Department of
Environment and Conservation (NSW)

Our reference : HOF65391
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Waste Generation and Resource Efficiency Inquiry
Productivity Commission
LB2 Collins Street East
MELBOURNE VIC 8003

Dear Commissioners

The Department of Environment and Conservation is pleased to make a submission to the Productivity Commission's Waste Generation and Resource Efficiency Inquiry on behalf of NSW.

As a community, NSW has reached a critical point where we need to make a conscious decision – either to increase the use of landfills to dispose of the waste we create, or to change our attitudes, technologies and actions to make better use of our resources and minimise waste.

NSW has adopted the second course, and has set ambitious waste reduction and recycling targets backed up by market-based incentives to stimulate new technologies and approaches. The new approach is already paying dividends, with considerable increases in materials recycling and the beginnings of a capacity to export innovative waste processing technologies. The targets and the new approaches have received strong community support.

The attached submission sets out details of the NSW approach and examples, and proposes recommendations to assist the Commission.

I look forward to attending your hearing on Wednesday 1 March 2006, and to the outcomes of this inquiry.

Yours sincerely

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enclosure

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NSW GOVERNMENT SUBMISSION TO THE PRODUCTIVITY COMMISSION WASTE INQUIRY

The NSW Government is pleased to provide this submission in response to the Issues Paper released by the Productivity Commission to assist its Inquiry into Waste Generation and Resource Efficiency in Australia.
February 2006

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Executive summary

As a community, NSW has reached a critical point where we need to make a conscious decision – either to increase the use of landfills to dispose of the waste we create, or to change our attitudes, technologies and actions to make better use of our resources and minimise waste.

Some of the waste policy debate is not controversial - for example it is accepted that prevailing waste disposal technologies cannot yet fully eliminate the negative environmental impacts that arise from waste generation. Pollution of groundwater, foul odours, windblown dust and litter and emissions of greenhouse gases are some of the common problems of landfilling.

However, a new approach to waste avoidance and recycling is emerging. It is based on the recognition that current levels of waste generation are unsustainable, and increasing.

The manner in which resources are extracted, processed and used causes many significant environmental impacts which are not - and are not likely to be - accounted for in pricing or economic decision-making.

Based on this unsustainable pattern of waste generation, the new approach to resource management sees governments and companies re-working their activities to reduce their rate of resource use, and adopt new technologies to meet human needs with reduced environmental impact.

The new approach aligns with observable consumer and community preferences for products that have a reduced impact on the environment in their production and disposal.

From a Government perspective, this kind of approach requires developing frameworks to support innovation and technological development. NSW is seeking to be an early leader in Australia of a well-established international trend.

NSW has set ambitious waste reduction and recycling targets and provided economic incentives to stimulate new technologies and products. The new approach is already paying dividends, with considerable increases in materials recycling and reuse and the beginnings of a capacity to export innovative waste processing technologies.

This submission sets out more details and examples, and proposes recommendations to assist the Commission, which are summarised on the following page.

Recommendations

The NSW Government recommends that the Productivity Commission:

1 Recognise the policy context in NSW including that:

- Quantities of waste generated are large and are growing
- Landfill options are limited – particularly for metropolitan Sydney
- The community strongly supports waste avoidance and recycling
- With the right approach, governments can drive waste avoidance and recycling
- NSW's framework for action is robust and meets community expectations.

2 Confirm that the costs and benefits of waste management are complex and not easily resolved, but that:

- Environmental externalities are significant – even if it is not always possible to put a precise dollar value on them
- The benefits of reuse, recycling and energy recovery are substantial and not limited to cost savings
- The status quo is clearly unsustainable.

3 Supports government action to:

- Set clear, quantifiable and achievable targets
- Use economic instruments to provide incentives for continual improvement
- Support those economic instruments with complementary infrastructure and programs
- Provide meaningful data to inform policy and track progress
- Avoid perverse economic and environmental outcomes
- Seek national consistency where a national approach is warranted.

Furthermore, the NSW Government recommends that the Productivity Commission:

4 Acknowledge that the objective of sustainability is not only legitimate but also necessary in developing waste and other environmental policy.

5 Endorse the NSW approach as a robust and effective framework for waste avoidance and resource recovery.

Introduction

We live in a world where expanding population and increasing wealth puts increasing pressure on our natural environment and its finite resources. As the standard of living improves in both developed and developing countries, we have the means to consume more goods and materials. The world's capacity to supply raw materials for these is finite.

