reThink Waste!
reduce · reuse · recycle
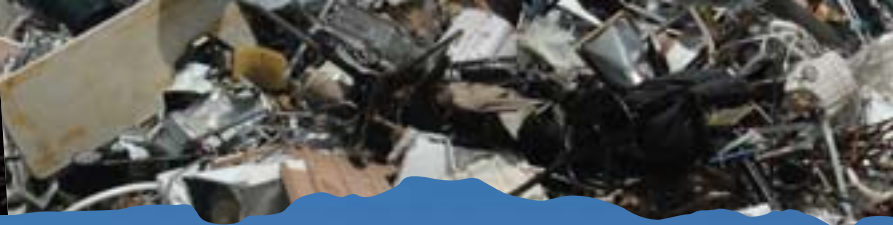
Queensland's Waste Reduction and Recycling Strategy 2010–2020

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Minister's foreword

Queensland is one of the largest generators of waste in Australia. We produce more than 32 million tonnes of it every single year, which is the highest amount of waste per capita of any state. Worse still, Queensland is one of the worst recyclers in Australia. While much of our waste is generated by heavy industry and is not recoverable, we only recycle about a third of our recoverable waste. While householders have proven to be prudent kerbside recyclers, Queensland is still too often choosing landfill over recycling, particularly in the business sector, and this is a problem that is unsustainable.

If we do not tackle the problem seriously now, we will leave a devastating legacy for our children: more rubbish tips encroaching on urban areas, increased rates for waste management and sky-rocketing greenhouse gas emissions from landfill.

We all produce waste in our daily lives, and every year as our population increases, so does our waste generation.

This situation has serious long-term environmental, social and economic implications for the state. We lose industry investment, job opportunities and regional market growth—while creating greenhouse gases and wasting valuable and often non-renewable resources.

Considerable work is currently underway nationally to address waste and increase resource recovery. But there is a lot more Queensland can do at a state level to catch up with the rest. The Queensland Government has set bold targets for our state in waste management. We want Queensland to go from one of the worst recyclers in the country to one of the best. We are also committed to tackling waste generation at the source, and aim to reduce waste generation by 400 kilograms for every Queenslander by 2020. That equates to a total statewide reduction in the generation of waste of more than two million tonnes.

To put our targets into perspective, Victoria has around 13 000 green jobs associated with waste. Queensland only has 5000. We can close this gap with the right amount of investment and behavioural change in our business community.

We will strive for a waste management system where recycling is the first option over landfill and more unwanted materials are given a new life by someone else. We want more trash to become someone else's treasure.

This requires action to avoid creating waste in the first place, and then to turn the waste we cannot avoid into valued resources. It requires overdue reforms. The question we need to ask is simple: what do we need to do to become a low-waste state?

In achieving this vision, we face some challenges including distance to processing and recycling markets and economies of scale for regional Queensland. The reforms described in this strategy include new legislation, an industry waste disposal levy and a comprehensive set of programs designed to discourage unnecessary disposal. It aims to prevent Queensland from becoming Australia's dumping ground, and encourage industry investment in resource recovery infrastructure, market development and green jobs.

The draft strategy presented the case for change and the many challenges that face us in making the necessary changes. It also proposed goals and targets for Queensland and a suite of program areas to help deliver these changes. Through consultation on the draft, these proposals have assisted in shaping a strategy that will help us meet current and future resource and environmental challenges. The reforms represent a new future in waste management and resource efficiency for Queensland. Through a mix of behavioural changes, economic incentives, improved infrastructure and programs, partnerships and smarter technologies, the strategy will deliver the vision of a low-waste state.

In the end, we cannot change the fact that people produce waste. What we can change is how much we produce, how we value the resource, and how we manage it.

This strategy places reducing waste—and better managing the waste we do produce—at the core of government policy to protect the environment and achieve a more sustainable future for Queensland.

The Honourable Kate Jones MP

Minister for Climate Change and Sustainability

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Executive summary

Queensland produces an ever-increasing and unsustainable amount of waste. A new, sustainable approach is needed to better use the state's resources and protect the environment into the future.

This strategy is a 10-year plan to achieve the government's vision of a low-waste Queensland.

The strategy is underpinned by the waste and resource management hierarchy. This internationally recognised framework for managing waste generation and disposal describes the preferred order for managing wastes and resources. The hierarchy places waste reduction as the preferred option, followed by reuse, through recycling and recovery options to disposal as the least preferred approach. Other important guiding principles that inform the strategy are resource efficiency, sustainability, engagement, and capacity building.

Based on these principles, the strategy's broad goals are to:

- reduce waste
- optimise recovery and recycling
- develop sustainable waste industries and jobs.

To achieve these goals the strategy adopts a five-part approach:

1. Clear targets and priorities
2. Setting a price signal – the waste disposal levy
3. Stronger regulation
4. New programs and investment strategies
5. Partnering for change

1. The strategy identifies priority products and sectors. Priorities have been identified according to criteria relating to resource efficiency and the economic and social impacts of disposing of these products at the end of their life.

A priority product statement will be prepared to help guide decisions about future funding and actions, and the voluntary and mandatory measures needed to improve resource recovery for priority end-of-life products and waste materials. Decision-making is transparent in this process, helping Queensland to better support national 'product stewardship' approaches (such as take-back schemes) as well as adopt state-based action.

The strategy sets clear targets for reducing waste, and explains how the targets will be monitored and reported. Over the next decade Queensland will:

- reduce waste to landfill by 50 per cent
- reduce landfill gas emissions by 50 per cent
- increase the recovery and recycling of resources across all waste streams
- reduce generation of waste
- reduce the total amount of, and the environmental impacts from, litter and illegal dumping.

2. The Queensland Government will introduce a waste disposal levy as a price signal to change disposal behaviour. A levy is a price charged in addition to the normal gate fee at waste disposal facilities. The levy will provide:

- a price signal to encourage waste generators to reduce waste generation and disposal
- reduce the disposal of interstate waste in Queensland
- incentive for industry investment in resource recovery infrastructure
- funding for programs to improve waste reduction and resource recovery practices.

A levy of $35 per tonne applies to commercial and industrial, construction and demolition waste and contaminated and acid sulfate soils. Lower-hazard regulated waste is levied at $50 per tonne and higher-hazard regulated waste at $150 per tonne. Levy rates are linked to the Consumer Price Index. Municipal solid waste has no levy applied.

3. Queensland's outdated legislative framework will be reformed to support the goals of the strategy in promoting waste reduction and resource recovery and developing sustainable waste and resource recovery industries. The legislation will reflect modern waste and resource management practices and an awareness of the need for Queensland to reduce its ecological footprint.

A new Act will provide the head of power necessary to improve waste and resource management in Queensland. New regulation will support the Act, strengthening and co-ordinating compliance and enforcement. Stronger regulation of illegal activities will ensure fairness and encourage industry investment.

4. The strategy outlines the priority program areas for the first four years. The actions reflect imperatives identified by stakeholders and government in the consultation process, and will build on achievements to date by local government, business and households. Successful existing programs will be enhanced and some programs from other states adopted to help provide a nationally consistent approach and help meet Queensland's priorities.

The strategy outlines program areas for households, the waste and resource recovery industry, general business and industry, local government, and state government. A four-year business plan will be released in 2011 that describes program details and funding.

5. The strategy outlines the crucial partnerships and the roles and responsibilities of all Queenslanders. Effective partnerships between state government, industry, local government and the community are critical to achieving the strategy's goals and targets.

The case for change: a low-waste future for Queensland

The vision of a low-waste Queensland

Our current rates of waste generation, resource wastage and disposal are unsustainable.

Moving towards a more resource-efficient society will reduce the environmental, social and economic impact of waste, and place a higher value on recovering resources previously considered waste. The strategy is designed to drive a decade of significant improvement in managing Queensland's waste and recovering resources.

The Queensland Government is committed to a sustainable Queensland. This means a low-waste Queensland where there is less wasteful generation, where resources are used more efficiently, and where disposal is seen as a last – not a first – option.

Why is a strategy needed?

The strategy will provide the vision, and the means, to achieve a low-waste Queensland. It sets clear targets, which, supported by a strong legislative framework and a price signal to discourage disposal, underpin the behavioural change required to reduce waste generation and disposal. The strategy will drive a decade of significant improvement in waste and resource management in Queensland, and will make the most of the economic opportunities arising from optimising resource efficiency.

Implementing this strategy will progressively shift the emphasis from recycling toward a culture where waste reduction is an accepted lifestyle choice. This will become the usual way of doing business for Queenslanders, while still recognising the need for flexibility based on local and regional economic, social and environmental conditions.

In Toward Q2: Tomorrow's Queensland the Queensland Government addresses current and future challenges for the state, and sets a target to cut Queenslanders' carbon footprint by a third by 2020. The strategy will help meet this goal by reducing household waste to landfill.

