Bill was passed by the Parliament of Australia.

Australian environment ministers have agreed that in pursuing work towards a national framework for product stewardship, priority will be given to expediting three specific product stewardship schemes: computers and televisions; tyres; and mercury-containing lamps (FluoroCycle).

National Television and Computer Recycling Scheme

Televisions and computers, forms of 'e-waste', are a significant part of the waste stream; few are recycled and most are sent to landfill. They contain hazardous substances such as lead, bromine, mercury and zinc, and also valuable recoverable materials such as glass and plastics, and precious metals such as gold. In 2007–08, 16.8 million units, or 106 000 tonnes, of televisions and computers reached the end of their life in Australia. If no action is taken it is estimated that this figure will reach 44 million units, or 181 000 tonnes of television and computer waste going into Australian landfills in 2027-28.

Following consideration of a Regulation Impact Statement (RIS), Australian environment ministers agreed in November 2009 that televisions and computers would be the first products to be regulated under the new *Product Stewardship Act 2011*.

Following extensive consultation with industry and the community, the *Product Stewardship (Televisions and Computers) Regulations*⁵ came into effect on 8 November 2011 and the Amendment Regulations came into effect on 29 November 2011. These Regulations aim to increase television and computer recycling rates from the current 10 per cent to 80 per cent by 2020–21. Importers and manufacturers of televisions, computers and computer peripherals are now required to fund and carry out national collection and recycling of these products, with households able to recycle them free of charge. Collection services will be rolled out across Australia over five years from early 2012.

The consultation process leading to the establishment of these Regulations was comprehensive, with a joint government and industry working group set up to develop the operational arrangements, and a highly engaged stakeholder reference group. A one-stop website was established and an e-bulletin⁶ issued monthly to provide updates on development.

State and Territory Highlights

New South Wales 1

In March 2011, New South Wales released the *Reducing Waste: Implementation Strategy 2011–2015* to enhance program and policy settings to reduce waste and increase recovery in NSW. This links to all strategies of the National Waste Policy.

In March 2011, the construction of two sections of road pavement using recycled crushed glass commenced in Great Lakes Council. The project is evaluating the performance and durability of the road surfaces over the next five years to promote use of recycled materials to local government, state government, civil construction and recycling industry stakeholders. The trial is being delivered through a partnership between Great Lakes Council, Office of Environment and Heritage (OEH), Australian Food and Grocery Council, Institute of Public Works Engineering of Australia and the NSW Roads and Traffic Authority. The construction will use an estimated 100 tonnes of recycled crushed glass from the recently opened JR Richards and Sons glass and reprocessing facility in road pavement (asphalt and granular pavement). This project showcases the effective markets resulting from the novel usage of construction and demolition waste in infrastructure applications, and links to strategies 10 and 11 of the National Waste Policy (see pages 26–30).

Waste and Sustainability Improvement Payment program

The NSW Government will provide more than \$256 million of funding derived from the waste and environment levy directly to the 72 councils in the levy area from 2011-2016 through the Waste and Sustainability Improvement Payment program. In 2010–11 and 2011–12 this will provide \$62.4 million towards waste and sustainability projects of local government. In 2010–11 and 2011–12 councils have collectively directed an average of \$20 million per annum of this funding towards enhancing recycling including infrastructure, education, improving systems and enhancing landfill management and planning.

In March and April 2011, following the release of a consultation paper on the proposed Regulations, public meetings were held around the country. As part of this process 62 public submissions were received, and in September 2011 further extensive consultation was undertaken on the exposure draft of the Regulations.

Planning has also been under way within industry for operations under the co-regulatory arrangements. Applications and information for participating in a co-regulatory arrangement in the National Television and Computer Recycling Scheme were made available in November 2011. Companies such as Australian & New Zealand Recycling Platform Limited and DHL Supply Chain have publicly announced their interest in participating.

In March 2011 work also began on an Australian/New Zealand (ANZ) standard for the collection, transport and recycling of e-waste, including televisions and computers, to ensure these activities are safe and environmentally appropriate. It is expected the draft ANZ standard will go out for public consultation through Standards Australia in early 2012, with the agreed standard available by late 2012.

National Product Stewardship Scheme for end-of-life tyres

In Australia in 2009–10, 48 million tyre Equivalent Passenger Units (EPUs¹) reached end-of-life. There are environmental impacts associated with disposing of these tyres, as the majority are typically disposed of through landfill, stockpiles, export or illegal dumping and only a small proportion are recycled. In November 2009 Australian environment ministers asked the tyre industry to develop a voluntary industry-led product stewardship scheme to help reduce the environmental impacts of end-of-life tyres and increase the use of end-of-life tyres in Australia.

The tyre industry and government established a working group in April 2010 with a one-year timeline to report to environment ministers with a proposed scheme. The working group's membership comprised representatives of the major stakeholders in the tyre supply chain: the Australian Tyre Industry Council, the Federal Chamber of Automotive Industries, the Motor Trades Association of Australia, the Australian Tyre Recyclers Association and the Victorian Automobile Chamber of Commerce, as well as the Australian, New South Wales and Queensland governments.

A Tyres Steering Group was formed to oversee and monitor the development of the scheme with a broad membership of tyre industry and government representatives. It included members of the above working group as well as divisions of the Motor Trades Association of New South Wales, Queensland, South Australia, Western Australia, the Australian Capital Territory and the Northern Territory. The steering group also included members of Australian Logistics Council, the Minerals Council of Australia and a number of industry observers.

From this process a model product stewardship scheme for end-of-life tyres was developed. The model scheme will be market-based, industry-led and operated and will acknowledge the inherent value of all end-of-life tyres across Australia. It is proposed that Tyre Stewardship Australia, a not-for-profit company that will be funded by tyre manufacturers and importers, will be established to administer the scheme.

A draft of this model was put forward to stakeholders for consultation in May 2011 and received in-principle agreement from industry by July 2011. In September 2011 the Australian environment ministers gave their in-principle support to the model scheme and encouraged the tyre industry to consult with key stakeholders in finalising the guidelines, and to seek accreditation for the scheme under the *Product Stewardship Act 2011*.

¹A measurement which tyres of various sizes to an equivalent new passenger tyre with an assumed mass of 9.5 kg

In November 2011 the industry-government working group was reconvened to provide a forum for representatives across the tyre supply chain to be involved in completing the scheme's design and to further develop the guidelines in consultation with a broad range of stakeholders. The working group is expected to agree guidelines in mid-2012 and recommend these for implementation to Tyre Stewardship Australia. In a parallel process, the Australian Tyre Industry Council is to establish Tyre Stewardship Australia by late 2012.

FluoroCycle Scheme for mercury-containing lamps

Mercury is a potent neurotoxin that is harmful to human health and the environment. The appropriate management of mercury is an issue confronting governments worldwide. Australia, as a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, has international obligations in regard to the management of mercury as a hazardous substance. Mercury-containing lamps, including fluorescent tubes, compact fluorescent lamps and high intensity discharge (HID) lamps, are the largest single category of products generating mercury waste to landfill in Australia.

On 21 July 2010 the voluntary national scheme FluoroCycle (www.fluorocycle.org.au) commenced, with the aim of reducing the amount of mercury entering the environment from waste mercury-containing lamps by increasing recycling. The initial focus of the scheme is on the commercial and public lighting sectors, which account for the majority of all lighting waste. Recycling of mercury-containing lamps from the household sector may be considered later.

The scheme is a partnership between government and industry and is being delivered jointly by Lighting Council Australia and the Australian Government on behalf of environment ministers.

State and Territory Highlights

New South Wales 2

Sustainability Advantage program

The NSW Government's Sustainability Advantage program helps medium to large organisations improve their environmental performance, reduce cost and add value to their business. The program now has more than 530 members, an increase of 110 to June 2011. Members employ more than 300 000 people in NSW, with 47 per cent of members based in regional areas and the remainder in Sydney. The Sustainability Advantage program has a demonstrated track record in assisting companies to reduce costs and use resources more efficiently. Members are achieving ongoing savings of \$50 million a year from improved productivity and reductions in electricity (92 000 MWh pa), gas (47 000 GJ pa), water (3360 MI pa) and waste (85 000 tonnes pa).

Waste and Resource Recovery Strategy Progress Report 2010

In March 2011 the NSW Government released the *Waste and Resource Recovery Strategy Progress Report 2010*. A progress report is released every two years, reporting on volumes of waste generated and resources recovered in NSW in the context of reviewing progress towards meeting the key outcome areas of the Waste Avoidance and Resource Recovery (WARR) Strategy 2007.

To help drive further progress OEH released the *Reducing Waste: Implementation Strategy 2011–2015* that outlines priority areas and actions to meet the WARR Strategy targets. More information on the strategy can be found at <http://www.environment.nsw.gov.au/resources/warr/110147implementstrat2011-15.pdf>.

Guidelines were released in 2010 setting out the overall operations of the scheme, including its objectives, performance measures and governance arrangements, as well as the roles and responsibilities of signatories.

The Australian Government has provided funding of up to \$600 000 to Lighting Council Australia to administer the scheme for the first three years. FluoroCycle is also supported by key industry bodies including the Australian Council of Recyclers, the Facility Management Association of Australia, the Australian Local Government Association, the Property Council of Australia and the National Electrical and Communications Association. The intention is to establish the basis for a continuing scheme that will be run by industry. Lighting Council Australia has advised that it will seek accreditation of FluoroCycle as an industry-led, voluntary arrangement under the *Product Stewardship Act 2011*.

The FluoroCycle Administrative Committee is comprised of the Australian Government as chair, and representatives of the governments of New South Wales and South Australia. It oversees the implementation of FluoroCycle and provides policy and strategic direction, reporting on progress to environment ministers. The FluoroCycle Stakeholder Advisory Group, consisting of representatives of government and industry, provides advice to the administrative committee as necessary. A review of the scheme is due to commence in mid-2012.

FluoroCycle gives public recognition to businesses and organisations that commit to recycle their waste lamps or to promote the scheme. It includes an active outreach program targeting industry associations and individual companies and working with them to increase recycling rates. A promotional strategy to highlight the commitments and achievements of signatories is a key element of the scheme.

As at end November 2011 there were 82 signatories to FluoroCycle. Of these, 32 are 'commercial users', or generators of waste mercury-containing lamps, and 50 are 'facilitators', or collectors, recyclers and promoters of FluoroCycle.

Sustainable Procurement

Strategy 2: *Governments as significant procurers of goods, services and infrastructure embody and promote sustainable procurement principles and practices within their own operations and delivery of programmes and services to facilitate certainty in the market.*

Sustainable procurement represents a procurement process which considers, and aims to reduce, the environmental, social and economic impacts of goods and services over their life. In this context, value for money is based on the true cost of a good or service from production and supply through to use and disposal, rather than initial cost alone.

Strategy 2 of the National Waste Policy requires all Australian governments to promote and report sustainable procurement practices within their jurisdictions and factor in sustainable aspects when making decisions on procurement. All governments are responsible for developing and encouraging the uptake of sustainable procurement initiatives within their own jurisdictions.

