



Australian Government

Department of the Environment, Water, Heritage and the Arts

A National Waste Policy: Managing Waste to 2020

Consultation Paper

Waste Policy Taskforce
Department of the Environment, Water, Heritage and the Arts

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Revisions

Table 2, page 11; NSW information amended on 14 April 2009. NSW does legislate for waste avoidance and recovery. Accordingly the sub-categories of 'waste minimisation', 'reuse' and 'recycling' have been changed from "X" to "√".

Table 3, page 14; ACT information amended 9 April 2009. Landfill ban changed from "X" to "computers". Waste and recycling targets changed from "X" to "√".

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1. Introduction

In November 2008 the Minister for the Environment, Heritage and the Arts, the Hon Peter Garrett MP, announced that the Australian Government, with the support of the Environment Protection and Heritage Council, would lead the development of a new national waste policy for Australia.

A Waste Policy Taskforce was formed within the Australian Government Department of the Environment, Water, Heritage and the Arts to consult widely among the community, business and government and to develop a draft national waste policy for consideration by Australian governments.

The purpose of this consultation paper is to seek input from individuals, community groups, businesses, industry and governments on the priority issues to be considered in the development of a national waste policy and how these might be addressed. The paper sets out:

- the potential scope of and process for developing a national waste policy (Section 3)
- an overview of considerations in developing a national waste policy (Section 4)
- key questions on the future of waste management and resource recovery (Section 5). These questions are repeated at appropriate points throughout this consultation paper.
- information on the current administrative arrangements and strategies for waste management in Australia (Section 6)
- national approaches to waste management and resource recovery (Section 7)
- information on waste management and resource recovery trends in Australia (Section 8)
- a summary of issues associated with organic waste (Section 9) and electronic waste (Section 10)
- the potential for a national waste policy to contribute to other national agendas (Section 11)
- waste management and resource recovery's contribution to the economy (Section 12)
- conclusion (Section 13).

2. How to make a submission

The Department of the Environment, Water, Heritage and the Arts welcomes submissions on questions raised in this paper as well as any other matter relevant to the development of a national waste policy. Submissions should be supported with evidence and data wherever possible. Where submissions address one or more of the specific questions in this paper, the relevant question number(s) should be noted. If you made a submission to the Productivity Commission Inquiries into Waste Management or Chemicals and Plastics Regulation or the Senate Inquiry into the Management of Australia's Waste Streams, please note that these will also be used to inform the development of a national waste policy.

The closing date for submissions is **13 May 2009**.

To protect your privacy, please complete a submission cover page available at www.environment.gov.au/wastepolicy.

Submissions may be published on the department's website (www.environment.gov.au/wastepolicy) in full, and submissions or extracts from submissions may also be reproduced in public documents such as the national waste report, unless marked confidential. For submissions from individual community members, the publication of contact details will be limited to name, suburb and state unless marked confidential, in which case no contact details will be published.

Confidential information should be provided in a separate document with 'Confidential' clearly marked on every page and a title such as 'Confidential annexure to submission by [INSERT NAME] on [INSERT DATE]'.

Provision of electronic submissions by email is preferred. The department encourages interested parties to make submissions either in Microsoft Word or in PDF format.

Submissions may be directed to:

wastepolicy@environment.gov.au (include the word 'submission' in the title)

or:

Waste Policy Taskforce
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
Canberra ACT 2601

Questions about the consultation paper may be directed to the Waste Policy Taskforce: wastepolicy@environment.gov.au.

If you are unable to download a submission cover page, please call 1800 803 772.

3. Developing a national waste policy: scope and process

The purpose of developing a new national waste policy is to identify best practice in waste management and resource recovery and to ensure that Australia has the right mix of incentives and regulation to achieve environmental, economic and community benefits from these activities. The Australian Government, with the support of the Environment Protection and Heritage Council, is seeking to develop a coherent, efficient and environmentally responsible waste management policy for Australia to 2020.

A national waste policy will seek to provide environmental, social and economic benefits to the Australian community through a framework of guiding principles and relevant strategies. This framework will enable the national waste policy to complement government policies to deliver emission reductions, reduce energy and water use, support jobs and invest in future long term economic growth. In achieving these goals, the national waste policy will take into account relevant Council of Australian Government (COAG) agreements such as the National Partnership Agreement to Deliver a Seamless National Economy which aims to ‘deliver more consistent regulation across jurisdictions, and address unnecessary or poorly designed regulation’.

A national waste policy will allow government, community and business to set directions and achieve common goals and to align or complement actions taken to achieve those common goals, while maximising the overall benefit to the community. All waste streams, that is, municipal waste, commercial and industrial waste and construction and demolition waste may be covered by the national waste policy.

The goal is a national waste policy that will:

- clearly articulate the objectives of waste management and the respective roles of governments
- set out the basis for collaboration between jurisdictions
- provide the basis for effective and efficient approaches to domestic waste issues
- ensure that waste management remains aligned with Australia’s international obligations, including the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes
- complement the Australian Government’s approach to climate change and sustainability.

The policy development process will explore what opportunities exist to manage waste more effectively for better environmental outcomes and overall community benefit including how such a policy can:

- minimise the generation of hazardous and other wastes, and related greenhouse emissions
- advance the environmentally sound management of materials and products through whole-of-life-cycle strategies to minimise waste and improve resource recovery (for example through better design)
- realign waste policy to address issues holistically, including removing duplications and inconsistencies in current waste policies
- address identified market and governance impediments
- provide that any measures, whether voluntary or regulatory, balance social, environmental and economic outcomes, and are implemented by the appropriate level of government, industry or the community
- ensure the availability of and access to comprehensive national data and analytical tools on waste, including data related to landfills, individual products and reuse of materials
- provide for emerging issues and priorities to be addressed as they arise.

4. Overview

The last statement of national waste policy was in 1992 with the endorsement by the Council of Australian Governments (COAG) of the National Strategy for Ecologically Sustainable Development.¹ The strategy sets out ‘the broad strategic and policy framework under which governments will cooperatively make decisions and take actions to pursue ESD [ecologically sustainable development] in Australia’. The strategy is still in effect.

As part of the National Strategy for Ecologically Sustainable Development, a national approach to waste minimisation and management and two objectives were agreed (Appendix A). The challenge posed in the National Strategy was:

To improve the efficiency with which resources are used and reduce the impact on the environment of waste disposal, and to improve the management of hazardous wastes, avoid their generation and address clean-up issues.

For details see www.environment.gov.au/esd/national/nsesd/strategy/wastes.html.

Australia is a party to a number of international conventions and agreements which guide national waste policy. Australia’s obligations as a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (the Basel Convention) are particularly relevant. Under the Convention, Australia is required to take appropriate measures to ensure that the generation of hazardous and other wastes (including household wastes) is reduced to a minimum taking into account social, technological and economic aspects; that adequate disposal facilities exist for the environmentally sound management of wastes; and that waste managers take steps to prevent pollution due to waste or, if this is not possible, minimise the consequences for human health and the environment. Also relevant is that the 2002 United Nations World Summit on Sustainable Development agreed a framework of programs to accelerate a shift towards sustainable consumption and production (www.worldsummit2002.org/). This framework will be reviewed in 2010.

Australia is not unique in having in place a national policy for waste minimisation and ‘resource recovery’ (resource recovery activities include recycling and recovering embodied energy from waste). Developed and developing countries across the globe are pursuing sustainability strategies that include minimising waste, and managing materials and products across their life cycle to reduce waste and improve resource recovery in waste management overall. While Australia’s physical, geographic, economic and demographic situation may be unique, there may still be opportunities to learn from the experience of other countries, adopt innovative technology and use relevant research in developing Australia’s approach to waste minimisation and resource recovery.

There are a number of emerging changes in governance arrangements for managing hazardous materials domestically and internationally that may affect waste management. Internationally these include current work to list new organic pollutants under the Stockholm Convention (<http://chm.pops.int/>) and the recent United Nations agreement to develop a legally binding instrument on mercury (www.chem.unep.ch/MERCURY/GC25/Draft_decisionapproved.pdf). Domestically,

¹ Ecologically Sustainable Development Steering Committee, *National strategy for ecologically sustainable development*, Canberra, AGPS, 1992

they include changes to chemical regulation recommended by the Productivity Commission report on chemicals and plastics (www.pc.gov.au/projects/study/chemicalsandplastics).²

Since 1992, all Australian governments have introduced a range of legislative and policy instruments for waste management and resource recovery which work towards COAG's objectives and share common principles. For example most states have adopted strategies based on the 'waste hierarchy' (ie waste avoidance, reuse, recycling and reprocessing, with the last option being disposal) and targets for waste minimisation.

The evolution of policies, legislation and programs across jurisdictions over the last 10 to 20 years has resulted in a diversity of approaches, rather than a framework on waste in which roles, objectives, the basis for collaboration and the need for national leadership are clearly articulated. Certain aspects of waste policy may need to be tailored to fit a particular community, sector, product, region or state, and there are particular challenges for small and/or remote Indigenous communities. However, there is also a need to ensure that 'people enjoy the benefit of equivalent protection from air, water or soil pollution and from noise, wherever they live in Australia' (*National Environment Protection Council Act 1994*).³

Since 2002, the work of the Environment Protection and Heritage Council and others have highlighted a number of areas that could benefit from exploration in the context of a national waste policy. The Environment Protection and Heritage Council has developed a national waste framework as the basis for collaborative action on issues of national priority including electrical products (televisions, computers and mobile phones), hazardous substances, tyres, degradable plastics, and packaging. More broadly, questions around national approaches to product stewardship⁴ (Section 7.3), organic waste (Section 9), and electronic waste (e-waste) (Section 10) are being raised by business and the community.

In December 2008, COAG signed the National Partnership Agreement to Deliver a Seamless National Economy, which 'is intended to deliver more consistent regulation across jurisdictions and address unnecessary or poorly designed regulation, to reduce excessive compliance costs on business, restrictions on competition and distortions in the allocation of resources in the economy'.⁵ The diversity of approaches to waste management across Australia raises questions about whether a more 'seamless' approach can be achieved for certain aspects of waste nationally, while still providing for local differences. For a national waste policy to be effective there needs to be clarity around governance and what is appropriately dealt with by each level of government, business or community. There also needs to be agreement on the guiding principles for waste management.

² Productivity Commission, *Chemicals and Plastics Regulation*, Productivity Commission Research Report, July 2008

³ www.austlii.edu.au/au/legis/cth/consol_act/nepca1994432/

⁴ Product stewardship is an approach that recognises that manufacturers, importers, governments and consumers have a shared responsibility for the environmental impacts of a product throughout its full life cycle (www.ephc.gov.au).

⁵

www.coag.gov.au/intergov_agreements/federal_financial_relations/docs/national_partnership/seamless_national_economy_np.pdf

The trends in the diversion of waste from landfill suggest that the objectives relating to waste minimisation and management that underlie the 1992 National Strategy for Ecologically Sustainable Development have been broadly adopted. Resource recovery from waste increased 10-fold over the period from 1996–97 (when around 6 per cent of solid waste was diverted from landfill) to 2002–03 (around 46 per cent).⁶ By 2006–07, around 49 per cent of solid waste was diverted from landfill. Total waste generation (including waste diverted from landfill) increased by around 28 per cent (from 32 to 41 million tonnes) from 2002–03 to 2006–07 (Hyder Consulting 2008).⁷

Table 1: Disposal and recycling trends, 2002–03 to 2006–07

Waste	2002–03 (tonnes)	2006–07 (tonnes)	Proportion in 06-07	Increase
Recycled	14,956,000	20,485,000	49%	37%
Disposed	17,423,000	20,917,000	51%	20%
Generated	32,379,000	41,402,000		28%

If these diversion and landfill trends continue there will be a need for additional infrastructure, which may present opportunities to innovate. In developing a national waste policy it may be necessary to consider, in terms of overall community benefit, what strategies and actions might be employed to manage these trends (Section 8.3).

In 2006 around 3.26 million tonnes of hazardous waste (as defined by the Basel Convention) were produced in Australia, about 7.9 per cent of Australia's total waste generation (<http://www.basel.int/natreporting/compPII.html>). This figure does not include all hazardous materials as defined under state and territory regulation.

Managing hazardous materials and the risk of harm to human health and the environment can be difficult and costly. Technological advances have the potential to create new products and processes which can do away with the need for hazardous substances, and therefore reduce the need for these to be managed at end-of-life. A consideration for a national waste policy is what steps are needed to minimise the generation of hazardous and other waste and ensure that these wastes continue to be managed appropriately within Australia in the future (Section 7.2).

Landfill is the main means of waste disposal in Australia and has been since the introduction in the early 20th century of public health legislation that required local government to manage household waste. Landfill standards have improved with the widespread use of landfill liners and a better understanding of geology. The approach to landfill to date has been based on landfill sites being placed away from urban areas to manage issues such as odour and other emissions. This is posing challenges for managing closed landfills and siting new landfills, with greater expansion of the population and with many communities not wanting someone else's rubbish in their back yard. How can appropriate technology and better business models provide

⁶ Australian Bureau of Statistics, *Australia's environment: issues and trends*, ABS 2007

⁷ Hyder Consulting, *Waste and recycling in Australia*, Department of the Environment, Water, Heritage and the Arts, 2008

improved outcomes for the community and business in managing and siting waste management facilities? (Section 8.6)

As identified in the Senate Inquiry into the Management of Australia's Waste Streams report (www.aph.gov.au/senate/committee/eca_ctte/aust_waste_streams/index.htm) and the 2006 Productivity Commission report on waste management (www.pc.gov.au/projects/inquiry/waste/docs/finalreport), there is a lack of consistent and complete waste data to inform planning for and management of waste. There are insufficient data on the level of hazard to human health or the environment from certain wastes, for example on the interactions, impact and fate of hazardous materials when combined in landfill, particularly in the long term, both in Australia and internationally. The lack of national waste data limits the information on which to make decisions about waste and to measure success in achieving national objectives. There is a need to decide what basic information is required and how these data could be collected and reported (Section 8.1).

At the same time, Australians are now more aware of how vulnerable our country is to climate change and to water scarcity, and sustainability has become an important feature of the policy landscape. The introduction of the Carbon Pollution Reduction Scheme will have an impact on the waste sector, particularly in relation to methane emissions from landfill which will be regulated under the scheme (Sections 9 and 11). The national waste policy will need to reflect these changes in policy and the natural environment and contribute to broader sustainability outcomes where feasible (Section 11).