The strategy will direct the development of the first four-year business plan, which will detail the programs to help to achieve the strategy's goals and targets. The diagram below illustrates these savings, compared with the unwelcome outcomes of continuing with business-as-usual.
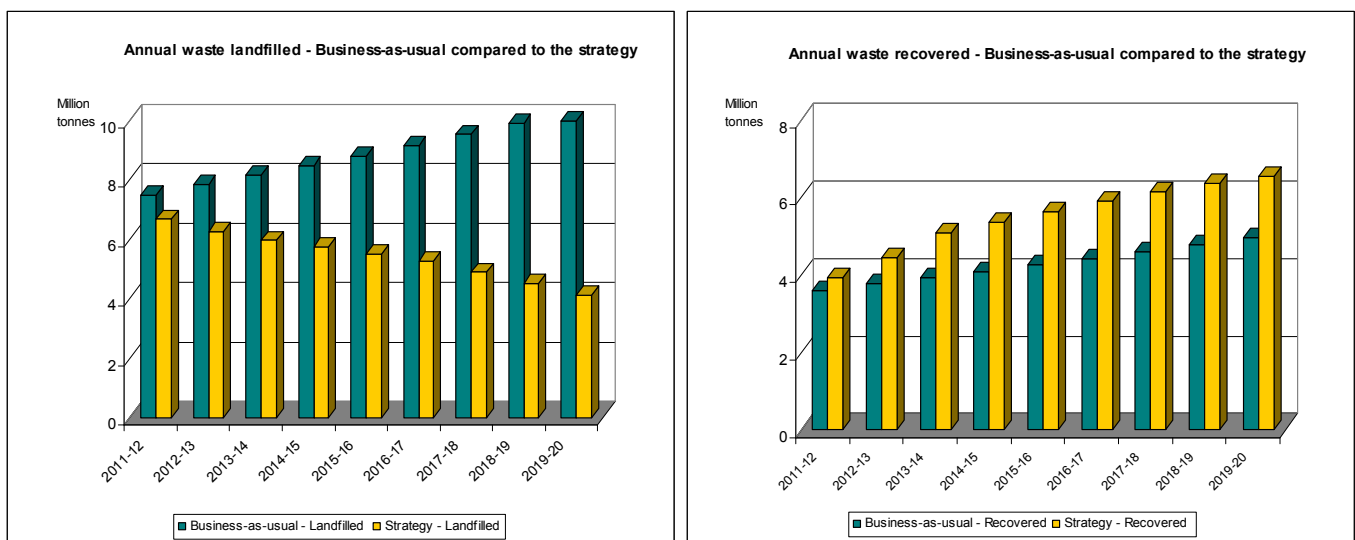

Figure 2 – Annual resource recovery and waste to landfill: business-as-usual compared to the strategy.

Implementing this strategy will move Queensland towards:

- cutting waste to landfill
- reducing waste generation, so that it does not exceed population growth
- increased industry investment resulting in an expansion of new green jobs

- reducing the total amount of, and the environmental impacts from, littering and illegal dumping

- boosting recycling rates across all sectors

- cutting green and organic waste to landfill

- reducing greenhouse gas emissions from waste

- increasing the number of businesses participating in waste reduction and recycling

- strong regional collaboration to identify and implement local solutions to local issues

- an effective and responsive land-use planning system for waste management infrastructure and activities

- accurate and timely information to help us make informed waste management and resource recovery decisions

- Queensland Government departments and local governments improving waste , recycling and green procurement.

Why waste must be reduced?

1. Resources are finite: every year in Queensland, millions of dollars are wasted burying valuable and finite resources. Waste is an inefficient use of natural resources, water, energy, money and land.

2. Waste production has environmental impacts: producing waste has environmental impacts from extracting resources right through to disposal in landfill.

3 Disposal has environmental impacts: even disposal of wastes into well-designed and managed landfills can create environmental impacts, from transporting the waste for disposal, to potential leachate, odour and greenhouse gas emission impacts.

4. Disposal has social impacts: the more waste that is created and unnecessarily disposed of, the faster landfill capacity is used. This puts pressure on local councils to find suitable sites for new disposal facilities. For some local governments, finding suitable sites that won't impact on nearby land uses, such as residential areas, is increasingly difficult and expensive, leading to higher costs for ratepayers.

5. Disposal has economic impacts: inefficient management of finite resources also means lost opportunities for business investment and job creation. Queensland is losing valuable investment and job creation opportunities in the resource recovery sector to other states where there are clear incentives to reuse and recycle.

6. Waste is increasing: the amount of waste generated in Queensland is steadily growing and this trend will continue unless action is taken. By 2026, Queensland's population is projected to reach close to six million people, a 30 per cent increase from 2006. This growth will put increasing pressure on Queensland's available space and future infrastructure planning. While much of this growth will occur in south-east Queensland, regional pressures will also be experienced.

As Queensland's population grows and standards of living increases, more goods are consumed and more waste is produced. Rising disposable income**,** convenience-led lifestyles, unsustainable consumption, changing attitudes and fashions, and design for obsolescence all contribute to this trend.

Queensland produces a large volume of waste every year. In 2008, an estimated 32.6 million

Figure 1 – 2008 waste generation, recycling and disposal.

tonnes was reported being generated from commercial and industrial, construction and demolition, and household activities. This includes data collected on waste that is classified for indefinite storage—such as fly ash from electricity generation—which amounts to 22.3 million tonnes. Queensland households and businesses generated the remaining 10.3 million tonnes.

The trend over the past five years has been for a significant increase in waste generation and disposal. The data shows that domestic waste generation in 2007–08 was 40 per cent higher than in 2003–04, but the population grew by only 10 per cent.
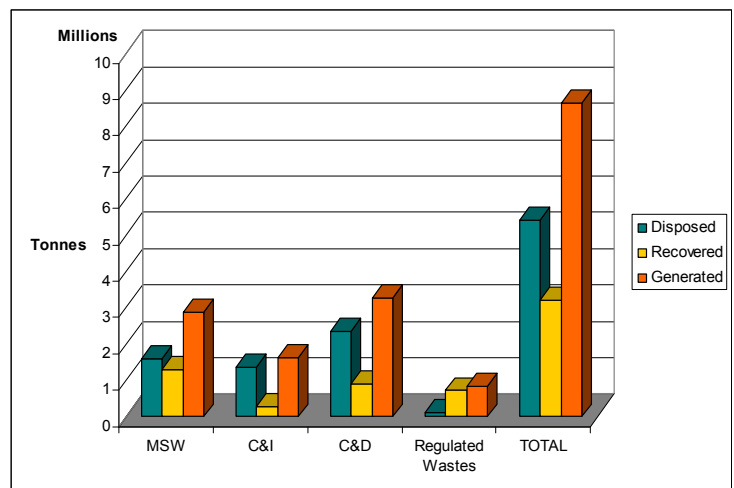
In 2007–08, more than 60 per cent of the waste generated by households and businesses was disposed to landfill. In 2008, each Queenslander generated around 2.4 tonnes of waste from the three main waste streams—commercial and industrial (C&I), construction and demolition (C&D) waste and municipal solid waste (MSW). This is an increase of around 20 per cent from 2007 generation estimates.

7. Community demand: there is an increasing community desire to recycle more, beyond the current recycling services provided by many local governments. There is growing community and business interest in being able to recycle end-of-life products such as televisions and computers, batteries and fluorescent lamps. There is also increasing community pressure for stronger government intervention and leadership to encourage business and industry to take action to reduce unnecessary packaging, increase recyclability of products and provide opportunities for consumers to recycle.

8. National trends: the National Waste Policy, released in November 2009, and the national agreement for Commonwealth product stewardship legislation, provide a foundation for take-back or producer responsibility schemes to reduce the impacts of end-of-life products.

Most other states have long-term strategies supported by waste levies to discourage disposal and encourage greater recycling. These levies range from around $28 to $70 per tonne for general waste disposed, making waste disposal in Queensland the cheapest.

See Supplementary paper 1: The challenges for waste reduction and resource recovery in Queensland, for more about the Queensland context.

> **Benefits of recycling**
>
> - 95 per cent less energy is needed to make aluminium from used cans than from the raw material, bauxite.
>
> - Every aluminium can that is recycled saves enough electricity to light a 20-watt energy-efficient bulb for 17.5 hours, or a TV for three hours.
>
> - The energy saved from recycling one glass bottle is enough to light a 20-watt energy-efficient bulb for 20 hours.
>
> - It also reduces air pollution by 20 per cent and water pollution by 50 per cent.
>
> - Recycling one tonne of glass saves 1.1 tonnes of raw materials (sand, limestone, soda ash), and reduces energy use by 30 per cent.
>
> - Adding used steel to new steel production reduces energy use by 25 per cent, air pollution by almost 90 per cent, water pollution by 76 per cent, mining wastes by 97 per cent and water usage by 40 per cent.

The challenge for Queensland

Everyday activities create pressure on the environment.

By creating less waste, impacts on the Earth can be reduced and social and economic benefits gained; in effect, using resources more efficiently to do more with less.

Waste generation in Queensland is increasing rapidly. Between 2003–04 and 2007–08 waste generation grew by 40 per cent. Over the same period, the population increased by 10 per cent and retail turnover increased by 21 per cent.

One of the significant challenges to tackle is the perception that nothing is wrong with the way things are done now. If good management is measured in terms of providing efficient and cost-effective collection and disposal services, then waste in Queensland is managed relatively well. For most Queenslanders, waste management simply means putting their waste in a bin that is removed with a minimum of fuss.

Unlike community resources such as water, there is never a lack of waste services and, for the most part, no lack of infrastructure to treat and dispose of the waste. Because waste is removed efficiently, there is no real understanding that too much is being generated or that maintaining the level of services and infrastructure required is difficult and expensive.

For households, waste management charges appear as a fixed amount on rates notices. In most cases, the charge is the same, regardless of how much or little waste the householder generates. This means there is no immediate imperative or incentive to take action and avoid generating waste, reduce the amount of waste discarded or even to recycle more effectively.

There is also a perception that there are plenty of places to put waste in Queensland. Much of Queensland does not have the high population densities and limited space for landfills that create difficulties for areas such as Sydney and Melbourne.

However, some south-east Queensland local governments are already grappling with rapidly filling landfills and finding acceptable solutions to managing the waste that continues to be generated. Landfill capacity varies between each local government area. Some local governments have significant landfill capacity remaining, while other local governments only have a couple of years left, and limited opportunities to establish new sites. A shortage of accessible facilities leads to increased road pressures as business travels further to dump waste.

Queensland is a huge state, and must find viable waste management and resource recovery solutions for its more regional and remote areas. Island communities, in particular, have difficulty finding sustainable and economically viable waste management solutions, due to small populations, limited transport options, significant transport and logistics costs and planning issues, and limited storage space. Some communities, such as those in the Torres Strait, also have quarantine issues to contend with when transporting waste and recyclables between islands and the mainland.