The Australian Government Department of Sustainability, Environment, Water, Population and Communities, in close consultation with the Department of Finance and Deregulation, is leading work to promote Australian Government agency uptake.

The Australian Government has commenced research into sustainable procurement initiatives, and held a workshop in November 2011 to discuss sustainable procurement opportunities with key agencies.

As a signatory to the Australian Packaging Covenant (APC), Australian Government agencies were required to report on aspects of sustainable procurement in a questionnaire for the 2010-11 APC Annual Report. Results of this survey will be summarised and made available in 2012, and will provide a baseline for sustainable procurement activity in Australian Government agencies.

Sustainable procurement is included in the Queensland Government's state procurement policy⁷, released in September 2010. This policy requires Queensland Government agencies to include sustainable procurement strategies and targets in the *Corporate Procurement Plan* and report annually on progress against targets. In addition, agencies must comply with product-based targets mandated by the Queensland Government Chief Procurement Officer.

In NSW local councils implement sustainable procurement through Sustainable Choice, a partnership between the Local Government and Shires Association and the NSW Office of Environment and Heritage. The program provides local councils with tools, resources and support to implement and enhance sustainable procurement within their organisation. The *Annual Data Report 2011*⁸ highlighted that the majority of member councils are specifying sustainable products in tenders and contracts, as well as having clauses or policies to help drive sustainable procurement within their organisation.

Member councils are continuing to purchase sustainable products across the full spectrum of products. The Sustainable Choice website database lists approximately 271 suppliers with more than 1500 sustainable products and services. In 2010-11, a series of workshops and forums were delivered to 149 staff from 43 councils on sustainable event management, green roads, green information technology and engaging staff on sustainable procurement issues.

State and Territory Highlights

New South Wales 3

Industrial Ecology

The Office of Environment and Heritage (OEH) has been developing the understanding and application of Industrial Ecology in NSW. 'Industrial ecology' involves one business finding uses for another business's waste. Industrial ecology initiatives are being driven through work with members of OEH's Sustainability Advantage program for businesses and other organisations.

Projects under way include the reuse of material from old mattresses and used carpet underlay that would normally be landfilled. Up to 5000 tonnes of used polyurethane foam will go back to making new carpet underlay in 2011. Another large metals recycler no longer sends any waste to landfill.

Coal combustion products (coal wash fines and fly ash), drill muds, aluminium smelter dross, foundry sands and dust, glass fines (bottles), fibre reinforced cement, mixed plastics packaging (from agricultural and food production) along with timber off-cuts (furniture, packaging, pallets) are just some of the materials that were traditionally landfilled and are now being reused by Sustainability Advantage members and other participants in the NSW Industrial Ecology Network. These businesses will reuse more than 2.5 million tonnes of industrial by-product wastes in 2011 as alternative raw materials for road construction and related civil works, manufacture of building products (flooring, builders wrap, steel, cement and concrete) and packaging (food and beverage containers).

In 2010 the ACT Government implemented a Stationery Procurement Contract which allows for reporting against an 'earth saver' sustainable product line and developed sustainable procurement circulars to help employees consider choices for more sustainable and 'green' procurement.

Packaging

Strategy 3: *To better manage packaging to improve the use of resources, reduce the environmental impact of packaging design, enhance away-from-home recycling and reduce litter.*

Australian Packaging Covenant

On 1 July 2010 the Australian Packaging Covenant commenced, delivering on a major milestone under Strategy 3. The covenant builds on earlier national instruments for managing the environmental impacts of consumer packaging in Australia, in particular the *National Packaging Covenant 2005-2010*. Following an independent review environment ministers agreed that the covenant arrangements were working well and should continue. This led to the development of an extended framework for a new covenant, with a continued focus on litter reduction programs and workplace and public place recycling, but with simplified goals and performance indicators and improved evaluation procedures.

The Australian Packaging Covenant follows the principles of the 'waste hierarchy', giving highest priority to avoiding and minimising packaging waste, followed by reuse, recycling, recovery and disposal of waste. It is an agreement between industry and all levels of government to reduce the environmental impacts of consumer packaging. Strategies include designing more resource-efficient and recyclable packaging, increasing recycling of used packaging, and taking action to reduce packaging litter. Responsibility is shared throughout the supply chain (raw material suppliers, packaging manufacturers and suppliers, brand owners and retailers) and by consumers, waste service providers, recyclers and all levels of government. By early 2011, 93 per cent of signatories to the old covenant had re-signed the Australian Packaging Covenant.

In September 2011 environment ministers approved the National Environment Protection (Used Packaging Materials) Measure (NEPM)⁹, which supports the Australian Packaging Covenant, and this was registered and gazetted in October 2011. While participation in the covenant is voluntary, brand owners which choose not to become signatories, or fail to comply with the covenant requirements, will be regulated under this NEPM in each of the jurisdictions within which the company sells its products.

The new covenant is open-ended and subject to five-yearly reviews. An early focus of these reviews will be the possibility of transitioning the Covenant under the new Product Stewardship Act.

Developing National Standards for Packaging

Australian Standard AS 4736, which applies to biodegradable plastic in commercial compost, was released in 2006. It requires a plastic to disintegrate so that 90 per cent will pass through a 2 millimetres sieve after 12 weeks. In recognition that not all households have access to commercial composts, and as part of the delivery of Strategy 3, in July 2010 a new Australian Standard AS 5810 for biodegradable plastic in home composting¹⁰ was finalised and released. This standard specifies requirements and procedures to determine whether a plastic material is biodegradable in home composting conditions and provides the basis to allow labelling of materials or products made from plastics as 'home compostable'.

Independent scientific research has also been completed by the CSIRO on the rate and extent of disintegration of biodegradable plastics in Australian soil and marine environments, and in September 2011 *Degradable Plastics Packaging Materials: Assessment and Implication for the Australian Environment*¹¹ was released.

Improving recycling of packaging and reducing litter

In July 2010 environment ministers released a ‘choice modelling’¹² report - *Estimating consumers’ willingness to pay for improvements to packaging and beverage container waste management*¹³, which sought to quantify the non-market benefits that consumers place on improvements to packaging and beverage container waste management.

Consultation Regulation Impact Statement

In July 2010 environment ministers considered the ‘choice modelling’ report and agreed to undertake the development of a Consultation Regulation Impact Statement (RIS) on national measures to increase packaging recovery and to decrease packaging litter. It was agreed that it would include all consumer packaging made of any material, including sales and distribution packaging arising as waste, both at home and away from home. Ministers agreed that the RIS would consider a range of measures, including a container deposit scheme, an advanced disposal fee and co-regulatory arrangements which may have a tangible impact on packaging recovery rates and litter reduction. The consultation process has included stakeholder input, including two formal workshops involving all key stakeholders in December 2010 and July 2011. Stakeholders have also been given the opportunity to submit options for inclusion. The Consultation RIS and its associated documents¹⁴ were released in December 2011 for a public consultation period ending in March 2012.

State and Territory Highlights

Queensland

On 1 December 2011 the Queensland Government introduced a levy on the commercial and industrial and construction and demolition waste streams. All waste destined for recycling or beneficial reuse is exempt. Funds generated will partly be used to encourage investment in recycling, composting and reuse facilities. This links to strategies 7, 10 and 11 of the National Waste Policy.

The ‘reThink business waste program’ targeting Queensland businesses was launched in September 2011, linking to strategies 5, 7, and 10 of the National Waste Policy.

IMPROVING THE MARKET

Definition and Classification System

Strategy 4: *To introduce a national definition and classification system for wastes (including hazardous and clinical wastes) that aligns with definitions in international conventions, provides for when a product or material ceases to become a waste, and reflects these classifications in relevant policies and instruments.*

Waste definition and classification systems play a vital role in ensuring that specific waste streams are appropriately managed, to protect both the environment and human health. They are directly linked to regulation in each jurisdiction. Currently, there are differences in jurisdictional definitions, classifications and methodologies for measuring waste data which may also cover different materials, affecting how waste is regulated, managed, moved and tracked. At a national level, inconsistent classifications and definitions can increase complexity, place additional costs on business and affect their ability to operate across local, state and international boundaries.

A consistent definition and classification system will improve management of all wastes, including hazardous wastes, in line with Australia's international obligations. It will ensure that all Australians have equivalent levels of environment protection, cut red tape for business and governments, and provide the basis for a consistent approach to waste management and recycling data and reporting requirements.

As a first step towards development of a national system, in February 2011 the Australian Government released *Australian waste classifications—roles in decision making*¹⁵. This report describes the waste classifications used in Australian states and territories and works towards the eventual development and introduction of a national definition and classification system for waste.

Principles, specifications, best practice guidelines and standards

Strategy 5: *To facilitate the development of a suite of agreed national principles, specifications, best practice guidelines and standards to remove impediments to the development and operation of effective markets for potential wastes.*

Existing regulatory and policy settings can act as an impediment to recovery of waste resources and establishing secondary markets for waste. An example is the differences between jurisdictions in the way waste is defined, classified and regulated which can place additional costs on business and impact on their ability to operate across boundaries, whether local, state or international. This could be addressed through improved national co-ordination.

A further impediment identified by the Productivity Commission¹⁶ is the lack of information and assurance relating to the quantity of supply and quality of the end product, which may discourage consumers, industry and government purchasers from buying recycled or recovered materials (even where they perform better than virgin materials). The use of national specifications, guidelines and standards for products that re-use recovered materials would provide assurance that end products are of a consistent, recognised standard, and would facilitate market certainty and development. The development of engineering specifications for use of recycled materials in road construction is one example.

In March 2010 the *Review of the application of landfill standards*¹⁷ was released by the Australian Government. The report provides a snapshot of Australian landfill management performance and a comparison of this performance with best practice techniques. The study examined the landfill guidelines for all jurisdictions (except Western Australia and the ACT, which do not have published guidelines).

In April 2010 NSW issued an updated industry-wide specification for the use of recycled materials in local roads, other pavements and civil works. The specification¹⁸ sets the standard for the recovery industry to supply quality recycled materials. This in turn provides the confidence required in the marketplace for designers, specifiers, councils and contractors. The specification will be considered in a national context.

In 2010–11 NSW established demonstration trials using recovered glass in asphalt and road pavement construction in Waverly and Great Lakes Council areas. The two projects were delivered in partnership with councils and the Office of Environment and Heritage, Australian Food and Grocery Council, Institute of Public Works Engineering of Australia and the NSW Roads and Traffic Authority.

An industry-led revision of the Australian Standard for the use of recycled organics in composts, soil conditioners and mulches, DR AS 4454, was released for public comment on 22 July 2010. A revised draft Standard, DR2 AS 4454, was released for comment on 29 July 2011. The final Standard AS 4454 for composts, soils and mulches is expected to be available in early 2012.

In April 2011 Queensland's Department of Transport and Main Roads released Main Roads Specification MRS35 for *Recycled Materials for Pavements*¹⁹. The specification is included in the *Standard Specification Roads*²⁰.

State and Territory Highlights

Western Australia 1

In 2011 the following significant developments in waste management and recycling took place in Western Australia (WA).