The waste management sector (ie activities associated with waste disposal) and resource recovery sector (ie activities such as recycling and the recovery of embodied energy from waste) make an important contribution to the economy. In 2002–03 waste management, not including resource recovery, contributed 0.2 per cent to Australian Gross Domestic Product and had an industry value of \$1.3 billion. Over 14,000 people were employed in 1,092 public and private businesses; 74 per cent of all businesses were small enterprises employing up to four people.⁸ An estimate for 2006 was that the Australian recycling industry contributed \$11.5 billion or 1.2 per cent of Australia's Gross Domestic Product, directly employed 10,900 people and indirectly employed another 27,700.⁹

The resource recovery sector, is vulnerable to the current global financial crisis, although the impact is not uniform. For example, markets for recovered cardboard, plastics and metals are being affected by the slowing of demand. There are potential short-term flow-on effects such as reduced income for exporters, increased waste going to landfill, and reduced demand for recycling collection services. The waste management and resource recovery industries' ability to generate strong productivity gains into the future relies on their capacity to innovate and create new markets. Development of the national waste policy provides an opportunity to consider how to address market impediments (Section 12).

As recognised by COAG in 1992, there is a clear need for a strategic and a truly “national approach” to waste management and resource recovery. In the 1992 strategy

⁸ Waste Management Services, Australia, Australian Bureau of Statistics, *Report No. 8698.0, 2002–03*

⁹ Australian Council of Recyclers, *Australian recycling values: a net benefits assessment*, July 2008

all Governments agreed to undertake specific actions and, to be effective, a new national waste policy will require the same commitment.

However, taking national action to effectively manage waste and to recover resources is not just the province of government. All Australians produce waste and manage waste. The majority of Australian households are actively involved in resource recovery through recycling and some community organisations have a central role in leading national activities aimed at better waste management and encouraging resource recovery. The private sector has a much greater role in the direct management of waste and resource recovery than it had in 1992. Modern businesses are far more conscious of the need to be environmentally sustainable and many see they have a key role to play in managing their own waste and, where relevant, as stewards of their products. The following paper provides a starting point for a discussion about the priorities for national action and how to more effectively manage Australia's waste, and find new opportunities to innovate, use different business models and technology to add value to the management of waste and resource recovery.

5. Questions raised in this consultation paper

The questions are in order of their appearance in the paper; they are numbered for ease of reference and are not in order of priority. The questions are repeated at appropriate points in the discussion.

1. *Are there opportunities to further coordinate, harmonise or streamline approaches to waste management across jurisdictions?*
2. *Are the categorisations, definitions and standards used to manage waste between and within the different levels of government effective and appropriate?*
3. *Do the current waste management frameworks across jurisdictions:*
 - *deliver an effective regulatory framework?*
 - *provide an appropriate suite of approaches to address waste and resource recovery issues?*
 - *work effectively in conjunction with planning and other environmental legislation?*
 - *provide the right incentives to manage materials, products and waste sustainably and holistically?*
 - *need improving, and if so, how could this be done?*
4. *In the 1992 National Strategy for Ecologically Sustainable Development, COAG endorsed the strategies and objectives for a national approach to waste management (Appendix A). Looking ahead to the next decade, how could these strategies and objectives be updated to provide the basis for a national waste policy that responds to current and future challenges and opportunities?*
5. *What waste issues would most benefit from a national approach? What strategies could be considered and how could the need for local solutions be integrated with a national approach?*
6. *Are there waste management initiatives in operation overseas that could apply in the Australian context? If so, which ones and why?*
7. *Australia needs to safely manage hazardous waste and waste containing hazardous materials over the long term.*
 - *Are there any changes to current arrangements that would improve Australia's capability to safely manage hazardous waste, for example in regard to adequate infrastructure or disclosing the contents of goods and substances?*
8. *There are a number of approaches to product stewardship operating in Australia.*
 - *What, if any, role is there for a national approach and what would be the costs, benefits, opportunities and focus of such an approach?*
 - *What models might work in Australia?*

9. *Are there any aspects of waste management that could be improved or streamlined through adopting national standards?*
10. *What fundamental data sets does Australia need to collect to better inform waste management policies, practices, investment, business operations and to assess and manage risk?*
11. *What, if any, place should there be for approaches that seek to avoid waste through changes in design, production processes and transport?*
12. *What changes could be made to improve management of the municipal waste stream and those of the commercial and industrial sector and the construction and demolition sector?*
13. *Landfill is currently the primary means of waste disposal. What, if any, changes need to be made to manage Australia's waste stream in the long term given current trends in the volume and nature of the waste?*
14. *Reducing the amount of organic waste sent to landfill has the potential to contribute to reducing greenhouse gas emissions as well as other potential environmental and economic benefits. What are the benefits and opportunities, costs and disadvantage of increased diversion and/or recycling of organic wastes?*
15. *What, if any, changes are needed to the way e-waste is managed?*
16. *The Carbon Pollution Reduction Scheme will apply to emissions from landfill. Are there related approaches that would complement the scheme and thus contribute to meeting the emissions targets and the timeframes set in the Australian Government's climate change policy?*
17. *What are the opportunities to reduce water and energy use through the way waste is managed?*
18. *In what ways can waste management and resource recovery (including recycling, re-processing, re-manufacturing) industries add further value to the economy and create employment?*

6. Current governance arrangements

This section summarises the current governance arrangements for waste management and resource recovery and highlights some of the policy instruments as well as contributions from business and the community.

An overarching policy framework for waste management and resource recovery was agreed in 1992 by the Council of Australian Governments (COAG) through its endorsement of the National Strategy for Ecologically Sustainable Development, which included agreement on a national approach to waste minimisation and management (see Appendix A).

Managing waste is not just the province of governments. The diversity of materials, products, services and processes that generate waste mean that governments, relevant industries, business, communities, households and individuals are all actively involved in waste management and in resource recovery.

The materials and processes covered by waste management and resource recovery policy vary from jurisdiction to jurisdiction. In simple terms, waste is generated each time goods and services are produced or consumed, but that waste may then be considered as having been 'diverted' from the waste stream depending on how it is managed. In reading this paper it is worth noting that what constitutes a waste, including such considerations as what is viewed as hazardous, varies across jurisdictions and is usually contained in legislation. See Appendix B for a summary of each state and territory's waste management and resource recovery measures.

6.1 Australian Government

The Australian Government has responsibilities in relation to international agreements, legislation and its participation in national activities through the Environment Protection and Heritage Council.

Key international instruments

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (the Basel Convention)
- International Convention for the Prevention of Pollution from Ships, 1973
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and its 1996 protocol
- Stockholm Convention on Persistent Organic Pollutants
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- Montreal Protocol on Substances that Deplete the Ozone Layer
- Organisation for Economic Co-operation and Development (OECD) Recommendations on the Environmentally Sound Management of Wastes and Resource Productivity

Key Australian Government legislation

- *Environment Protection (Sea Dumping) Act 1981*
- *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*
- *Hazardous Waste (Regulation of Exports and Imports) Act 1989*
- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*
- *Industrial Chemicals (Notification and Assessment) Act 1989*
- *Agricultural and Veterinary Chemicals Act 1994*
- *National Environment Protection Council Act 1994*
- *Product Stewardship (Oil) Act 2000*
- *Environment Protection and Biodiversity Conservation Act 1999*

6.2 State and territory governments

Waste management is primarily the responsibility of state, territory and local governments which enact policy measures and instruments to achieve waste or resource recovery objectives (see Appendix B). All states and territories have in place waste policies/strategies and/or legislation to protect the environment and conserve natural resources.

Following COAG's endorsement of the National Strategy for Ecologically Sustainable Development, most states have established waste minimisation objectives and in many cases targets. Most have introduced or are considering landfill levies and have adopted strategies or legislation based on elements of the 'waste hierarchy', noting that an order of preference for one element over another is not always expressed within a jurisdiction's strategy or legislation. The waste hierarchy (ie avoidance, reuse, recovery, recycling/reprocessing, disposal) is a 'list of approaches to managing waste, arranged in order of preferability... with the least preferred option for managing waste, disposal, located at the bottom and the most preferred option, avoidance and minimisation, located at the top'.¹⁰

Table 2: Waste hierarchy elements reflected in state and territory legislation*

(√ = yes, X = no)

State	Avoid	Minimise	Reuse	Recycle	Recover	Dispose
ACT	√	X	√	√	√	√
NSW	√	√	√	√	√	√
NT	√	√	√	√	X	√
QLD	√	X	√	√	√	√
SA	√	√	√	√	√	√
TAS	X	√	√	√	X	X
VIC	√	X	√	√	√	√
WA	√	X	√	√	√	√

¹⁰ <http://www.wastenet.net.au/information/hierarchy>

* Note the NSW information has changed. Please refer to 'revisions' on page ii for details.

A variety of measures have been adopted by states and territories including licensing of specified waste management activities, tracking of regulated wastes, design rules for waste equipment, financial mechanisms to support market and infrastructure development, behavioural change initiatives and product stewardship approaches (Table 3 and Appendix B).

Since 2007 most states have released discussion papers and other documents on the future of waste minimisation and resource recovery in their state (see Appendix B) and these will inform the development of the national waste policy.

Table 3: State and territory waste management and resource recovery measures*

(√ = yes, X = no)

	Landfill levy	Landfill ban	Product stewardship (including extended producer responsibility (EPR) schemes) ¹¹	Waste & recycling targets	Waste management strategy	Household hazardous waste collection
ACT	√	Computers	X	√	√	X
NT	X	X	X	X	Under development	X
NSW	√	X	Legislation allows for EPR but no schemes in place	√	√	√
QLD	X	Limits on number of tyres allowed in new landfills	X	Under consideration	New strategy under development	X
SA	√	Considering a ban on a range of materials to landfill	Beverage containers	√	√	√
TAS	X	Whole tyres and untreated clinical waste. From 30 June 2009, controlled wastes unless landfill is approved to accept such material.	X	Considering waste reduction goals and targets	Under development	X
VIC	√	Automotive batteries, whole tyres and some other wastes.	Batteries, computers and paint.	√	√	√
WA	√	X	X	√	√	√

6.3 Local government

The role of local government depends on the regulatory framework of a particular state or territory and can vary significantly.

Local government plays an important role in delivering household waste collection and recycling services, managing and operating landfills, providing education and awareness programs and providing and maintaining litter infrastructure. They may

¹¹ All jurisdictions except the Northern Territory and the Australian Government have product stewardship legislation in place to give effect to the National Packaging Covenant.

* Note the ACT information has changed. Please refer to 'revisions' on page ii for details.

also contribute to aggregated approaches to waste management through the payment of waste levy contributions.

Local governments often have compliance and enforcement roles in littering and the illegal disposal of waste and in some cases, develop and deliver community-based initiatives such as clean up days, e-waste collections and composting trials. Some local governments have established regional waste bodies, usually in high population areas, to efficiently manage waste, share the costs of capital investment and achieve economies of scale in service delivery. These regional organisations (whether formally incorporated or informal affiliations) also play an important role in information and knowledge sharing and as a point of contact, particularly for smaller and remote local governments.

6.4 Community and business

The waste and recycling industry and national associations such as the Australian Council of Recyclers and the Waste Management Association of Australia will have a vital role to play in delivering the national waste policy. Companies operating landfills and alternative waste treatment facilities actively raise awareness of waste management and resource recovery issues and opportunities as well as provide education and training support.

Some businesses have their waste generation, treatment and disposal activities directly regulated under licensing conditions by the relevant state, or in the case of export of some waste, the Australian Government. However, some industry organisations and individual businesses have voluntarily taken additional steps to reduce their waste and improve product stewardship.

At a local level, for example, computer companies have worked with individual local governments to run computer recycling days, providing resources for transport and recycling of the collected computers.

Various businesses that operate in a number of states and or territories in Australia make significant financial and in-kind contributions to such activities as Clean Up Australia Day, the National Packaging Covenant, as well as implementing voluntary recycling schemes like MobileMuster, drumMUSTER, newspaper recycling, and Cartridges for Planet Ark (see Section 7.3).

Community and business organisations have undertaken national activities to reduce waste, encourage resource recovery and reduce littering. Organisations such as Keep Australia Beautiful, Clean Up Australia and Planet Ark play an important role in championing national campaigns and raising the awareness of individuals and the community on environment issues, including waste management, recycling and litter prevention. Other non-government organisations also play consumer and environmental advocacy roles.

The role of community and voluntary action needs to be considered in developing a national waste policy.

Consultation questions

- 1. Are there opportunities to further coordinate, harmonise and streamline approaches to waste management across jurisdictions?*
- 2. Are the categorisations, definitions and standards used to manage waste between and within the different levels of government effective and appropriate?*
- 3. Do the current waste management frameworks across jurisdictions:*
 - deliver an effective regulatory framework?*
 - provide an appropriate suite of approaches to address waste and resource recovery issues?*
 - work effectively in conjunction with planning and other environmental legislation?*
 - provide the right incentives to manage materials, products and waste sustainably and holistically?*
 - need improving and if so, how could this be done?*

7. National approaches to waste management and resource recovery

This section summarises the current national approaches for waste management and resource recovery, highlights some of the policy instruments and poses questions about future directions.

In developing a national waste policy and considering delivery options, it is important that the parties who are best placed to act are identified and play an appropriate role in implementation. This is likely to involve action on the part of the Australian Government, state and territory governments, local governments, business and the community – with the various parties potentially taking sole responsibility for some measures and working collaboratively with others to achieve other outcomes.

With all levels of government reviewing and refocusing their waste strategies, there is both an opportunity to reduce the regulatory burden and the risk that waste management may become increasingly complicated in an administrative and regulatory sense. The challenge is to develop waste strategies that are appropriate to the needs and aspirations of different communities while harmonising approaches where a national focus is warranted or where national markets are involved. A national waste policy also has the potential to support research and development and trial new technologies.

Governments have identified climate change (in particular the Carbon Pollution Reduction Scheme) and sustainability (including water and energy saving) as important influences in considering resource recovery options and future management of wastes. It is also timely to explore how the waste sector can add further value to the Australian economy. The national waste policy will need to be aligned with these policy frameworks where appropriate (Section 11).

National action on waste and resource recovery falls into several categories:

- Australian Government activities relating to international agreements and Australian Government legislation
- action by Australian Government statutory bodies such as the Australian Pesticides and Veterinary Medicines Authority and National Industrial Chemicals Notification and Assessment Scheme that control how certain substances are managed
- activities by all jurisdictions through the Environment Protection and Heritage Council, including regulatory action by all jurisdictions through national environment protection measures under the *National Environment Protection Council Act 1994*¹².
- voluntary action by business and community organisations, as well as joint government/business and/or community action.

¹² www.austlii.edu.au/au/legis/cth/consol_act/nepca1994432/

As well as developing responses to specific issues, it is important that a national waste policy be underpinned by a framework of guiding principles. In determining what these principles are, it is necessary to consider whether the strategies and objectives agreed by COAG in 1992 (see appendix A) still serve Australia well, or whether they need to be updated to reflect current and future challenges and opportunities.

