

THE UK AND AUSTRALIAN APPROACH TO ORGANIC WASTE COLLECTIONS

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1 Introduction

Councils in New Zealand are in the early stages of developing separate food waste collections. There is a history of green and food and green waste collections in some locations. Commercial green waste collections are well established in many urban centres. Processing infrastructure includes open windrow, aerated and vermicomposting facilities, with some indoor composting systems managing both green and food waste. Anaerobic Digestion is well established for waste water treatment solids, but has not been applied to other organic wastes in New Zealand.

As Councils around the country consider their options, it is opportune to reflect on successes and failures in other countries. Particularly the key aspects, which have driven service provision elsewhere, when planning for future services and infrastructure in New Zealand.

The United Kingdom (UK) and Australia both have well developed systems, particularly in urban areas. There are a range of drivers in each country and typical systems have emerged in response.

This paper discusses the key aspects and lessons learnt from the UK and Australia in terms of implementing organic waste collections and discusses where New Zealand can learn from these.

Furthermore the paper will:

- Identify what underpins organic waste collection services, including legislation and policy requirements;
- Outline achievements to date in Australia and the UK in terms of collection systems of organic waste; and

- Identify key aspects driving trends in organic waste collections in the UK and Australia, which require consideration before applying these approaches in New Zealand.

2 The context for organic waste collection.

There are a number of key aspects which have enabled organic¹ waste collections and associated infrastructure to develop across Australia and the UK. Both countries have developed collection services and infrastructure in light of legislation and policy set out by government and subsequently enforced and/or delivered by local authorities. The collection services have been shaped by policy and funding regimes, as well as other factors such as markets and existing services.

2.1 Legislation and policy

The UK, Australia and New Zealand all have a similar aim in terms of waste management legislation, with a common goal: to prevent harm/avoid having a negative impact on the environment or human health. There are also policy goals to reduce the quantity of waste disposed to landfill and in some cases focusing to maximize value or benefit from reuse of unwanted materials.

While the policy objectives are similar, differences lie in varying approaches to achieving the outcomes. Differences exist in the detailed policy and supporting or complementary measures including funding, climate change policy and energy policy.

2.1.1 The UK

European Union law requires transposition of key elements of the Waste Framework Directive (WFD) (2008) into UK law², with a key component to apply the waste hierarchy. UK local authorities establish their policies through waste prevention programmes and management plans. At this point, differences in recycling successes of organic waste begin to materialise, mainly due to implementation differences of local policies. Within the UK, there

¹ For the purposes of this paper, organic waste is defined to include garden or green waste and food waste. In some cases additional degradable wastes may be processed, for example wastewater treatment solids.

² Waste (England and Wales) Regulations 2011

are marked differences in recycling rates between England and Wales, and yet both are regulated under the WFD and the Waste (England and Wales) Regulations 2012.

Supporting measures include landfill tax (\$165 excluding gate fees), renewable energy credits and Council driven collection systems.

2.1.2 Australia

Australian waste management policy is driven by the federal government in terms of legislation and policy implementation via state legislation and policy, with service delivery through local government. The Australian Government is responsible to meet international obligations, whereas state and territory governments have responsibility to enact waste management and recovery legislation. The National Waste Policy (NWP) (2009)³ outlines responsibilities which state and territory governments have for management of waste. The NWP has a strong drive towards reducing greenhouse gases through reduction of organic waste sent to landfill.

Supporting measures vary around the Country and include landfill levies, funding for collections and infrastructure and climate policy including support for emissions reduction projects.

2.2 Other drivers

Both UK and Australia have a track record of being legislative and policy driven in terms of organic waste collection service provision, however there are other contributing factors. Funding for establishing or upgrading collection services has been important alongside funding for processing infrastructure.

The model for provision of household waste services is different to that in New Zealand. In both cases Councils are typically the exclusive provider of household waste collections (including residual, recycling and organics) with services funded through rates/property taxes. This means any shift of material from refuse to organic waste collections has an impact on collection and refuse disposal costs incurred by Council.

³ Based on the *National Strategy for Ecologically Sustainable Development (1992)*

Environmental benefits are often a driver for diversion of organic waste from landfill, for example a headline aim to reduce methane emissions from landfill. Good practice composting avoids methane generation, while Anaerobic Digestion (AD) produces methane in a controlled environment with capture for use (heat or power generation).

Odour is a potential local impact from organic waste processing operations. Open windrow composting relies on good practice to manage odour (careful selection of inputs, effective initial blending of feedstock(s) and turning to maintain aerobic conditions). While enclosed composting and AD supplement good practice operations with allowance for treatment of odour, before release to the atmosphere, typically through biofilters.