The Government committed \$1.5 million over three years to subsidise up to 50 per cent of e-waste recycling and disposal costs for metropolitan depots and up to 50 per cent of disposal and transport costs for non-metropolitan depots. This links to strategy 1 of the National Waste Policy, and will operate as a transitional scheme until the National Television and Computer Product Stewardship Scheme is fully rolled out.

The Waste Authority of WA has negotiated a revised specification for the use of recycled construction and demolition (C&D) materials in road base. In late 2011 Main Roads WA endorsed the revised specification for road pavements, also adopted by the Institute for Public Works Engineering Australia and the WA Local Government Association. This creates a market for more than one million tonnes of recycled C&D material and links to strategies 2, 6 and 11 of the National Waste Policy.

Funding of \$10 million over four years was allocated to the Waste Authority's Household Hazardous Waste program, which supports the collection and safe disposal of hazardous materials from the domestic sector in Perth and major regional centres. This links to strategy 12 of the National Waste Policy.

Recycled Paint

In 2011 an initiative was developed to enable the use of recycled paint for line marking at grassed sports fields. A trial will commence in 2012. This links to strategy 12 of the National Waste Policy.

In September 2011 VicRoads released technical note 107 on the *Use of Recycled Materials for Road Construction*²¹. This lists the different VicRoads Standards for using recycled crushed concrete, reclaimed asphalt pavement or crushed glass as a sub-base or co-mingled stockpile material.

In December 2011 Main Roads WA released a revised *Specification 501 for Pavements*²², which allows for crushed recycled concrete from construction and demolition material to be used as a sub-base material.

The *Construction and Demolition Waste Status Report*²³, released in December 2011, is the result of research and consultation with Australian, state, territory and local governments, and industry stakeholders. It outlines current jurisdictional standards, specifications and industry initiatives for construction and demolition waste. The report aims to improve the knowledge of construction and demolition waste management across Australia and inform the development of a national approach to standards and specifications for use of recovered construction and demolition waste in roads and infrastructure.

The *Construction and Demolition Waste Guide*²⁴ was published in December 2011. It facilitates the development of effective markets for materials diverted or derived from the construction and demolition waste stream. The guide includes 15 case studies from Australian jurisdictions of companies profiting and growing while contributing to a more ecologically sustainable built environment.

In 2011 the Australian Government commissioned a study on the Australian recycling sector. It is intended to provide an up-to-date profile of the Australian recycling sector. It includes a stocktake of existing standards, specifications, principles and guidelines and identifies priorities in terms of the development of additional standards, specifications, principles and guidelines. The study also assists with the identification of impediments to the development and operation of effective markets for potential wastes by identifying market barriers. The *Australian Recycling Sector Study Report* will be available in early 2012.

Work under Strategy 5 is also closely aligned to work under way in other strategies including:

- The development of an Australian/New Zealand standard for the collection, transport and recycling of electrical and electronic waste, including televisions and computers, under Strategy 1.
- The release of Australian Standard AS 5810 for biodegradable plastic in home compost under Strategy 3.
- The release of the NSW *Specification for supply of recycled material for pavements, earthworks and drainage* under Strategy 11.

Knowledge exchange

Strategy 6: *To provide access to knowledge and expertise in sustainable procurement and business practices.*

Sharing knowledge, approaches and best practice examples amongst the jurisdictions, industry and business is an important aspect of the National Waste Policy. Knowledge exchange will showcase innovation across jurisdictions, industry and business, and assist in applying similar approaches nationally.

Information exchange mechanisms developed under Strategy 6 will provide access to current information and analysis of waste management and reprocessing technologies; regulatory and institutional settings, research, business case information and consumer values drawn from the other 15 strategies of the National Waste Policy. It will also identify areas for future national focus.

In December 2011 the National Waste Policy Knowledge Store²⁵ was launched, initially containing a number of case studies from the construction and demolition sector. It provides a platform for Australian jurisdictions, industry, business and the community to showcase their efforts towards the recycling, reuse, avoidance and reduction of waste. Agencies from Australian, state, territory and local governments are invited to submit case studies for inclusion; as are industry, business and community organisations. *Guidelines for the submission of case studies for the National Waste Policy Knowledge Store* can be accessed from:

<http://www.environment.gov.au/wastepolicy/knowledge-store/case-study-guidelines.html>.

State and Territory Highlights

Western Australia 2

In mid-2011 the Minister for Environment approved \$6.78 million over five years for the Waste Authority's Regional Funding Program. It encourages local governments to work together to provide regional waste management solutions and increase efficiencies. It also facilitates improved local government waste management infrastructure and services throughout the state and aids continuous improvement in waste avoidance, resource recovery and disposal of solid waste. This links to strategy 14 of the National Waste Policy.

The Local Government Waste and Recycling Data Collection and Reporting Protocol was rolled out in 2011 across the state. Local governments are required to report waste and recycling data to the Department of Environment and Conservation (WA) in the annual Waste and Recycling Census. The program is designed to deliver improvements in the way waste data is collected and reported under the WA Census through consultation, training and the provision of data collection tools to local governments. This links to strategy 16 of the National Waste Policy.

PURSUING SUSTAINABILITY

Reduced biodegradable material to landfill

Strategy 7: *Building on existing commitments, continue to phase down the amount of biodegradable material sent to landfill.*

The primary form of biodegradable material sent to landfill is organic waste originating from plant or animal sources. Food scraps, garden waste, paper and wood are examples of organic waste generated by Australian households and industry.

When organic waste decomposes in landfill it contributes to the production of landfill gas, but this can be avoided if it is recycled. Compost, biochar, soil conditioners and biogas are some of the products that can be produced from recovered organic waste. Better management of organics can produce significant benefits. For example, a tonne of composted mulch applied in agriculture can sequester 25 kilograms of carbon in soil, at the same time improving soil fertility and water retention.

The Australian Government, in consultation with state and territory governments, is considering ways to improve the sustainability of organic waste through the National Waste Policy.

In May 2011 the *National Food Waste Assessment* was completed. This project documents Australian food waste knowledge, the quality of that knowledge, and who holds it. The report will be available in early 2012.

In June 2011 work commenced on developing consistent benchmarks for supermarket food waste performance consistent with the *National Australian Built Environment Rating System* (NABERS). Work is expected to be completed by June 2012.

Most jurisdictions have policies and programs aimed at reducing the amount of organic waste sent to landfill. The NSW Government launched the Love Food Hate Waste program in May 2010. The program aims to raise awareness about the environmental and financial impacts of food waste in NSW and to reduce the amount of 'good' food being sent to landfill. A website (www.lovefoodhatewaste.nsw.gov.au) and supporting resources have been established to promote easy and practical solutions for buying, cooking and storing food. In 2010-11 grants were offered to help program partners - councils, NGOs and community groups - deliver community education projects. To date, 14 projects involving 48 partner organisation have been funded to the value of \$201 655. In 2010-11 the focus has been on households; however, the program will be expanded to target food waste avoidance in businesses in 2012.

Growing markets for recycled organic material is essential to reducing the amount of biodegradable material sent to landfill. The NSW Government has been working over a number of years to research, trial and demonstrate the benefits of composted products. In 2010 and 2011 the focus has been on:

- trialling and promoting the use of compost for vegetable production in the Sydney Basin
- working with the viticulture industry in the Hunter region to use composted viticulture mulch. Trials on Semillon vineyards have produced astounding results, and can improve the quality of the region's leading wine grape variety
- partnering with local government to research the use of compost products in renovation and maintaining sporting fields. Results have been good and the NSW OEH has been working to overcome potential reluctance to use compost in this application. An 'app' for use on mobile devices by park and garden managers has been trialled and is being evaluated.

The NSW Government *Waste Avoidance and Resource Recovery Strategy Progress Report 2010*²⁶ shows that 72 per cent of garden organic material in the Sydney, Hunter, Central Coast and Illawarra regions was being recycled in 2008-09. Since 2003, recycling in those areas has jumped from 48 per cent to 72 per cent in 2008-09. This equates to more than 683 000 tonnes per annum.

In 2010 NSW increased the waste and environment levy to drive investment in resource recovery infrastructure, and the recovery of resources from biodegradable waste streams. Eight general and specific resource recovery exemptions were then assessed and developed, to facilitate the beneficial reuse of biodegradable waste materials as soil amendments.

On 27 May 2010 Victoria introduced new landfill levies to increase recycling. The levy for dumping a tonne of waste at a metropolitan waste facility increased from \$9 per tonne to \$30 per tonne. The Metropolitan Waste Management Group coordinated a green waste tender for 11 councils, with in-vessel composting technology to be built and operated by Veolia.

Also in 2010, the Queensland Government released *Queensland's Waste Reduction and Recycling Strategy 2010–2020*²⁷, and South Australia committed \$6.1 million over four years (2010-11 to 2013-14) to help councils implement kerbside collection of food waste as part of the existing Food Waste Incentives Program. Meanwhile, waste audits in north and north-west Tasmania were followed by organic waste collection trials.

State and Territory Highlights

Northern Territory

In September 2010 a report on the *Guidelines for the siting, design and management of solid waste disposal sites in the Northern Territory* was released. The guidelines aim to provide guidance to landfill operators, developers, planning authorities and regulatory bodies. The report addresses site selection, development, design, construction, operation, closure and post-closure management of municipal solid waste, and commercial and industrial (C&I) general waste landfill facilities so they can comply with the *Waste Management and Pollution Control Act*. This links to strategies 7, 8 and 10 of the National Waste Policy.

In March 2011 the Northern Territory Government passed the *Environment Protection (Beverage Containers and Plastic Bags) Act 2011* to ban shops giving away or selling single-use, non-biodegradable plastic bags from 1 September 2011. On 3 January 2012 a container deposit scheme commenced offering 10 cents per eligible beverage container. These initiatives link to strategies 1 and 3 of the National Waste Policy.

In recognition of the need for an overarching waste management strategy to improve standards, in 2011 the Northern Territory Government began developing a Northern Territory Waste Strategy. The strategy will be the primary document guiding territory and local government agencies, business, industry and the community in waste management, reduction and resource recovery in the Territory. This links to strategies 4, 5, 7, 10, 11 and 14 of the National Waste Policy.

Management of health and safety risks from landfill gas emissions

Strategy 8: *Ensure the safety and health risks arising from landfill gas emissions are managed across all landfills through appropriate regulation and licence requirements.*

Regulations and licence requirements set standards for the location, design, monitoring and operation of landfills. Landfills can have impacts on air, water, soil and biota. Potentially hazardous substances from landfill can be released to the air and also migrate through the surrounding soil either directly, via leachate, or in landfill gas. Landfill gas is created by the decomposition of organic waste and consists mainly of methane and carbon dioxide, both of which are significant greenhouse gases.

Methane is highly explosive in air and therefore requires careful management. It can accumulate in structures within and surrounding the landfill and present a risk to local vegetation, wildlife and surrounding communities. Most modern landfills are required to manage landfill gas as part of their licence conditions. Over the past two decades there has been a trend of increasing and stricter environmental regulation of landfills and the consolidation of small landfills into large landfills servicing a greater population. Concerns over the impact of landfill gas on surrounding communities and infrastructure, and the financial incentives for landfill gas capture, has increased the uptake of this technology, especially for large landfills. Capping with a layer of soil or vegetation is also widely used, particularly for smaller landfills.