Consultation questions

4. *In the 1992 National Strategy for Ecologically Sustainable Development, COAG endorsed the strategies and objectives for a national approach to waste management (Appendix A). Looking ahead to the next decade, how could these strategies and objectives be updated to provide the basis for a national waste policy that responds to current and future challenges and opportunities?*
5. *What waste issues would most benefit from a national approach? What strategies could be considered and how could the need for local solutions be integrated with a national approach?*
6. *Are there waste management initiatives in operation overseas that could apply in the Australian context? If so, which ones and why?*

7.1 Environment Protection and Heritage Council/National Environment Protection Council

The Environment Protection and Heritage Council of Australia and New Zealand was established in June 2001 by the Council of Australian Governments. The Environment Protection and Heritage Council addresses broad national policy issues relating to environmental protection, particularly in regard to air, water, and waste matters. The Environment Protection and Heritage Council also addresses natural, Indigenous and historic heritage issues. The Environment Protection and Heritage Council incorporates the National Environment Protection Council, a statutory body under the National Environment Protection Council Acts of the Australian Government, the states and the territories. The two Councils meet simultaneously.

Through the Australian Government *National Environment Protection Council Act 1994* a number of national environment protection measures (NEPMs) have been established, with jurisdictions putting in place harmonised legislation to bring into effect the NEPMs. NEPMs which have a connection to waste matters are:

- Movement of Controlled Waste between States and Territories NEPM
- Used Packaging Materials NEPM (complementing the voluntary strategies in the National Packaging Covenant)
- National Pollutant Inventory NEPM
- Assessment of Site Contamination NEPM
- Ambient Air Quality NEPM
- Air Toxics NEPM.

For further details see www.ephc.gov.au/nepms.

The Environment Protection and Heritage Council is also responsible for implementing parts of COAG's response to the Productivity Commission's report on chemicals and plastics (www.pc.gov.au/projects/study/chemicalsandplastics).¹³ In particular this involves developing a new governance structure to oversee chemicals and plastics regulatory reform. This may have an impact on the management of relevant wastes.

In 2002, the Environment Protection and Heritage Council developed a national waste framework as the basis for collaborative action on issues of national priority including electrical products (televisions, computers and mobile phones), hazardous substances, tyres, degradable plastics, and packaging. In November 2008, the Environment Protection and Heritage Council agreed to review this framework. This review will be informed by the development of the national waste policy.

For further details on the Environment Protection and Heritage Council's activities see www.ephc.gov.au.

7.2 Hazardous waste

Hazardous materials are potentially injurious and are a risk to human health and the environment.

In 2006, approximately 3.26 million tonnes of hazardous waste (as defined by the Basel Convention) were produced in Australia, about 7.9 per cent of Australia's total waste generation. This does not include all hazardous materials as defined under state and territory regulation. The National Pollutant Inventory (www.npi.gov.au/), which provides information to the public on the transfer or release of 93 substances to the Australian environment, collects data on a number of hazardous wastes controlled by the Basel Convention and a number of persistent organic pollutants controlled under the Stockholm Convention.

Hazardous wastes (sometimes known as controlled or scheduled wastes depending on the jurisdiction) can be by-products or residues from agricultural, manufacturing or industrial processes. Hazardous wastes can also result from substances embedded in products. Many products contain chemicals or metals which are potentially hazardous to humans and the environment, including, packaging, foam, furnishings, electrical and electronic equipment, batteries, paints, adhesives, solvents, pharmaceuticals, cleaning products, household pesticides and insulation.

Hazardous wastes are regulated through state and territory planning, environment protection and waste management regulations. In some cases, if the waste is covered by an international agreement to which Australia is a party, specific Australian Government legislation applies. Australia is party to a number of international agreements dealing with hazardous wastes or hazardous materials (see Section 6.1).

Australia has regulations in place to meet its obligations under international conventions dealing with hazardous substances and hazardous wastes. It also has advanced systems in place for managing the import and export of intentionally produced hazardous chemicals and wastes (under the *Hazardous Waste (Regulation of Exports and Imports) Act 1989*).¹⁴

¹³ Productivity Commission, *Chemicals and plastics regulation*, Productivity Commission Research Report, July 2008

¹⁴ www.environment.gov.au/settlements/chemicals/hazardous-waste/index.html

There are some seeming inconsistencies in the way hazardous waste is managed in Australia. Consumer products such as televisions, computers, mobile phones, some batteries, and fluorescent lamps, that contain hazardous substances and are defined as hazardous wastes under the Basel Convention, and require an export permit, may not be defined as hazardous domestically. The current approach to dealing with waste products that contain hazardous materials has been to deal with them on a product-by-product basis, rather than with their combined impact on the environment. There are limits to current understanding of the interaction and long-term impact of some materials being landfilled. There has been little research on what happens over a long period when a diverse mix of materials interacts in a landfill.

In other countries, such as Canada and the European Union, the approach to products containing hazardous material is quite different.

From 1 July 2006 the European Union's Restriction of Hazardous Substances Directive placed a ban on the marketing of electrical and electronic products containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, and polybrominated biphenyl or polybrominated diphenyl ether flame retardants. The directive's primary objective is to reduce the risks to human health and the environment during the manufacture, use, disposal and/or recycling of electrical and electronic equipment. The directive covers household appliances, information technology and telecommunication equipment, consumer equipment, electrical and electronic goods, toys, leisure and sports equipment automatic dispensers, lighting equipment, light bulbs and household lighting. A number of Australian businesses already produce products that meet the requirements of the directive in order to export to European markets, but businesses importing materials into Australia are not required to meet the directive.

There are new challenges ahead in managing hazardous waste and products containing hazardous materials, as understanding improves about the chemicals and materials used in products and their long-term impacts on human health and the environment. This has implications for both managing landfills and managing recycling to take account of the presence of hazardous materials and chemicals.

The recent (February 2009) United Nations Environment Programme decision to develop a legally binding instrument on mercury may have an impact on the way Australia manages mercury, including in products and as waste (www.chem.unep.ch/MERCURY/GC25/Draft_decisionapproved.pdf).

Example: The Stockholm Convention aims to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the food chain and pose a risk of causing adverse effects even at low concentrations. Currently, 12 chemicals are listed for action under the Convention with another nine under scientific consideration. The addition of new chemicals to the Convention is an ongoing process.¹⁵

Currently there are gaps in Australia's regulatory system for chemicals and there may also be changes to how chemicals are managed in Australia, based on COAG's

¹⁵ <http://chm.pops.int/>

response to the 2008 Productivity Commission report on chemicals and plastics¹⁶ which recognised that the current institutional and regulatory arrangements are less effective in managing risks to the environment than in other sectors. The report also recognised the need for a more systematic research program to identify and deal with the risks of chemicals in consumer articles

(www.pc.gov.au/projects/study/chemicalsandplastics).

The Montreal Protocol on Substances that Deplete the Ozone Layer aims to protect the ozone layer by phasing out the production of substances which have been shown to play a role in ozone depletion. Australia has met and exceeded all of its phase-out obligations under the Montreal Protocol. However, the treatment of wastes that contain ozone depleting substances or synthetic greenhouse gases remains an area of concern. These substances are present in refrigeration and air conditioning equipment (domestic and commercial), foam products (including insulation), aerosols and fire protection equipment. They can enter the domestic, commercial and demolition waste streams and can be emitted at the point of decommissioning equipment, when equipment is broken up for scrap or gradually when equipment is sent to landfill.

In Australia there are two dedicated programs to collect and dispose of ozone depleting substances. Used and unwanted fluorocarbon refrigerants are collected and disposed of through the industry-run Refrigerant Reclaim Australia scheme. Halon in fire protection equipment is collected and disposed of through the Australian Government's National Halon Bank. Both of these schemes are underpinned by regulation and licence conditions under the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*. Other than halon fire extinguishers, there are no dedicated disposal programs for equipment containing ozone depleting substances in Australia.

While there are some state and local government programs that regulate or manage the disposal of household chemicals (such as cleaners, garden products and paints) which can contain hazardous substances, there is no national and consistent system in place. These types of products are often not labelled for their contents. Information campaigns are sometimes run to create awareness of the potential risks associated with these products but the majority end up in sewage systems and landfills. These products have the potential to contaminate recyclable material.

It is difficult to determine the composition of many imported products and equipment because the manufacturing, assembling and packaging of a product may occur in a number of countries and very few countries label the composition of components. If the materials used in imported products are unknown, the products are difficult to recycle or reprocess. There is the potential to contaminate the recycle stream and there may be health and safety aspects to be addressed in reprocessing recovered materials. Such contamination can lower the value of the recycle or make it unfit for particular purposes. The composition of plastics presents a particular problem in this regard.

Technological advances can also bring with them new waste challenges if not carefully introduced. Nanotechnology is one area where international attention is

¹⁶ Productivity Commission, *Chemicals and plastics regulation*, Productivity Commission Research Report, July 2008

being focused. Many chemicals behave differently when they are produced as a nanoscale material, as they have a greater surface area and are generally much more chemically reactive. Some nanomaterials can cross cell membranes and affect the inner workings of cells. The OECD is working on developing methods to assess the impacts of manufactured nanomaterials.

Technological advances also have the potential to create new products and processes which can do away with the need for hazardous substances, and therefore reduce the need for these to be managed at end of life.

Consultation question

7. Australia needs to safely manage hazardous waste and waste containing hazardous materials over the long term.

- *Are there any changes to current arrangements that would improve Australia's capability to safely manage hazardous waste, for example in regard to adequate infrastructure or disclosing the contents of goods and substances?*

7.3 Product stewardship

Product stewardship is an approach that recognises that manufacturers, importers, governments and consumers have a shared responsibility for the environmental impacts of a product throughout its full life cycle. Product stewardship schemes establish a means for relevant parties in the product chain to share responsibility for the products they produce, handle, purchase, use and discard.

Internationally, product stewardship has been applied broadly, to a range of products and stakeholders, but recently there has been a shift in emphasis to extended producer responsibility schemes. Under these schemes the producer takes primary responsibility for the reuse, recycling or disposal of their products once no longer required by the consumer. These schemes are an extension of the 'polluter pays' principle making manufacturers/producers bear the cost of the waste associated with their products. In many countries overarching product stewardship frameworks are utilised, under which priority products or groups of products are identified for action. This approach is widespread in Canada, New Zealand, Japan, some parts of the United States and the European Union.

Example: In British Columbia, Canada, the Environmental Management Act provides for a Recycling Regulation which requires industry and consumers to take life-cycle responsibility for products they produce and use within three defined categories (beverage containers; containers that hold less than 3 per cent residue by volume; and electronic and electrical goods). A producer (usually the first seller of the product in the province) of a scheduled product must have an approved product stewardship plan and comply with the plan in order to sell or distribute the product in British Columbia. Producers are required to report annually on their efforts to reduce environmental impacts throughout the product's life cycle, including the design and manufacturing stages. Stewardship program funding is the responsibility of the producer (www.env.gov.bc.ca/epd/recycling/history/index.htm).

Product stewardship has had more limited application in Australia. At a national level, product stewardship schemes include:

- a regulated scheme: the Product Stewardship for Oil Scheme, where a levy collected on new oil funds benefit payments to used oil recyclers (www.oilrecycling.gov.au/)
- a co-regulatory scheme: the National Packaging Covenant, supported by the Used Packaging National Environment Protection Measure (www.ephc.gov.au/nepm/)
- voluntary schemes including Mobile Muster (collection and recycling of mobile phone handsets, batteries and accessories) (www.mobilemuster.com.au/), Cartridges for Planet Ark (collection and recycling of imaging consumables with raw material output streams returned to the manufacturer for reuse in new printers and cartridges) (www.cartridges.planetark.org/) and ChemClear and drumMUSTER (collection and safe disposal of obsolete and unwanted agricultural chemicals and their containers) (www.chemclear.com.au/ and www.drummuster.com.au/).

The Environment Protection and Heritage Council is examining a national product stewardship approach for computers, televisions and end-of-life tyres (see www.ephc.gov.au under product stewardship). The relevant industries have each proposed voluntary industry managed schemes, supported by free-rider regulation to prevent non-participating businesses from gaining a competitive advantage. The proposed schemes feature a recycling fee charged when a product is purchased. Efforts to address waste issues of national significance have proved challenging and time consuming for the reasons outlined below. The Environment Protection and Heritage Council has a current project to explore the generic principles associated with product stewardship so as to provide guidance to Government on the development of effective product stewardship policies and approaches.

One of the key difficulties in establishing product stewardship schemes has been developing Regulatory Impact Statements, and in particular demonstrating that a proposed scheme will deliver a net community benefit. The challenge has been to quantify the environmental and social benefits from taking action and to value or obtain evidence of environmental impacts or risks, where these may not be realised for many years. It is difficult to determine from “the market”, for example, how much a person is realistically willing to pay in dollar terms to recycle a product. To this end, the Australian Government is funding a project to explore methodologies that better capture non-market values within a cost benefit framework.

At the state level, South Australia established Australia’s first regulated container deposit scheme in 1977. Under the scheme, a charge is incorporated into the sale of some beverages and redeemed when the beverage container is returned to a collection depot. The industry pays for the infrastructure to collect and recycle recovered containers. The Environment Protection and Heritage Council is examining potential national approaches to beverage containers, including container deposits. NSW has identified in legislation 17 products and materials that could be subject to product stewardship or extended producer responsibility action. These products include tyres, televisions and computers, which all involve national markets, and NSW is working through the Environment Protection and Heritage Council to develop a national approach to these products. Other product stewardship initiatives are being trialled in different states and territories.

The Senate Inquiry into the Management of Australia's Waste Streams recommended that 'the Environment Protection and Heritage Council revitalise the product stewardship National Environment Protection Measure to address waste issues of national significance in a timely and coordinated manner'.¹⁷ A NEPM is one way of implementing a national approach to product stewardship. If a national approach to product stewardship were to be included in the national waste policy it would be helpful to confirm what principles would underpin such an approach, the outcomes being sought, what might work in the Australian context and how such an approach might result in an overall benefit to the community.

Consultation question

8. There are a number of approaches to product stewardship operating in Australia.

- *What, if any, role is there for a national approach and what would be the costs, benefits, opportunities and focus of such an approach?*
- *What models might work in Australia?*

7.4 National standards

Australian Standards touch almost every aspect of life in Australia (www.standards.org.au/). Standards are not legally binding but define benchmarks that can help to ensure that products, goods and services consistently perform in the way they are intended. Industry often uses standards as a way of assuring consumers that a product is safe or meets other requirements, and standards may be referenced in government policy and legislation. Standards can support Australian innovation, complement regulation, make markets work better, improve quality of life, increase employment, improve safety, health and the environment and help Australians use our national resources more efficiently.

Several Australian Standards address specific waste or chemicals related issues such as hazardous waste classifications, management of clinical wastes, composting, and how to assess the potential for waste to contaminate groundwater. Standards Australia is currently developing standards concerning the degradability of plastics in various end environments such as home composting, fresh and marine water and soil. These will add to the published standard for commercial composting.

Australian Standards do not cover all aspects of waste management and resource recovery, but state, territory and local government arrangements may already provide an appropriate level of protection. For example there are no Australian Standards for landfill liners or leachate management, but these areas are regulated within each jurisdiction. International standards cover a wider range of topics including landfill liners, landfill gas measurement and landfill drainage. There may be scope to use Australian Standards to support innovation in waste management and resource recovery industries.