A growing number of individuals and businesses are beginning to question current practices. For instance, people are concerned about the potential environmental impact from disposing of end-of-life products that contain potentially hazardous chemicals, such as mercury, lead and cadmium.

People are also concerned about the wasted resources when these items are disposed of. Many of these resources are finite and their extraction has the potential to cause significant environmental damage. There is also growing community interest in being able to take stronger action to prevent litter and illegal dumping activities.

The community is increasingly concerned about the local impacts of siting landfills and other waste management and resource recovery facilities dealing in composting, concrete crushing and grinding, packaging materials recovery facilities and transfer station operations. People are worried about the legacy of landfills and issues such as landfill gas migrating into houses near landfills. Communities are becoming much less tolerant of waste management infrastructure close to households and other sensitive land uses.

The challenge in attempting to change behaviour before there is a commonly perceived need is creating the understanding that while waste may not be a problem today, that doesn't mean it won't be a problem tomorrow.

The hazardous legacies of some past waste management and disposal practices are well documented, and ongoing monitoring and clean-up comes at a high cost to governments and the community. It is important to start doing something now to change the way people think about waste management so that a similar legacy is not left for the future.

There has been good progress in some areas of waste management, such as improved landfill design and operation and introducing kerbside waste and recycling services. However, there is a long way to go and some key challenges remain.

Business is often frustrated by the limited options for recycling wastes. Up-take of available recycling services by commercial waste generators is variable and, currently, most voluntary product stewardship is dependent on motivated industry leaders and 'early adopters'. The quality of information available about the make-up of waste streams and trends generally remains poor.

Developing the strategy

Queensland's previous waste strategy was released in 1996, and no longer reflects the current state of play or the potential for improved waste reduction and resource recovery. Since 2001, waste industry and local government stakeholders have been requesting the government to prepare a new strategy with a secure funding source to provide investment certainty and policy direction.

An international trend towards resource recovery and recycling is leading to unprecedented growth in the industry. But Queensland's outdated waste management framework is resulting in investors choosing to invest in other states, and Queensland is missing the opportunity to benefit from this emerging industry.

The government started the process of developing a modern strategy by releasing a waste discussion paper in October 2007. Response to the discussion paper overwhelmingly supported developing a state-wide strategy to provide vision and drive reform.

A draft strategy and waste disposal levy proposal was released for public comment in May 2010, feedback from which can be viewed at <www.derm.qld.gov.au/waste>. The feedback was used to finalise the strategy, which represents the first step in more than a decade to undertake genuine reform across all aspects—strategic, legislative and economic—of waste management in Queensland.

Strategy principles

The waste and resource management hierarchy

The strategy is a new take on an old theme—the waste and resource management hierarchy, an internationally accepted guide for prioritising waste and resource management practices. Waste reduction is the preferred option, followed by reuse, recycle, other recovery, treat and, finally, dispose (see Supplementary paper 2: The waste and resource management hierarchy, for more detail).

To start changing behaviour and the way people perceive waste—and begin the journey towards valuing the resource—this strategy uses the hierarchy to underpin its goals and actions.

The hierarchy and the following guiding principles steer the delivery of programs and inform this strategy.

Most preferable

Reduce
Reuse
Recycle
Other recovery
Treat
Dispose

Least preferable
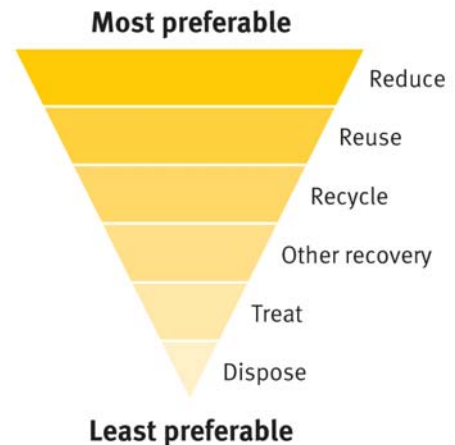
Resource efficiency

- Moving from a linear 'extract-process-use-dispose' resource use model towards 'closing the recycling loop' in a more cyclical system where resources are recovered and recycled again and again.

- Making better use of finite resources (energy, water, materials) by encouraging waste avoidance and improving recovery through product stewardship or 'take-back' schemes.

Sustainability

- Maximising the net benefits to all Queenslanders: environmental, social and economic.

- Building on existing programs and achievements.

- Facilitating sustainable local solutions for local issues.

Engagement

- Taking the views of all stakeholders into consideration

- Achieving results through partnerships with the community, business and industry and government.

- Facilitating and encouraging shared responsibility.

- Taking into consideration relevant national and international trends in waste technologies, laws and policies.

Capacity building

- Facilitating business and industry development and building sustainable local and export market capability, while recognising the different approaches needed for metropolitan, regional and remote areas.

Strategy goals

Based on these principles, the strategy will aim to:

1. reduce waste

2. optimise recovery and recycling

3. develop sustainable waste industries and jobs.

The goals highlight the areas where action is necessary to secure real progress in achieving the vision of a low-waste Queensland. The goals and the vision of a low-waste Queensland will be achieved through a five-part strategy.

A five-part strategy

1. Targets and priorities

The strategy sets ambitious but achievable targets aimed at tackling waste generation, and optimising opportunities for recovering, reusing or recycling materials and end-of-life products. The targets will help influence infrastructure planning processes and the activities of government, business, and households. The strategy also identifies priority areas for action.

Targets

Over the next decade Queensland will:

- reduce waste to landfill
- reduce landfill gas emissions
- increase the recovery and recycling of resources across all waste streams
- reduce generation of waste
- reduce the total amount of, and the environmental impacts from, litter and illegal dumping.

Key targets and dates				
Target	**2008 baseline**	**By 2014**	**By 2017**	**By 2020**
Reduce waste disposal to landfill, compared to business-as-usual projections	Business-as-usual – no strategy	Reduce landfill disposal by 25 % – 4.6 million tonnes of avoided landfill disposal since 2010	Reduce landfill disposal by 40 % – 9.9 million tonnes of additional avoided landfill disposal since 2014	Reduce landfill disposal by 50 % – 16.3 million tonnes of additional avoided landfill disposal since 2017
Increase recycling of construction and demolition waste	35 %	50 %	60 %	75 %
Increase recycling of commercial and industrial waste	18 %	40 %	50 %	60 %
Increase recycling of regulated waste	30 %	35 %	40 %	45 %
Increase recycling of municipal solid waste	23 %	50 %	55 %	65 %
Target 150: increase recycling of household waste to 150 kg per person per year	64 kg per person per year	80 kg per person per year	100 kg per person per year	150 kg per person per year
Reduce generation of waste	2.4 tonnes per person per year	5 % reduction 2.3 tonnes per person per year	10 % reduction 2.2 tonnes per person per year	15 % reduction 2 tonnes per person per year

The targets have been set after analysing the available data and trends, and by working with stakeholders as part of consultation on the draft strategy.

The targets represent aggregated outcomes across the whole of Queensland, as it is expected that metropolitan areas will initially out-perform regional and rural areas of the state. The targets are designed to encourage collaboration and partnerships in regional areas to work together to achieve the strategy's goals and aim for continuous improvement and innovative local solutions. A range of programs and initiatives will be available to regional Queensland to align with the goals and targets of the strategy.

Developing innovative and accessible resource recovery technologies will be vital to meet the targets.

Measuring progress

Feedback on the draft strategy highlighted the relatively poor quality of Queensland's waste data. Despite improvements in recent years, there are still issues with the completeness and reliability of the information. Improving data collection and reporting is a high priority. Without it, it is not possible to measure progress and achievements, refine priorities, and develop specific targets for waste materials. While it is not necessary to wait for more accurate data to commence the reforms, as the general trends are obvious, the issue needs to be addressed as soon as possible.

The following initiatives will help establish improved methodologies and reporting mechanisms:

- Conducting composition audits of commercial and industrial (C&I), construction and demolition (C&D) and regulated wastes to help measure recovery performance.

- Analysing infrastructure across Queensland to identify current capacity and gaps in management and processing capacity.

- Developing a standard methodology for measuring and reporting on public place and event recycling.

- Developing a standard methodology for measuring and reporting on waste disposal and resource recovery.

- Conducting composition audits on municipal waste to identify priority products and recoverable materials.

Progress towards achieving the targets will be measured every three years against the 2008 base case. The government will monitor performance and achievements through three-yearly progress reports. Strategy priorities, targets, levy pricing, and the effectiveness of programs will all be part of the regular review and public reporting.

Waste reduction target

Under the waste and resource management hierarchy, waste reduction is the preferred option. By avoiding waste generation in the first place, the entire community's reliance on resource-depleting waste disposal will be reduced.

The Queensland Government can influence waste avoidance by engaging with national processes and working with manufacturers, industrial processes and research sectors to help create more efficient and innovative processes to avoid generating waste. Population and retail growth also needs to be taken into account, as both influence waste generation.

Measuring how much waste has been avoided is difficult. One way is by calculating the reduction in overall waste generation (measured as recovered-plus-disposed). The waste avoidance target proposed by the strategy is:

Reduce generation of waste by 15 per cent per capita by 2020.

Recovery targets

Resource recovery means recovering materials for re-use, recycling, or energy recovery. Resources can be recovered through separating recyclable materials at the source (such as household kerbside recycling) or from a mixed load of waste at a transfer station, treatment facility or landfill (such as using a 'dirty' materials recovery facility to separate recyclable material from non-recyclable waste prior to landfill disposal).

The environmental benefits of resource recovery generally come from reducing waste disposal and offsetting the use of virgin, and often finite, resources. The benefits include conserved resources and landfill space, reduced greenhouse gas emissions, less air pollution and water savings.