In July 2011 the final report of the *Landfill Ban Investigation*²⁸ was released. The review addresses the different approaches to banning or restricting flows of wastes and materials to landfill. This includes the interaction of landfill bans and restrictions with other waste policies, programs and initiatives including product stewardship schemes. International experiences and Australian examples of landfill restrictions (such as the South Australian pre-sort conditions) are also covered.

In 2010-11 the states and territories introduced a number of measures to address the safety and health risks of landfills. In September 2010, South Australia introduced the *Environment Protection (Waste to Resources) Policy*²⁹, and Victoria released the revised *Best Practice Environmental Management—Siting, Design, Operation and Rehabilitation of Landfills*³⁰. Queensland's *Waste Reduction and Recycling Act 2011*³¹ received Royal Assent on 28 October 2011. A study funded by Western Australia's Waste Authority in 2010 recommended a waste levy of \$32 per tonne across all waste streams as optimum for addressing landfill amenity and greenhouse issues.

In 2011 the Australian Government commissioned a study on the role and performance of local government in waste and recycling, including aspects relating to landfill and greenhouse gas emissions. The results of this study are due for release in early 2012.

Measures to address emissions from disposal of waste to landfill

Strategy 9: *To develop a strategy for measures to address emissions from disposal of waste to landfills and other waste activities and through these support the operation of the Clean Energy Act and Carbon Farming Initiative*ⁱⁱ.

When organic waste decomposes in landfills it produces landfill gas, consisting of about 55 per cent methane. Methane gas has a global warming potential over 20 times that of carbon dioxide, and is odorous and highly flammable. In 2008 emissions from the waste sector, including solid waste in landfill, were 2.5 per cent of Australia's national emissions of greenhouse gases.

Measures to reduce or abate landfill emissions will contribute to the nation's emissions targets. The landfill sector contributed 11 mega tonnes (Mt) CO₂-e in 2008 to Australia's overall greenhouse gas emissions profile and with a price on carbon is predicted to fall to around half of these levels by 2020. The projections are based on the assumptions that organic waste will continue to be diverted from landfill at an increasing rate, and that landfill gas capture will grow.

Central legislation is now in place to deliver a clean energy future for Australia. This legislation includes the *Clean Energy Act 2011*, *Clean Energy (Household Assistance Amendments) Act 2011*, *Steel Transformation Plan Act 2011* and *Australian Renewable Energy Agency Act 2011* and 17 other related Acts. The administration of the *Clean Energy Act 2011* commences on 2 April 2012, with the introduction of the carbon price to begin on 1 July 2012.

ⁱⁱ Strategy 9 of the National Waste Policy referred to "the future Carbon Pollution Reduction Scheme." For the purposes of this progress report these words have been replaced with a reference to the "*Clean Energy Act and Carbon Farming Initiative*", in recognition of the fact that the Australian Parliament passed the Clean Energy legislative package in November 2011.

State and Territory Highlights

Australian Capital Territory

The *ACT Waste Management Strategy 2011–2025* (the strategy) was released on 15 December 2011. It outlines a framework for resource recovery and waste minimisation in the ACT through to 2025. It envisages full resource recovery by 2025 with less than 10 per cent of waste generated deemed as unrecoverable. The strategy, consultation documents, supporting studies and cost-benefit analysis can be found at:

www.environment.act.gov.au/waste

The outcomes targeted by the strategy - less waste generated; full resource recovery; a clean environment and a carbon neutral waste sector—are consistent with those of the National Waste Policy. Commercial waste has been identified as a key area for initial improvements in resource recovery within the ACT. To this end the Government expanded its highly successful ACTSmart Office and the ACTSmart Business programs that facilitate on-site waste reduction and recycling by Canberra businesses. Many participants in these programs have not only reduced waste to landfill but have reduced their waste removal costs. By implementing the ACTSmart Business program, Canberra Stadium diverted 86 per cent of its waste from landfill in 2011.

In 2011 the government selected a preferred tenderer to build, own and operate a dry commercial waste material recovery facility in the ACT. These activities link to strategies 7 and 10 of the National Waste Policy.

The ACT also implemented a ban on single-use plastic shopping bags. The ban came into effect on 1 November 2011 and the response from the community has been largely supportive. This links to strategies 1 and 3 of the National Waste Policy.

This legislation is relevant to local governments and other operators which may be liable to pay a carbon price on their methane emissions from landfill.

Landfill facilities with direct emissions of 25 000 tonnes of CO₂-e a year or more will be liable under the carbon price.

The carbon price will not apply to emissions from waste deposited before 1 July 2012 (this is known as legacy waste emissions) or to landfill facilities with emissions of less than 25 000 tonnes (CO₂-e) carbon pollution a year for at least the first three years of the carbon price. More information is available at www.cleanenergyfuture.gov.au.

A number of measures to reduce legacy waste emissions are eligible for credits under the *Carbon Credits (Carbon Farming Initiative) Act 2011*. In particular, this allows for landfills to create carbon credits for the destruction of methane beyond both common practice and regulatory requirements. These credits can be used by landfill operators to acquit their liability under the carbon price or be sold for a profit. It is estimated that the number of landfill carbon credits will exceed the liability on the landfill sector in the period to 2020.

Landfill operators liable under the carbon price will now be required to report their greenhouse gas emissions from 1 July 2012 to the Clean Energy Regulator. The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) provides a framework for methodologies for estimating these emissions. Methods for estimating methane from landfills have been developed in consultation with stakeholders and are outlined in Part 5.2 of the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*. The Government will conduct information and training sessions for affected landfill operators to meet their requirements under the NGER reporting framework in early 2012. More information about the National Greenhouse and Energy Reporting Framework³² is available from the Department of Climate Change and Energy Efficiency.

Landfill operators can reduce their carbon price liabilities, or in some cases avoid liability, by reducing their emissions below the liability threshold. Activities that reduce emissions include capturing landfill gas to generate electricity, flaring methane, waste diversion, recycling and composting. Many of these activities can generate revenue and may be eligible for Government incentives through schemes such as the Renewable Energy Target and the Carbon Farming Initiative.

In 2011 the Australian Government funded the Waste Management Association of Australia to conduct a new survey of Australian landfills to provide data for mapping the location of operating landfills, closed landfills and waste transfer stations in Australia and to improve the transparency of information about landfills.

In 2011 a summary of jurisdictional approaches to greenhouse aspects of waste and recycling was completed. The Australian Government also undertook related projects under Strategy 7 on food waste assessment and developing consistent benchmarks for supermarket food waste performance consistent with the National Australian Built Environment Rating System (NABERS). This included aspects relating to landfill and greenhouse gas emissions. These reports are due for release in early 2012.

New South Wales continues to assess and develop resource recovery exemptions for the beneficial reuse of organic waste and is in the process of investigating the development of a new waste-to-energy policy.

As well as specific end markets, the NSW Office of Environment and Heritage has helped the compost industry prepare for the carbon market. This has been undertaken to help the overall marketability of compost products but also to assist in quantifying the contribution of compost to mitigating climate change. The Organics Program has been working with the compost industry to examine opportunities for the industry in the Carbon Farming Initiative.

Commercial and industrial waste

Strategy 10: *To achieve major improvements in waste avoidance and reuse of key materials in the commercial and industrial waste stream.*

The commercial and industrial (C&I) waste stream is diverse. C&I waste is generated from commercial and industrial operations, including, but not limited to: commercial office buildings, education facilities, shopping centres, public buildings and government facilities (other than from councils), sports facilities, and a range of industrial sites ranging from light industry (such as warehousing) through to heavy industry (such as manufacturing). It may include hazardous or potentially hazardous wastes.

In 2010 New South Wales undertook a review of its waste strategy and policy. The *NSW State Plan* and the *Waste Strategy* sets resource recovery targets to be achieved by 2014 for three waste sectors: municipal; commercial and industrial; and construction and demolition. In the same period, South Australia implemented the Resource Efficiency Assistance Program (REAP) which helps companies measure their resource usage through auditing waste, energy, water, systems and plant efficiency.

State and Territory Highlights

South Australia

On 1 September 2010, South Australia (SA) introduced its *Environment Protection (Waste to Resources) Policy*. This supports the target in *South Australia's Strategic Plan 2007* of reducing waste to landfill by 25 per cent by 2014.

It aims to achieve sustainable waste management by applying the waste management hierarchy consistent with the principles of ecologically sustainable development, as set out in the *SA Environment Protection Act 1993*.

This progress links to strategies 2 and 6 of the National Waste Policy.

South Australia's Waste Strategy

On 22 December 2011, South Australia introduced a new waste strategy, *South Australia's Waste Strategy 2011–2015* which commits the state to further enhancing the recycling and reuse of waste. South Australia's Waste Strategy is comprehensive and identifies many targets and goals. At its heart are two key objectives: to avoid or reduce the amount of overall waste; and to maximise the useful life of materials by making them last longer through re-use and recycling.

The Waste Strategy identifies priorities for actions and objectives that are broken down into different waste streams. Municipal solid waste covers material from household waste collected at the kerbside. Hazardous waste includes oil, paints, batteries, fungicides and pesticides. There are commercial and industrial and construction and demolition waste streams.

The strategy outlines targets that can be measured and tracked in stages. This will help identify performance over the next five years. The key targets are: household waste – 70 per cent diversion by 2015; commercial and industrial waste - 75 per cent diversion by 2014; construction and demolition waste - 90 per cent diversion by 2015.

This links to all strategies of the National Waste Policy.

In November 2010 the Queensland Department of Environment and Resource Management (DERM) partnered with Planet Ark to expand the Business Recycling Directory³³ in Queensland. This national online directory was developed in 2009–10 by Planet Ark and enables recycling businesses to register their services on the site, free of charge. It makes recycling easy for businesses by providing a list of recycling drop-off facilities with a map function and available pick-up services for more than 80 material types. The NSW Office of Environment and Heritage and Pitney Bowes are also foundation partners. Zero Waste South Australia became a promotional partner in 2011.

The draft *ACT Sustainable Waste Strategy 2010–2025*³⁴ and *Queensland's Waste Reduction and Recycling Strategy 2010–2020* were released in December 2010.

In 2011 a study on biosolids in Australia was commenced by the Australian Government Department of Sustainability, Environment, Water, Population and Communities; in collaboration with the ANZ Biosolids Partnership. Results of this study are expected to be released in early 2012.

In 2011 the Queensland Department of Environment and Resource Management (DERM) partnered with industry associations to deliver waste avoidance seminars for small to medium enterprises. DERM also launched the 'reThink business waste program' targeting Queensland businesses in September 2011.

Queensland's *Waste Reduction and Recycling Act 2011* received Royal Assent on 28 October 2011. The legislation will establish a new framework to modernise waste management and resource recovery practices in Queensland. On 1 December 2011 the Queensland Government increased the waste levy to \$35 per tonne for commercial and industrial waste. The levy creates a financial incentive to help make waste reduction and recycling practices more viable.