There are numerous hazardous chemicals standards in place to protect human health covering products as diverse as pesticides, industrial chemicals and foods. The health sector's Standard for the Uniform Scheduling of Drugs and Poisons (www.tga.gov.au/ndpsc/susdp.htm), the occupational health and safety sector's

¹⁷ www.aph.gov.au/senate/committee/eca_ctte/aust_waste_streams/report/a03.htm

National Model Regulations for the Control of Workplace Hazardous Substances (<http://hsis.ascc.gov.au/>) and the transport sector's Australian Dangerous Goods Code (www.infrastructure.gov.au/transport/australia/dangerous/index.aspx) are relevant examples. In contrast, there is no current standard-setting role for chemicals in the environment sector. Following a report by the Productivity Commission on the regulation of chemicals and plastics which found that national approaches to policy development and standard setting can improve effectiveness and efficiency and a supplementary study where a number of mechanisms that Australian governments have used to coordinate national approaches are identified (www.pc.gov.au/projects/study/chemicalsandplastics and www.pc.gov.au/_data/assets/pdf_file/0004/85297/chemicals-plastics-supplement.pdf),¹⁸ COAG has asked the Environment Protection and Heritage Council to progress work in this area.

In September 2006 the Environment Protection and Heritage Council adopted a national approach to the beneficial reuse of industrial residues.¹⁹ The national approach outlines criteria for determining whether a particular industrial residue is fit for reuse and identifies the need for guidelines on acceptable levels of contaminants in fertilisers. The Commonwealth Scientific and Industrial Research Organisation completed the first phase of the guidelines' development in 2005 and is currently undertaking a second phase.

Consultation question

9. Are there any aspects of waste management that could be improved or streamlined through adopting national standards?

¹⁸ Productivity Commission, *Chemicals and plastics regulation*, Productivity Commission Research Report, July 2008

¹⁹ Environment Protection and Heritage Council, *Development of a national approach: principles and guidance for assessing the beneficial reuse of industrial residues to land management applications*, 2005

8. Waste management and resource recovery trends

This section outlines trends in waste management, including minimisation and resource recovery. It raises the issue of what information and data are needed to make decisions about waste in Australia. It uses the structure of the waste hierarchy in examining different approaches to waste management and resource recovery, as well as looking at the contribution different sectors make to waste generation.

Unless otherwise indicated, all statistical information in this section is drawn from Hyder Consulting 2008, *Waste and recycling in Australia*, Department of the Environment, Water, Heritage and the Arts.

8.1 Waste data

National information on waste and resource recovery is limited and there are differences from jurisdiction to jurisdiction in how data are collected and reported. This makes comparison of figures such as disposal and recovery rates across states and territories and presentation of national data problematic, particularly as new figures are published. As well as gaps in statistical information, there are also limits to scientific knowledge about the environmental and health impacts and future risks of some of the materials disposed of to landfill. Limited information limits the capacity of governments to develop the most effective policy responses. Both the 2006 Productivity Commission report on waste²⁰ and the 2008 Senate Inquiry into the Management of Australia's Waste Streams report²¹ raise concerns and make recommendations about the need to improve information about waste and resource recovery.

In 1990 an Australian waste database was endorsed by Australia's environment ministers to house data provided by each state on the amount and type of waste going to landfill and to facilitate monitoring of national waste minimisation achievements. The database was not successful due to a lack of agreed definitions; ongoing resourcing challenges and the limited scope for sourcing data. In 2008, the Australian Government agreed to fund a feasibility study on establishing a national mechanism for collecting, storing, collating and accessing data.

A national waste policy will need to address these issues, and identify what data need to be collected and reported on and how progress in implementing a national waste policy can be measured.

Consultation question

10. What fundamental data sets does Australia need to collect to better inform waste management policies, practices, investment, business operations and to assess and manage risk?

²⁰ Productivity Commission, *Waste management: Productivity Commission inquiry report*, 2006

²¹ Standing Committee on Environment, Communications and the Arts, *Management of Australia's waste streams (including consideration of the Drink Container Recycling Bill 2008)*, 2008

8.2 Waste avoidance and reuse

Waste minimisation through avoiding waste or reusing products and materials, with little or no reprocessing, is considered in most Australian and many international waste management strategies and/or regulatory systems as the most desirable outcome of waste management policy. Minimising waste generation through avoidance or reuse has the potential to reduce costs to business and the community, either by reducing materials used or by reducing the amount of waste to be disposed of, so that the cost of waste management is also decreased.

Many actions in Australia to encourage waste minimisation through avoidance and reuse are education and information focused. In terms of waste avoidance there are also some measures in place to encourage improvements in the production process to either reduce waste from the production process or potential waste from the product itself (for example through the National Packaging Covenant).

It is difficult to assess the degree to which Australians avoid waste or reuse products. There is no system in place to report on these matters, in part because action can occur at any point in the supply chain. Attempts have been made to measure waste avoidance under the National Packaging Covenant by estimating the amount of materials being saved through product design changes such as ‘lightweighting’ packaging (www.packagingcovenant.org.au). Individual product studies have provided some information on reuse, for example, 65 per cent of computers are believed to enter the second-hand market but a comprehensive picture for Australia is not available.

Changes in design and technological advances have the potential to create new products and processes which can reduce the waste generated through production, and reduce the resources needed to produce a product. Changes in design and technology can contribute to managing a product throughout its life cycle, including improving its capacity to be reused or disassembled for recovery at end of life. This is known as green design or eco-design which aims to ‘design and develop products which are more durable, energy efficient, avoid the use of toxic materials and which can be easily disassembled for recycling’.²² In many cases, taking a life-cycle approach to a product has worked well in meeting both business goals (by reducing costs) and environmental goals.

Consultation question

11. What, if any, place should there be for approaches that seek to avoid waste through changes in design, production processes and transport?

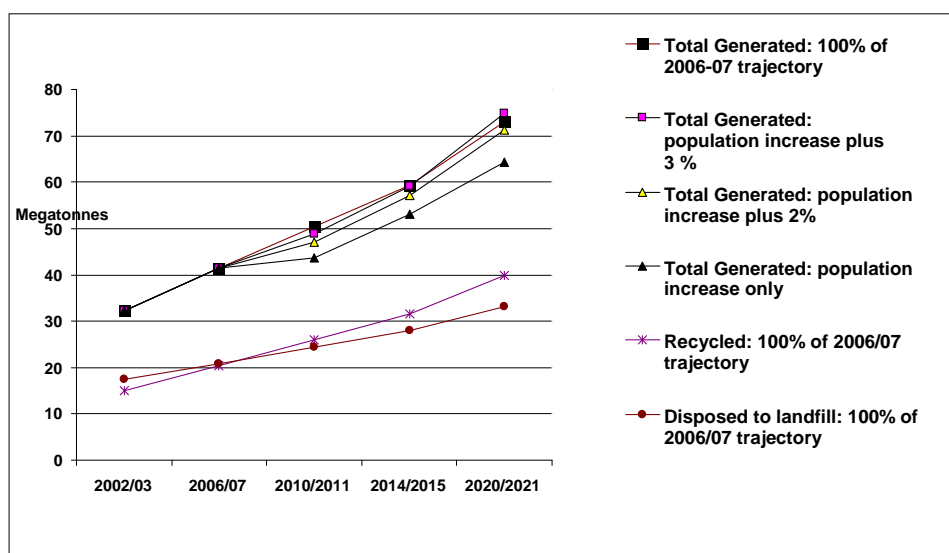
²² Centre for Design, RMIT University, *Green design policy review, report for the Department of the Environment, Water, Heritage and the Arts*, December 2008, p.9

8.3 Waste disposal and resource recovery

In 2006–07 an estimated 41.4 million tonnes of waste was generated in Australia, with around 49 per cent reported as being recycled and 51 per cent as being disposed of to landfill. This is around a 28 per cent increase in the waste generated from 2002–03 to 2006–07. A continuation of this trend would see around 70 million tonnes of waste being generated by 2020, with around 34.3 million tonnes being recovered.

At a state level, there is a wide variation in landfill and resource recovery rates. In 2006-07 Hyder Consulting estimated that material being disposed of to landfill ranged from 26 per cent to 99 per cent of total waste generated. It will be important to understand the reasons for these differences in developing a national waste policy.

Figure 1: Waste scenarios to 2020–21
(extrapolated from information in Hyder Consulting 2008)

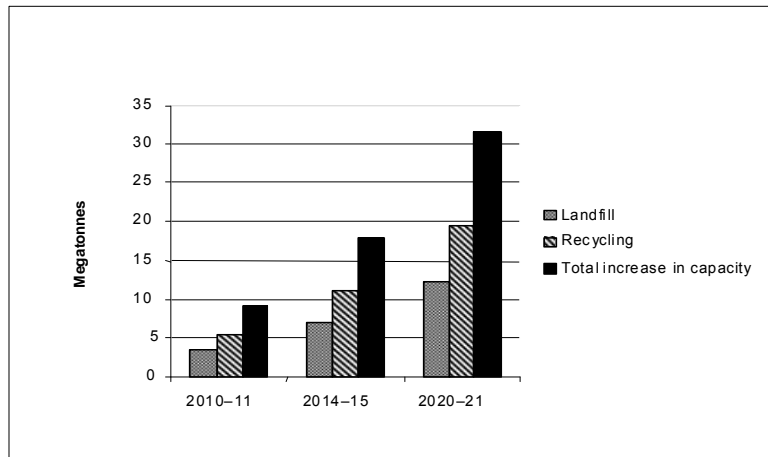


This trajectory will be influenced by broad economic and social factors. These include changes in demographics such as an increase in population to between 22–24 million,²³ average household size continuing to decrease, with between a quarter to a third of all households predicted to be one person households²⁴ and an increase in the number of dwellings and households. Economic factors will also influence trends in waste disposal and resource recovery: while the economy may be slowing in 2009, it is expected to recover in the medium term. As household disposable income rises the trend toward relatively short replacement cycles of many household goods such as computers will continue. These factors will shape the makeup and volume of the waste stream.

²³ Year Book 2006, Australian Bureau of Statistics, Report No. 3222.0, *Population projections, Australia 2006 to 2101*, September 2008

²⁴ Year Book 2006, Australian Bureau of Statistics, Report No. 3222.0, *Population projections, Australia 2006 to 2101*, September 2008

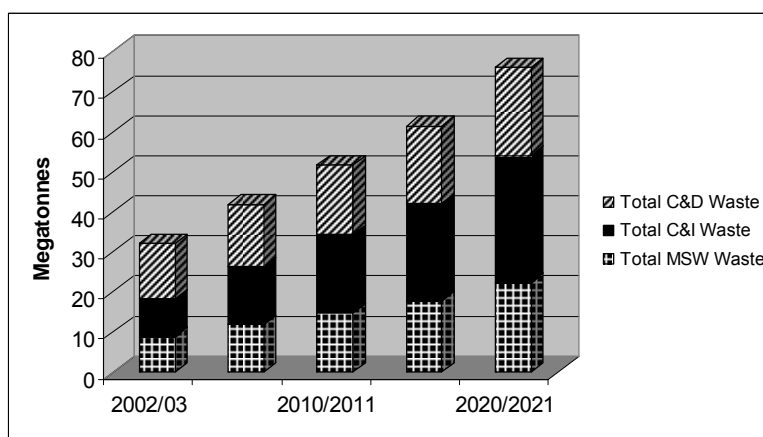
Figure 2: Additional capacity required to maintain current trajectory
 (extrapolated from information in Hyder Consulting 2008 based on 100 per cent of 2006–07 trajectory)



8.4 The waste sectors

Waste is generally categorised into three sectors: municipal; commercial and industrial; and construction and demolition. Different sectors make different contributions to both waste disposal to landfill and diversion from landfill, noting that determining actual levels of waste generation, disposal and recycling is affected by the different definitions and measurement methods for waste that is in place across jurisdictions. All sectors have seen an increase in the proportion of material recycled and an increase in waste generation overall. The nature of each sector poses different challenges in terms of resource recovery and disposal.

Figure 3: Predicted growth in generated waste by sector to 2020
 (based on Hyder Consulting 2008)



C&D = construction and demolition; C&I = commercial and industrial; MSW = municipal

Municipal waste sector: In 2006–07, an estimated 11.9 million tonnes of municipal waste were generated of which 7.3 million tonnes were disposed of to landfill and 4.6 million tonnes recycled.

Municipal waste is waste generated from domestic premises and from municipal services. It includes biodegradable material and a wide range of non-degradable material including household appliances and electronic equipment, old furniture and household lighting, and liquids such as paint. Some of this waste contains substances which are known to harm the environment and human health (such as sewage sludge too contaminated to be used for other purposes, batteries, pesticides and other household hazardous wastes). These forms of waste are managed by local government authorities directly or through contractual arrangements with waste collection providers or by regional waste bodies.

From 2002–03 to 2006–07, municipal waste increased by 34 per cent. If this trend continues, Australia may have a municipal waste stream of up to 22.4 million tonnes in 2020.

Commercial and industrial: In 2006–07, 14.4 million tonnes of commercial and industrial waste were generated in Australia of which 6.4 million tonnes were disposed of to landfill (44.5 per cent) and 8 million tonnes recycled (55.5 per cent).

Commercial and industrial waste includes waste from institutional, commercial and industrial activities. It covers waste from the food industry, retail industry, financial services, health services, hospitality, wood and paper production, distribution services, communication services and manufacturing. The most common materials in this waste stream are concrete, asphalt, brick, sand, soil and rubble, food waste and other organics, paper and cardboard, timber, metals and plastics. It may also include electronic and office equipment and materials from office refits.

In general, commercial and industrial wastes are collected and disposed of by commercial waste collectors under contract to individual businesses or premises. Operators of commercial and industrial premises determine the contractual requirements for waste disposal and to date, there has been little demand for widespread separating of materials for recycling. In some local government areas, the local government may provide a waste and recycling service to small-to-medium enterprises in a similar fashion to the household service.

From 2002–03 to 2006–07, there was a 52 per cent increase in the amount of commercial and industrial waste generated, with a 21 per cent increase in the amount disposed of to landfill and a 92 per cent increase in the amount recycled. If the trend continues, Australia is likely to have a commercial and industrial waste stream of 33.2 million tonnes in 2020.

Construction and demolition: In 2006–07, 15.6 million tonnes of construction and demolition waste were generated in Australia, of which 8.5 million tonnes (54.5 per cent) were recycled and 7.1 million tonnes (45.5 per cent) were disposed of to landfill.

Construction and demolition wastes are wastes arising from demolition and building activities, including road and rail construction and maintenance and excavation of land associated with construction activities. The most common materials in the construction and demolition waste stream are concrete, asphalt, brick and sand, soil and rubble, timber, metals and clean excavated materials. The construction and demolition waste stream also includes plastics, paints, polymers, coatings, foam, insulation, solvents and adhesives which may contain hazardous materials.