Another key driver for the UK, although not legislated is the circular economy concept. Defra estimates billions of pounds a year could be saved by UK businesses, through efficient use of resources. The collection and processing of organic waste for beneficial use aligns well with this model (Figure 1).

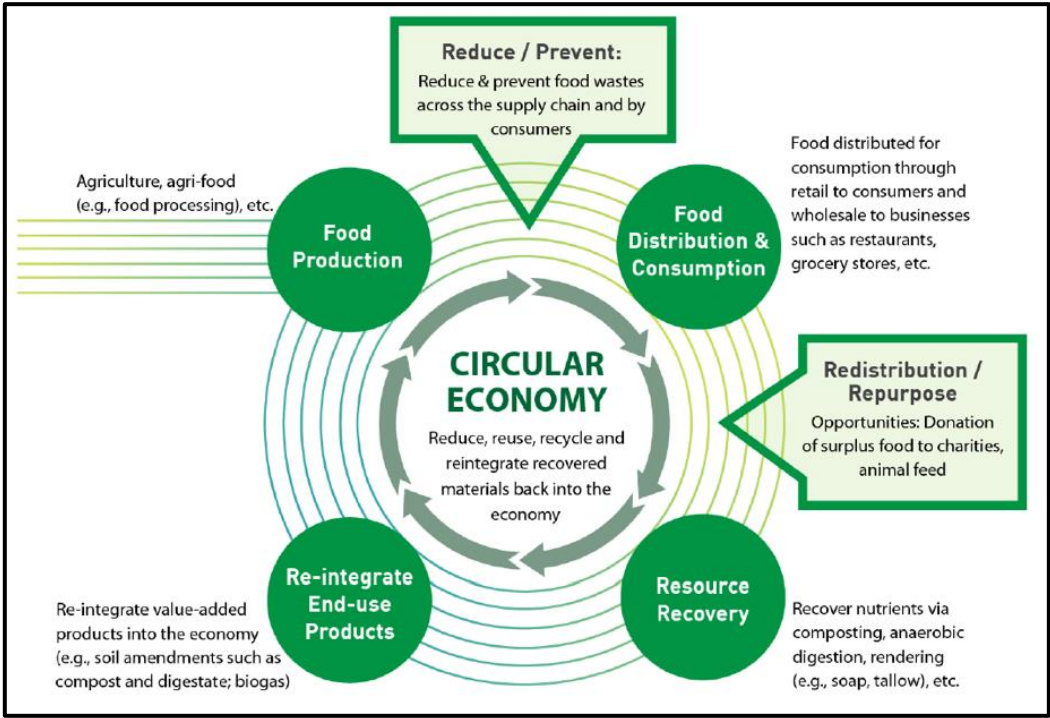


Figure 1 Food in the Circular Economy (Werf, 2017)

2.2.1 Summary - Key drivers

To summarise the key factors that support organic waste collection include:

- Legislation and policy;
 - Diversion targets with penalties;
 - Funding for collections and processing infrastructure;
- Incentives for renewable energy (driving AD and energy from waste); and
- Council control of household collections (refuse, recycling and other materials).

3 The current situation

3.1 Services and Infrastructure

UK County Councils manage waste across entire county areas, with Borough Councils covering a proportion of this and having responsibility for collecting and managing waste.

Current organic waste services in the UK include food organics (FO), garden organics (GO) and some combined food organic and garden organic (FOGO) collections. Regularity of collections vary between weekly and fortnightly. In some cases regular organic waste collections are accompanied by fortnightly (rather than the more typical weekly) refuse collection. Where FO collections are not available, food waste is collected as part of the residual waste stream, with predominant treatment options including energy from waste or mechanical biological treatment.

Service availability in the UK reflects the policy and funding environment, specifically:

- Councils have the ability to provide (and fund) a service for all households with reduced refuse disposal costs contributing to the cost of any new service.
- Renewable energy credits support AD, providing an outlet for food only collections.
- Government funding supports collections and processing infrastructure.

Local governments in Australia predominantly provide household waste collection and recycling services either using in-house or contracted resources. Councils also typically deliver management and operation of landfill sites outside of metropolitan areas. In many metropolitan areas Councils provide either GO or FOGO services. GO service collections are generally fortnightly and in some cases offered as an opt in service. FOGO collections are often developed as a change to a GO only service, in an effort to meet diversion targets as appropriate processing capacity becomes available. FOGO services are in general collected

weekly, in some cases combined with fortnightly refuse collection. Service provision also varies between rural and residential areas.