New South Wales worked towards major improvements in waste avoidance and reuse of key materials in the commercial and industrial waste stream in 2011. The *NSW Reducing Waste: Implementation Strategy 2011-2015* was released in 2011. It sets out an implementation strategy to help achieve the 2014 waste targets outlined in the NSW Waste Avoidance and Resource Recovery Strategy 2007.

NSW is working with the Timber Development Association (TDA) on two projects to divert timber in the C&I waste stream from landfills. The first project includes the development of an online calculator of carbon benefits of pallet reuse/recycling that was made available for industry testing in 2010-11 and will be finalised and launched in 2011-12. The calculator estimates the carbon savings attributable to these options compared to landfilling. It is available on the National Timber Product Stewardship website at www.timberstewardship.org.au/calculator.

The second project is to assess the suitability of shredded end-of life wood packaging as an alternative to sawdust/clean shavings in poultry bedding. TDA carried out a review of the use of shredded wood packaging as poultry bedding, and developed draft specifications for this product based on the Western Australian specifications. Field trials with poultry growers showed that there is good demand for this material if the poultry industry could be assured of consistent supply of clean material meeting the required grading and moisture content. An industry reference group has been convened and further demonstration of the potential use of this material is scheduled for 2011-12 so the specifications can be finalised and a market established.

In addition, NSW established demonstration trials using recovered glass in asphalt and road pavement construction in the Waverley and Great Lakes Council areas. The two projects were delivered in partnership with councils and the Office of Environment and Heritage, Australian Food and Grocery Council, Institute of Public Works Engineering of Australia, and the NSW Roads and Traffic Authority. A trial is under way to establish the viability of large-scale collection systems for plastic from small to medium sized enterprises.

In NSW the resource recovery exemption mechanism enables the safe and lawful recovery of waste materials where this is a genuine, fit for purpose, reuse opportunity rather than opportunistic waste disposal. This removes impediments to the development and operation of effective markets for recovered waste materials while protecting the environment and human health. Resource recovery exemptions are waste-type specific and provide regulatory clarity to waste generators, processors and consumers, which significantly assists in the development of markets for waste-derived materials.

In 2011 the ACT commissioned in-depth reports to examine the barriers to increasing business recycling.

A variety of sources exist for food waste in the commercial and industrial sector, including supermarkets, restaurants and cafes and food processors. The amount of food waste in the commercial and industrial sector is inferred from waste audits and there is little detailed information on the contribution of different sources to the sector's total food waste.

State and Territory Highlights

Victoria 1

On 27 May 2010 new landfill levies to increase recycling were introduced. The levy for dumping a tonne of waste at a metropolitan waste facility rose from \$9 per tonne to \$30 per tonne. This links to strategies 7, 8, 10 and 11 of the National Waste Policy.

In September 2010 Victoria released the revised guidance on best practice environmental management for siting, design, operation and rehabilitation of landfills. This encourages removal of putrescible fractions from the waste stream. This links to strategies 7 and 8 of the National Waste Policy.

Green Waste Processing

The Metropolitan Waste Management Group has facilitated a competitive tendering process, on behalf of 11 councils in the north and west of Melbourne, for the provision of processing services for organic waste (including green organics or mixed green and food organics collected as part of councils' kerbside green/garden collections).

Veolia Environmental Services is the preferred tenderer, and this is now expected to lead to the construction by Veolia of a best practice 'in-vessel' processing facility at Bulla, north of Melbourne, and a transfer station at Wyndham to receive organics from the western suburbs. This material will then be transported to the Bulla facility for processing. With quantities of residential garden organics projected to grow, an additional composting facility at the Wyndham site is expected within the next five years.

On 23 June 2011 an issues paper to inform the development of a national food plan³⁵ was released by the Australian Government Department of Agriculture, Fisheries and Forestry. This is the first step towards developing a national food plan which will outline the Australian Government's vision for the food industry and consumers, to guide Australian Government actions and provide certainty for other stakeholders. Public consultation on the issues paper, including food waste, closed on 2 September 2011 and a green paper is being developed.

Projects undertaken under strategy 7, including the *National Food Waste Assessment* and the development of consistent benchmarks for supermarket food waste performance consistent with the *National Australian Built Environment Rating System* (NABERS), will also contribute to our knowledge in this sector. These reports are due for release in early 2012.

Construction and demolition waste

Strategy 11: *All governments continue to encourage best practice waste management and resource recovery for construction and demolition projects.*

Construction and demolition (C&D) waste is defined as waste from residential, civil and commercial construction and demolition activities and consists of:

- waste from demolition sites, e.g. concrete, bricks, timber, tiles, ceramic fittings, plastic pipes and cable
- unwanted materials, e.g. soil, rocks and trees, removed when sites are prepared for construction, waste generated during construction, e.g. scrap plasterboard, timber and pipe off-cuts, broken bricks and tiles and packaging (plastic film, strapping, paint pails, cardboard boxes, cement bags)
- waste from office refurbishments, e.g. used carpet, packaging, wall panels, timber partitions and cupboards - approximately 10-20 per cent of commercial floor area is estimated to be refurbished each year (referred to as 'churn')
- waste from home renovations (although much of this is likely to be included in data for municipal waste)
- waste generated during the rehabilitation and reconstruction of roads, e.g. concrete pavement and asphalt.

Recycling of C&D waste is largely driven by commercial factors. The materials in the C&D waste stream most commonly recycled are concrete, bricks, asphalt, soil and rubble and ferrous metals. These are either available in large quantities from demolition sites and have a ready market in the construction industry (e.g. concrete, bricks and asphalt), or have a relatively high commercial value (e.g. metals).

In December 2011 the *Construction and Demolition Waste Status Report* was released. The report is the result of research and consultation with Commonwealth, state, territory and local government and industry stakeholders on the current standards, specifications and industry initiatives for C&D waste. The report aims to improve the knowledge of C&D waste management across Australia and assist the development of a national approach to standards and specifications for use of recovered C&D waste in roads and infrastructure.

The *Construction and Demolition Waste Guide* was published in December 2011. It facilitates the development of effective markets for materials diverted or derived from the construction and demolition waste stream. The guide identifies examples of how C&D waste is being used in a variety of infrastructure applications, including roads, bike paths, bridges and buildings. It includes 15 case studies from Australian jurisdictions where companies are profiting and growing while contributing to a more ecologically sustainable built environment.

Between February and June 2010, the NSW Government funded trials in Fairfield City Council using recycled concrete and asphalt in road construction. The trial on Delgarno Road at Bonnyrigg Heights is the first in the area to use 100 per cent recycled construction and demolition waste rather than quarried rock. The site is being used to drive change in industry through presentations of results at the Local Government Conference and to the civil engineering industry through presentations at Civil Contractors Federation conferences. Importantly for 'green skills' development, the site has also had field trips from TAFE students, with further opportunities for TAFE and engineering students being explored.

In April 2010 NSW issued an updated *Specification for supply of recycled material for pavements, earthworks and drainage*³⁶. The specification sets out the performance standards required of the materials processing industry for the supply of quality recycled materials. This in turn provides the confidence required in the marketplace. The specification includes information on the legal requirements to be met for the recovery and reuse of construction materials, and guidelines for the placement of pavement materials, including recycled materials, to ensure the degree of compaction necessary to achieve design performance. The specification will be considered in the national context.

In July 2010 NSW updated and re-released fact sheets and DVDs that compare the costs and benefits of deconstructing buildings to demolition.

In 2010 the Queensland Government established a partnership with the Urban Development Institute of Australia to encourage the housing development industry to minimise the generation of waste.

The development of national principles, specifications, best practice guidelines and standards under Strategy 5 will also help remove impediments to the development and operation of effective markets for the C&D waste sector and will address jurisdictional inconsistencies in dealing with C&D waste.

State and Territory Highlights

Victoria 2

Illegal Dumping Strike Force

EPA established an illegal dumping strike force that has a focus on investigating and enforcing in cases of large-scale industrial waste dumping on land that is not licensed to accept waste. The strike force team also works to educate the business community about its legal requirements for waste management. The team is building relationships with councils and other government agencies to identify dumping hotspots and develop strategies to address problems. Through these networks, EPA is increasingly prosecuting significant dumping offences.

Landfill Gas Guidelines

EPA developed landfill gas monitoring guidelines which establish consistent procedures for on-site sampling and analysis of landfill gas fugitive emissions. They are designed to provide license holders, landfill owners, consultants and industry with information on guidance and performance monitoring. These guidelines also support EPA Victoria's reformed landfill license conditions, which include preventing emissions of landfill gas from exceeding the levels specified in Landfill Best Practice Environmental Management (BPEM).

REDUCING HAZARD AND RISK

Hazardous waste management

Strategy 12: *To ensure that our international obligations are met; hazardous materials entering the waste stream are reduced; transboundary movement of hazardous waste is effectively, efficiently and legally undertaken within Australia and complies with international requirements; product stewardship is adopted to provide for the impacts of a product with potentially hazardous materials being responsibly managed during and at the end-of-life; and facilities are available to handle and dispose of hazardous substances that become waste, in an environmentally sound manner.*

Strategy 13: *The Australian government, with the support of State and Territory governments, will adopt a system that aligns with international approaches, to reduce hazardous substances and products and articles sold in Australia that represent potential risk during and at the end-of-life to human health, safety or the environment.*

Materials and products containing hazardous substances are found in all waste streams and include medical waste, electronic waste, household chemicals, treated timber, floorings, plastics, paint, polymers, coatings, adhesives and solvents. Over past decades there has been a significant increase in the diversity, toxicity and complexity of waste, and this has increased the risk of hazardous substances being released into the environment and posing a threat to humans and wildlife.

Reducing these risks is one of the key objectives of the National Waste Policy. The goal is a comprehensive, nationally integrated system for the identification, classification, treatment, disposal and monitoring of hazardous substances that aligns with international obligations. Strategies 12 and 13 of the National Waste Policy have incorporated a large body of work within this area aimed at ensuring that potentially hazardous content of wastes is reduced, and that waste recovery, handling and disposal are consistent, safe and accountable. Activity is driven from two major directions - Australia's obligations under internationally binding agreements such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) and the Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention), and by the chemicals and plastics regulatory reform agenda of the Council of Australian Governments.

COAG Reforms for Chemicals

In November 2008, as part of the *National Partnership Agreement to deliver a Seamless National Economy*, the Australian Council of Governments (COAG) directed environment ministers to develop proposals to better manage chemical impacts on the environment. The reforms include establishing a standards-setting body to develop chemicals risk management recommendations for environmental protection, and a framework within which environment ministers can make nationally consistent risk management decisions for these chemicals. COAG noted that these risk management decisions could then be adopted automatically by reference and applied consistently in all jurisdictions.

These reforms will close a significant gap in the current arrangements for environmental protection since - unlike other sectors such as health, transport and occupational health and safety - there is no regulatory body capable of making and implementing national decisions on the risk management of environmental impacts of industrial chemicals. There is also little formal oversight available to environment portfolios. In 2009 the COAG environmental reforms were included as a key project under Strategy 12 of the National Waste Policy.