From 2002–03 to 2006–07, there was a 13 per cent increase in the amount of construction and demolition waste generated, with a 20 per cent increase in the amount disposed of to landfill and 9 per cent increase in the amount recycled. If this trend continues, Australia is likely to have a construction and demolition waste stream of 20.9 million tonnes in 2020.

Consultation question

12. What changes could be made to improve management of the municipal waste stream and those of the commercial and industrial sector and the construction and demolition sector?

8.5 Resource recovery

Resource recovery activities include recycling and the recovery of embodied energy from waste (ie waste to energy) as well as methane capture. Recycling is the common term used for collecting and processing used materials into new products and can take a number of forms including reprocessing and re-manufacture (ie disassembly and reuse of components). Waste to energy processes involve recovery of the embodied energy from waste, for example through burning waste as an alternative to other fuels (for example tyres and used oil as an alternative fuel in cement kilns). Methane is emitted from landfills and can be captured and used to generate electricity.

Since 1992 there has been a significant change in the pattern of waste management in Australia. In 1996-97 only around 1.5 million tonnes of waste were reported as being diverted from landfill, with 21.5 million tonnes going to landfill.²⁵ According to the Hyder Consulting report of 2008, of the 41.4 million tonnes generated, Australia now diverts around 20.5 million tonnes from landfill (around 49 per cent of all waste generated). If similar levels of diversion from landfill are maintained, as the amount of waste Australia generates grows, demand for recycling services, infrastructure and markets will grow. If the current trend continues roughly 40 million tonnes per year will be diverted from landfill by 2020–21.

Available information suggests that most of the waste that has been diverted from landfill was recycled. The amount of energy being recovered from waste is difficult to determine, in part because of differences in definition from jurisdiction to jurisdiction. For example, burning waste as part of making cement may be classed as waste disposal, not resource recovery. It is also worth noting, if comparing Australian recycling rates to those of other countries, particularly Europe, that incineration is frequently counted as resource recovery/recycling and that incineration is a common approach to waste management in other countries. For example, in Denmark 75 per cent of waste generated is diverted from landfill, including through incineration.

In Australia national strategies, combined with individual government and community actions, have led to increased recycling rates for a number of materials, including:

- Used oil recycling is regulated under the *Product Stewardship (Waste Oil) Act 2000*; 253 million litres of used oil were recycled in 2007–08,²⁶ up from 194 million litres in 2003.

²⁵ 8698.0 Waste Management Industry, Australia, 1996–97 www.abs.gov.au/AUSSTATS/

²⁶ <http://www.environment.gov.au/about/publications/annual-report/07-08/outcome1-human-settlements.html#pollution>

- The recycling rate for packaging was estimated at 56 per cent in 2007. The quantity going to landfill had decreased by about 23 per cent from 2003, despite increased generation of packaging waste.²⁷
- Newspaper publishers recycled 76 per cent of newsprint in 2007, a diversion of over 500,000 tonnes of paper from landfill. This world-class recycling rate has been made possible by investment such as a \$130 million newsprint recycling plant built in Albury–Wodonga which manufactures newspaper with a recycled content of between 20–55 per cent.²⁸

Market forces have also played a part in current resource recovery rates. Until very recently there has been strong demand for materials like metals, plastics, paper and cardboard, particularly from China.

In the municipal sector, since 1992 there has been substantial investment in kerbside collection services for recyclable materials, with increased collection frequency, systematic provision of collection containers, extensive community education campaigns and development of new markets for recycled materials. Over 90 per cent of households have access to kerbside recycling collection.²⁹ In regional areas, many local councils provide decentralised recycling stations for ratepayers who do not have access to kerbside recycling. Since 1999, some of these improvements have been driven by the National Packaging Covenant, and funded, in part by industry.

In 2006–07, the commercial and industrial sector and the construction and demolition sector diverted 55.5 and 54.5 per cent respectively of generated wastes from landfill. The materials most actively recovered included metals (ferrous and non-ferrous), paper and cardboard, and concrete/sand/brick/rubble. For materials like paper and cardboard, the recovery rates are comparable to the municipal sector. However, the volume of such waste materials generated and disposed of to landfill, particularly by the commercial and industrial sector, is larger than the volume handled by the municipal sector. The large volume of materials used by the commercial and industrial and the construction and demolition sectors means that the residual 13,506,000 tonnes of waste disposed of to landfill accounted for 65 per cent of Australia's total waste disposed to landfill in 2006–07. Unlike the municipal sector, within the other sectors there are significant differences in infrastructure, including collection services and recycling facilities, from place to place and industry to industry.

There may well be a role for improving information about waste as a resource in order to reduce business costs. For example, in the construction and demolition sector rubble from a demolition site may be useful as fill at another site and in the mining industry one miner's waste could form part of another miner's processing of raw materials, but none of these businesses may be aware that they have a mutual interest.

There may be opportunities to innovate in the resource recovery arena to gain efficiencies and add value to the economy, for example by using technologies to recover more recyclables from garbage, converting waste to energy and improving arrangements for recycling some materials in different sectors.

²⁷ www.packagingcovenant.org.au/documents/file/executive document final.pdf

²⁸ www.environment.news.com.au/html/newspaper_recycling.htm

²⁹ *National Packaging Covenant 2005–2010*, p.10

Government intervention, changes in community and business behaviour, and market forces have all played a part in the current pattern of resource recovery versus disposal of waste. In forming a view about future policy settings, there is a need to understand the opportunities available and the benefits and costs of maintaining or increasing recycling rates.

8.6 Disposal to landfill

In considering the future and given the potential for an increase in volume of waste to landfill, it is important to consider the composition and profile of what is going into landfill. It is also important to determine how effective current approaches will be in managing future waste streams and meeting the community's economic, social and environmental needs.

Landfill remains the main form of disposal of municipal and other waste in Australia. The nature of the waste stream has however changed dramatically since provision was made in the Health Acts of the early 20th century for disposal of household waste. At that time, such waste was predominantly organic in nature and was disposed of in open landfill usually at some distance from the population because of the odour and pests.

While organic waste is still a significant part of the waste stream (see Section 9), today waste comprises higher volumes of manufactured goods, materials and packaging that do not readily decompose or degrade into inert compounds. In addition waste is often contaminated with household chemicals or chemicals in plastics and other products. These materials may interact in landfill to form compounds that can be harmful to health and are mobile in water (such as many persistent organic pollutants). They need to be adequately contained to reduce the future risk to people and the environment.

The process of disposal is not as simple as depositing materials into landfill. It has a complex 'supply chain' for getting waste to disposal and recycling/recovery facilities. Increasingly, landfills are not just rubbish 'dumps', but carry out other functions, including separation of materials for recycling and energy generation from methane. The business models for waste disposal differ between sectors. A variety of technologies are used to make landfill safe and to sort materials.

Since 1992, there have been advances in waste disposal and landfill management with a move towards more stringent licensing conditions, better reporting and improved management practices based on better understanding of site geology and hydrology. A 2007 survey identified 446 landfill sites of which 185 had some form of liner, 259 were unlined and the status of lining was unspecified for two sites.³⁰ Unlined sites received 5.7 million tonnes of waste annually or 28 per cent of the total.³¹ Twenty-seven per cent of landfills employed leachate treatment.³²

Landfill liners have been subject to considerable research effort and technology development, for example geo-textile liners have been developed for hazardous wastes. Synthetic flexible membrane liners, in combination with a clay liner, are

³⁰ Hyder Consulting, *Waste and recycling in Australia*, November 2008, p.101, Table 8-2

³¹ Hyder Consulting, *Waste and recycling in Australia*, November 2008, p.102, Table 8-6

³² Hyder Consulting, *Waste and recycling in Australia*, November 2008, p.135, Table 10-1

considered ‘best practice’ technology, however there is still some debate about the life expectancy of these landfill liners. Liners are not subject to warranty and the expected life is around 10 to 25 years depending on installation, substrate and site geology.

There are intergenerational equity and risk issues to be considered when selecting, designing and managing landfills. Social and economic factors are also playing a role in location and design of landfill. Communities are becoming increasingly vocal on the matter of the location and construction of new landfill sites. For example, landfill is no longer allowed on the Swan River Plain in Western Australia as Perth relies on this aquifer for its potable water supply and finding suitable sites for Perth that are acceptable to local communities is a difficult task. The increasing distances to transport waste to remote locations and the encroachment of peri-urban sprawl on cities and towns will make landfills increasingly difficult to place. Cost is particularly important for rural local governments who have smaller ratepayer bases than major urban local governments. In some cases this may drive efficiencies where groups of rural local councils band together to purchase waste services and in others it means decisions on new landfills are deferred.

The cost of and difficulty in siting and managing new landfills and providing associated infrastructure is an important consideration for future waste management and resource recovery policy, for each state, territory and local government to work on. There may or may not be a greater role for national policy in addressing scientific, technological, social and economic challenges around landfill.

Differences between local and state and territory arrangements for waste management and differences in landfill pricing may affect resource recovery or generate perverse incentives to transport waste between regions or jurisdictions, resulting in increased greenhouse gas emissions and impacts on other infrastructure such as roads. This raises questions about whether a more coordinated approach can be achieved.

How materials are classified invokes a range of regulations with varying requirements for their handling and disposal. Definitions of what constitutes a waste or type of waste or even a waste facility vary across jurisdictions. These differences may:

- affect the national market for waste management and resource recovery
- have unintended consequences (for example differences in levies may result in waste being moved from one state to another, increasing greenhouse emissions)
- prevent the movement of certain materials to an appropriate facility, leading to stockpiling where building a hazardous waste disposal facility is not economic within a state
- make operating national businesses more complex.

Not all national actions can be scaled down to a local level, for example recycling in remote communities could be expensive and be beyond the capacity of the community to fund. Other environmental impacts such as increased greenhouse gas emissions through transporting materials long distances also need to be considered.

Consultation question

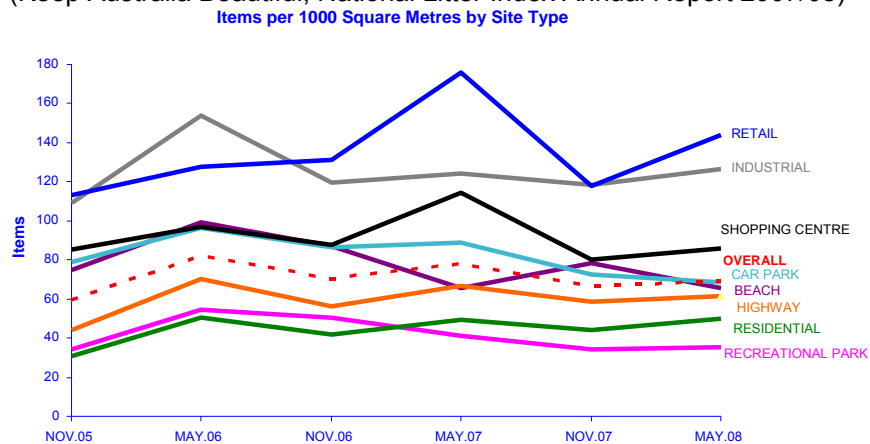
13. Landfill is currently the primary means of waste disposal. What, if any, changes need to be made to manage Australia's waste stream in the long term given current trends in the volume and nature of the waste?

8.7 Litter

A report to the Environment Protection and Heritage Council in 2008 indicated that a wide range of actions are being undertaken by government and non-government organisations to minimise the impacts of litter on the environment. Based on data from a range of sources, including the Keep Australia Beautiful National Litter Index, the Environment Protection and Heritage Council noted that national litter levels have been steady for at least the last three years and concluded that no additional national action on litter is required at this stage.

Figure 4: National litter levels 2005–2008

(Keep Australia Beautiful, National Litter Index Annual Report 2007/08)



9. Organic waste

This section explores the issue of organic waste in the context of its significant contribution to the waste stream and its role in contributing to greenhouse gas emissions from landfill. It touches on the impact of the Carbon Pollution Reduction Scheme on waste management and raises questions about what action could be taken to complement the scheme and reduce emissions from landfill.

Organic waste, in this context, is waste containing carbon compounds derived from plant and animal products. It includes garden and food organics, paper and cardboard, wood/timber, straw, manure, animal mortalities, oils, grease, sludges and paper pulp. Organic waste makes a significant contribution to the volume of waste generated in Australia. The National Greenhouse Energy Reporting (Measurement) Determination 2008 (Australian Government 2008) specifies that organic waste comprises 64 per cent of municipal waste, 78 per cent of commercial and industrial waste and 11 per cent of construction and demolition waste.

Table 4: Estimated amount of organic and other material disposed of to landfill, Australia, 2006–07

(Hyder Consulting 2008)

Waste stream	Municipal	Commercial & industrial	Construction & demolition	Total
Material	Tonnes			
Food	1,905,000	385,000	0	2,290,000
Paper and cardboard	1,905,000	3,528,000	213,000	5,646,000
Green organics	733,000	192,000	142,000	1,067,000
Wood	147,000	898,000	425,000	1,470,000
Other (non-organic)	2,637,000	1,411,000	6,311,000	10,359,000
Total	7,326,000	6,415,000	7,091,000	20,832,000

All figures have been rounded. Minor discrepancies may occur between the stated totals and the sums of the component items, as totals are calculated using the component item values prior to rounding.

Organic waste breaks down in landfill by anaerobic processes to form methane, a powerful greenhouse gas that is also odorous and highly flammable. The waste degradation process occurs slowly and methane emissions continue long after waste is placed in landfill. Estimates of greenhouse gas emissions in any year include a large component of emissions resulting from waste disposal over the preceding 50 years. This means that recent changes in waste management practices that might reduce emissions only impact reported methane emission levels over time.

In 2006 methane emissions from solid waste disposal in landfill were 13.2 Mt CO₂-e, representing 79.2 per cent of total emissions from the waste sector or 2.3 per cent of net national emissions.³³ This figure is expected to increase to 33.4 Mt CO₂-e by 2020 (a 90 per cent increase over 1990 levels).³⁴ This highlights the importance of methane capture, which has increased significantly from a negligible amount in 1990 to 4.6 Mt CO₂-e in 2006 as well as organic waste diversion measures. Methane

³³ Department of Climate Change, *National Greenhouse Gas Inventory 2006*

³⁴ Department of Climate Change, *Waste sector greenhouse gas emissions projections 2007*

emissions from landfill will be subject to the Carbon Pollution Reduction Scheme and monitoring will be required as part of that scheme.