As a community, NSW has reached a critical point where we need to make a conscious decision – either to increase the use of landfills to dispose of the waste we create, or to change our attitudes, technologies, practices and actions to use our resources better and minimise waste.

Waste is harmful to the economy, to the environment and to our health. It contributes to greenhouse gases, water and air pollution. Littering and windblown waste despoil our living spaces.

Our challenge is to minimise waste and ensure that the wastes we can't avoid are appealing substitutes for 'virgin' materials.

Context to resource recovery and waste management in NSW

Quantities of waste generated are large and are growing

In NSW, the greatest volume of waste is produced in the Greater Sydney Region (metropolitan Sydney plus the Hunter, Central Coast and Illawarra). In 2004-05 this Region disposed of over 5.6 million tonnes of waste (DEC 2005). This roughly consists of 45% commercial and industrial (C&I) waste, 32% municipal waste and 23% construction and demolition waste (C&D).

Volumes of waste are growing with changing lifestyles and higher rates of consumption. According to the OECD, global per capita consumption is expected to follow GDP growth over the next two decades and similar trends can be expected throughout Australia. Although recycling rates have increased and have slowed the growth in waste destined for final disposal, total volumes of waste generated are nevertheless increasing.[1]

A significant proportion of growth in consumption is inherently wasteful. Recent research by The Australia Institute (March 2005)[2] showed that in 2004 Australians spent $10.5 billion dollars on goods and services that are never or hardly ever used (more than $1000 per average Australian household).

Landfill options are limited – particularly for metropolitan Sydney

Sydney has a relative shortage of available landfill capacity compared to other capital cities around Australia. Siting of new landfills for Sydney's waste has historically met with very strong community opposition. For example, two recent applications for landfills in the Hunter Valley region were both rejected as a result of community opposition and other technical factors.

The community strongly supports waste avoidance

There is strong community support for individual and government action to reduce waste and encourage recycling. This is demonstrated by:

- Increasing household recycling rates – in 2004, Sydney residents set aside an average of more than 100kg of material for recycling - 17kg more than in 1990.
- A recent Dell computer recycling take-back program in Sydney yielded 9.6 tonnes of computers in one day - far exceeding the expected response.
- The success of the 2000-03 *'Don't be a tosser'* ad campaign - with research indicating 96% of people in NSW having seen the advertisement, a high understanding of the central messages and a significant increase in people who say they never litter.

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[1] '*Towards sustainable household consumption? Trends and policies in OECD countries', OECD Policy Brief, July 2002, pp 3-4*

[2] Wasteful Consumption in Australia, Discussion Paper No 77, Australia Institute, March 2005

In addition, a recent survey undertaken by the Waste Management Association of Australia and the Alternative Waste Treatment Working Group to test consumer support for new technologies found that:

- Over 90% of respondents think that new waste technologies that use organic waste for compost and green energy is a good or excellent idea.
- Reasons for supporting new technologies included; making good use of waste, environmental benefits, taking pressure of landfills, reducing and eliminating waste, increasing recycling, creating renewable energy and reducing fossil fuel use.
- Almost 90% of respondents were willing to pay additional weekly fees to encourage new technologies, with 60% willing to pay an additional $2 per week.

This legitimate community concern about resource management and support for waste avoidance continues to be a strong driver of NSW waste policy.

With the right approach, governments can drive waste avoidance

To respond to the unsustainable growth in waste, governments must create frameworks to support innovation and technological development. NSW is seeking to be an early leader in Australia of a well-established international trend.

NSW has set ambitious waste reduction and recycling targets and provided economic incentives to stimulate new technologies and products. This new approach is already paying dividends, including considerable increases in materials recycling and reuse as well as the beginnings of a capacity to export innovative waste processing technologies.

The overall approach that NSW has taken to achieving good waste outcomes is to:

- Reform its regulatory framework so that it: protects the environment, provides clear and effective requirements that can be readily understood and ensures that legitimate businesses can grow and not be undercut by non-complying environmentally damaging competitors;
- Assist sectors to identify priorities for action, opportunities for collaboration and delivery of a more coordinated approach across NSW;
- Pursue partnership approaches that involve the community in decision making, recognising that there are no “one-fit” solutions as well as the need for solutions that suit each local community;
- Ensure an integrated approach designed to bring economic benefits for NSW whilst guaranteeing ecological sustainability;
- Provide an effective economic lever by strengthening the waste and environment levy to discourage waste generation and provide an incentive for reprocessing and recycling technologies;
- Measure success by outcomes (i.e. reduction in waste) rather than process
- Consider waste in the context of its lifecycle - including extraction, manufacturing, distribution, consumption and recovery for reprocessing or disposal; and
- Recognise the value of, and potential for, new national approaches - particularly in the areas of product stewardship and Extended Producer Responsibility.