In April 2010 COAG endorsed a detailed proposal in relation to the 'standards-setting', or risk management advisory body. As scoping and development work for the new body has progressed, it has become apparent that there are strong links between this work and the other two reform areas.

Environmental labelling is a tool that can be used to effectively communicate risk management measures, and monitoring of chemicals in the environment can also be used to improve and monitor the effectiveness of risk management measures.

In recognition of this, environment ministers noted that the three reforms could be combined to create a cohesive risk management framework to protect the environment from the hazardous effects of assessed industrial chemicals. Labelling and monitoring, where needed, would be part of the environmental risk management decision. In September 2011 the ministers agreed to an integrated implementation plan to deliver these three reform areas, and work on developing a regulatory impact analysis is under way. Previous work on environmental labelling of chemicals will inform this analysis, including a desktop review of existing labelling requirements in Australia and the development of options for environmental labelling in Australia.

State and Territory Highlights

Tasmania

In 2011 the Waste Advisory Committee established under the *Tasmanian Waste and Resource Strategy 2009*, developed a number of funding and governance options for the delivery of the strategy. These options have been endorsed by the Environment Protection Authority and submitted to the Minister for the Environment, Parks and Heritage for consideration.

The Southern Waste Strategy Authority (SWSA) commissioned Blue Environment Pty Ltd to undertake a review of waste management and governance practices in southern Tasmania. The *Waste Management 2020 and Beyond* report was released in February 2011 with the objective of a coordinated vision for solid waste management across the 12 member councils of SWSA, and the optimum governance structures to implement it. This links to strategies 7, 10 and 11 of the National Waste Policy.

In a joint initiative between the Northern Tasmanian Waste Management Group (NTWMG) and the Cradle Coast Authority, a trial kerbside organics collection service for 1000 households in the North and North West of Tasmania was held from 1 July 2011 to 31 January 2012. Participants were issued with a 240 litre bin to be collected weekly. This would result in an estimated 25 per cent reduction in waste entering landfill, and will avert 152 765 tonnes of CO₂ being emitted. The outcomes of the trial will help councils decide whether such a service to households is worthwhile. This links to strategies 7, 8 and 9 of the National Waste Policy.

Basel Convention

Australia is a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which came into force in 1992. This convention is concerned with the generation of hazardous waste and its movement between countries. A central goal is 'environmentally sound management' (ESM) of hazardous wastes, the aim of which is to protect human health and the environment by minimising hazardous waste production whenever possible.

Under the Basel Convention Australia is required to take appropriate measures to:

- ensure that its generation of hazardous wastes is reduced to a minimum
- ensure there are adequate disposal facilities for hazardous wastes, located, to the extent possible, within Australia
- ensure that those involved in the management of hazardous waste within Australia do what is necessary to prevent pollution from hazardous waste and, if such pollution does occur, minimise the consequences for human health and the environment.

Australia is required under the convention to report annually on implementation issues. Key elements of Australia's annual report include information on the generation, import and export of hazardous wastes, efforts to reduce such waste, disposal options within Australia's jurisdiction and measures undertaken for the development of technologies for reducing or eliminating hazardous waste.

Australia's obligations under the Basel Convention are implemented by the *Hazardous Waste (Regulation of Exports and Imports) Act 1989*, which mirrors the convention's classification system. The main purpose is to regulate the export and import of hazardous waste to ensure it is disposed of safely so humans and the environment, both within and outside Australia, are protected from its harmful effects. The Australian Government has commenced a review of this Act, to ensure that it remains fit-for-purpose.

Stockholm Convention

Australia is also a party to the Stockholm Convention on Persistent Organic Pollutants, which came into force in 2001. This convention is concerned with chemicals, known as persistent organic pollutants, or POPs, which remain intact in the environment for long periods, become widely distributed geographically, and accumulate in the fatty tissue of humans and wildlife. Some of these chemicals are used in many consumer products and materials and find their way into waste streams. Their end-of-life management is therefore also a significant waste management issue. The convention commits governments to reducing, and where feasible eliminating, the production and environmental release of these chemicals.

In September 2010, as part of addressing Australia's obligations under the convention and in line with Strategy 12 of the National Waste Policy, the Australian Government began a program to monitor levels of chemicals of concern in air over time. A four-year pilot program has commenced with the CSIRO (see case study on page 34).

In line with the Strategy 13 goals of reducing hazardous content at source, work was completed in June 2011 relating to the identification of articles and products in Australia containing persistent organic pollutants listed under the Stockholm Convention. This is contributing to the extensive body of work being undertaken by the Australian Government to inform a regulatory impact analysis, as part of Australia's treaty-making process for changes to the Stockholm Convention.

National Pollutant Inventory

The National Pollutant Inventory (NPI) is Australia's national mechanism for monitoring and measuring toxic emissions to air, land and water. A proportion of the pollutants it identifies are classed as hazardous, and the National Waste Policy recognises that this could assist in meeting Australia's reporting requirements under the Basel Convention. Under Strategy 12 above, guidance materials for the NPI are to be progressively updated to help industry calculate and report the emission and transfer of these substances. This will allow for a more complete understanding of the movement and treatment of waste in Australia. A list of priority guidance materials for review and updating has been established, and four manuals have been revised for publication in early 2012. The priority list is regularly reassessed to ensure the future work program on guidance documents remains current.

The NSW Government's Household Chemical CleanOut program enables households to dispose of common household hazardous materials in an environmentally acceptable manner. In 2010–11 the program held 43 collections throughout the Sydney, Hunter and Illawarra regions, in which 26 690 households participated and 9 820 751 kg of hazardous materials were recycled or safely disposed of. Collection events for 2010–11 have shown community support and participation rates continue to grow. A detailed study has been completed to review the current program, identify trends and evaluate options for different collection methodologies for the future.

Case Study

Ramping up our Persistent Organic Pollutants (POPs) Monitoring Role

In May 2011 CSIRO commenced a new atmospheric monitoring program, beginning an investigation into the effectiveness of international efforts to eliminate or restrict the use of POPs, such as DDT, dieldrin and other toxic compounds.

As a party to the Stockholm Convention on Persistent Organic Pollutants, Australia and 172 other countries are committed to eliminating or restricting the production and use of a range of chemicals that pose a major, long-term threat to humans and the environment. (See page 34)

Previous research conducted under the National Dioxins Program by CSIRO scientists Dr John Gras and Dr Mick Meyer established that levels of several chemicals - including polychlorinated dibenzodioxins and furans - were highest in the Australian atmosphere following major fires such as wild or controlled bushfires and farm plant burn-offs.

CSIRO atmospheric scientist Dr Melita Keywood explained: "With this background knowledge we are initiating a monitoring program at sites in north-west Tasmania, south-east Melbourne and Darwin. Together with a review of the science, this will give us a baseline of information which we can use to identify trends, as well as a wider network of permanent sites for detecting the presence of dioxins.

"New datasets resulting from this sampling will also be used to develop and test atmospheric chemical transport models."

The same monitoring will be used to establish baseline levels of mercury in the air which will assist Australia in participating in the United Nations Environment Programme's efforts to develop a global approach to reducing population and ecosystem exposure to mercury.

The \$1.4 million research project - initiated and funded by the Department of Sustainability, Environment, Water, Population and Communities, which represents the Australian Government under the Stockholm Convention - could be used to inform future atmospheric monitoring.

Australia is required to report its data on 12 pollutants by 2015.

TAILORING SOLUTIONS

Regional and remote waste and resource recovery

Strategy 14: *To identify regional and remote waste and resource recovery actions to build capacity and ensure an appropriate suite of services is available to communities.*

Waste disposal and recycling in regional and remote communities are often costly and difficult to implement due to the small populations involved and the large distances to the nearest facilities. Often local landfill is a cheaper alternative to transporting materials for recycling but may pose risks to human health and the environment. These risks need to be considered when costing alternatives and developing solutions.

In remote communities there is a need for tailored solutions, guided by local circumstances, to allow these communities to manage their waste and participate in re-use and recycling schemes effectively.

Small-scale facilities, particularly in the organics, waste-to-energy and C&D materials recycling sectors, may prove viable at a regional level and provide environmental and community benefits. The cost of establishing such facilities and of transporting materials to consolidated regional facilities is problematic as many small communities do not have sufficient resources.

The Regional and Remote Australia Working Group, one of the groups established to implement the National Waste Policy, has visited a variety of remote communities to develop an understanding of the challenges faced by proponents for waste management, recycling and reuse. It is compiling waste management case studies that have contributed to improved waste management practices in regional and remote Australia. The compilation will include projects that have been delivered in a variety of geographical and demographic contexts, which will assist in identifying both the achievements and gaps in waste management in regional and remote Australia. Expected to be released in mid-2012, the compilation aims to provide stakeholders with information to aid the planning of their own waste management projects, based on lessons learnt from past projects, and to promote the establishment of waste management networks.

Individual jurisdictions have undertaken a number of initiatives to improve regional and remote waste and resource recovery. In 2011 the Regional Funding Program in Western Australia was allocated \$6 780 000 over five years. The program objectives are to:

- encourage local governments to work together to provide regional waste management solutions and increase efficiencies
- facilitate improved local government waste management infrastructure and services throughout the state, with measureable progress towards meeting waste strategy targets
- facilitate continuous improvement in waste avoidance, resource recovery and disposal for solid waste managed by local government in line with the relevant targets within the Waste Strategy.

In 2010–2011, the South Australian Government developed a Regional Waste Management Priorities and Implementation Plan (The Rubbish Report) for the Anangu Pitjantjatjara Yankunytjatjara (APY Lands). This project sought to develop a strategic approach to reducing waste, increasing recovery of resources and improving landfill management across the APY Lands.

In 2010–11 the NSW Government, through the Aboriginal Lands Clean-Up Program (ALCUP), awarded \$177 261 to five NSW Local Aboriginal Land Councils (LALC) and their partnering Councils (Bega LALC and Bega Valley Shire Council; Deerubbin LALC and Penrith City Council; Wilcannia LALC and Central Darling Shire Council; Moree LALC and Moree Plains Shire Council; and Wanaruah LALC and Muswellbrook Shire Council) to implement projects during 2011-12. The ALCUP supports partnership projects to:

- clean up and prevent illegal dumping on Aboriginal-owned lands
- increase resource recovery
- strengthen relationships between Aboriginal communities and local councils
- improve the well-being of Aboriginal communities
- increase the capacity for Local Aboriginal Land Councils to manage waste sustainably.

In 2010–11 the NSW Environmental Trust provided \$1.86 million to support the activities of RENEW NSW. RENEW NSW is the collective identity of the eight voluntary regional waste groups that have a combined membership of 96 rural/regional councils in NSW. It provides the medium for pooling resources and sharing knowledge and skills to improve waste management and resource recovery in rural/regional NSW. This approach is providing cost-effective solutions to rural/regional issues. Economies of scale provide small councils with access to recycling services that were previously not geographically or economically viable.