Recycling targets have been set for the three main waste streams and for higher-hazard regulated waste. A sub-target for municipal solid waste—domestic kerbside collection—has also been set, as comparatively good data is available for this stream. 'Target 150' aims to both increase household recycling (from 64 kg per person per year) and decrease household waste disposal (from 267 kg per person per year) to 150 kg per person per year by 2020.

Recover and recycle by 2020:

- **75 per cent of construction and demolition waste**
- **60 per cent of commercial and industrial waste**
- **45 per cent of regulated waste**
- **65 per cent of municipal solid waste**
- **Target 150 – recycle 150 kg of household waste per person per year.**

Disposal targets

While well-designed and engineered landfills that capture landfill gas for re-use can be operated with reduced environmental and social impact, many landfills do not meet this standard, and burying resources and useful materials is not an optimal use of resources. However, there is an opportunity to reduce the environmental impact of landfilling by optimising the capture and re-use of landfill gas wherever practicable.

Another way to reduce greenhouse gas emissions from waste disposal is by reducing the amount of organic waste that goes to landfill. To achieve the strategy's target, organic waste from both domestic and commercial sources will have to be diverted from landfill.

Litter and illegal dumping are the most obvious evidence of irresponsible and wasteful attitudes. In implementing the strategy, the Queensland Government will be mindful of the potential impacts of policies, such as introducing a waste disposal levy, on illegal dumping. The strategy aims to minimise the environmental impact of disposal, and, in particular, unlawful disposal such as littering and illegal dumping.

The focus has moved away from just cleaning up litter once it has been dumped and towards preventing unlawful activity in the first place. The strategy does not propose a reduction target at this stage as current baseline data is not good enough to establish a target to:

- **reduce waste to landfill by 50 per cent**
- **reduce landfill gas emissions by 50 per cent**
- **reduce the total amount of, and the environmental impacts from, litter and illegal dumping.**

Achievability and risks

Construction and demolition waste (recycling target of 75 per cent by 2020)

Achievability of this target is rated as **high** due to the highly recyclable nature of this waste stream. Information provided by the sector indicates that the majority of waste produced during construction of a residential dwelling is clean soil. Concrete, timber and steel are also produced, all of which are readily recyclable.

Applying the levy will also create an incentive for this sector to reduce waste disposed and explore opportunities to avoid waste generation or increase recycling. Initially, regional areas may have limited opportunities to recycle construction and demolition wastes. In time, however, investment in regional recycling infrastructure, and developing markets for recycled products, will bring improvements.

To reduce the risks, the Queensland Government will engage with the construction and demolition sector to support research and improved site practices to reduce contamination and identify opportunities for recycling, and encourage purchase of recycled-content products.

Commercial and industrial waste (recycling target of 60 per cent by 2020)

Achievability of this target is rated as **medium** due to the current comparatively low rate of recycling in this sector and applying a price signal in the form of a waste disposal levy to encourage behavioural change.

The commercial and industrial sector covers many areas of business and the resulting waste is varied in its composition. There is also no processing infrastructure dedicated to large-scale mixed commercial and industrial waste sorting and recovery.

Some businesses may lack the capacity and expertise to undertake the changes required. This may be especially true for small business, or for multi-tenanted buildings where the business has little control over waste management systems. However, there is recognition by companies and business associations that business and industry could do more to recycle their wastes.

To reduce the risks, the Queensland Government will:

- work with this sector, and in particular small-to-medium enterprises, to help with education and awareness about available recycling technologies and systems suitable for a range of businesses, auditing and developing waste reduction action plans, and best practice contracting for waste management services
- work with waste contractors to support expanded recycling services for the commercial sector.

Municipal solid waste (recycling target of 65 per cent by 2020)

Achievability of the target is rated as **medium** at best due to both the limited opportunities to recycle some of this waste and the lack of a price signal. Municipal solid waste includes wastes arising from local government maintenance of street bins and street sweeping operations. There may also be limited capacity in regional areas to improve recycling activities due to economies of scale and transport costs to processing infrastructure.

Achieving this target is also highly dependent on commercial decisions, such as by retailers and manufacturers who could choose to provide goods in recyclable or minimal packaging. Over 10 years, this target is also likely to be susceptible to changing commodity prices and the introduction of new materials and products that generate different wastes.

Perhaps the largest gains in this area can be made by targeting household green waste and organic recovery. While there are risks with this approach, primarily from a lack of markets for products, organics make up around 40 per cent of the waste from household bins, presenting a significant opportunity.

To reduce the risks, the Queensland Government will:

- encourage and support product stewardship arrangements
- use education and awareness programs and strong community partnerships to ensure appropriate recycling in households
- work with local government and communities to implement household green waste and organic programs.

Priority areas

This strategy and the proposed legislative reforms challenge old ways of thinking about what has traditionally been considered as 'waste'. Priority will be given to sectors and areas with the greatest need and potential to deliver the greatest gains and cost-effective improvements over the next decade.

Priority wastes and end-of-life products

Each waste stream contains many individual waste materials and end-of-life products. Many occur in more than one stream. For example, packaging occurs in all waste streams, and 'e-waste', such as end-of-life computers and electronics, occurs in municipal solid waste and commercial and industrial waste.

Feedback on the draft strategy suggested many potential candidates for priority action. Supplementary paper 3: Identifying priority products, outlines a process to transparently identify and manage priority products and materials by publishing a priority product statement. Wastes are assessed in terms of disposal impact, resource efficiency, and the economic and social impacts of waste generation and disposal.

This helps to shape the initial set of priorities for the first term of the strategy, which will include the **high priority red hotspots** highlighted below. The **lower priority amber spots** show areas that can be tackled later, either because substantial progress is already being made, or because more time is needed to develop recovery infrastructure or end-markets. This means that, for example, programs to better recover organic wastes should initially target household garden waste and commercial food processing waste, while the more difficult challenge of household food waste can be tackled later.

Hot spot table ● Highest priority ● Secondary priority	Mixed	Packaging	Computers and televisions	Batteries and fluoro lights	Tyres	Organic – green & garden	Organic – processing & food scraps	Timber, concrete	Gas bottles	Higher hazard regulated
Municipal solid waste		●	●	●	●	●	●		●	
Commercial and industrial waste		●	●	●	●	●	●		●	●
Construction and demolition waste	●	●						●		

Taking action on priority products

New legislation will help identify priority wastes, enabling Queensland to support national approaches or to adopt state-based action. A detailed priority product statement will be released in 2011, identifying priority products and materials, preferred management options and performance measures.

More detailed data on waste streams will be needed to refine these priorities, or to develop targets for particular materials. Actions to audit and characterise waste streams are a high priority.

Possible actions for particular priority wastes include:

- voluntary or mandatory 'product stewardship' or take-back schemes
- disposal bans
- education and awareness campaigns to target reduced generation and enhanced recovery
- support for collection programs or reprocessing infrastructure
- investing in design-for-environment to increase recyclability or reduce toxicity of inputs.

Coordinating with national processes

Some end-of-life products are currently targets for national product stewardship action. These include tyres, packaging waste, computers and televisions, mercury-containing lamps, and plastic bags. Some industry sectors already have voluntary recycling schemes, including the telecommunication industry (MobileMuster), agricultural and veterinary chemicals (DrumMuster and ChemClear) and newsprint (Publishers National Environment Bureau). The Queensland Government will work with industry sectors to help build on achievements made through existing schemes and help promote product stewardship activities. The Queensland Government is also interested in working with other industry sectors to foster new product stewardship arrangements.

2. Price signal – waste disposal levy

The Queensland Government will introduce a waste disposal levy as a price signal to change disposal behaviour. A levy is a price charged in addition to the normal waste disposal gate fee at a waste disposal facility.

How the levy will work

The levy will only apply at the point of disposal and is, therefore, largely an avoidable charge. This is because a person who disposes of waste to landfill pays the levy, whereas a person who avoids generating waste, or recycles their waste, does not pay the levy.

The levy will provide:

- a price signal to encourage waste generators to reduce waste generation and disposal

- a deterrence to the unnecessary disposal of interstate waste in Queensland

- an incentive for industry investment in resource recovery infrastructure

- funding for programs to improve waste avoidance and resource recovery practices.

Ultimately, the levy will help achieve the strategy's targets and reduce Queensland's carbon footprint by cutting landfill disposal.

Levies have worked in other states, when accompanied by targeted and effective programs and investment in resource recovery infrastructure. In turn, levies provide a source of funding to deliver waste reduction programs.

An initial rate of $35 per tonne of waste disposed will apply to commercial and industrial waste, construction and demolition waste, and contaminated and acid sulfate soils. Municipal solid waste, which includes household kerbside and self-haul waste, and wastes from park and street bin maintenance, will not attract levy payments.

Regulated waste, from non-domestic sources, includes acids, oil, batteries, tyres, food processing and clinical waste. Higher levels of levy will apply depending on whether it is lower hazard or higher hazard as prescribed by regulation. Certain wastes, such as declared disaster waste or correctly managed asbestos, will be exempt.

Waste stream	Levy $/tonne disposed
Commercial and industrial waste	$35
Construction and demolition waste	$35
Contaminated and acid sulfate soils	$35
Lower hazard regulated waste	$50
Higher hazard regulated waste	$150
Municipal solid waste	$0

The levy rates have been set to strike a balance between the need to change behaviour—from waste disposal to reduction and recovery—while not imposing unnecessary costs on business. The levy is also proportionate to that in other states so that Queensland does not become a cheap dumping ground for interstate waste.