NSW's framework for action is robust and aligns with community expectations

The NSW Waste Avoidance and Resource Recovery Strategy ('the Strategy') was released in 2003 and provides a framework for reducing waste and making better use of resources. It was a first for Australia and is available on the DEC website at http://www.resource.nsw.gov.au/strategy.htm. DEC research has shown that the focus on waste reduction over the past decade has led to increased efficiencies – indeed, for every dollar's worth of economic activity in NSW, we are producing 25% less waste than we did 10 years ago.

The Strategy identifies four key areas where action is needed to achieve results and sets broad targets in each area (as set out in the table below). These targets reflect international best practice, and are achievable with contributions from all sectors in the community.

Broad targets for each outcome area as set out in the 2003 NSW Waste strategy

Outcome area	***Target***
Preventing and avoiding waste	*To hold level the total waste generated for the next 5 years.*
Increased recovery and use of secondary resources	*By 2014, to:* - *Increase recovery and utilisation of materials from municipal sector from the current 26% to 66%* - *Increase recovery and utilisation of materials from the commercial & industrial sector from the current 28% to 63%* - *Increase recovery and utilisation of materials from the construction & demolition sector from the current 65% to 76%.*
Reducing toxic substances in products and materials	*By 2014 or earlier:* - *To phase out priority substances in identified products as a first choice or if not possible to achieve maximum recovery for re-use and;* - *where identified products containing these priority substances require disposal as a last resort, the permitted "leachability" of the substances will be reduced to the levels that are permitted for inert waste.*
Reduce litter and illegal dumping	*Reduce total volume and tonnages of litter reported annually.* *Reduction in total tonnages of illegally dumped material reported by regulatory agencies and Regional Illegal Dumping (RID) squads annually.*

NSW recognises that waste is one stage in the life cycle of goods and materials that also includes extraction, manufacturing, distribution, consumption and recovery for reprocessing or disposal. To ensure a comprehensive approach to waste avoidance, appropriate action must be taken to drive efficiencies and sound decision-making at every stage in the cycle – with emphasis on the stages where results will be most effective. Indeed, different materials will require different approaches based on economic and social factors, geography, available feedstock quantities, markets and potential environmental costs and benefits.

Central issues identified by the Productivity Commission

This submission addresses the three central issues identified by the Productivity Commission on page 10 of the Issues Paper.

1 Economic, environmental and social costs and benefits

There are significant negative environmental impacts that arise from waste generation.

Costs of waste

Each tonne of waste disposed by landfill has associated environmental and social costs that are not charged to the landfill operator. Some of the environmental externalities of waste disposed by landfill include:

- Greenhouse gas emissions (between 0.08 and1.01 tCO_{2e}/ t MSW from methane emissions from landfill depending on gas recovery and electricity generation);

- Opportunity costs of disposing to landfill materials, which could displace the use of virgin resources. A US EPA study[3] found that using recycled aluminium rather than virgin resources saves 15.72 t CO_2 /t MSW which at $15/t CO2 is equivalent to $235 savings per t MSW, similarly for mixed paper, the saving is $44/t MSW;
- Local amenity costs – these can manifest in reduced property values and reduced enjoyment for those who live or work near facilities and hence increasing community hostility to the location of new landfills;
- Transport corridor costs as landfill sites are located at greater distances from waste source;
- Pollution of groundwater and odours;
- Windblown dust and litter; and
- Intergenerational costs across the lifetime of the landfill and beyond - as resources are no longer available for the potential use of future generations.

Estimating values for many of these externalities and compliance costs is not easy. Recent cost benefit analyses and estimates of compliance costs show that compliance costs are invariably overestimated and the benefits under-estimated[4]. The overestimation of compliance costs often arises because analysts adopt a static approach, ignoring the subsequent innovation, technological development and process improvements that follow well-crafted regulation and economic incentives. Difficulty in quantifying the negative environmental impacts arise because most are currently not priced.
Some of the benefits of waste reuse and recycling are set out in the following sections.