Case Study

Hamilton Island Waste Management and Recycling Project

Hamilton Island Enterprises, in partnership with the Queensland Department of Environment and Resource Management and the Packaging Stewardship Forum, is introducing a holistic recycling service to make significant improvements to waste management practices.

Previously, all waste materials were removed from the island by barge to be disposed of in landfill on the mainland. Hamilton Island Enterprises has been working to change the way the island's waste is collected and disposed of. Recyclable materials are now source-separated into glass, aluminium, cardboard and steel, and plastics, which are separated into milk bottles, clear PET plastic and mixed plastic.

The glass is crushed and re-used on the island as a sand and aggregate replacement in garden beds and service trenches. The separated plastics, cardboard, aluminium and steel cans are baled for transport as back loads to Brisbane recycling markets. This improves the economic viability of the project.

Hamilton Island management has now purchased its own garbage trucks and bins and employed staff to collect waste and recyclables on the island. Composting trials using food waste, treated night soil and vegetation clippings are being undertaken to further divert waste from landfill.

The project is expanding to construction and demolition waste from new building projects and renovations being undertaken on the island. Builders are provided with two bins, one for waste to landfill and one for recyclable material including timber, metals, tiles, bricks and cardboard. All clay-based products are separated at the island's waste transfer station to be used as clean fill, while metal, timber and cardboard is recycled.

This project has reduced the volume of waste sent to landfill by two-thirds and halved the monthly landfill gate fee.

Audit of waste infrastructure in remote Indigenous communities

Strategy 15: *To undertake an audit of existing waste infrastructure and local capability in selected remote Indigenous communities as part of a larger municipal and essential services audit under the Council of Australian Governments' National Partnership on Remote Indigenous Housing.*

In remote communities waste management may be difficult and intermittent. The availability of suitable disposal facilities for certain materials, in particular hazardous waste, can be limited.

The Council of Australian Governments' National Indigenous Reform Agreement (Closing the Gap) lists inadequate waste collection among the important contributors to the current unsatisfactory living conditions in many communities. The National Partnership Agreement on Remote Indigenous Housing, signed in December 2008, sets performance indicators and benchmarks for essential and municipal services, which includes waste disposal and the management of infrastructure and municipal services. The performance indicator is that Indigenous communities will have “normalised service level standards and delivery arrangements”; that is, “reflect a standard of service delivered to non-Indigenous people in communities of similar size and location”. The benchmark is for all communities to have rubbish disposal by 2018.

The Department of Families, Housing, Community Services and Indigenous Affairs conducted an audit of municipal and essential services in 70 remote Indigenous communities as part of the National Partnership Agreement on Remote Indigenous Housing. The audit results will inform a report to the Council of Australian Governments on clearer roles and responsibilities and funding for municipal and essential services delivery.

PROVIDING THE EVIDENCE

Data and reporting

Strategy 16: *To develop and publish a three yearly current and future trends waste and resource recovery report. This will be underpinned by a system that provides access to integrated national core data on waste and resource recovery that is accurate, meaningful and up-to-date and available online.*

Accurate, consistent, transparent and timely data are necessary to support informed and timely decision-making by industry, government and the community, and to track progress in areas such as resource recovery. Currently, waste data are collected at all levels of government and by independent bodies. Jurisdictional waste data are collected to meet specific regulatory and policy requirements. While these data are fit-for-purpose within specific jurisdictions, they may not be consistent or comparable across jurisdictions and thus do not provide comprehensive, aggregated national data. The range and number of waste classifications affect the accuracy and comparability of waste data across jurisdictions.

Current waste and recycling data arrangements reflect large recent investments by state and territory governments, and have improved the extent, quality and utility of waste data in Australia. However, there are opportunities to improve the efficiency of data collection, analysis and disclosure, especially where they rely on voluntary reporting and estimation rather than direct measurement. Collaboration among governments will be required to explore and develop future national reporting on waste and recycling, including the underlying data systems and arrangements.

National Data

To facilitate the development of a national data system, a study on the requirements of a national waste data system was undertaken. This *National Waste Data System Requirements Study*³⁷, released in May 2010, provides an analysis of the issues with waste data arrangements at a state, territory and federal level. It identifies possible inefficiencies and inadequacies with existing arrangements and the design requirements of a future national waste data system. The findings will be a key input to future design of a national waste data system under the National Waste Policy.

A National Waste Data System (NWDS) stakeholder workshop was held on 5 May 2011 to discuss possible outcomes and core data. Documentation of national data systems related to a NWDS was completed in September 2011. The documentation of these systems will be released in early 2012.

Work undertaken in 2011 to complete a comprehensive map of Australia's landfills will underpin a national data system by providing access to core data on waste and resource recovery that is accurate, meaningful and up-to-date and available online. The national mapping of landfills and waste management facilities³⁸ was completed in July 2011 and further updated in December 2011.

This was a collaborative exercise between the Department of Sustainability, Environment, Water, Population and Communities, the Department of Climate Change and Energy Efficiency, the Australian Bureau of Statistics, Geoscience Australia and the Waste Management Association of Australia.

The map is Australia's first national, spatially accurate, extensive mapping of key waste infrastructure and will assist with regulation and determining future infrastructure requirements.

Case Study

National Food Waste Assessment

The Australian Government commissioned the Institute for Sustainable Futures (ISF) at the University of Technology Sydney to compile and assess data, information and knowledge on food waste in Australia. This is the first national assessment of what we know about food waste, how good that knowledge is, and who holds the knowledge.

More than 1200 data sources or data sets were reviewed. The assessment covered food waste from the farm gate through to final disposal or destination. Both sources related to household food waste and food in commercial and industrial waste, were covered.

The assessment found that:

- The current state of food waste data, information and knowledge in Australia is inadequate at a national scale.
- Food waste data within commercial and industrial waste, including food manufacturing and food retail, is scarcer and of lower quality than data on household food waste.
- Current data gaps and uncertainties could be addressed by a better coordinated and standardised approach to measuring and understanding food waste.
- Even with these data uncertainties, evidence exists that a large percentage of total food flows within the Australian economy are unnecessarily lost to waste, at significant economic and environmental cost.

The Australian Government also provided funding to the Waste Management Association of Australia to conduct a new survey of Australian landfills to provide data for mapping and other purposes.

In 2010 Zero Waste SA launched the Zero Waste Environmental User System (ZEUS), a web-based system providing an easy way to collect data on waste within South Australia. ZEUS allows Zero Waste SA to measure the state's performance against targets set in the SA Strategic Plan.

A project documenting Australian Government data systems relating to waste was completed in June 2011 and is expected to be released in early 2012. The project looked at the National Greenhouse and Energy Reporting System and the Online System for Comprehensive Activity Reporting, the National Pollutant Inventory, and the Australian Bureau of Statistics.

National data on 2008–09 waste and recycling was provided for the *Australia State of the Environment 2011* report, which was tabled in Parliament on 12 December 2011.

In 2011 an assessment of liquid waste management and disposal in Australia, including hazardous wastes, was conducted. The *Liquid Waste Assessment* collates and assesses readily available Australian data and information on this waste. The report documents different definitions and classifications for liquid waste in Australia, describes the liquid waste management pathways, estimates the amount of hazardous liquid waste in solid hazardous waste data, reports on the availability of liquid waste data and identifies significant gaps in data availability. The *Liquid Waste Assessment* will be available in early 2012.

National Waste Report

The *National Waste Report* presents key information on waste management and resource recovery. It draws on a range of published sources, commissioned research and information from states and territories. It is a first step towards establishing baseline data and developing a comprehensive account of waste issues which can be used by industry, government and the community to make informed and timely decisions. The first *National Waste Report* was published in 2010³⁹.

As well as presenting national, state and territory waste data, the report discusses the impacts of landfill, recycling, hazardous waste, organic waste and litter, and describes how we managed waste in the past, our current arrangements and emerging issues and trends. The report also examines the quality of data on waste and recycling.

To better inform priorities and identify improvements for the next National Waste Report to be released in 2013, a stakeholder evaluation was conducted on the *National Waste Report 2010*. As part of this, workshops were held in Tasmania, Western Australia, Queensland and South Australia. A report presenting the outcomes of the evaluation will be available in 2012.

ACRONYMS

ABS	Australian Bureau of Statistics
APY	Anangu Pitjantjatjara Yankunytjatjara
C&D	Construction and Demolition
C&I	Commercial and Industrial
COAG	Council of Australian Governments
DCCEE	Department of Climate Change and Energy Efficiency
ESD	Ecologically Sustainable Development
EPHC	Environment Protection and Heritage Council
EPHSC	Environment Protection and Heritage Standing Committee
LCA	Lighting Council of Australia
NABERS	National Australian Built Environment Rating System
NEPM	National Environment Protection Measure
NGERS	National Greenhouse and Energy Reporting System
NPI	National Pollutant Inventory
NWDS	National Waste Data System
OSCAR	Online Survey, Certification and Reporting
REAP	Resource Efficiency Assistance Program
RIS	Regulation Impact Statement
SOC	Senior Officials Committee
SCEW	Standing Council on Environment and Water
TOG	Thematic Oversight Group
WMAA	Waste Management Association of Australia
ZEUS	Zero waste Environmental User System

APPENDIX A: WORKING GROUPS

National Waste Policy Strategy	National Waste Policy Cluster Working Groups	
	Product Stewardship	
	Chair: Australian Government	
	1	The Australian Government, with the support of state and territory governments, will establish a national framework underpinned by legislation to support voluntary, co-regulatory and regulatory product stewardship and extended producer responsibility schemes to provide for the impacts of a product being responsibly managed during and at end of life.
	3	The Australian Government, in collaboration with state and territory governments, industry and the community will better manage packaging to improve the use of resources, reduce the environmental impact of packaging design, enhance away from home recycling and reduce litter.
	Markets & Standards	
	Co-chairs: NSW and Vic	
	2	All governments as significant procurers of goods, services and infrastructure, will embody and promote sustainable procurement principles and practices within their own operations and delivery of programs and services to facilitate certainty in the market.
	4	The Australian Government, in collaboration with state and territory governments, will introduce a national definition and classification system for wastes (including hazardous and clinical wastes) that aligns with definitions in international conventions, provides for when a product or material ceases to become a waste, and reflects these classifications in relevant policies and instruments.
	5	The Australian Government, in collaboration with state and territory governments through the Environment Protection and Heritage Council, will facilitate the development of a suite of agreed national principles, specifications, best practice guidelines and standards, to remove impediments to the development and operation of effective markets for potential wastes.
	6	The Australian Government, in collaboration with state and territory governments, local governments, industry, business and the community, will provide access to knowledge and expertise in sustainable procurement and business practices.
	Landfill Management	
	Chair: Vic	
	7	State and territory governments building on existing commitments, continue their focus to phase down the amount of biodegradable material sent to landfill.
	8	State and territory governments ensure the safety and health risks arising from landfill gas emissions are managed across all landfills through appropriate regulation and licence requirements.
	9	The Australian Government, in collaboration with state and territory governments, will develop a strategy for measures to address emissions from disposal of waste to landfills and other waste activities, and these support the operation of a future Carbon Pollution Reduction Scheme.
Commercial & Industrial, Construction & Demolition & Governments		
Chair: WA		
10	State and territory and local governments, in collaboration with the Australian Government, industry and business, to achieve major improvements in waste avoidance and re-use of key materials in the commercial and industrial waste stream.	
11	All governments continue to encourage best practice waste management and resource recovery for construction and demolition projects.	
Reducing Hazard & Risk		
Chair: Australian Government		
12	The Australian Government, in collaboration with state and territory governments, will ensure that: our international obligations are met; hazardous materials entering the waste stream are reduced; transboundary movement of hazardous waste is effectively, efficiently and legally undertaken within Australia and complies with international requirements; product stewardship is adopted to provide for the impacts of a product with potentially hazardous materials being responsibly managed during and at the end of life; and facilities are available to handle and dispose of hazardous substances that become waste in an environmentally sound manner.	
13	The Australian Government, with the support of state and territory governments, will adopt a system that aligns with international approaches, to reduce hazardous substances in products and articles sold in Australia that represent a potential risk during and at end of life to human health, safety or the environment.	
Regional & Remote Australia		
Chair: WA		
14	State and territory and local governments to work together to identify regional and remote waste and resource recovery actions to build capacity and ensure an appropriate suite of services is available to communities.	
15	The Australian Government will undertake an audit of existing waste infrastructure and local capability in selected remote Indigenous communities as part of a larger essential services audit under the Council of Australian Governments' National Indigenous Housing Partnership Agreement.	
Data		
Co-chairs: Australian Government & NSW		
16	The Australian Government, in collaboration with state and territory governments, will develop and publish a three-yearly current and future trends waste and resource recovery report. This will be underpinned by a system that provides access to integrated national core data on waste and resource recovery that is accurate, meaningful and up-to-date and available online.	