Services in Australia reflect the policy and funding environment, specifically:

- Council have the ability to provide (and fund) a service for all households with reduced refuse disposal costs contributing to the cost of any new service.
- There is a strong target based policy framework in some states.
- In some states funding supports establishment of new collections and processing infrastructure.
- Both composting and AD are supported by climate policy.
- Many Councils have moved from GO to FOGO collections using the same collection system and moving to new or upgraded composting operation.

The UK and Australia utilise a wide range of processing and treatment technologies for organic waste, these include:

- Home composting (UK and Australia) - FOGO;
- Open windrow composting (UK and Australia) – GO;
- Enclosed composting (UK, Australia) – FOGO;
- Vermicomposting (Australia) – FO (additionally sewage sludge, manure);
- Anaerobic Digestion (UK and Australia) - FO (additionally wastewater solids, commercial food organics);
- Mechanical Biological Treatment (UK and Australia) – FO within residual waste; and
- Waste to energy (UK) – FO within residual waste.

3.2 Funding

3.2.1 UK

A contributing factor to service provision in the UK is funding available to Councils, businesses, government institutions, not for profit (NFP) organisations, community groups and the public.

Over the past 10-15 years the Waste Resource Action Programme (WRAP)⁴ has funded campaigns including the Love Food, Hate Waste and individual projects through the Anaerobic Digestion Demonstration Programme, the Organics Capital Programme and

⁴ Wrap is funded by the Department for Environment, Food and Rural Affairs, Northern Ireland Executive, Zero Waste Scotland, the Welsh Government and the European Union.

launching of the Food Waste Recycling Action Plan. Other funding regimes have also been available.

Funding for renewable electricity, for both infrastructure and energy production, developed a drive towards these infrastructure types, namely AD and gasification. Including the Renewables Obligation (RO) for large scale renewable electricity projects (over 5000 kilowatt (kW)), registering between 2002 and 2017. The scheme issues certificates to operators of accredited renewable electricity, operators are paid for certificates they possess.

For smaller scale renewable energy generation, the feed in tariff (FIT) scheme, suitable for small scale AD with production capacities up to 5000 kW. Electricity is paid from a tariff of rates in pence per kW hour (Ofgem, 2017).

3.2.2 Australia

There are a number of funding regimes available in Australia. The Emissions Reduction Fund (ERF voluntary) provides incentives for eligible projects. For example, a plant in Western Sydney for the construction of a new enclosed composting facility supported by the ERF, will divert up to 100,000 tonnes of waste materials (Commonwealth of Australia, 2017).

In New South Wales (NSW), the Waste Less, Recycle More campaign offered a range of grants for:

- New or improved household kerbside collection services for organics⁵;
- New and enhanced infrastructure for processing of FO, GO or FOGO services⁶;
- Facilitating collection and redistribution of edible FO from businesses;
- Improvement of recycled organic product quality; and
- Development of new or existing markets.

3.3 Associated costs and charging schemes

The UK charge a Council tax, where a proportion is allocated to waste service provision (approximately 3-4%). Although no breakdown for actual spend on organic waste is

⁵ Organics Infrastructure Fund

⁶ Organics Infrastructure (Large and Small) Program

available. In general no further payments for waste collection or treatment are required by the householder.

Australia also charge via property taxes/rates, typically with a fixed charge per serviced property for the service provided. In some cases households have the ability to select a range of bin sizes or additional bins with payments varied annually. As noted above some collection services are supported through funding schemes like Waste Less, Recycle More.

3.4 Recycling statistics

Over 7.3 million tonnes (Mt) of food and 3.7Mt of green waste was produced by UK householders in 2015. Data indicates that 74% of food waste was diverted from landfill, 15% recycled via composting or AD and 31.5% processed in energy from waste facilities as part of the residual waste stream (WRAP, 2017a).

Local authorities in the UK offered green waste (96%) and food only (38%) collections in 2016/17. 42% of households have no separate food waste collection system in England (Wrap, 2017b).

Over the past ten years provision of food waste recycling schemes has increased, with 13.8 million households in the UK having access to a food waste collection in 2015, compared to 3.2 million in 2007 (Wrap, 2016).

In 2014/15, an estimated 15Mt (637kg/capita) of organic waste (food, green and timber) was produced in Australia, 8.8Mt was recovered through composting of garden waste and some energy recovery (gas collection from landfill) (diversion 58%). Food waste generation was 5.3Mt, 42% diversion (224kg/capita) (Pickin and Randell, 2017). Green and timber waste production was 9.7MT and 67% was diverted from landfill.

In Australia, garden organics collection is common in metro and regional (as opposed to rural) areas. Food and garden organics is becoming increasing common, often as an 'upgrade' to garden only collection services.