Benefits from household recycling

In 2005, DEC undertook a *Benefits of Recycling Study* to assess recycling of different household materials (eg paper, cardboard, containers). The study found that kerbside recycling provides:

- Substantial greenhouse emission reductions;
    - A typical NSW household recycling 3.76 kg each year avoids over 100 kg of CO2 emissions (equivalent to 50% of the annual household lighting energy);
    - Statewide savings equate to taking 55,000 cars off the road permanently[5]; and
- Substantial water and energy savings and conservation of non-renewable virgin resources. Households with high recycling rates can "save" up to a third of their total electricity consumption and water savings equate to over 3000 litres of water (or flushing a toilet 615 times).

The full report is available at
http://www.resource.nsw.gov.au/data/Benefits_of_Recycling_(2005).pdf

Benefits from construction material recycling

The major market for recycled construction materials in NSW is the Sydney metropolitan area and industry sources have advised DEC that in Sydney:

- Recycled road making products made from (C&D) wastes (eg. concrete, brick and tile) are $10-$15 per tonne cheaper than natural products; and

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[3] USA EPA, 1998 Greenhouse Gas Emissions From Management Of Selected Materials In Municipal Solid Waste

[4] See International Chemical Secretariat (2004) Report 6:04 *Cry Wolf* and Network of Heads of European Environment Protection Agencies (2005) *The Contribution of Good Environmental Regulation to Competitiveness*

[5] *Benefits of Recycling,* DEC May 2005

- Recycled aggregates are $15-$20 per tonne cheaper than natural aggregates.

Over 3 million tonnes of recycled C&D wastes were sold in NSW in 2003-2004 (DEC 2005), resulting in substantial savings to businesses, local government and state government authorities in NSW.

DEC's experience is that use of recycled materials of this type did not increase significantly prior to the introduction of the waste levy and better landfill controls. In other words, the mere fact that it was cheaper to recycle did not stimulate investment to exploit the opportunity. A policy 'jolt' was required.

Within Sydney, transport costs are lower for recycled C&D products as recyclers tend to be located close to markets for construction materials. In contrast, established quarries of natural products are becoming exhausted, particularly those close to Sydney. The subsequent price differential is expected to increase further in coming years as major quarries in the Sydney area close (Wallgrove in 2005/6, Prospect in 2007 and Emu Plains in 2012).

The economic benefits are not limited to cost savings. They can also include performance and workability advantages. For example:

- Recycled masonry materials are capable of being worked in wetter conditions, resulting in less down time in wet weather. They more effectively bind together to reduce potholes and scouring, and require less brooming to finish[6]; and
- The NSW RTA expects three times the benefit using crumbed rubber asphalt when compared with conventional asphalt for use over jointed concrete pavements or fatiguing pavements.[7]

Litter and illegal dumping costs the community

A research project commissioned by DEC in 2003-04 collated all available information and data on illegal dumping in NSW[8]. It concluded that:

- NSW local governments alone spend $10 million per year trying to combat illegal dumping and landfilling;
- Total recorded incidents were comprised of household waste (44%), green waste (15%), abandoned cars (13%), construction and demolition waste (12%), soil and excavation (8%) and tyres (6%); and
- NSW Government agencies and private organisations also spend considerable amounts on cleanup and enforcement.

Benefits of the waste industry

An efficient waste policy framework can drive job creation, foster technological innovation and result in export opportunities.

In NSW alone, the waste industry employed more than 5200 people and generated an income of over $1 billion in 2002-03[9].

2 Reasons for intervention – sustainability, equity and market failure

A new approach to waste avoidance and recycling is emerging based on recognition that current levels of waste generation are unsustainable and increasing.

The manner in which resources are extracted, processed and used causes significant environmental impacts which are not - and are not likely to be - accounted for in pricing or economic decision-making.

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[6] Deane, B. (2002) *A Draft Specification for Supply of Recycled Material for Roads, Drainage & Fill*, paper presented at the Institute of Public Works Engineers Australia (IPWEA) NSW Division Annual Conference, 2002

[7] RTA/DEC "Business Plan to Commercialise Scrap Rubber Asphalt".

[8] Undertaken by Institute for Sustainable Futures for DEC in 2004. Currently unpublished.

[9] Australian Bureau of Statistics, 2002–03 Waste Management Services, 8698.0, p. 13

Based on the observation of the current unsustainable pattern of waste generation, a new approach is being developed in jurisdictions around the globe and in many large corporations. This new strategy sees governments and companies re-working their activities and processes to reduce their levels of resource use, and develop new technologies that meet human needs at a reduced environmental impact.

