

Why collect organics?

This factsheet will help councils to gain an understanding of the reasons for why to collect source separated food and garden organics. The factsheets describes how diverting organics from landfill can achieve great environmental outcomes, alleviate costs of landfill disposal, and help avoid carbon price impacts. It provides examples of how diverting organics can help conserve valuable resources; and explores the social benefits of a food and garden organics collection service.

Diverting food and garden organics from landfill through the use of a kerbside collection service followed by an appropriate treatment process may assist in:

✓	Achieving superior environmental outcomes
✓	Supplying substitutes for dwindling virgin materials
✓	Manufacturing high quality products
✓	Conserving essential plant nutrients
✓	Achieving landfill diversion and recovery targets
✓	Reducing climate change impacts
✓	Attaining renewable energy certificates
✓	Reducing carbon price impacts for liable facilities
✓	Reducing exposure to landfill levies
✓	Reducing landfill disposal costs
✓	Realising parks and gardens costs savings
✓	Enhancing local investment and employment
✓	Meeting community and voter expectations
✓	Achieving long term behaviour change
✓	Enhancing social capital
✓	Conserving existing landfill airspace

There is a new direction in the way in which Australian councils are managing their wastes. The historic 'mass dump' mentality is making way for more innovative waste and resource management solutions, supported in part by the introduction of a carbon pricing mechanism in 2012, as well as landfill levies, waste minimisation and recycling targets, and the ability to generate renewable energy certificates.

Food and garden organics are a key target for increased resource recovery. The fact that organics represent the single largest fraction in a household garbage bin, plus the detrimental environmental impacts organics can have in a landfill environment, have led to the development of segregated collection schemes for organics, combined with development of appropriate processing facilities, products and markets.

Up to 60% of the household waste we throw away each week is food and garden organics.

However, the contents of everyone's bin differ slightly depending on the food we eat, the items we buy, whether we have a garden or not, and whether we compost at home.

In the past few years governments around the world have increased their **focus on reducing food organics going to landfill**. The United Kingdom is active in engaging householders to address this issue, with more than 137 local authorities providing food organics collections. The European leaders in reducing household residual waste include Belgium, Netherlands, Austria, Germany and Switzerland. The German Government recently mandated all local governments establish combined garden and food organics collection schemes.

In Australia, many councils recover garden organics and an increasing number of councils are considering, trialling or implementing food organics recycling.



Benefits and drivers

The waste hierarchy is an internationally recognised classification system that prioritises waste management strategies in order of preference. Its aim is to extract the most benefit through resource recovery and generate the least amount of waste. In Australia, all governments have adopted the waste hierarchy as a guiding principle for waste management in their policies and legislation. Landfill disposal is the least preferred option in the waste hierarchy.



There are many reasons to avoid sending food and garden organics to landfill. These include cost savings from avoided landfill levies and other economic benefits, as well as the environmental and social benefits. The introduction of organics collection schemes usually requires an economic driver or a political imperative. Non-economic arguments often get lost in the debate. But economic principles should prompt the introduction of organics collection schemes wherever cost savings can be demonstrated.

The detrimental economic, environmental and social issues associated with landfilling organic residues have seen them targeted as a priority for increased resource recovery at all levels of government. The introduction of market-based instruments (such as landfill levies) has helped make the economic rationale for action clearer in many Australian regions.

There are still, however, many areas of Australia where direct economic figures may not quite stack up in favour of organics recycling, such as where landfill disposal is relatively cheap or where low quantities of organics are produced. As the beneficiaries of organics recycling schemes often extend well beyond the immediate sphere of the waste management department in council, a holistic assessment of the costs and benefits of an organics collection scheme, for example through a life cycle assessment, may allow for a more balanced assessment and outcome.

Economics

The carbon pricing mechanism

Under the Federal Government's Carbon Pricing Mechanism, landfill operators, including councils, will be financially liable for carbon pollution associated with landfill greenhouse gas emissions, where those emissions exceed the facility threshold of 25,000 tonnes CO₂-e (carbon dioxide equivalent) per annum. The carbon price will not apply to emissions from waste deposited prior to 1 July 2012 (known as legacy waste emissions), but legacy waste emissions do count towards determining whether a facility meets the participation threshold.

Councils that do not operate their own landfill may still be exposed to carbon price mechanism if they send waste to a commercially run landfill that exceeds the 25,000 tonnes CO₂-e emissions threshold.

The starting price for carbon pollution will be \$23 per tonne CO₂-e in 2012, rising to \$24.15 in 2013 and \$25.40 in 2014. From 1 July 2015, an emission trading scheme will commence, under which the carbon price will be determined by the market. A price collar will be in place for the first three years, with the "ceiling" \$20 above the expected international price for 2015, rising by 5% in real terms per year.