4 So what about New Zealand?

4.1 Legislation and Policy

Waste management in New Zealand is specifically covered by the Waste Minimisation Act (WMA, 2008), with waste processing activity regulated under the Resource Management Act 1991. The WMA has similar objectives to corresponding legislation in the UK and Australia and enables typical tools including a landfill levy, product stewardship and national or local controls on specific materials and activities.

However the tools available in New Zealand have not been applied in a comprehensive way:

- The waste levy remains at \$10 per tonne, effective in raising funds, but providing limited incentive to avoid landfill disposal.
- There are no mandatory product stewardship schemes in place in New Zealand.
- There are limited national controls on waste management activities and local by-laws vary widely around the Country.
- While some local authority Waste Minimisation and Management Plans set targets, there is limited tracking of progress towards these targets at a local or national level.

Complimentary policy, for example relating to climate change or controlling disposal or processing activities is also different to the UK and Australia. The emissions trading scheme currently in place (October 2017) adds around \$25 per tonne on waste disposed to landfill based on typical organic waste content. At current carbon prices, the scheme has not incentivised development of AD for food waste and there are no mechanisms to support composting as an alternative waste treatment or processing approach.

The Waste Minimisation Fund provides funding to Councils (50% of levy received) and through a contestable fund for activities that contribute to the objectives of the Waste Minimisation Act. In practice Council funding has largely supported existing or new education and recycling activities while the contestable fund is only starting to result in significant new infrastructure. Neither aspect of waste levy funds has been targeted towards organic waste collections or processing.

4.2 Infrastructure

GO collections are in place in Whakatane (all properties) and South Taranaki (optional, annual sticker). FOGO collections are in place in Christchurch, Timaru and Selwyn (optional). GO collections are available from commercial collectors in many urban centres with some providers informally collecting food waste (Hawkes Bay).

FO collections are scheduled for early implementation in Auckland (to commence in Papakura in early 2018) and Hamilton (procurement). One factor in pursuing FO rather than GO or FOGO collections has been the presence of existing GO collections.

In all cases where Councils have or are considering organic waste collection services they deliver refuse collection services to the majority of residents through rates funded bags (Hamilton, considering bins) or rates funded bins (most of Auckland, Christchurch, Timaru, Whakatane, South Taranaki). Selwyn are the exception taking a user charges based approach offering a low cost 80L bin (\$121 per year), 240L bin or low cost bags (\$2.00 per bag).

In many cases Councils have invested in or directly procured processing capacity to support collections. Examples include Christchurch (tunnel composting), Timaru (Gore bag composting) and Selwyn (HotRot composting). Whakatane and South Taranaki GO collections make use of existing windrow composting capacity, servicing materials delivered to transfer stations and from commercial landscaping operations.

While AD is well established in New Zealand for treating wastewater treatment solids, there are no existing examples of household sourced materials being digested.

5 Overall comment

Generally Council services will look for the lowest cost option to achieve the defined objective. This means considering a range of factors including existing services, potential grant funding (capital or operating), ongoing funding options, savings to be made (including who is saving the money) and processing cost inclusive of revenue from sale of product(s).

In the UK, food waste collection has gained traction with incentives for renewable energy generation reducing the cost of AD as a processing option (less suitable for GO and FOGO feedstock). With aggressive targets for the diversion of organic waste, evidence suggesting recovery of food organics is higher in a dedicated collection has supported having both GO and FO collections in place.

In Australia FOGO is gaining traction, reflecting a different combination of factors. Councils have identified an opportunity to capture additional material within existing GO collections. Policy incentives and funding support for both composting and AD and a potentially large market. Diversion targets in Australia generally apply to all household waste with processing of residual waste required to meet 65 -70% in some states.

Table 1 identifies key factors impacting the viability of organic waste collection based on this brief review of experience in New Zealand, the UK and Australia.

- Many policy drivers in the UK and Australia are not in place in New Zealand.
- Council control of refuse collection is an important factor in New Zealand as well as the UK and Australia.
- It makes sense to complement private sector activity (collections, processing) where possible.
- Targeted funding for organic waste collection and processing has made a difference.

Table 1 Key Factors influencing organic waste collection viability

Factor	UK	Australia	New Zealand
Diversion targets with penalties	✓	✓	
Funding for collections and processing infrastructure	✓	✓	
Incentives for renewable energy (driving AD and energy from waste)	✓		
Council control of household collections	✓	✓	In some cases
Existing private sector household garden waste collections			✓
Landfill levy	\$155/T	\$50-150/T	\$10/T
Emission trading scheme (landfill)			✓ (~\$25/T)
Contestable funding for waste minimisation projects			✓
Existing composting sector	✓	✓	✓
Existing AD sector	✓		
Existing Council garden waste collection services	✓	✓	In some cases

6 References

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