Distribution of levy funds

Over the first four years of its collection, the levy will be distributed as follows:

- $159 million towards targeted programs to help business and industry reduce the amount of waste they generate, and to encourage industry investment in recycling technologies, particularly in regional areas

- $120 million for local governments to spend on environmental projects, focusing on better waste management facilities and practices

- Any surplus funds will be dedicated to priority Queensland Government environmental initiatives, including acquiring land for national parks.

Next steps

The levy will commence from 1 July 2011. The levy collection zone covers 34 local government areas, each with populations of more than 10 000 people. The strategy will be reviewed every three years.

The Queensland Government has committed to excluding domestic self-haul waste from application of the levy. The government will continue to monitor the effectiveness of its current policy and any impacts that may arise, in particular the potential to see misrepresentation of commercial waste as domestic waste. The government will also scope options to achieve its policy intent through other mechanisms, such as a voucher system.

3. Stronger legislation

The need for a new legislative framework

Queensland's waste management legislation is outdated and mainly deals with managing the impacts of pollution caused by waste—not trying to stop it being generated in the first place.

While there have been significant developments in waste management and resource recovery since the introduction of the *Environmental Protection Act 1994* and subsequent introduction of the Environmental Protection (Waste Management) Policy 2000 and Environmental Protection (Waste Management) Regulation 2000, there is little scope under the current Queensland framework for taking the same action as other states on waste reduction, product stewardship or resource recovery and efficiency.

New legislation is needed to underpin the strategy, including promoting waste reduction and resource recovery and diverting potential resources from landfill. The legislation needs to reflect modern waste management practices and an awareness of the need for Queensland to reduce its ecological footprint.

The government will deliver a new Act and regulations, and amend and strengthen existing laws. This will provide the necessary head of power to improve waste and resource management in Queensland. The new framework will clearly define the legislative options for managing end-of-pipe, front-end and whole-of-life impacts. This approach is consistent with the framework used in other states.

The proposed legislative reforms will:

- help achieve the goals and targets of the strategy
- provide a more flexible approach that can readily keep pace with changes in technology
- help to regulate illegal activities more effectively and provide a level playing field for legitimate and responsible facility operators
- help manage priority wastes more effectively
- ensure more consistency with other states.

Priority products, product stewardship and landfill bans

The legislation will set out a process for publishing a priority product statement, which will identify priority products and materials, preferred management options and performance measures. While in some cases the most effective management option could be education or market development, the legislation will also empower the government to take strong action where appropriate, such as:

- establishing product stewardship programs under which producers take back end-of-life products
- phased-in disposal bans for certain priority products.

Other legislative measures

Legislation will also be introduced in 2011 that:

- requires the Queensland Government to regularly review and report on this strategy
- introduces a waste disposal levy to change behaviour
- strengthens requirements for implementing state and local government strategic waste plans
- establishes requirements for resource recovery from waste streams prior to disposal
- sets mandatory reporting requirements for the waste and resource recovery sector
- delivers stronger litter and illegal dumping provisions, including third-party public reporting of vehicle-related litter offences.

4. Programs and actions

Waste is everyone's responsibility and the Queensland Government will work together with local governments, business and industry, environment groups and the community to deliver a set of actions and effective programs.

In order to achieve improved practices, people must have the ability to recycle, and companies collecting recyclable materials must have markets for the products. The Queensland Government will work with industry sectors to foster the strong institutional and infrastructure foundations necessary for increased investment, employment and innovation in waste and resource management.

Investment will be encouraged for operations and technologies suited to different materials, generation sources and geographic locations. Priority areas and products will be identified, emphasising areas currently under-represented, as indicated by the available resource recovery data.

Developing new markets for recycled products is essential to achieving the resource recovery targets in the strategy. While strong markets do exist for some recovered materials, such as plastic, aluminium, and cardboard, there is scope to improve the use of these recovered materials. Other wastes, such as construction and demolition waste and recycled organics, are high priorities for market development. As new and expanded recovery programs take effect, and new challenges are presented by product take-back initiatives, further opportunities will emerge for market and research development.

This section outlines the key action areas over the next four years that reflect imperatives identified by stakeholders and the government. They will be funded by an estimated $279 million raised from the levy over four years.

The actions reflect the current situation and knowledge, but changing circumstances or national priorities may prompt review and redirection of the focus. These actions will build on the valuable work to date by business and households, by enhancing successful programs—such as the 'Do the right thing, use the right bin' away-from-home recycling program—and by adopting interstate programs to meet Queensland's priorities.

A four-year business plan to be released in 2011 will describe the details and funding of the programs. The main actions are outlined here, aligned with the strategy's goals and targets. While the targets and most of the actions belong to the preferred reduce and recycle end of the waste hierarchy which is the main focus of this strategy, several actions also aim to mitigate the impacts of waste disposal in remote and regional areas of the state.

Sector	Initial action areas and strategy targets	Goal 1 – Reduce waste	Goal 2 – Optimise recovery & recycling	Goal 3 – Sustainable waste industries
	Reduce waste to landfill and landfill greenhouse gas emissions **Increase recycling of commercial and industrial waste to 40% by 2014**			
State government	Towards a resource-efficient government • State government departments will be required to include targets for purchasing recycled-content products, recycling and waste reduction actions in their mandatory strategic waste management plans, and to report on progress.	✓	✓	✓
	Sector-wide actions • Implement state-wide action such as product stewardship schemes on priority wastes, including those that are part of the national waste strategy agenda such as tyres, or televisions and computers.		✓	✓
	• Regional and state-wide collection programs, including infrastructure for collecting priority products, and 25 strategic regional resource recovery programs aimed at creating green jobs in regional areas.		✓	✓
	• Improved compliance and regulation of the waste and resource recovery sector.			✓
	• State-wide litter prevention strategy, including public reporting for littering from vehicles, a ban on the mass release of lighter-than-air balloons from government-organised events, reducing litter from plastic bags and advertising material, and support for existing successful anti-litter programs.	✓		

Sector	Initial action areas and strategy targets	Goal 1 – Reduce waste	Goal 2 – Optimise recovery & recycling	Goal 3 – Sustainable waste industries
Business and industry	**Reduce per capita generation of waste** **Reduce waste to landfill and landfill gas emissions** **Increase recycling of commercial and industrial waste to 40 % by 2014** **Increase recycling of construction and demolition waste to 50 % by 2014** **Increase recycling of regulated waste to 35 % by 2014**			
	• Support business to make the transition to low-waste, including: o help to identify and reduce waste, and help for small to medium businesses to install recycling infrastructure or avoid waste such as by re-using manufacturing off-cuts	✓	✓	✓
	o partnerships between suppliers, retailers and government to reduce waste.	✓		
	• Business information/networking services, including investigation of an online waste exchange register.		✓	
	• Hazardous/regulated waste reduction and recycling fund, including research on characterisation, options for avoidance, treatment to reduce hazard characteristics, and alternative end-uses.	✓	✓	✓
	• Improve recovery of construction and demolition waste through state-wide planning measures such as standardised site waste management and minimisation plans.	✓	✓	✓
	Waste and resource recovery sector			
	• Competitive grants for infrastructure for priority areas including organics, construction and demolition waste, end-of-life tyres and e-waste.		✓	✓
	• Market development programs for priority wastes; organics and construction and demolition waste.		✓	✓
	• Incentives for sustainable recovery and recycling of wastes from regional areas.		✓	✓
	Research and development			
	• Support for research and development programs to identify and commercialise opportunities for innovative waste technologies, processes and products.	✓		✓
	• Design for Environment (D4E) program to support product development and design professionals to use sustainable product design across the entire lifecycle of the product.	✓		

Sector	Initial action areas and strategy targets	Goal 1 – Reduce waste	Goal 2 – Optimise recovery & recycling	Goal 3 – Sustainable waste industries
Households, schools, and community organisations	**Reduce waste to landfill and landfill gas emissions** **Increase recycling of municipal solid waste recycling to 50 % by 2014** **Target 150: recycle 150 kg household waste per person per annum by 2010** **Reduce total amount of litter**			
	• Household waste reduction initiatives including:			
	o educational campaigns based on the waste hierarchy and focusing on consumer purchasing decisions and plastic bag reduction	✓		
	o the Target 150 campaign to increase household recycling and decrease waste disposal	✓		
	o investigating incentives to waste less (e.g. with smaller waste and larger recycling bins).	✓		
	• Public place recycling; expanding Queenslanders' access to recycling bins away from home.	✓	✓	✓
	• Reducing household organic waste through kerbside green/food waste bin pilots and incentives, community gardens, and education.	✓	✓	✓
	• Encourage hazardous waste collections for householders.	✓	✓	
	• Community organisation recycling and re-use grant scheme.		✓	✓
	• Recycling educational programs such as five 'recycling ambassadors' to provide community leadership, and the 'Do the right thing, use the right bin' school waste minimisation program.			
Local government	**Reduce waste generation and greenhouse gas emissions** **Reduce the total amount of, and environmental impact of, litter and illegal dumping** **Recycling targets for all waste streams**			
	• Local government reference group to establish regional priorities.			
	• Assistance for local government/regional strategic waste management planning.	✓	✓	✓
	• Incentive scheme for improved resource recovery practices.			✓
	• Assistance for assessment of small to medium disposal facilities, and alternative waste technologies.			
	• Partnership programs to act on litter and illegally dumped waste, and clean up historical wastes, including in Indigenous communities.			

5. Partnerships to deliver change

The goals and targets of the strategy will be realised through consultation, engagement and successful cooperation between stakeholders. Householders, businesses, industry, and state and local governments must all help reduce waste and, in doing so, help Queensland develop sustainable waste industries and jobs. Everyone has a role to play.

Engagement and education are fundamental to achieving behaviour changes that will translate into better decisions and long-term improved practices. The most lasting outcomes arise from programs with strong core messages, local level engagement and participation, and which are linked to providing supporting infrastructure.