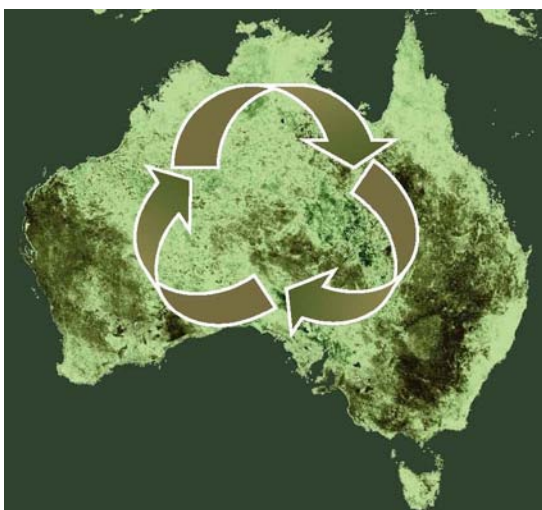
In terms of the waste sector, the carbon price mechanism will incentivise a reduction in emissions through the diversion of biodegradable material (including garden and food organics) from landfill and the capture of landfill gas and its destruction (flaring) or use as an energy source, on sites where the gas volumes are sufficient to make this feasible. More information is available at:

<http://www.cleanenergyfuture.gov.au/opportunities-and-obligations-landfill-managers>.

Landfill costs and levies

One of the objectives of landfill levies is to provide an incentive to minimise the disposal of waste to landfill, and support efforts to develop recycling and resource use. Source separation of organics will reduce landfill disposal costs, including the cost of landfill levies.

Food and garden organics collections trials and services in Australia are reported to have, on average, achieved a capture rate of 8 kg per household per week, or more than 400 kg / household/ year. Diversion of such quantities reduces disposal costs. Potential savings for various hypothetical councils are demonstrated in the table below by calculating reductions in landfill gate fees, landfill levies and carbon price liabilities following the introduction of an organics collection scheme. The modelling assumes organics collections are offered to 50% of all households in the council area, of which 80% actually participate in the scheme).



Renewable Energy Certificates

There may be potential for councils or organics processors to gain financial benefits via **Renewable Energy Certificates (RECs)** if these materials are used for generating 'green' energy. For instance, woody garden organics and other wood residues (shredded and particle size graded) can be used for co-firing industrial boilers, while anaerobic digestion can be used for energy recovery from moist organic residues. In both cases, the generated energy may be used to power the facility, with surplus energy exported to the grid. The associated RECs can be an additional source of income for the facility.

Enhanced investment and employment

Kerbside collection and processing of garden and food organics requires investment, creates employment, and enhances economic activity compared with the mass-dump model. Necessary investments include the purchasing of bins, kitchen caddies and collection vehicles, as well as the construction of a processing facility. On-going direct employment will be created for drivers of collection vehicles and for staff at the processing facility. Indirect employment will also be created.

In 2011, the Organics Recycling Industry estimated the 120 businesses (approximately) that are involved in organics recycling and composting in Australia overall have combined capital investment of more than half a billion dollars (\$580,867,000) and employ the equivalent of 1,900 full-time people, in addition to creating jobs in transport, distribution and application of products across Australia.

The enhanced commercial activities resulting from organics recycling, and the wider societal benefits that flow from it, should ensure organics recycling is the preferred option even if costs are on par with landfilling (or even slightly higher).

Recovery targets

Most states and territories in Australia specify waste diversions and/or resource recovery targets in their waste management strategies. Significant reductions in food and garden organics disposed to landfill will be vital to achieving the waste diversion and recovery targets for municipal solid waste (MSW), as outlined below:

State	Target
NSW	66% recovery of MSW by 2014
SA	60% recovery of MSW by 2012 and 70% recovery by 2015
VIC	65% recovery of MSW by 2014
WA	50% recovery of MSW in Perth Metropolitan Region by 2015 and 65% by 2020
QLD	50% recovery of MSW by 2014 and 65% by 2020 (aspirational only, not mandated)
NT	Reduction of waste to landfill by 50% by 2020 (aspirational only, not mandated)
ACT	Increase in resource recovery rates by over 80% by 2015, over 85% by 2020 and over 90% by 2025

Environmental benefits

Reducing greenhouse emissions

Segregating and recovering food and garden organics from the waste stream, or minimising or avoiding it in the first place, will reduce greenhouse gas (GHG) emissions. Organic material that decomposes in the anaerobic environment of a landfill produces methane, a potent GHG with a global warming potential significantly greater than carbon dioxide.

When landfill gas is captured and either flared or used to generate power, GHG impacts are reduced. However, not all landfill gas can be captured due to inherent inefficiencies of the collection systems—while estimates can vary widely, in general 40–75% is considered by the industry to be the average range of lifetime capture efficiencies. Capture efficiency will depend on a number of factors in addition to system design details, such as whether the gas capture system was retrofitted, or installed as part of the original landfill development. Another important factor is the instability of the landfill mass, caused by the decay of buried material. This can lead to fissures developing through which gas may escape. It should be noted that not all landfills in Australia have a gas capture system installed because in many cases it is not considered to be economical unless the landfill accepts a large volume of waste.

Using a life cycle assessment approach, the Environmental Benefits of Recycling Study has demonstrated kerbside collection and composting of each tonne of garden and food organics or garden organics alone saves 250 and 320kg of CO₂e, respectively. In 2006–07, the Australian Organics Recycling Industry diverted at least 3.7 million tonnes of organic material from landfill, comprising materials such as garden and food organics, wood and timber, biosolids and sludges.