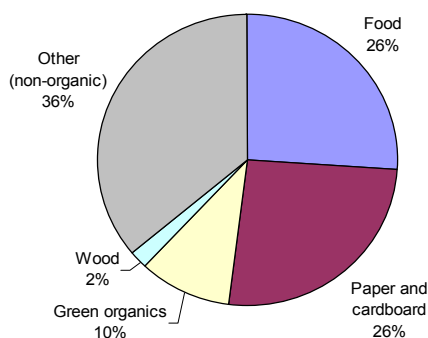
The design of the Carbon Pollution Reduction Scheme (www.climatechange.gov.au/whitepaper/index.html) was released in December 2008. According to the White Paper, the policy position for the treatment of emissions from landfill is that:

In general, the Scheme will cover landfill facilities that emit 25,000 tonnes or more of carbon dioxide equivalent a year. However, to avoid waste displacement from covered to uncovered sites, a lower participation threshold of 10,000 or more of carbon dioxide equivalent a year will apply to landfill facilities that are operating in proximity to another operating landfill facility (within a distance to be determined). This participation threshold will return to 25,000 tonnes or more of carbon dioxide equivalent a year, 10 years after the site closes.

Some forms of organic waste are already being diverted from landfill. All states recycle paper and cardboard from the municipal waste stream with an estimated 940,000 tonnes recycled in 2006–07. Not all states collect data on paper and cardboard recycling from the commercial and industrial waste sector. An estimated 863,000 tonnes were recycled in Victoria, South Australia, Western Australia and the Australian Capital Territory in 2006–07. In all these jurisdictions, a landfill levy provides a financial incentive for the diversion of this waste and other waste from landfill.

Figure 5: Estimated breakdown of the municipal waste stream

(Hyder Consulting 2008)



A substantial proportion of the commercial and industrial sector waste stream is organic waste. Of the ‘waste sectors’, comparatively large amounts of paper and cardboard go to landfill from the commercial and industrial sector (for example 3.5 million tonnes compared with the municipal sector’s 1.9 million tonnes).

The Review of National Packaging Covenant Projects by Covec (August 2008) estimated that diverting around 172,000 tonnes of paper and cardboard waste from landfill to recycling will give a reduction in landfill emissions of 20,600 tonnes of methane or 433,000 tonnes of CO₂ equivalents per year. The Australian Council of

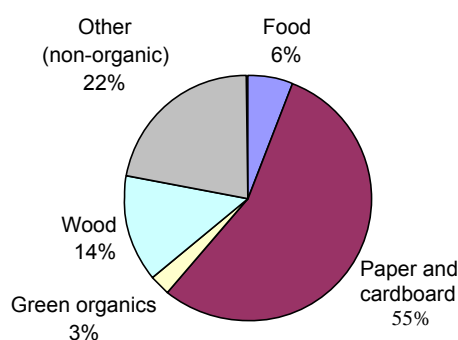
Recyclers³⁵ indicated that paper and cardboard recycling produces a saving of 1,215,448 tonnes of CO₂ equivalents per year, the equivalent of removing 249,323 cars from the road.

Given there is existing capacity in Australia to recycle paper and cardboard, there may be opportunities to divert more paper and cardboard from the commercial and industrial sector and from the municipal sector, to avoid methane generation.

All states recycle garden and landscaping waste, to a greater or lesser degree, mostly in the municipal sector. There is limited waste collection of food in any of the sectors, and the infrastructure for collecting food waste so that it can be diverted from landfill is relatively undeveloped when compared to other resource recovery activities. Some households compost organic waste although the Australian Bureau of Statistics 2006 data suggest that this practice is declining. In 1996, 54 per cent of households composted material, declining to 46 per cent in 2006. This may relate to changes to housing, with the increase in high density living and reduction in block size during the period.

Figure 6: Estimated breakdown of the commercial and industrial waste stream

(Hyder Consulting 2008)



The introduction of the Carbon Pollution Reduction Scheme is expected to provide incentives to stimulate measures to reduce methane production from waste. The Carbon Pollution Reduction Scheme White Paper states:

The Scheme will encourage resource recovery because the alternative—sending waste to landfill—will become more expensive once pollution permits are required for emissions from waste landfill facilities.

³⁵ Australian Council of Recyclers, *Australian recycling values - a net benefits assessment*, 2008, p.iv

However, the uptake or realisation of such measures will depend on, among other things, management practices at landfills, the uptake of organic recycling infrastructure and assessments of suitable technologies.

Increased diversion from landfill would place pressure on existing infrastructure and markets for diverted organics (primarily compost at this stage). Consideration may need to be given to policies that facilitate the innovative use of organic materials. These could include improving standards for compost and composting facilities, encouraging more sophisticated technology and examining the merits of using organics more in waste to energy facilities.

Consultation question

14. Reducing the amount of organic waste sent to landfill has the potential to contribute to reducing greenhouse gas emissions as well as other potential environmental and economic benefits. What are the benefits and opportunities, costs and disadvantages, of increased diversion and/or recycling of organic wastes?

10. Electronic waste

This section explores the issue of electronic and electrical waste (e-waste) and its management as a growing part of the waste stream.

Electronic waste or e-waste is discarded electronic or electrical equipment. It typically includes televisions, video and DVD players, stereos, mobile phones, computers, photocopiers, fax machines, printers as well as cartridges, batteries and peripheral devices associated with the equipment. E-waste consists predominantly of metals and plastics with some components having an economic value if recycled and some containing hazardous substances (which may also be valuable) (see Table 5).

There is some community concern with the practice of landfilling electrical and electronic waste (e-waste). This may be because such waste contains hazardous substances, but also because of the relatively short life of these products, the desire not to waste the resources embodied in the waste, and the increasing volume going to landfill.

Table 5: Key materials in electrical and electronic equipment

Component	Equipment	Substances of concern	Recyclable materials
Cathode ray tube	Personal computer monitor, television	Lead, antimony, mercury, phosphors	Mercury
Glass screens	Computer monitors, televisions, microwaves	Lead	
Liquid crystal display	Notebook, laptop, mobile phone, some desktop computers	Mercury	Mercury
Circuit board	Telephone, personal computer, notebook, laptop, television, radio, audio amplifier, CD/DVD player, handheld games machines, mobile phones	Lead, beryllium, antimony, Brominated flame retardants, cadmium, arsenic	Gold Silver Palladium
Batteries	Telephone, personal computer, laptop, mobile phone, handheld games machines	Lead, lithium, cadmium, mercury	Cadmium Cobalt Nickel Mercury
Power or external cables	Most electronic and electrical equipment	Phthalates	Copper
Plastic housing	Most electronic and electrical equipment	Brominated flame retardants	PVC

(Based on *WEEE and Hazardous Waste, A report for DEFRA*, March 2004 by AEA Technology. The report defines WEEE as waste from electrical and electronic equipment. DEFRA is the United Kingdom Department for Environment, Food and Rural Affairs.)

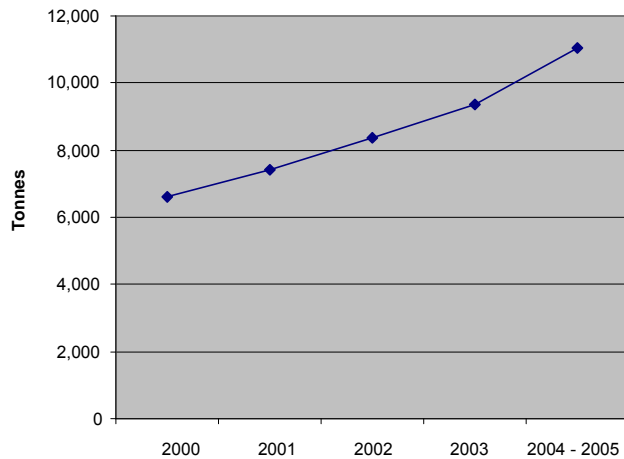
E-waste is a growing component of the waste stream. In 2005 an estimated 697,000 tonnes of electronic equipment was consumed with approximately 312,930 tonnes of electronic equipment disposed of to landfill.³⁶ It is estimated that approximately

³⁶ Hyder Consulting, *Waste recycling in Australia*, November 2008, p.68

570,900 computers are disposed of annually in Australia, with only a quarter being recycled. Current annual disposal of televisions is around 350,000 units.

Figure 7: TVs landfilled 2000–2005

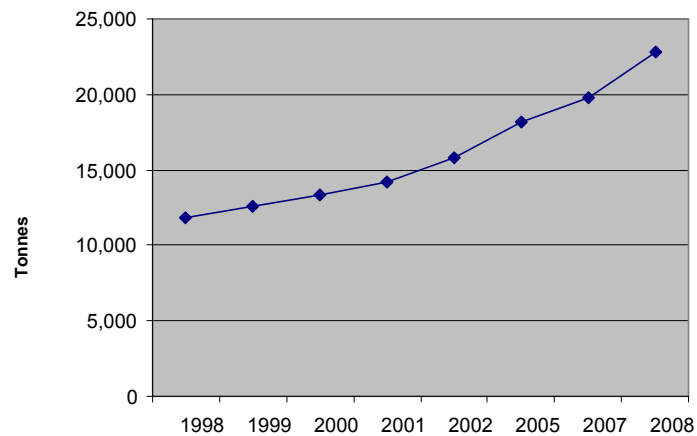
(Hyder Consulting, 2008)



Data for the years 2004 and 2005 is only available in aggregated format.

Figure 8: Computers landfilled 1998–2008

(Hyder Consulting, 2008)



In 2007–08 approximately 8.87 million mobile phone units were imported into Australia, an increase of 1.48 million from 2006–07 (7.39 million).³⁷ For televisions, Hyder Consulting reported an 18 per cent increase in sales from 2003 to 2004.³⁸ An estimated 3.5 million computers were purchased in Australia in 2005, including units that were assembled locally from imported parts.³⁹

³⁷ *Mobile Muster 2007–08 Annual Report*, p.6

³⁸ Hyder Consulting, *Waste recycling in Australia*, November 2008 p.53 and 54

³⁹ Hyder Consulting, *Waste recycling in Australia*, November 2008, p.49

The rapid growth in e-waste is driven by factors including consumer demand to have the latest equipment, the need to upgrade systems to accommodate new software, the rate of technological change, the short lifespan and technical obsolescence of the equipment and increasing affordability.

There are limited options for the public to recycle domestic e-waste. Most e-waste is disposed of to landfill, while the cost for recycling of e-waste is carried primarily by those consumers who take the initiative to recycle their computers through a recycling centre. The potential long-term costs arising from landfilled e-waste, including health and environmental costs from the possible leaching of contaminants from e-waste into the environment, are likely to be carried by the community.

A number of computer recyclers operate in Australia, some offer pick-up services and the majority charge a fee for recycling. Some local councils hold collection days for end-of-life computer equipment and either stock pile the waste or send it to recyclers. There are a number of voluntary initiatives for recycling e-waste, including recycling mobile phones through Mobile Muster (www.mobilemuster.com.au), Cartridges for Planet Ark (www.cartridges.planetark.org) and the computer industry and Victorian Government partnership to run the Byteback computer recycling scheme (www.bytebackaustralia.com.au/).

Currently the Australian Capital Territory is the only state or territory to have regulation governing the domestic management of e-waste, placing a levy on the disposal of televisions and computers at landfill sites. South Australia is in the process of consulting on legislation to ban computer monitors and televisions from landfills, with a ban on all other electrical or electronic equipment within three years. The New South Wales Government has also identified computers, televisions, mobile phones and “other electricals” as “wastes of concern” and is investigating product stewardship arrangements.

The Environment Protection and Heritage Council is examining options to deal with end-of-life televisions and computers. Among the options are proposals from both the television and computer industries for product stewardship schemes. The industry-proposed product stewardship schemes would place a charge on eligible new product that would then be used to pay for recycling at the end of its life (an advance recycling fee).

Consultation question

15. What, if any, changes are needed to provide a national approach to the way e-waste is managed?

11. Waste, climate change and sustainability

This section explores the potential for a national waste policy to contribute to other national agendas including climate change and sustainability.

Collecting and using recycled materials can have environmental benefits including greenhouse, energy and water savings. As with all policy approaches, recycling and other resource recovery activities should be evaluated to ensure that they do deliver appropriate environmental benefits and do not lead to perverse outcomes.

Over and above reducing methane emissions from landfill, material published by the recycling industry in the course of Australian Government consultation on the Carbon Pollution Reduction Scheme suggests that there are opportunities for resource recovery activities to have a positive impact on emissions, helping Australia to meet greenhouse gas abatement targets, and to also reduce energy and water use. For example, when a recovered material is utilised, it may avoid the need to use virgin material, saving the energy and other inputs used to extract and refine the virgin resource.

The Australian Council of Recyclers⁴⁰ estimates that in 2006 recycling commodity materials in Australia contributed a total greenhouse benefit of over 8.8 million tonnes of CO₂ equivalent and saved 202 TJ of energy and 92 GL of water. The Australian Council of Recyclers also estimates the equivalent of three million trees, 365,000 tonnes of sand, four million tonnes of iron ore and 1.6 million tonnes of bauxite were saved through these reprocessing activities. Benefits associated with specific resource recovery streams are set out in Table 6.

Table 6: Benefits associated with specific resource recovery streams

Material type	Greenhouse savings (t CO _{2-e} /yr)	Energy savings (TJ)	Water savings (ML)	Resource conservation (mass of resource in tonne equivalents)
Paper and cardboard	1,215,448	37,474,585	33,223,	2,992,212
Glass	524,064	1,209,115	1,078	364,670
Ferrous	2,107,031	104,958,763	-13,727	4,153,948
Aluminium	4,933,503	54,971,726	73,018	1,555,134
PET	40,808	1,454,170	-845	60,548
HDPE	22,164	1,980,677	-1,126	91,129
Total	8,843,019	202,049,035	91,622	

PET = Polyethylene terephthalate

HDPE = High density polyethylene

⁴⁰ Australian Council of Recyclers, *Australian recycling benefits: a net benefits assessment*, July 2008

Example: Aluminium can be recycled over and over again without loss of properties. Recycling aluminium has considerable benefits in terms of conserving energy and natural resources. Recycling saves up to 95 per cent of the energy required for primary aluminium production,⁴¹ making it highly economic to recycle. These energy savings also mean a reduction in greenhouse gas emissions. It is estimated that aluminium recycling accounts for over half of the 8.8 million tonnes of CO₂ greenhouse savings generated by the recycling sector each year in Australia and is equivalent to taking more than one million cars off the road.⁴²

At the household level, the New South Wales Department of Environment and Conservation⁴³ estimated that a typical household that participated in kerbside recycling and recycled 3.76 kilograms per week (net) is:

- equivalent to avoiding 50 per cent of the greenhouse gas emissions of the electricity used for lighting their home or 40 per cent of the electricity used for their cooking
- saving 928 KWh of electricity per year, equivalent to 15 per cent of a typical household's total electricity consumption for a whole year
- saving 3,075 litres of water per year, equivalent to the average water consumption of one person for 12 days.

Given the evident potential for resource recovery to contribute to sustainability outcomes, a national waste policy may be able to contribute not just to the better management of waste, but also to improving Australia's overall sustainability.

Consultation questions

16. The Carbon Pollution Reduction Scheme will apply to emissions from landfill. Are there related approaches that would complement the scheme and thus contribute to meeting the emissions targets and the timeframes set in the Australian Government's climate change policy?