Market failure, including externalities

In theory, if it were possible to set extraction prices for raw materials (eg minerals, timber, water) that reflect all relevant externalities, and to limit extraction rates to sustainable rates, it would be unnecessary for policies to drive recycling and use of recycled content.
Key reasons why this does not happen in practice and why market intervention by governments is justified include:

- governments around the world struggle to set adequate prices or sustainable extraction rates for primary resource extraction, as the desire to support economic growth and poverty alleviation objectives compete with the value that future generations will place on resources, and the immediate impact on human health, and the environment.
- international trade means that even if Australia unilaterally set optimal prices this would not sufficiently influence local product markets - it might only potentially lead to a higher number of imports substituting for local produce and therefore ‘exporting’ environmental impacts to less developed nations; and
- there have been numerous analyses of the cost-benefit of recycling. These clearly demonstrate benefits although there is continuing debate about how to best ‘price’ or represent these benefits in the analysis. Regardless of the debate, however, the benefits are real and substantial.

Where to intervene

Given the difficulties inherent in properly pricing and regulating resource extraction, there is ongoing debate about the merits of intervening at the point of disposal to drive resource recovery and resource efficiency.
Even if generators can be located and contacted, for many - especially small and medium businesses - waste is a minor component of the bottom line so there is little financial incentive for resource recovery. In fact, there are still many businesses that do not even have access to disposal services, let alone recycling services.
In addition, the way waste pricing is currently structured (eg. on a per lift basis, regardless of fullness of bins) can make it harder to offset any initial cost of recycling. Working with councils to explore the expansion of existing kerbside recycling systems to small business has been one strategy for tackling this problem since economies of scale offset systems costs and can provide a low cost recycling option.
Time pressures and availability of space on premises can also mean that source separation isn’t practical for many, again often smaller businesses. Options for recovery of more materials from mixed inert non-putrescible waste streams (eg through post consumer sorting technologies) may be able to counteract this.
There is also an opportunity for intervention in waste recovery outside of the main metropolitan areas. Farm rubbish dumps, for example, create significant hazards including bushfires and water pollution.
Although larger agribusiness usually have effective internal waste management systems and the small rural holdings have access to municipal waste collection services, there are thousands of farm businesses without effective waste management strategies. In many instances, waste has been accumulating for decades.

A significant barrier to primary producers making a greater contribution towards management and resource efficiency objectives is the cost of transporting recovered resources in areas outside the metropolitan region.

There is clear evidence that the NSW waste levy has influenced decisions at other points in a product's lifecycle to reduce the amount of waste being produced or recycled therefore reducing disposal costs.

This is demonstrated by the considerable volumes of waste saved across 460 organisations participating in the NSW Industry Partnerships Program. These companies have diverted over 8,100 tonnes of waste per annum and saved over $600,000 in annual disposal costs.

Again, NSW's experience is that many companies, if assisted by government programs, successfully formulate a policy or program that actually results in increased profits.

3 Strategies for adoption by Governments to improve outcomes

Set clear quantifiable and achievable targets

There is strong support from many sectors within the community for the establishment of targets and goals for waste reduction and recycling on the basis that they provide transparency and scrutiny of public process and can ensure that results, or lack thereof, are clearly measured. Targets provide certainty for industry as well as a signal to the community of policy direction.

Targets and aspirational goals such as "zero waste" can be used at broad jurisdictional level as well as for specific sectors relating to producer responsibility outcomes. Target setting is used internationally to drive waste related outcomes in both of these areas.

The challenge lies in setting goals and targets appropriate to Australia. Few international systems or targets can be directly applied given the substantial differences in population distribution, institutional frameworks and economy.

Ambitious yet achievable targets have been set for waste avoidance in the NSW Strategy to encourage waste avoidance and provide a driver for the development of new technologies and products.

Use economic instruments to provide incentives for continual improvement

Economic instruments can provide a powerful driver to influence actions to reduce waste and increase resource recovery and resource efficiency. The NSW Waste and Environment levy is a key economic tool for waste reduction in NSW. It is simple to apply, readily understood and broad in its coverage.

The levy has been in operation since 1971 and was increased in 1997 from $7.20 to $17 per tonne in the metropolitan region and $10 in an extended region.