APPENDIX B: MORE INFORMATION

Visit the Australian Government's Department of Sustainability, Environment, Water, Population and Communities website www.environment.gov.au/wastepolicy to:

- download the National Waste Policy, the *National Waste Report 2010*, the *National Waste Policy Implementation Plan* or an electronic copy of this implementation report;
- register your interest in receiving progress updates on implementation; and
- find out how you can contribute to the delivery of the National Waste Policy.

Email questions to wastepolicy@environment.gov.au or write to the Department of Sustainability, Environment, Water, Population and Communities, GPO Box 787, Canberra, ACT 2601.

Table 1. Links to Jurisdictional Websites

<u>Australian Government</u>	Department of Sustainability, Environment, Water, Population and Communities www.environment.gov.au Department of Climate Change and Energy Efficiency www.climatechange.gov.au
<u>ACT</u>	Department of the Environment, Climate Change, Energy and Water www.environment.act.gov.au
<u>NSW</u>	Office of Environment & Heritage www.environment.nsw.gov.au Department of Planning and Infrastructure www.planning.nsw.gov.au
<u>NT</u>	Department of Natural Resources, Environment, The Arts and Sport www.nt.gov.au/nreta Environment Protection Authority www.epa.nt.gov.au
<u>Qld</u>	Department of Environment and Resource Management www.derm.qld.gov.au Office of Climate Change www.climatechange.qld.gov.au
<u>SA</u>	Department of Environment and Natural Resources www.environment.sa.gov.au Sustainability and Climate Change Division, Department of Premier and Cabinet www.climatechange.sa.gov.au Environment Protection Authority www.epa.sa.gov.au Zero Waste SA www.zerowaste.sa.gov.au
<u>Tas</u>	Department of Primary Industries, Parks, Water and Environment www.dpipwe.tas.gov.au Environment Protection Authority Tasmania www.epa.tas.gov.au
<u>Vic</u>	Department of Sustainability and Environment www.dse.vic.gov.au Environment Protection Authority Victoria www.epa.vic.gov.au
<u>WA</u>	Department of Environment and Conservation www.dec.wa.gov.au Environmental Protection Authority of Western Australia www.epa.wa.gov.au Waste Authority www.zerowaste.wa.gov.au

APPENDIX C: TABLE OF RESOURCES

-
- ¹ National Waste Policy: Less waste, more resources:
http://www.ephc.gov.au/sites/default/files/WasteMgt_Rpt_National_Waste_Policy_Framework_Less_waste_more_resources_PRINT_ver_200911.pdf
- ² National Waste Policy Implementation Plan:
http://www.ephc.gov.au/sites/default/files/WasteMgt_National_Waste_Policy_Implementation_Plan_Final_201007.pdf
- ³ National Waste Policy Status report 2010:
http://www.ephc.gov.au/sites/default/files/WasteMgt_National_Waste_Policy_Status_Report_Final-amended_201011.pdf
- ⁴ Product Stewardship Act 2011:
<http://www.comlaw.gov.au/Details/C2011A00076>
- ⁵ Product Stewardship (Televisions and Computers) Regulations 2011:
<http://www.comlaw.gov.au/Details/F2011C00912>
- ⁶ National Waste Policy E-bulletin:
www.environment.gov.au/settlements/waste/ewaste/subscribe.html
- ⁷ Queensland Government State Procurement Policy:
http://www.qgm.qld.gov.au/02_policy/spp.htm
- ⁸ Annual Data Report 2011:
http://www.lgsa-plus.net.au/resources/documents/Sustainable_Choice_2011_Annual_Data_and_Evaluation_Report.pdf
- ⁹ National Environment Protection (Used Packaging Materials) Measure:
[http://www.ephc.gov.au/sites/default/files/National%20Environment%20Protection%20\(Used%20Packaging%20Materials\)%20Measure%20-%20F2011L02093\[1\].pdf](http://www.ephc.gov.au/sites/default/files/National%20Environment%20Protection%20(Used%20Packaging%20Materials)%20Measure%20-%20F2011L02093[1].pdf)
- ¹⁰ AS 5810 for biodegradable plastic in home composting:
<http://infostore.saiglobal.com/store/Details.aspx?ProductID=1418390>
- ¹¹ Degradable Plastics Packaging Materials: Assessment and Implication for the Australian Environment:
http://www.ephc.gov.au/sites/default/files/Degradable%20Plastic%20Packaging%20Materials_CSIRO%20Report.pdf
- ¹² Choice Modelling: A step by step guide by Jeff Bennett:
<http://www.derm.qld.gov.au/register/p01585aa.pdf>
- ¹³ Estimating consumers willingness to pay for improvements to packaging and beverage container waste management:
http://www.ephc.gov.au/sites/default/files/BevCon_Rpt_PwC_WTP_Packaging_Final_Report_201007_0.pdf
- ¹⁴ Packaging Impacts Consultation Regulation Impact Statement:
http://www.ephc.gov.au/sites/default/files/Packaging%20Impacts%20Consultation%20RIS%20-%20December%202011_ISBN%20updated%20201211.pdf
- ¹⁵ Australian Waste Classification – roles in decision making:
www.environment.gov.au/wastepolicy/publications/waste-classifications
- ¹⁶ Waste Management – Productivity Commission Inquiry Report:
<http://www.pc.gov.au/projects/inquiry/waste/docs/finalreport>
- ¹⁷ Review of the application of landfill standards:
<http://www.environment.gov.au/settlements/waste/publications/pubs/landfill-standards.pdf>
- ¹⁸ Specification for Supply of recycled Material for Pavements, Earthworks and Drainage 2010:
<http://www.environment.nsw.gov.au/resources/warr/104SupplyofRecycledMaterial.pdf>
- ¹⁹ MRS35 Recycled Materials for Pavements:
<http://www.tmr.qld.gov.au/~media/85db4959-bcb4-4385-a1b7-cbe7daf5fcd1/mrs35.pdf>

-
- ²⁰Standard Specification Roads:
<http://www.tmr.qld.gov.au/Business-and-industry/Technical-standards-and-publications/Standard-specifications-roads.aspx>
- ²¹Use of recycled Materials for Road Construction:
<http://www.bookshop.vicroads.vic.gov.au/redirectpdf/pdfs/tn107.pdf>
- ²² Specification 501 for Pavements:
<http://www.mainroads.wa.gov.au/BUILDINGROADS/TENDERPREPARATION/SPECIFICATIONS/Pages/500Series.aspx>
- ²³ Construction and Demolition Waste Status Report:
<http://www.environment.gov.au/wastepolicy/publications/construction-waste.html>
- ²⁴ Construction and Demolition Waste Guide:
<http://www.environment.gov.au/wastepolicy/publications/pubs/case-studies.pdf>
- ²⁵ National Waste Policy Knowledge Store:
<http://www.environment.gov.au/wastepolicy/knowledge-store/index.html>
- ²⁶ Waste Avoidance and Resource Recovery Progress Report 2010:
<http://www.environment.nsw.gov.au/warr/WARRStrategy2007.html>
- ²⁷ Queensland's Waste Reduction and Recycling Strategy 2010-2020:
http://www.derm.qld.gov.au/environmental_management/waste/pdf/waste-strategy.pdf
- ²⁸ Landfill Ban Investigation:
<http://www.environment.gov.au/wastepolicy/publications/pubs/landfill-ban.pdf>
- ²⁹ Environment Protection (Waste to Resources) Policy:
[http://www.legislation.sa.gov.au/LZ/C/POL/Environment%20Protection%20\(Waste%20to%20Resources\)%20Policy%202010.aspx](http://www.legislation.sa.gov.au/LZ/C/POL/Environment%20Protection%20(Waste%20to%20Resources)%20Policy%202010.aspx)
- ³⁰ Best Practice Environmental Management – Siting, Design, Operation and Rehabilitation of Landfills:
[http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/abe3ec1f4d20ecd3ca2577750002322f/\\$FILE/788.1.pdf](http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/abe3ec1f4d20ecd3ca2577750002322f/$FILE/788.1.pdf)
- ³¹ Waste Reduction and Recycling Act 2011:
<http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WasteRedRecA11.pdf>
- ³² National Greenhouse and Energy Reporting Framework:
www.climatechange.gov.au/government/initiatives/national-greenhouse-energy-reporting.aspx
- ³³ Business Recycling Directory:
BusinessRecycling.com.au
- ³⁴ Draft ACT Sustainable Waste Strategy 2010-2020:
http://www.environment.act.gov.au/_data/assets/pdf_file/0009/210501/SustainableWaste_Strategy_WEB.pdf
- ³⁵ Issues paper to inform the development of a national food plan:
http://www.daff.gov.au/_data/assets/pdf_file/0009/1926315/nfp_-_final.pdf
- ³⁶ Specification for supply of recycled material for pavements, earthworks and drainage:
<http://www.environment.nsw.gov.au/resources/warr/104SupplyofRecycledMaterial.pdf>
- ³⁷ National Waste data System Requirements:
<http://www.environment.gov.au/settlements/waste/publications/nwds.html>
- ³⁸ National map of landfills and waste management facilities:
www.ga.gov.au/products/servlet/controller?event=GEOCAT_DETAILS&catno=72592
- ³⁹ National Waste report 2010:
<http://www.environment.gov.au/wastepolicy/publications/national-waste-report.html>