Community

When provided with the right information and good systems to enable behavioural change, the community demonstrates improved practice. Household recycling is most obvious example of this. Recycling has really only been easily available to Queensland households since the early 1990s. More than 90 per cent of households now have access to kerbside recycling and it is a well-accepted and supported part of everyday household activities.

Extending recycling beyond households into workplaces and public places, while starting to happen, requires a concerted effort from government, business and the waste industry.

Consumers will rely increasingly on industry to develop products with a lower environmental impact, and on governments to provide a framework conducive to waste reduction and resource recovery.

The Queensland Government will partner with local governments and community organisations to promote household and community awareness, litter prevention messages and actions, and school education and awareness programs. The role of community partners will be further articulated in the business plan.

Business and industry sectors

Many businesses already avoid waste through resource-efficient manufacturing, or recycling the waste they generate. Business also influences consumer behaviour by marketing recyclable and recycled-content products.

The Queensland Government will need to forge strong partnerships with general business and industry, businesses generating regulated waste, and the construction and demolition sector. The business sector is an important partner in meeting the targets of the strategy. It influences the design of sustainable products in the market, the availability of services, end-of-life product management, and purchasing and recycling behaviour in offices and retail areas.

The Queensland Government will partner with industry associations from the commercial, manufacturing and construction sectors. For example, the Department of Environment and Resource Management is a sponsor of the waste and materials sections of the Urban Development Institute of Australia's Enviro-Development framework.

Waste and resource recovery industry

Queensland's waste and resource recovery industry is vital to the state achieving the goals and targets of the strategy over the next decade. This sector provides collection, sorting and processing, and disposal services. Some companies are contracted to local government to undertake household waste and recycling collection services and, in some cases, transfer station and landfilling operations.

This sector faces challenges including securing appropriate sites for future infrastructure needs, and certainty of raw material inputs and end-markets. Operators within this sector vary greatly in size and nature, from large multinational companies offering a wide range of services, to small specialised service providers.

The Queensland Government will partner with local government and the waste and resource recovery sector to explore any barriers in Queensland's framework to establishing the infrastructure necessary to achieve the strategy's goals and targets.

Academic and research community

Research into innovative solutions and new technologies, practices, markets and products is essential to the strategy. Partnerships with tertiary institutions and research organisations will provide crucial information about future directions and priorities.

A core program will be investigating options for regulated waste producers to either avoid producing this waste in the first place, or reduce the volume or toxicity of the waste. Queensland companies can be important innovators in product substitution processes and technologies to reduce this waste stream.

Local government

Local governments have the primary role of providing waste and recycling services to households, and waste management and recycling education to the community. Some also provide public place or business recycling services. Local governments also have a regulatory role in enforcing requirements for waste management activities in their areas, and in litter prevention and enforcement. Almost every local government in Queensland is responsible for at least one landfill facility and several transfer stations.

There are regional local government organisations that help local governments plan for regional waste and resource management activities. These groups are also a valuable information sharing service and allow for better coordination of services and training across the region.

Successful waste management and improved resource recovery requires coordinated planning and action at local and regional levels.

State government

Several Queensland government agencies have administrative responsibilities for waste management in the state. Under the new framework, the Queensland Government as a whole has a responsibility to lead by example in purchasing recycled-content products and improving resource recovery performance. Individual government departments will be responsible for developing waste management plans that reflect the strategy's goals and targets, and for adopting green purchasing standards. The State Procurement Policy currently requires departments to set purchasing sustainability targets, including more use of recycled products.

The Queensland Government is in a position to address some of the impediments to reusing recovered resources, particularly in its own activities. The Queensland Government, together with local governments, is also responsible for regional planning, which has a significant impact on future infrastructure development.

In 2009, the Department of Public Works released the Recycling Policy for Buildings and Civil Infrastructure to promote sustainability in the built environment through improved use of resources and reduced pressure on landfill waste sites. The policy sets a target of 40 per cent recycling of each material type by weight. The Queensland Government's objective is to ensure that all practical and cost-effective opportunities for recycling and reuse of materials used in building and civil infrastructure projects are implemented. All Queensland Government departments and government-owned corporations and companies are required to develop a resource (waste) recovery program for recyclable materials in any significant government building or infrastructure that is being demolished or redeveloped.

Other Queensland Government departments, such as the Department of Transport and Main Roads and Department of Education and Training, have a significant role to play in improving practices and promoting recycling and recycled-content product use in building civil infrastructure, such as roads, bridges and buildings.

Department of Environment and Resource Management

The Department of Environment and Resource Management (DERM), along with local governments, administers and enforces the *Environmental Protection Act 1994* and its various instruments.

DERM also implements the Queensland Government's responsibilities under the Australian Packaging Covenant, gives effect to the National Environment Protection (Used Packaging) Measure by enforcing non-compliance with provisions of the Environmental Protection (Waste Management) Regulation 2000, and chairs the Jurisdictional Projects Group established to consider funding applications under the Covenant.

Under the new framework, DERM will need to establish strong partnerships with the community, business and government to deliver effective programs and meet the goals and targets of the strategy.

Australian Government

National waste management issues are co-ordinated through the Environment Protection and Heritage Council, which is made up of all state and territory environment ministers and chaired by the Commonwealth environment minister. In November 2009, the Council released the National Waste Policy: Less Waste, More Resources which sets the national agenda on waste up to 2020. The policy aims to avoid the generation of unnecessary waste, reduce waste going to landfill, manage waste as a resource, and ensure that waste disposal is done safely to protect human health and the environment. The policy identifies product stewardship and landfill management as areas that would benefit from a national or coordinated approach.

The Australian Government also has responsibility for international waste management issues, such as meeting Australia's signatory obligations under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The Australian Government is an important strategic partner for the Queensland waste reform process, as many priority issues for Queensland are also issues of national concern.

Glossary

Commercial and industrial waste (C&I)	Waste that is generated as a result of commercial or industrial activities. Commercial or industrial activities include, but are not restricted to: • manufacturing and industrial processes • wholesale or retail trade • sorting, resource recovery, reprocessing and recycling operations • commercial services including those provided to households (e.g. gardening, skip or bin hire, etc), • accommodation, cafes, pubs and clubs, restaurants, resorts and other hospitality sector activities • primary industries including agricultural, forestry and fishing • office, administration, institutional or other business activity.
Construction and demolition waste (C&D)	Waste that is generated as a result of building, refurbishing, renovating or demolishing structures, buildings and infrastructure such as roads, bridges and docks, and includes material such as timber, clean soil, concrete, asphalt, plasterboard, steel, bricks, ceramic and clay tiles, and aluminium.
Domestic waste	Waste arising from domestic premises that is collected by or on behalf of the local government through the provision of a regular kerbside bin service.
Ecological footprint	A resource accounting tool that can measure how much land and water area a person, event, business, city or country needs to produce the resources it consumes and to absorb its waste. The footprint is measured in global hectares.
End-of-life product	A product that has reached the end of the useful life for which it was first produced, provided or manufactured. Examples are scrap tyres or discarded computers.
E-waste	Waste electrical and electronic products, such as end-of-life computers, televisions, or kitchen appliances.
Global hectares	The global hectare is a measurement of bio-capacity of the entire Earth that defines an area of global average productivity. It is used in the measurement of ecological footprint.
Global warming potential (GWP)	A relative scale to enable comparison between greenhouse gases. Gases are given a number based on their effect on the atmosphere relative to carbon dioxide (CO_2), which is rated at 1. The rating changes relative to the length of time the gas remains in the atmosphere; for example, methane has a GWP rating of 21 over 100 years, meaning it has 21 times the heating capacity of CO_2.
Greenhouse gas	Greenhouse gases in the Earth's atmosphere absorb and re-emit infrared radiation. The Kyoto Protocol lists six major greenhouse gases, which vary in their relative warming effect. The principal greenhouse gases produced by waste in landfill are carbon dioxide and methane.
Methane	Methane is released into the atmosphere from landfills, some agriculture (rice, cattle and sheep), burning biomass, mining and using fossil fuels (coal, oil and gas) as well as from natural wetlands. Methane has an atmospheric lifetime of about 10 years.
Municipal solid waste (MSW)	Domestic waste, and waste generated by the provision of local government municipal services, such as maintenance of parks, gardens and street bins, and residues from local government sewage and water treatment plants. MSW does not include waste generated from the commercial or administration activities of local governments.
Product stewardship	A waste management approach by which producers and users of goods and services have a shared responsibility with government to manage the environmental impacts throughout the life cycle of the goods and services, including the ultimate disposal of the end-of-life products and any resulting wastes.
Regulated waste	Waste generated from non-domestic sources that is listed in Schedule 7 of the Environmental Protection Regulation 2008, such as acids, oil, batteries, tyres and clinical waste. Regulated waste may be a solid or liquid. These wastes require a higher level of control and management. • Regulated waste classified as lower-hazard for levy collection purposes would include household and business organic wastes • Higher-hazard regulated wastes would include asbestos or chemical residues from industrial processes.
Residual waste	Waste remaining after extraction of any reusable or recyclable materials.
Resource recovery	Broadly means the extraction of useful materials or energy from solid waste.

Supplementary paper 1: The challenges for waste reduction and resource recovery in Queensland

Challenge 1 Waste generation is increasing

Queenslanders are consuming goods and resources at record rates. Every year, Queensland households and businesses generate more waste and send increasing amounts to landfill for disposal. In 2008, a reported 32.6 million tonnes of waste was generated in Queensland.

While more than 22 million tonnes of this waste was generated by heavy industrial processes and is held in indefinite storage—meaning much of this waste will not fall under this strategy—an estimated 10.3 million tonnes of waste were generated by Queensland households and businesses, which represents around 2.4 tonnes per person, and a 21 per cent increase over 2007 figures.

There are several reasons why waste continues to increase, including:

When is waste not a waste?