The levy has provided an ongoing price incentive to promote the diversion of materials from disposal to other economically viable uses and a mechanism to provide funds for a range of programs to overcome the financial, technical, institutional and social barriers to reducing waste disposal.[10] To date the levy has been particularly effective for large tonnages of materials and for heavy wastes such as construction and demolition waste.

In November 2005, the NSW Premier announced increases in the waste levy by $6/tonne in Sydney and in the Hunter, Central Coast and Illawarra regions each year for 5 years. It should be noted that by 2010-11 this would result in a net increase of only 17c/week per household. These increases will encourage:

- Waste generators to reassess options for waste reduction – particularly in the case of heavier, bulky materials such as cardboard, paper, construction and excavation materials;
- A greater number and range of alternative waste technologies; and

[10] *Report on the Waste Minimisation and Management Act (EPA 2001)*

- The establishment of additional recycling capacity that can compete with landfill.

The levy has already been successful in driving waste reduction and resource recovery as demonstrated by NSW's achievements in organics recycling:

- Recovery of organics is estimated to have increased from 40% of the total generated in 1998 to over 50% in 2002-03 (in 1990, no coordinated organics recycling existed in NSW); and
- In 2004, 61 licensed composting facilities existed and over 71 councils provided regular organics recycling services.

Even after the recently announced increases, the NSW levy remains quite low compared to parts of the United States, Britain and other parts of Europe. For example, the Blair Government in the UK is increasing its waste levy from $A35 to $A82 per tonne, in addition to implementing a cap and trade scheme for landfill.

Support economic instruments with complementary infrastructure and programs

The effectiveness of the NSW levy is enhanced by a range of complementary programs, including:

- A new Local Government Waste Performance Improvement Payment, worth up to $80 million over five years to help local government to achieve improvements in local waste management activities - this payment will be made to councils who achieve specified improvements in waste management practices and is aimed at rewarding local initiatives that improve resource recovery outcomes. A critical component is improved quality of separated waste streams, making it easier to reuse and recycle materials;
- Urban sustainability grants worth $80 million over five years for local governments to work in partnership with business and the community to address priority urban sustainability issues;
- Guidelines and decision making tools to assist Councils to assess alternative waste technologies, composting and recycling options;
- Community education programs – including the *'Don't be a tosser'* ad campaign;
- The Cleaner Production program, which assists companies to identify options for alternative uses of waste streams;
- New assessment guidelines for non-standard fuels that provide certainty for beneficial energy-from-waste proposals;
- New regulations to ensure that only substances that are of benefit and do not cause harm are used for growing plants – allowing for waste reuse opportunities to be distinguished from basic land disposal practices; and
- Establishing best practice guidelines for kerbside recycling, public place and events recycling, office paper recovery and performance benchmarks for particular industry sectors.

Provide meaningful data to inform policy and track progress

Over the last few decades there has been considerable debate about the adequacy of waste data and the efficiency of its collection to most effectively inform policy development without incurring unnecessary costs.

NSW data is collected to monitor and enforce regulatory requirements and to inform NSW waste policy development. DEC currently collects two types of waste data:

- Data reported by landfills about the amount of waste received and disposed of; and
- Data about the composition of the waste stream obtained through audit.

This data is generally of high quality and is reported publicly in aggregated format. However, ongoing action will be needed to continuously improve available data.
For example, the collection of reliable and complete resource recovery data has been more difficult. Voluntary mechanisms have not been successful and to date NSW has been reluctant to impose mandatory requirements where the data is not directly related to a business environmental management requirement. DEC, however, has had some success working with peak industry bodies to collect the data on its behalf.
The type of waste data reported varies between states and territories. Although attractive in concept, consistent reporting between jurisdictions would be very difficult to achieve as a result of the different regulatory approaches operating in each state. Previous attempts to achieve nationally consistent reporting have not been successful.
There are, however, a number of data issues requiring attention which could be usefully progressed on a national level. These include:

- Development of simple decision making tools to allow targeted consideration of life cycle costs and benefits - while life cycle analysis is conceptually very attractive, the cost of conducting it robustly is prohibitive and data collection should focus on areas where meaningful data can be extracted quickly and at relatively low cost.
- Mechanisms to provide better access to information about waste including:
    - Matching waste generators and processors with potential opportunities for use of waste streams i.e. overcoming information gaps that impede waste markets; and
    - Building consumer confidence in products from recycled wastes, particularly in respect to health and safety.
- Development of a standard methodology to calculate volumes of waste generation which includes other alternative uses of waste beyond waste disposed or recycled (which are the only volumes currently recorded).