Conservation of valuable resources

Garden and food organics are essentially plant matter, containing carbon (energy), nutrients, minerals and water, all of which are cycled endlessly in natural ecosystems. Disposing food to landfill therefore wastes the energy and nutrients contained in the produce, and it also wastes the energy, water and resources used to produce, process, store and transport the food.

Organic residues have the potential to be beneficially reused, either for land management purposes or for energy generation, or both. Organic residues were traditionally processed through particle size reduction and/or composting, and used in landscaping as well as in agriculture and horticulture, providing benefits primarily through the supply of organic matter (carbon) and nutrients to maintain productivity and improve soil health.

By processing more than 5.8 million tonnes of organic material (including municipal and commercial organics, biosolids and manures), organics recycling in Australia recovers nutrients equivalent to more than 29,000 tonnes of urea, 2,900 tonnes of super phosphate and 14,500 tonnes of potassium sulphate that would otherwise be lost to landfill each year. Recovery and re-use of phosphorous is extremely important in the long-term, as rock phosphate deposits are finite (100–130 years) and crop production will cease without it.

In more recent times, woody organic residues have seen a renaissance in their use as fuel for steam or energy generation. The remaining ash (for example boiler ash from sugar mills) contains minerals that have agricultural value, and can be used to improve soil health and productivity so long as contaminant levels are not excessive.

Anaerobic digestion can in some situations offer the best of both worlds, allowing for the generation of energy while also providing organic matter and plant nutrients for land management and crop production.

Soil carbon sequestration can potentially help mitigate climate change. The use of organic soil amendments such as mulch, compost or biochar as a means of increasing stable soil carbon pools has therefore become increasingly popular. It is estimated that approximately 10% of carbon applied with a mature garden organics compost will still be in the soil after 100 years, while most carbon contained in biochar will remain in the soil for much longer. However, supply of degradable carbon to the soil is equally important, as it provides energy to drive biological and biochemical processes, and improves soil health.

The declining supply of virgin materials such as top soil, peat moss and forestry residues (sawdust, bark), due to increasing demand and decreasing supplies in urban centres over the last 15 to 20 years, is being partly compensated through the use of recycled organic products.

The raw materials used in composting largely determine the quality of the finished product. Recycled organic products manufactured from source separated organics have shown low levels of physical and chemical contamination. These products therefore have wide potential application and the chance of being accepted in a wide variety of markets. The use of recycled organic products with low contaminant levels is central to developing agricultural and horticultural markets, and also for minimising soil contamination.

As a minimum, mulch and compost products should comply with specifications stipulated in the *Australian Standard for Composts, Soil Conditioners and Mulches* (AS 4454-2012). This standard specifies the minimum product quality requirements, but does not ensure efficacy for various applications. It is desirable that product quality, and in fact management of the entire processing operation, is third party audited.

While it is advantageous to generate products that comply with industry standards, the ultimate test is customer satisfaction, something that is largely based on product efficacy and value for money. The first priority is to develop and manufacture products that meet customer demand and expectations. This is no different with a council's own Parks and Gardens Department, except that, when the products work well, associated cost savings and benefits will stay with council.

Being able to supply residents with a high quality compost product that is made from their organic residues can be used very effectively for on-going education and motivation of the community, something that also aids market development.



Social benefits

Potential for behaviour change

The Australian Institute estimates *“the average household in Australia throws out about \$616 worth of food a year, or \$239 per person”*.

It has been demonstrated that the introduction of a third bin for collection of food and garden organics inherently encourages people to source separate other materials from the residual waste stream, and can reduce overall waste produced.

Social capital

Social capital is a sociological concept which refers to the value of social relations and the role of cooperation and confidence to get collective results. In general terms, ‘social capital’ is the core of social relations, and covers benefits derived from cooperation between individuals and groups.

Social capital develops when individuals and groups within a social system interact for mutual benefit in a variety of ways over a period of time. They may build long-term trust through consistent behaviour and high levels of involvement in a council’s work.

Community strengthening and positive opinion of council – an organics collection scheme may help to strengthen the local community and stimulate interest and involvement in a council’s environmental and sustainability initiatives.

Conserving landfill space

Developing a new landfill is a major undertaking for any council or company. Planning, getting approvals, building community support and finally constructing the cells, requires significant human and financial resources. Consequently, an existing landfill represents a very valuable asset, the replacement costs of which are difficult to predict.

As it is often very difficult to find suitable locations for new landfills (not to mention hard to convince the surrounding community of the benefits of having a new landfill constructed nearby), councils and private landfill owners aim to utilise existing landfill sites for as long as possible. A good way of achieving this is the reduction of waste going to landfill through waste minimisation and recycling.

The reduction of organic material going into landfill may also alter the quantity and quality of leachate and landfill gases generated, which may offer savings in management and treatment costs.

NB: Information in this factsheet is taken from the *Food and Garden Organics Best Practice Collection Manual* (2012) published by the Department of Sustainability, Environment, Water, Population and Communities. The full document is available on the department’s website www.environment.gov.au/wastepolicy/publications/organics-collection-manual