To achieve a more sustainable environment, there is real value in diverting suitable waste for resource recovery through reuse, recycling and energy recovery activities.

Effective resource recovery extracts materials and end-of-life products from the waste stream that can be reused, recycled or have an energy value.

A material remains a waste until suitable action has been taken to reuse or recycle it, or recover the available energy from it.

Products derived from waste are not waste. Any resulting residue from processing the recovered resources may need to be treated as waste, or there may be an inherent value remaining in the material that means it can be further recovered.

Increased disposable income	There is a clear link between economic growth and waste generation; however, in Queensland waste generation is significantly outstripping economic growth. In 2008 retail turnover grew by around 21 per cent while waste generation increased by 40 per cent.
Convenience-led lifestyle	People are spending more time at work and lead busier, faster-paced lives. This mean less free time and more demand for convenience and speed, increasing consumption of ready-made meals, packaged snack-sized portions and a vast array of disposable items to make life easier.
Fashion trends	Today's society is more fashion conscious than ever, and with many goods previously considered as 'luxury' items now available at low cost, the trend is towards replacing items when they go out of fashion, or when the next model becomes available. As a percentage of income Australia is one of the top countries in the world in terms of spending on items such as mobile phones and computers. On average, mobile phone users change handset every one-and-a-half to two years.
Changing attitudes	There is no longer an attitude of 'make do and mend'; people would rather buy a new item than repair an old one. Rising wages have also made repair costs disproportionate to the value of the goods.
Design for obsolescence	Many products are not designed to be repaired and, as a consequence, when they reach the end of their life they can only be disposed of.
Unsustainable consumption	Consumption is a fact of modern way of life. However, current consumption patterns are unsustainable. For instance, in 2009, the Australia Institute surveyed consumption and found that Australians waste around $10 billion per year in things they buy and then discard. More than half of this was household food waste. Queenslanders performed the worst in relation to food waste—wasting around $262 per person per year on food bought then thrown away.

Challenge 2 Queensland's size and population distribution

Queensland is large. Although around 80 per cent of the population is located in its south-east corner, Queensland is unique among Australian states and territories in having large population centres located in its regions.

Queensland's size and population distribution fragments delivery of waste management and resource recovery services. It is often not economically viable to provide the same level of service to residents of smaller regional and rural areas as is enjoyed, and accepted as normal, by residents of metropolitan areas.

As more people move from metropolitan areas to regional and rural areas, increasing pressure is placed on these local governments to match the services of metropolitan areas, including recycling and kerbside collections.

Regional Queensland faces unique challenges, including providing cost-effective and efficient waste management and recycling services, distance to recycling markets and its capacity to provide and operate suitable infrastructure, such as transfer stations and landfills.

Many of the markets for recyclable materials are located in south-east Queensland. This makes recycling in regional Queensland a costly exercise due to the combination of smaller quantities of material being collected, longer transport distances, higher transport costs and the real risk of a load being rejected once it arrives at the processing facility due to contamination or off-specification issues.

Challenge 3 Encouraging industry investment and greater involvement from businesses

The current level of investment by government or industry is not delivering the performance needed to attain improved practices and sustainable performance. Currently, around a third of the waste generated by households and businesses is being recycled.

Although some businesses have risen to the challenge and are recycling well, disposal continues to outstrip recycling. While more than 90 per cent of households have access to some form of recycling service, a relatively small number of businesses recycle.

Disposing of waste to landfill can often be the cheapest and easiest option. At present, Queensland does not have a strong policy direction or price signal to discourage unnecessary disposal or encourage the necessary behavioural and operational changes to transform from a throwaway society to one that values the resources it currently wastes.

Local governments, business and industry need policy certainty to make long-term investment decisions to help grow Queensland's regional capacity, improve waste management and resource recovery outcomes, and boost employment.

Challenge 4 Reducing the climate change impacts of waste management

In September 2008, the Queensland Government released Toward Q2: Tomorrow's Queensland. This document outlines the Queensland Government's targets and measures to reduce the state's carbon footprint, including reducing emissions from waste disposed to landfill.

Disposing of biodegradable organic wastes, such as food scraps and green waste, into landfill generates methane, a gas with a global warming potential around 23 times that of carbon dioxide.

Based on 2008 waste disposal data, Queensland's landfill disposal contributes around five megatonnes of carbon dioxide equivalent (Mt CO_2-e) every year. A carbon-constrained future will see an increase in the cost of doing business.

For operators of waste disposal facilities it means implementing options to reduce emissions liabilities. For waste generators, particularly generators of organic waste, it means either paying more to dispose of the waste produced or seeking alternative management options, such as avoidance or resource recovery.

Because Queensland is a highly decentralised state, one of the challenges is finding the optimal balance between increasing resource recovery and reducing greenhouse gas emissions.

On one hand, recycling can save significant amounts of landfill and avoid production and manufacturing emissions. On the other hand, these savings can quickly be offset by transport emissions generated getting recyclable material to processing facilities and markets.

Challenge 5 Getting the legislative framework right

Queensland's waste management legislation is more than 10 years old. There have been significant developments in waste management and resource recovery since the *Environmental Protection Act 1994* was introduced, and the subsequent introduction of the Environmental Protection (Waste Management) Policy 2000 and Environmental Protection (Waste Management) Regulation 2000.

New legislation is needed to provide regulatory underpinning for the strategy, including promoting waste reduction and resource recovery and diverting potential resources from landfill. The legislation needs to reflect modern waste management practices and an awareness of Queensland's need to reduce its ecological footprint.

The 2007 State of the Environment Report calculated Queensland's ecological footprint at 7.19 global hectares per person, nearly three and a half times higher than the world average. Avoiding waste generation and reducing the amount of disposal to landfill is vital to reducing the state's ecological footprint.

Challenge 6 Meeting infrastructure needs

A crucial part of modern waste and resource management is the infrastructure to collect, handle, transport, recover, process and dispose of it. Waste management and resource recovery facilities face potential issues between the facilities and their neighbours, requiring careful planning and management.

Most transfer stations and landfills in Queensland are owned by local governments which are also responsible for managing household waste and recycling services, either undertaking the service in-house or contracting to the private sector.

The private sector is largely responsible for managing commercial and industrial (C&I) and construction and demolition (C&D) waste, including regulated waste. The private sector is also primarily responsible for resource recovery infrastructure in Queensland, such as materials recovery facilities (MRFs), C&D recycling, composting, e-waste and tyre recycling.

Most of Queensland's existing processing and recycling infrastructure is located in south-east Queensland. This means long distances are involved when transporting material for recycling from regional areas.

Regional plans will be important in identifying potentially suitable areas to establish waste and resource management precincts for infrastructure. Establishing infrastructure is an expensive and time-consuming process involving several stages, including obtaining planning approvals, and designing and constructing the infrastructure. Depending on the infrastructure's type and complexity, this may take anywhere from six months to six years.

Challenge 7 Improving data collection

Municipal solid waste (MSW)

MSW comprises:

- domestic or household waste collected through kerbside wheelie bins (waste and yellow-top recycling) or dropped off at tips and transfer stations

- municipal waste such as street sweepings or park bins

- municipal green waste such as from kerbside collection and park maintenance, or garden waste drop-off.

MSW does not include waste from commercial activities or the normal administration and operations of local government, such as motor vehicle workshop waste or office waste.

The MSW data is gathered through annual figures local governments provide to the Department of Environment and Resource Management (DERM) as required by the Environmental Protection (Waste Management) Policy 2000.

Since most local governments report diligently and DERM has validated and reported the data in the same way for some years, there is a high level of confidence in the domestic component of MSW data. There is less certainty about the overall MSW figures as the green waste component is variable and more investigation is needed to establish how much of this waste stream is genuinely municipal (and not commercial) in origin.

Commercial and industrial waste (C&I) and construction and demolition waste (C&D)

C&I waste is produced by business and commerce, and includes waste from schools, restaurants, offices, retail, and wholesale businesses, primary production and manufacturing industries. C&D waste is waste from building or demolishing houses, roads and other infrastructure.

A small amount of data on these waste streams comes from local government, but most of this waste is handled by the private sector, especially in south-east Queensland. DERM gathers data from commercial landfills and recyclers by means of a voluntary annual survey. Both landfill and recycling figures are likely to be underestimated.

DERM licensing conditions now require landfills to report annually, but this does not apply to most of the older landfills. Recyclers are often reluctant to share commercial-in-confidence information with regulators. The number of responses has grown year by year, which in itself makes it hard to compare yearly trends.

Regulated waste

This is waste deemed harmful and requiring a higher level of regulation. Regulated waste is generated from non-domestic sources and may be a solid or liquid. Examples of regulated wastes include acids, oil, batteries, tyres, food processing and clinical waste. For the purpose of the levy, regulated waste is divided into lower and higher hazard wastes.

There is some uncertainty around the completeness of figures reported as regulated waste and some of this data may be being reported as C&I waste. While the reporting of biosolids is relatively complete, there is some doubt about the reported tonnage due to the variable moisture content. Wastes such as fly ash from power generation, and industrial monofills, are not included in calculating data trends as they do not enter the waste management system. Also, more facilities report each year, distorting the figures.

# Supplementary paper 2: The waste and resource management hierarchy

The waste and resource management hierarchy is a nationally and internationally accepted guide for prioritising waste and resource management practices. Use of the hierarchy in Queensland is not new, and it was introduced in legislation in 2000 with the commencement of the Environmental Protection (Waste Management) Policy 2000.

Although the hierarchy provides an effective framework for dealing with waste, the accepted wisdom that it contains is not being implemented in a coordinated manner in Queensland. In order to start changing behaviour and the way people perceive waste—in other words, to begin the journey towards valuing the things society wastes—this strategy uses the hierarchy to underpin its goals and actions. This recognises the value of used materials as resources and removes the implication that they have no value because they have been discarded.