17. What are the opportunities to reduce water and energy use through the way waste is managed?

⁴¹ Australian Aluminium Council, Fact sheet, January 2006 at www.aluminium.org.au/Page.php?d=1115

⁴² Australian Council of Recyclers, *Australian recycling values: a net benefits assessment*, 2008

⁴³ Department of Environment and Conservation, *Benefits of recycling*

12. Waste and the economy

This section explores the contribution made by waste management and resource recovery to the economy and the influence of market conditions on how waste is managed. It raises the issue of market impediments, and what impact ways of regulating waste may have on business. It also explores what opportunities there might be to add value to the economy through different business models, innovation and technology.

In 2006 around the same tonnage of waste was diverted from landfill as was placed in landfill. Based on the available data, the resource recovery sector's contribution to the economy is significantly larger than that of the waste management sector. In 2002–03 waste management, not including the resource recovery sector, contributed 0.2 per cent to Australian Gross Domestic Product and had an industry value of \$1.3 billion. Over 14,000 people were employed in 1,092 public and private businesses; 74 per cent of all businesses were small enterprises employing up to four people.⁴⁴ The Australian recycling industry is estimated to have contributed \$11.5 billion to the economy in 2006 or 1.2 per cent of Australia's Gross Domestic Product. It directly employed 10,900 people and indirectly employed another 27,700.⁴⁵

Some of the differences arise because treating a waste as a resource results in the creation of new businesses that haul, process and broker recovered materials, as well as companies that manufacture and distribute products made with these recycled materials. The jobs created by resource recovery businesses draw from the full spectrum of the labour market, ranging from low-skilled to highly skilled positions. Materials sorters, dispatchers, truck drivers, brokers, sales representatives, engineers and chemists are just some of the people employed in the recycling industry.

A shift away from viewing waste as 'an unusable or unwanted substance' to viewing waste as a resource may offer opportunities for the Australian economy, as well as social and environmental benefits. While facing similar challenges to the rest of the economy during the current economic downturn, the resource recovery sector also has the potential to make a greater contribution to economic growth and job creation, complementing the actions of Australian governments to support jobs and investment in future long-term economic growth. There are considerable volumes of recoverable materials still being landfilled and there has been only limited use in Australia of innovative approaches such as 'waste to energy'. While requiring more in-depth analysis to determine the costs and benefits of such an assumption, on face value the amount contributed to the economy by the resource recovery sector using 49 per cent of Australia's waste as a resource is roughly six times more than the value added to the Gross Domestic Product by landfilling 51 per cent of waste.

The 2009 economic downturn is likely to affect the viability of some businesses in the resource recovery sector, as in other resource sectors, and have a flow-on impact on waste management. Demand and prices for raw materials, including from recycled materials, are falling internationally. As a consequence there are widespread reports of increased stockpiling of paper, cardboard, plastics and other recycled materials

⁴⁴ Waste Management Services, Australia, Australian Bureau of Statistics, *Report No. 8698.0, 2002–03*

⁴⁵ Australian Council of Recyclers, *Australian recycling values: a net benefits assessment, 2008*

across the world (for example in New Zealand, Canada, the United States, the United Kingdom and China).

Australia's market for recovered materials is relatively small and many of the resources recovered are exported, particularly to China. Some parts of the sector may be affected to a greater degree than others, with consequent reduction in employment. For example, the low price of oil means that producing certain plastics from virgin materials is currently cheaper than using recycled materials, thus reducing the price and profitability of recycled plastics. Metal recycling is affected by reduced demand and therefore lower prices in similar ways to the mining industry. The challenge for the recycling sector is that while a mine can reduce production, the waste and recycling sectors do not control the amount of waste generated. The short-term impact on the sector may be a movement of waste away from recycling and towards landfill, creating challenges for landfill managers and unexpected costs for both resource recovery and waste management businesses.

However, for some materials Australia is less reliant than other countries on exports. For example, lower production in China may mean less demand for packaging and therefore waste cardboard/paper, but Australia is less reliant than other developed countries on exports of waste cardboard/paper and this may cushion some of the impact on this segment of the industry. Anecdotally, larger and vertically integrated firms, with local processing and manufacturing capacity, appear better able to respond to changing market circumstances.

Short term market change in the waste management and resource recovery sector may have implications for Australia's capacity to manage its growing waste stream in the future. This raises questions about how future waste policy should be formulated to facilitate the expansion of the resource recovery sector. Are current business models utilised by the resource recovery sector in Australia sufficiently robust and adaptable to changing economic circumstances and are there examples of best practice in innovation and technology that would not only provide economic benefits to this sector, but also address social and environmental objectives?

Broader than the direct contribution of the waste sector to the economy is the question of how waste markets and waste regulation indirectly affect businesses and individuals. Generally waste disposal is dealt with through rates paid by the community or in the commercial and industrial and the construction and demolition sectors by paying for the removal of waste and/or through landfill levies. Hence all members of the community carry the cost of disposal, not just the individual who purchases a specific product.

A key challenge for the future is to determine how the full environmental costs of managing waste might appropriately be factored into the supply chain for goods and services. If this were to occur at the beginning of the production chain, it could influence product design, the hazardous content of materials and components, manufacturing processes, packaging, transport and end-of-life disposal. It could also encourage easy disassembly of components for future reuse. In this way the broader community would not pay for benefits (the collection and disposal of particular product waste) that accrue to a small number of players (such as the manufacturer and their customers).

Like many sectors of the Australian economy, the waste management and resource recovery industry's ability to generate strong productivity gains into the future relies on its capacity to innovate, remain viable through market peaks and troughs, take up opportunities to upskill workforces, engage collaboratively with customers, create new markets and transform ideas into goods and services. There may be opportunities in this sector through adopting different approaches and different business models to overcome market impediments and create new jobs.

The use of new technology and new business approaches may also address some of the future challenges raised in earlier sections of this paper. It is conceivable from the experience in some European countries that with the application of different technology to waste management Australia might address the concerns of the community about waste (and some resource recovery) facilities. As governance and approaches to managing waste streams change, industry may be able to offer solutions that not only manage waste, but add value to it, for example to organic waste diverted from landfill as a result of the Carbon Pollution Reduction Scheme.

Consultation questions

18. In what ways can waste management and resource recovery (including recycling, re-processing, re-manufacturing) industries add further value to the economy and create employment?

13. Conclusion

The purpose of developing a new national waste policy is to identify best practice in waste management and resource recovery and to ensure that Australia has the right mix of incentives and regulation to achieve environmental, economic and community benefits. The Australian Government, with the support of the Environment Protection and Heritage Council, is seeking to develop a coherent, efficient and environmentally responsible waste management policy for Australia.

This commitment is consistent with the 1992 agreement reached by COAG to develop a strategic approach to waste management:

“In order to develop an effective approach, governments will seek to develop an integrated approach to waste prevention and minimisation, based on a hierarchy of measures at both the government and industry level. These measures will include actions to achieve cleaner production, reduced use of resources, recycling and reuse. In addition, attempts will be made to develop a common approach to waste management programs between various jurisdictions.”

Since 1992 all Australian governments have introduced legislative and policy instruments for waste management and resource recovery which contribute to the objectives of the National Strategy for Ecologically Sustainable Development. Many state and territory governments are now reviewing their waste policies and all jurisdictions are being invited to contribute their experience and ideas to the development of an effective national waste policy.

The need to address climate change and sustainability issues, such as conserving our water resources, has become pressing. The global economic downturn is impacting the Australian economy, including the waste management and resource recovery sectors. The development of a national waste policy presents an opportunity for the Australian Government to work with state and territory governments, industry, the community and other key stakeholders to develop a policy framework that will stimulate economic activity and innovation in the waste and resource recovery sectors, and foster synergies between good environmental outcomes, job creation and Australia's long term economic growth.

The national waste policy will therefore seek to provide environmental, social and economic benefits to the Australian community by complementing action by the Australian Government. In achieving these goals, the national waste policy will take into account relevant Council of Australian Government (COAG) agreements such as the National Partnership Agreement to Deliver a Seamless National Economy.

Notwithstanding the considerable efforts of governments, community groups, business and individuals, the fact remains that the amount of waste going to landfill is growing, and the content of the waste stream is changing. There is clearly a need to deal more effectively with Australia's waste. In particular, the Government invites submissions in response to this Consultation Paper regarding how waste policies can be developed to open up economic opportunities while at the same time generating environmental and other social benefits.

Extract from the National Strategy for Ecologically Sustainable Development

The strategy was prepared by the Ecologically Sustainable Development Steering Committee and was endorsed by the Council of Australian Governments in December 1992.

Waste Minimisation and Management, Part 3 Intersectoral Issues, Chapter 19

Challenge

To improve the efficiency with which resources are used and reduce the impact on the environment of waste disposal, and to improve the management of hazardous wastes, avoid their generation and address clean-up issues.

Strategic approach

In order to develop an effective approach, governments will seek to develop an integrated approach to waste prevention and minimisation, based on a hierarchy of measures at both the government and industry level. These measures will include actions to achieve cleaner production, reduced use of resources, recycling and reuse. In addition, attempts will be made to develop a common approach to waste management programs between various jurisdictions.

Objective 19.1

- *to improve the efficiency of resource use and reduce the impact on the environment of waste disposal*

Governments will:

- seek to develop improved means for providing support for local councils for increased recycling activity including kerbside recycling collections, and planning and operation of landfill disposal sites
- work towards introduction of pricing and charging structures which adequately reflect the full economic and environmental costs of waste disposal, while assisting the funding of rehabilitation and maintenance of facilities for waste disposal
- work to ensure the costs associated with changing waste management practices does not fall disproportionately on industry and local authorities
- encourage greater levels of involvement by industry in recycling activities and recognise the contribution already being made by industry in this area
- have regard to the principles and recommendations in the National Waste Minimisation and Recycling Strategy and the Industry Commission's report on recycling
- provide further support for the development of whole-life-cycle methodologies and a methodology for full social cost pricing of landfill and waste disposal facilities, taking into account social equity considerations in charges for waste disposal
- develop methodologies for the evaluation and assessment of the costs and benefits of various options for waste minimisation
- develop indicative targets for waste reduction

- at the Commonwealth level, continue work on development of a national pollutant inventory

Objective 19.2

- ***to avoid the generation of hazardous wastes, improve management of those wastes which are generated and improve mechanisms for their clean up***

Governments will:

- assess recommendations on the range of technologies available for the destruction of intractable wastes and decide on the preferred options, and appropriate regulatory and legislative mechanisms for the control of intractable wastes
- cooperatively work towards early finalisation and adoption of a national approach to regulation of intractable wastes and a memorandum of understanding for their management
- undertake a siting study to identify a short list of suitable sites for a repository of low-level radioactive wastes
- have regard to the guidelines for the Assessment and Management of Contaminated Sites
- through ANZECC 46, give further consideration to the issue of liability for clean-up of contaminated sites, including the issue of generating a public register of contaminated sites.

⁴⁶ Australian and New Zealand Environment and Conservation Council, a ministerial council operating between 1991 and 2001. In 2001 natural resource management matters were moved to the [Natural Resource Management Ministerial Council](#) and environment protection matters to the Environment Protection and Heritage Council.

Summary of state and territory waste management and resource recovery measures

New South Wales

Legislation: *The Protection of the Environment Operations Act 1997* provides for setting environmental standards, goals, protocols and guidelines. Licensed waste facilities pay a waste and environment levy, which increases annually, on all waste they receive. The levy works as an economic incentive to reduce waste disposal and to support resource recovery and alternate waste technologies. *Waste Avoidance and Resource Recovery Act 2001* requires the development of a NSW waste avoidance and resource recovery strategy. The Act also establishes a framework for extended producer responsibility schemes for industry. *Environmentally Hazardous Chemicals Act 1985* establishes a Committee to advise the Environment Protection Authority, which may declare substances to be chemical wastes under the Act and issue chemical control orders to regulate relevant activities.

Existing policy and other economic instruments: The Waste Avoidance and Resource Recovery Strategy aims to maximise the conservation of natural resources by avoiding waste and minimising environmental harm from waste management and disposal of solid waste. The strategy includes targets for waste reduction and diversion and focuses on preventing and avoiding waste, increasing recovery and use of secondary materials, reducing toxicity in products and materials and reducing litter and illegal dumping. The NSW Government Sustainability Policy (2008) sets new targets for resource use, disposal and procurement across energy, water and waste. The Waste Reduction and Purchasing Policy requires all NSW government agencies and corporations to develop and implement a plan for reducing waste and increasing the purchase of products with recycled content and report on their performance every two years (three years for small agencies). Resource Recovery Exemptions, introduced in 2008, enable the NSW Government to exempt certain waste-derived materials from the waste regulatory system (i.e. licensing & waste levy) where they are able to be reused and do not cause harm to the environment or human health. Exempt wastes can be applied to land or used as alternative raw materials or fuel. The Greenhouse Gas Abatement Scheme provides incentives for smaller landfill sites to capture landfill gas for generating electricity and for projects that divert putrescible waste from landfill for electricity.

Policy under development: Nil.

Landfill levies: Currently \$46.70 per tonne in Sydney Metropolitan Area, \$40 per tonne in Extended Regulated Area (Hunter, Central Coast and Illawarra). In 2008, the government legislated to increase the levy (in both regions) by \$10 per tonne pa (plus CPI) from 1 July 2009 until 2015-16. The levy has been extended to cover Wollondilly and Blue Mountains local government areas, and coastal local government areas from the Hunter to the Queensland border. A levy on traceable liquid wastes (currently \$46.70 per tonne) will also apply in this period.

Targets

- Stabilise waste generation for the period 2003–2008
- By 2014 increase the recovery and use of secondary materials in the municipal, commercial and industrial and construction and demolition sectors from 26 per cent to 66 per cent, 28 to 63 per cent and 65 to 76 per cent respectively compared to 2000 levels
- By 2014 or earlier, phase out priority toxic substances in identified products, or if not possible, achieve maximum recovery for reuse
- Reduce the total annual amount of litter and the total tonnages of illegally dumped items reported by regulatory agencies and squads.

Product stewardship: *The Waste Avoidance and Recovery Act* provides for the introduction of extended producer responsibility schemes in NSW. The Act sets a statutory requirement that the Director General of Department of Environment and Climate Change publishes an annual EPR Priority Statement. In the 2007 Priority Statement lightweight plastic bags, tyres, televisions and computers were listed.

Victoria

Legislation: *The Environment Protection Act 1970* regulates the discharge or emission of waste to water, land or air by a system of works approvals and licences; provides for state environment protection policies that set out acceptable environmental quality standards and conditions for discharging waste; allows for the development of industrial waste management policies; and establishes a range of enforcement actions. The Environment Protection (Distribution of Landfill Levy) Regulations 2002 regulate the distribution of landfill levy funds towards landfill monitoring and supervision, waste minimisation, community and industry engagement programs, the provision of infrastructure, and regional waste management planning and administration, with the balance allocated to the Sustainability Fund.