Avoid perverse economic and environmental outcomes

In developing waste policies it is clearly desirable to avoid perverse outcomes.
The regulatory delineation between wastes and non-wastes has been recognised as a potential hurdle for some waste reuse opportunities. Regulatory requirements need ongoing review to cater for emerging new uses, thereby informing decisions about acceptable use of materials and maintaining a level playing field for industry.
NSW has recently amended its legislation to provide a broad definition of waste (to overcome enforcement problems) with a clear exemption framework so that materials and businesses are not captured unnecessarily in the waste regulatory framework.
An additional key regulatory issue will arise as more resources and energy are extracted from wastes. Use of mixed or variable waste streams in energy generation can generate various harmful pollutants that are difficult or impossible to control with readily available technologies. NSW has put in place a new regulatory framework to manage these risks, while facilitating non-hazardous use of waste for energy production.

Seek national consistency where a national approach is warranted

There are some areas of waste policy where a national approach could result in a more efficient and effective approach. Examples include product stewardship and extended producer responsibility. There is increasing public pressure on industry to take more responsibility for its products once the consumer has finished with them. Producer responsibility initiatives for key products such as TVs, mobile phones, computers and tyres are emerging in response to both the NSW Priority Statement and national processes.

Governments can assist the development of producer responsibility schemes through clear guidance on expectations, acceptable approaches and what should be covered in product stewardship schemes as well as assistance in the collection of relevant sector-specific data.

A key issue is that purely voluntary schemes must address the potential for 'free riding'. The NSW framework provides significant scope for industry to develop voluntary schemes, with a commitment to overcome free rider issues as needed. Such measures should ideally be applied consistently across Australia with strong participation from the Australian Government.

Conclusion

The NSW waste policy framework is effective, efficient and robust. It aims to reduce waste to landfill and to drive sustainable use of natural resources.

Sustainability is not only a legitimate objective of waste policy, but it is necessary to ensure economic prosperity for current and future generations.

Case studies

Garden organics

A DEC *Assessment of Garden Organics Collection Systems* [11] supports strategies for source separation collection and recycling of organic materials. It found that:

- The environmental value of each tonne of garden organics is estimated to be $114 (including resource savings, avoided fertilizer use, avoided air and water pollution impacts and greenhouse emission reductions);
- The management of organics through source-separated collection systems, commercial composting and the application of recycled organics to agriculture offers substantial benefits to the environment, including:
    - Net greenhouse emission reductions, even if the recycled materials have to be transported up to 600 km for agricultural applications;
    - Positive benefits were found under all the other environmental indicators, including reduced potential for human toxicity, ecotoxicity and eutrophication;
    - Some minimal negative environmental impacts related to air pollution and non-renewable resource depletion - largely from the use of diesel fuel consumed while applying the compost material to agricultural soils;
- The benefits of providing collection bins for recycled organics are related to the volume of material collected. The report recommended that councils with a high rate of garden organics (over 175kg per household each year) introduce fortnightly collections;
- The net increase in total waste management costs for providing a separate garden organics collection varies from $5 to $15 per household per year assuming landfill disposal of domestic garbage; and
- Where garbage is thermally treated, the provision of a separate garden organics collection service reduced overall waste management costs.

The full report is available at:
http://www.resource.nsw.gov.au/data/Assessment_of_Garden_Organics_Collection_Systems_(2005).pdf

In addition, DEC is finalising a guide for councils on potential savings from increased 'recycled' content in landscaping product purchasing – '*Cost/benefit of using recycled organics in council parks and gardens operations'*. Cost savings are estimated based on reduced water, fertiliser and herbicide use and the price of recycled organic products (which are generally cheaper than 'virgin' products).

Use of recycled construction material

The NSW Roads and Traffic Authority (RTA) has been revising standards, specifications and procurement policy to identify opportunities for use of recycled material. Current initiatives include trials using recycled crumb rubber tyres in asphalt pavements, recycled crushed glass as a cement, sand and aggregate replacement in concrete and recycled organic materials in roadside landscaping. Achievements from these initiatives include:

- 10% replacement of virgin aggregate with recycled concrete in Sydney roads[12] ;

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[11] *Assessment of Garden Organics Collection Systems*, DEC, May 2006

[12] New South Wales State of the Environment 2003, Environment Protection Authority, Sydney.