The strategy regards the hierarchy as a key principle for guiding waste and resource management practices in Queensland while still recognising the need for flexibility based on local and regional economic, social and environmental conditions.

The hierarchy sets out the preferred order for consideration of management options and underpins the programs and actions contained in this strategy. The hierarchy is a decision-support tool that states that waste reduction is the preferred option, followed by reuse, recycling, other recovery and, finally, disposal.

However, it also needs to be acknowledged that recycling is only a step along the way. Implementing the strategies and actions contained in this strategy will progressively shift the emphasis from recycling toward a culture where waste reduction is an accepted lifestyle choice and the usual way of doing business for Queenslanders.

Most preferable

Reduce

Reuse

Recycle

Other recovery

Treat

Dispose

Least preferable
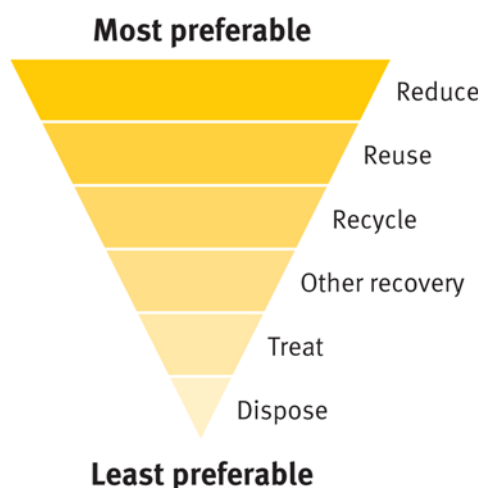
Reduce

Making sure that waste is not generated in the first place.

Examples:

- o Changing production processes to avoid waste generation at its source.

- o Reducing consumption to avoid unnecessary products or packaging such as plastic bags.

- o Where practical, purchasing items in bulk to reduce packaging; buying durable items designed to be repaired not discarded.

- o Dematerialisation of packaging to reduce the amount of resources needed to manufacture the product. For example, an aluminium drink can weighs around 14.7 g today compared to 16.55 g in 1992, providing an 11 per cent reduction in raw material use.

- o Reducing the use of raw materials as an input. For example, glass bottle manufacture uses up to 20 per cent recycled glass, saving raw materials in the form of sand, limestone and soda ash.

- o Treating regulated wastes to reduce the hazard characteristics and rendering it suitable to be reused or recycled.

Reuse

Using products or packaging again without further manufacturing.

Examples:

- o Purchasing second-hand and refurbished goods.
- o Purchasing and returning refillable containers. For example, retailers such as The Body Shop sell some products in returnable, refillable containers and Coles Supermarkets use returnable, washable and reusable plastic trays in the fruit and vegetable section.

Recycle

Processing materials to make the same or different products.

Examples:

- o Making new glass bottles and jars from used bottles and jars.
- o Processing end-of-life tyres to manufacture soft-fall for playgrounds.
- o Processing used paper into insulating products.
- o Plastic high density polyethylene (HDPE) milk bottles into wheelie bins.
- o Composting green and organic waste.
- o Using fly ash produced by power stations to manufacture cement.

Other recovery

Includes capturing the energy available in discarded products.

Examples:

- o Accelerating and collecting the gas generated in a bioreactor landfill by the decomposition of organic waste to generate electricity.
- o Using residual waste as a coal or gas substitute in boilers, incinerators, etc.

Treat

Treat waste prior to disposal to reduce the hazard characteristics of the waste.

Examples:

- o Treat clinical waste prior to disposal.
- o Encapsulate liquid regulated wastes.
- o Stabilise organic wastes prior to landfill to reduce greenhouse gas emissions.

Dispose

A final option, when no further use can be gained from the material.

Examples:

- o Landfilling of residual bottom ash from incineration facilities.
- o Landfilling of materials such as asbestos for which no other options exist.
- o Thermal destruction of some intractable wastes, such as polychlorinated biphenyl (PCB) compounds and pesticides, resulting in CO^2 and water as by-products.

Supplementary paper 3: Identifying priority products

Purpose of the priority product statement

The new legislative framework will require the government to publish a priority product statement. The statement will identify priority products or materials that, at the end of their useful life, have a high disposal impact and substantial potential benefit from recovery, warranting special attention and action.

The process and criteria to identify priority products will be transparent, and the priority product statement will be reviewed regularly.

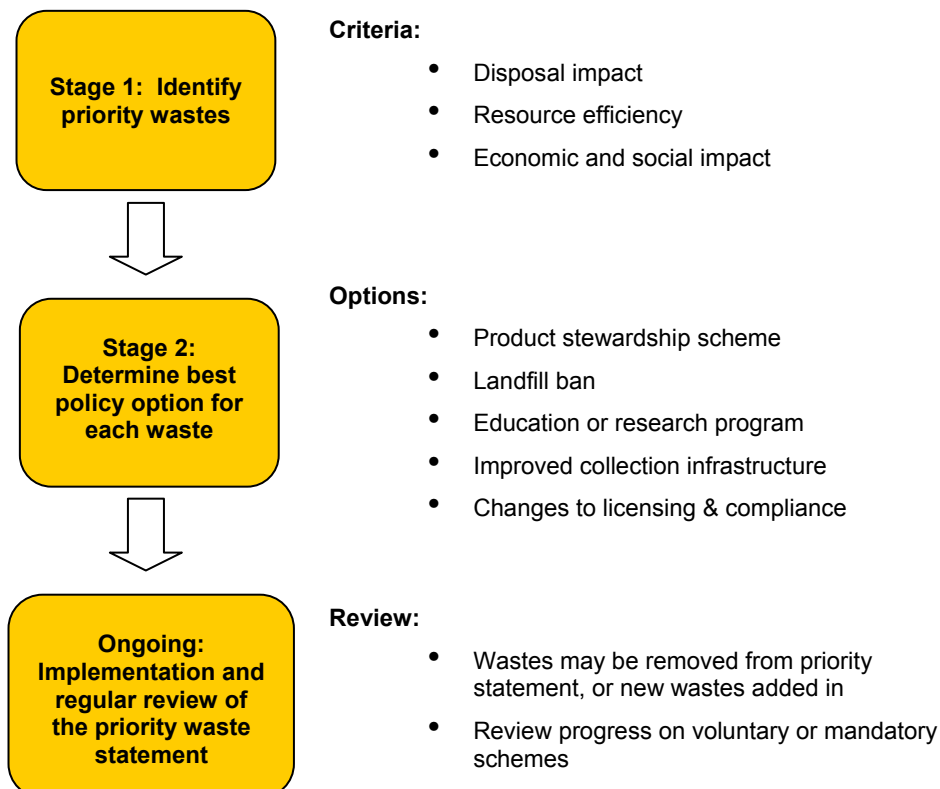The priority product statement will:

1. help guide decisions about strategy funding and efforts, and the voluntary and mandatory measures that are needed to improve resource recovery for priority end-of-life products and waste materials

2. provide a transparent decision making process

3. enable Queensland to support national approaches or to adopt state-based action.

Process for determining priority products

A two-stage process will identify priority end-of-life products or materials and the most effective management approach.

In Stage 1, end-of-life products or materials are assessed against standard criteria set in legislation.

In Stage 2, wastes that rate highly against the standard criteria are further assessed to determine the most suitable and practical management approach, which might range from consumer education campaigns through to take-back schemes or landfill disposal bans.

Stage 1: Identify priority wastes

Criteria:
- Disposal impact
- Resource efficiency
- Economic and social impact

Stage 2: Determine best policy option for each waste

Options:
- Product stewardship scheme
- Landfill ban
- Education or research program
- Improved collection infrastructure
- Changes to licensing & compliance

Ongoing: Implementation and regular review of the priority waste statement

Review:
- Wastes may be removed from priority statement, or new wastes added in
- Review progress on voluntary or mandatory schemes

Stage 1

End-of-life products or waste materials are assessed against standard criteria:

- Disposal impact
  - Toxic in landfill
  - Produce landfill greenhouse emissions
  - Other disposal impacts such as landfill leachate/odour, amenity, illegal disposal
- Resource efficiency
  - High impact of raw material extraction
  - High embodied energy, water or materials content
  - Large or increasing volume
- Economic and social
  - Dangerous in waste or recycle stream
  - Employment and regional development opportunities
  - Community concern

The table below shows a summary of how several wastes could rate:

	Disposal impact			Resource efficiency			Economic/social		
	Toxic in landfill	Landfill greenhouse emissions	Other disposal impacts e.g. leachate	Impact raw material extraction	Embodied energy, water, materials	Potential volume	Dangerous in waste or recycle stream	Employment and regional potential	Community concern
E-waste	High	Low	Medium	Medium	High	High	Medium	Medium	High
Timber		Medium	Low	High	High	Medium		Medium	
Gas cylinders				High	High	Low	High		
Household green waste		High	Low	Low	Medium	Medium		Medium	Medium
Household food waste		High	Low	Medium	Medium	Low		Low	Medium
C&I* food processing waste		High	Medium	Medium	Medium	High		Medium	

*C&I - Commercial and industrial.

Stage 2

Wastes that rate highly against the standard criteria will be included in a priority product statement to ensure action is taken to mitigate impacts. They are further assessed to determine the most suitable and practical management approach, which could include:

- voluntary or mandatory 'product stewardship' or take-back schemes
- ban from landfill disposal
- consumer education campaigns to target waste generation
- support for collection programs or reprocessing infrastructure
- investment in research program such as design-for-environment to increase recyclability or reduce toxicity.

Wastes that may be suitable for product stewardship approaches will be carefully assessed against additional criteria including:

- capacity of producers
- practicality; are there viable existing or potential collection/reprocessing methods and markets?
- interstate and international experience
- fairness
- cost effectiveness
- constitutional or other impediments
- national approaches.