Existing policy and other economic instruments: Waste Management Policy (Siting, Design and Management of Landfills) provides best practice guidance and creates the head of power for landfill bans. Towards Zero Waste Strategy seeks to reduce waste generation and increase resource recovery in Victoria through targets approaching 2014. The strategy outlines the priority materials and products for each waste sector and establishes a range of targets for solid waste reduction, reuse, recycling and/or energy generation and littering levels by 2014. The Metropolitan Waste and Resource Recovery Strategic Plan provides a long-term plan for the management and reduction of waste in Melbourne.

Policy under development: Nil.

Landfill levies and bans: Since 1 July 2007 levies for Melbourne are \$9 and \$15 per tonne for municipal and industrial waste. Outside Melbourne, levies are \$7 and \$13 per tonne for municipal and industrial waste. Landfill bans apply to automotive batteries, whole tyres and some other wastes.

Targets

- A reduction by 1.5 million tonnes in the projected quantity of solid waste generated by 2014.
- 75 per cent by weight of solid waste recovered for reuse, recycling and/or energy generation by 2014.

- Municipal waste: 45 per cent recovery rate (by weight) by 2008–09 and 65 per cent rate by 2014.
 - Commercial and industrial waste: 65 per cent recovery rate (by weight) by 2008–09 and 80 per cent by 2014.
 - Construction and demolition waste: 65 per cent recovery rate (by weight) by 2008–09 and 80 per cent by 2014.
 - All solid waste streams: 60 per cent recovery rate (by weight) by 2008–09 and 75 per cent by 2014.
 - A 25 per cent improvement, from 2003 levels, in littering behaviours by 2014.
- Product stewardship:** Joint industry and government initiatives including: Batteryback, a free recycling service via containers in some retail stores for rechargeable batteries; Byteback, permanent collection locations to enable households and small business owners to safely dispose of computer equipment for recycling; and Paintback, through which consumers can return unwanted paint and packaging to retail locations for recycling.

Queensland

Legislation: Waste in Queensland is currently regulated by the *Environmental Protection Act 1994*, the *Environmental Protection Regulation 2008* and the *Environmental Protection (Waste Management) Policy 2000*. The policy establishes a preferred waste management hierarchy and principles for achieving good waste management. The Waste regulations give legislative support to various national guidelines, plans and Australian Standards, while the Environmental Protection Regulation provides the ability to licence and apply conditions of operation to certain activities (Environmentally Relevant Activities), including transfer stations, regulated waste treatment facilities and waste disposal facilities. Waste legislation in Queensland is administered by the Environmental Protection Agency, the lead agency for waste-related issues in Queensland.

Existing policy and other economic instruments: The Waste Management Strategy for Queensland 1996 aims to minimise or avoid impacts on the environment due to waste whilst allowing for economic growth. State Procurement Policy requires government agencies to integrate the principles and practices of sustainability into the procurement of goods, services and construction. The policy outlines sustainable procurement and encourages the purchase of environmentally preferable goods and services as a key activity. The Whole-of-Government Recycling Policy for Buildings and Civil Infrastructure ensures practical and cost-effective opportunities for recycling and reuse of construction materials used in building and civil infrastructure projects are implemented. The policy applies to all Queensland Government agencies and corporations that are responsible for the management of government buildings and infrastructure. The policy introduces a non-mandatory recycling target of 40 per cent for building and infrastructure projects for an initial two year period.

Policy under development: In October 2007, the discussion paper *Let's Not Waste Our Future* was released to seek public input into the development of a new waste strategy and waste reform for Queensland. Issues discussed in the discussion paper included the application of a price signal to waste disposal, such as a waste disposal levy, separate waste and resource efficiency legislation, waste avoidance and recycling targets and the development of a new strategy.

Landfill levies and bans: Queensland does not have a landfill levy or legislated landfill bans. Queensland has an operational policy that places a limit on the disposal of whole tyres to new landfills. Landfill licence conditions may also impose waste acceptance criteria on a facility and some landfill operators use increased disposal charges to limit certain problematic wastes from disposed to that facility.

Targets: Nil.

Product stewardship: Nil.

Western Australia

Legislation: The *Environmental Protection Act 1986* and its associated regulations establish a licensing framework which covers a variety of waste facilities. The *Waste Avoidance and Resource Recovery Act 2007* and its associated regulations establish the Waste Authority whose key responsibility is the development of a long-term waste management strategy for Western Australia to improve waste services, to avoid generating waste and to set targets for resource recovery. The *Waste Avoidance and Resource Recovery Levy Act 2007* establishes the power to prescribe a levy that is to be payable in respect of waste received at disposal premises. The levy revenue is used to fund waste management initiatives through the Waste Avoidance and Resource Recovery Account.

Existing policy and other economic instruments: The 2004 Statement of Strategic Direction for Waste Management in Western Australia sets out a goal of zero waste and adopts principles for waste management which include the prevention of waste, the efficient recovery of wastes and the responsible management of waste for the environment.

Policy under development: The first State Waste Strategy created under the *Waste Avoidance and Resource Recovery Act 2007* is anticipated to be completed in the second half of 2009.

Landfill levies and bans: Landfill levies for putrescibles are \$7 per tonne for 2008–09, \$8 per tonne for 2009–10 and \$9 per tonne for 2010–11. For inert materials, the levy is \$3 per tonne for 2008–09 with the Waste Authority recommending increases to \$7 per tonne for 2009–10 and \$9 per tonne for 2010–11. There are no landfill bans in place.

Targets: Nil.

Product stewardship: In June 2005 the Western Australian Government released an Extended Producer Responsibility Policy Statement which aims to shift the focus from end of life waste management to front end interventions, waste avoidance and resource efficiency.

South Australia

Legislation: The *Environment Protection Act 1993* (as amended in 1996) includes a waste levy which is collected from licensed waste depot holders. Half of the revenue collected from the levy goes to the Waste to Resources Fund which is used to finance waste management and minimisation initiatives. The Act also continues Australia's first regulated container deposit scheme where a 10 cent charge is incorporated into the sale of some beverages and redeemed when the beverage container is returned to a collection depot. *Zero Waste SA Act 2004* provides for half of the revenue collected from the landfill levy to be used to finance waste management and minimisation initiatives. The *Plastic Shopping Bags (Waste Avoidance) Act 2008* requires free

lightweight plastic bags to be phased out in South Australia from 1 January until 4 May 2009 when the bag ban will be fully enforced (biodegradable bags are exempt).

Existing policy and other economic instruments: The Waste Strategy 2005–2010 aims to foster sustainable behaviour, redirect waste from landfill, establish systems and infrastructure to support waste management, enact policies to assist waste management and encourage cooperation between stakeholders. The strategy also sets material and recycling targets for different waste streams.

Policy under development: The Environment Protection (Waste to Resources) Policy is currently under development. It will require waste from metropolitan Adelaide to be taken to resource recovery facilities prior to disposal at landfill and ban a variety of wastes from landfill. It will also provide improved enforcement options for dealing with the unlawful disposal of waste (including illegal dumping and inappropriate stockpiling of wastes), the safe management, handling and disposal of various waste types, and will require a transparent and consistent approach to the assessment of waste and resource recovery facilities. The Environment Protection Authority is also developing protocols for the production and use of waste derived products for refuse derived fuel; waste derived fill; and waste derived soil enhancers.

Landfill levies and bans: As of July 2008, the landfill levy in South Australia is \$24.20 per tonne in metropolitan areas and \$12.10 per tonne in non-metropolitan areas. Through the development of the Environment Protection (Waste to Resources) Policy staged bans are being considered where material such as cardboard and paper waste, glass packaging, metals, some plastics and council-collected vegetative matter is aggregated for resource recovery by generator. Landfill bans also apply to hazardous waste, lead acid batteries, liquid waste, medical waste, oil, whole tyres, vehicles, fluorescent lighting and other lighting that contains mercury, computer monitors, televisions, whitegoods, other electrical and electronic waste.

Targets South Australia's Strategic Plan (2007) and the Waste Strategy 2005–2010 have a target of 25 per cent less waste to landfill by 2014. Other targets under the Waste Strategy 2005–2010 are:

- Municipal solid waste: by 2008, 50 per cent of all material presented at the kerbside is recycled; by 2010, 75 per cent of all material presented at the kerbside is recycled (if food waste is included).
- Commercial and industrial: by 2008, 15 per cent increase in recovery and use of materials; by 2010, 30 per cent increase in recovery and use of materials.
- Construction and demolition: by 2008, 35 per cent increase in recovery and use of materials; by 2010, 50 per cent increase in recovery and use of materials.

Product stewardship: The container deposit scheme, under the *Environment Protection Act 1993*.

Australian Capital Territory

Legislation: The *Environment Protection Act (1997)* enables the Environment Protection Authority to set conditions for activities that pose environmental risk and provides for these matters to be set out in environmental protection agreements. The *Waste Minimisation Act 2001* allows waste fees to be determined.

Existing policy and other economic instruments: The 1996 No Waste by 2010 Strategy establishes a framework for sustainable resource management and outlines

broad actions to achieve zero waste by 2010. An action plan, *Turning Waste into Resources 2004–2007*, supports this strategy.

Policy under development: A scheme to provide recycling and reuse services for e-waste.

Landfill levies and bans: Various landfill levies apply, based on whether the waste is commercial or domestic in nature, and the weight being disposed of. Domestic disposal levies apply for some products such as computer terminals (\$15 each); computer monitors (\$22.50 each); tyres (light vehicle only) – (\$3 per tyre); mattresses (\$5 per mattress).

Targets: Waste free society by 2010: No Waste Strategy.

Product stewardship: Nil.

Tasmania

Legislation: Waste is regulated under the *Environmental Management and Pollution Control Act 1994*.

Existing policy and other economic instruments: The *Landfill Sustainability Guide 2004* documents best practice environmental standards for the siting, design, operation and rehabilitation of landfills in Tasmania. While the guide is not legally binding, it forms the basis for reviews of permit conditions and assessments of new landfill proposals.

Policy under development: The Tasmanian Government is developing the *Tasmanian Waste and Resource Management Strategy*. The strategy sets overarching principles, objectives and actions for developing policy, waste initiatives and for improving practices and focuses on waste reduction, sustainability and best practice in waste and resource management. It also provides a framework for coordinating waste management.

Landfill levies and bans: There is no landfill levy system in Tasmania.

Targets: There are no waste targets.

Product stewardship: Nil.

Northern Territory

Legislation The *Waste Management and Pollution Control Act (2007)* aims to prevent and effectively respond to pollution, avoid and reduce the generation of waste, increase the reuse and recycling of waste and effectively manage waste disposal. It establishes the licensing conditions for landfills.

Existing policy and other economic instruments: The 2007 *Re-thinking Waste Disposal Behaviour and Resource Efficiency Interim Action Plan* is being implemented while work is being undertaken to develop a new waste strategy. It aims to identify effective incentives for appropriate disposal behaviour, opportunities to maximise resource efficiency and minimise environmental impacts, establish a sustainable resource-not-waste management framework and effective implementation mechanisms and promote greater awareness of resource efficiency issues.

Policy under development: The Northern Territory is developing a new waste strategy.

Landfill levies and bans: Nil.

Targets: Nil.

Product stewardship: Nil.

Glossary and acronyms

Glossary of terms

Commercial and industrial waste (C&I) – waste that is produced by institutions and businesses; includes waste from schools, restaurants, offices, retail and wholesale businesses, primary production and manufacturing industries

Construction and demolition waste (C & D) – waste produced by demolition and building activities, including road and rail construction and maintenance and excavation of land associated with construction activities

Electronic waste (e-waste) – discarded electronic or electrical equipment, typically including televisions, video and DVD players, stereos, mobile phones, computers, photocopiers, fax machines, printers as well as cartridges, batteries and peripheral devices

Environment Protection and Heritage Council (EPHC) – the council was established in June 2001 by the Council of Australian Governments and addresses broad national policy issues relating to environmental protection, particularly in regard to air, water, and waste matters. It also addresses natural, Indigenous and historic heritage issues

Extended producer responsibility – places primary responsibility on the producer for the reuse, recycling or disposal of their products once no longer required by the consumer

Hazardous wastes – wastes that are potentially harmful to humans and the environment

Intergenerational equity principle –states that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations

Municipal solid waste – waste produced primarily by households and council facilities including biodegradable material, recyclable materials such as bottles, paper, cardboard and aluminium cans and a wide range of non-degradable material including paint, appliances, old furniture and household lighting

Polluter pays principle – states that those who generate pollution and waste should bear the cost of containment, avoidance, or abatement

Precautionary principle – states that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

Prescribed waste – also known as prescribed industrial waste, prescribed wastes are closely regulated because of their potential adverse impacts on human health, the environment, or public amenity

Product stewardship – a policy approach recognising that manufacturers, importers, governments and consumers have a shared responsibility for the environmental impacts of a product throughout its full life cycle. Product stewardship schemes establish a means for relevant parties in the product chain to share responsibility for the products they produce, handle, purchase, use and discard

Resource recovery – the process of extracting materials or energy from a waste stream through reuse (using the product for the same or a different purpose without further production), recycling or recovering energy from waste

Waste – ⁴⁷ any discarded, rejected, unwanted, surplus or abandoned matter; or otherwise discarded, rejected, unwanted, surplus or abandoned matter intended for recycling, reprocessing, recovery, reuse, or purification by a separate operation from that which produced the matter; or sale, whether of any value or not

Waste hierarchy – a nationally and internationally used guide which prioritises waste management practices in order of preference (from most to least preferred) to achieve the best environmental outcome. The order of practice it sets out is avoidance, reuse, recovery, recycling, with disposal as a last resort ⁴⁸

Waste to energy – technologies and processes that generate electricity or heat from waste

Acronyms and shortened forms

ABS	Australian Bureau of Statistics
Basel Convention	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
C&D waste	Construction and demolition waste
C&I waste	Commercial and industrial waste
COAG	Council of Australian Governments
CPRS	Carbon Pollution Reduction Scheme
EPA	Environment Protection Authority
EPHC	Environment Protection and Heritage Council
EPR	Extended producer responsibility
Montreal Protocol	Montreal Protocol on Substances that Deplete the Ozone Layer
MSW waste	Municipal waste
NEPC	National Environment Protection Council
NEPC Act	<i>National Environment Protection Council Act 1994</i>
NEPM	National Environment Protection Measure
OECD	Organisation for Economic Co-operation and Development
Stockholm Convention	Stockholm Convention on Persistent Organic Pollutants

⁴⁷ National Environment Protection (Movement of Controlled Waste between States and Territories) Measure as varied December 2004

⁴⁸ *Lets not waste our future: Queensland waste strategy discussion paper, 2007, p.8*

Gases and units	
CO₂	Carbon dioxide
CO_{2-e}	Carbon dioxide equivalent
GL	Gigalitre
KwH	Kilowatt hour
ML	Megalitre
Mt	Megatonne
t	Tonne
TJ	TeraJoule