- Replacement of 5% of virgin aggregates with 850,000 tonnes of coarse blast furnace slag generated at Port Kembla steelworks[13];
- Use of around 20% of Port Kembla blast furnace slag as cement [14] (with significant greenhouse emission savings)[15] ; and
- Use of scrap rubber in road pavements is resulting in lower vehicle tyre noise than pavements using asphalt [16].

In addition to numerous private businesses and state government authorities, local councils use significant quantities of recycled materials. Examples of the savings that local councils have found using recycled C&D products include:[17]

- Newcastle City Council used recycled materials in road construction and found that material costs were approximately 40% of those for conventional products;
- Sutherland Council used recycled products for the construction of a road in Caringbah and found the materials cost 55% lower than conventional products, with no difference in performance; and
- Willoughby Council used recycled material for the construction of a car park. Savings to council were approximately 50% compared to using conventional road base.

Government Waste Reduction and Purchasing Policy - WRAPP

The Waste Reduction and Purchasing Policy (WRAPP) was introduced in 1997 as part of the NSW Government's commitment to show leadership in the sustainable management of its processes, operations and public assets.

The policy encourages NSW Government agencies to purchase recycled products, increase resource recovery and reduce waste in four key material categories. These are office paper, toner cartridges, vegetation materials and construction and demolition materials. WRAPP requires all NSW agencies to develop and implement WRAPP Plans and report on their progress every two years.

According to agencies' reports on efforts to avoid waste in the 2001-03 reporting period:

- The total amount of waste office paper generated by agencies fell;
- The amount recovered for recycling has increased, for example, paper recycling has increased from 59 per cent to 73 per cent; and
- The purchase of recycled content copy paper has nearly doubled between 2001 and 2003.

The amount of material currently recycled reduces around 46.3 million tonnes of greenhouse gas emissions (CO_2 equivalent) each year.

Specific examples of agency achievements include:

- Sydney West Area Health Service (13 hospitals & 15,000 staff) – new collection services are diverting over 2,000 tonnes of waste a year (beverage containers, paper, cardboard, timber pallets, mobile phones, computers and building materials) with a saving of $149,000 in avoided waste disposal costs;

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[13] Ibid

[14] Ibid

[15] *Reducing Greenhouse Emissions from Commercial and Industrial Buildings: what local government can do*, Australian Greenhouse Office, Department of Environment and Heritage, Australian Government, (2002)

[16] Hicks (2002) *Asphalt Rubber Design And Construction Guidelines. Volume I Design Guidelines,* Northern California Rubberized Asphalt Concrete Technology Centre & California Integrated Waste Management Board, Sacramento.

[17] IPWEA (2006) *Greenspec Case Studies*, Institute of Public Works Engineering Australia Limited, Sydney.

- Port Kembla Port Corporation - a new recycling service for timber packaging (which was previously landfilled or dumped at sea) is recycling 2,500 tonnes of timber per year and has saved around $200,000 through avoided landfill and handling costs; and
- Sydney Water - a new contract for the annual supply of 14,000 tonnes of aggregates and 28,000 tonnes of sand for pipe laying work has moved from virgin material to 100% recycled product - saving $10.15 per tonne on the aggregates and $6.90 per tonne on the sand.

Education programs

NSW has conducted a number of successful education programs designed to encourage individual and group action to tackle waste related issues.

The 2000-03 *Tosser* litter education program exceeded expectations with 96% of people in NSW having seen the *Tosser* advertisement at least once and 65% indicated that they had seen it four or more times. More than nine out of 10 people who recalled seeing the last *Tosser* commercial understood the following main messages:

- Disposing of litter is everyone's personal responsibility (97%);
- Littering in the streets and other public places is not appropriate (95%);
- The community disapproves of littering (94%); and
- Every bit of litter damages the environment (91%).

From 2000-03 there were changes in knowledge, attitudes and behaviours that built on the foundation of the earlier *'Do the right thing'* campaign that are attributable to the Litter Prevention Program which found:

- A trend to connect litter to wider environmental issues of waste management, illegal dumping and recycling;
- A growth in people's concern that litter is damaging to the environment. Explicit mentions of litter getting into waterways and being hazardous to wildlife increased over the period of the whole campaign;
- An increase in the social unacceptability of littering, even amongst those who continue to litter;
- A growing knowledge that personal actions are needed to reduce littering, rather than dependence on actions by authorities; and
- A significant increase in awareness of fines and strong support for littering fines with three in four people agreeing that people who litter should be fined.