

A Summary of the Current Situation of Source Separation and Collection of Biowaste in the UK

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Introduction

In the UK, the source separation of material for recycling has focused mainly on dry recyclables. However, following the adoption of the European Union's Landfill Directive and developments in UK policy and legislation, there is now an increased focus on source separation and collection of biowaste. The UK Composting Association (TCA) carries out regular surveys assessing the state of composting in the UK. Since 1998 these surveys have been carried out in collaboration with the Integrated Waste Systems research group at The Open University. Each year, the survey has become more comprehensive driven by the demand from policy makers for increasingly detailed knowledge about the industry, and since 1999 the survey has provided detailed information on source separation and collection of biowaste as well as composting activities. This paper summarises collection results from the latest survey, which was carried out in 2003, and related to the financial year 2001/02, and draws trends from data reported in previous surveys. The full report of the latest survey was published earlier this month, and is available from the TCA website <http://www.compost.org.uk>.

1. Policy context – targets, charging and legislation

Targets

Although targets for recycling municipal waste were introduced in the mid-1990s, these were indicative and non-regulatory, and did very little to stimulate source separation activity. This situation changed in 2000 when statutory recycling and composting targets were introduced for England in relation to household waste (DETR, 2000). Separate incremental targets have also been set for the devolved nations of Wales, Scotland, and Northern Ireland, although as yet these are not statutory. The targets for England and Wales are illustrated below:

England

- recycle or compost at least 25% by 2004
- recycle or compost at least 30% by 2010
- recycle or compost at least 33% by 2015

Wales

- recycle or compost 15% by 2003 (a min. of 5% from composting)
- recycle or compost 25% by 2006 (a min. of 10% from composting)
- recycle or compost 40% by 2009 (a min. of 15% from composting)

Unlike Wales, the targets for England are for combined recycling and composting, they do not set minimum requirements for the contribution from each. Also, the waste strategy for Wales states that only source segregated biowaste will qualify for the composting targets. The situation is not so clear cut in England, where qualification for the targets depends on a definition for composting, and for the composted material to be put to 'beneficial use'. At present, there are no specific guidelines or criteria as

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to what constitutes ‘beneficial use’, and this is subject to the interpretation of the regulator or waste auditor. It is hoped that the developments in the draft biowaste directive will inform debate in the UK to help bring about clearer guidelines.

Household Waste and Recycling Act (2003)

The *Household Waste and Recycling Act* was passed in November 2003, and requires all Local Authorities in England to provide a kerbside collection for all households for a minimum of two materials by 2010. Initially it was proposed that the materials targeted should not include biowaste, as this could detract from home composting, however, biowaste has been included in the final Act, and should lead to increased source segregation and collection of household biowaste.

Animal By-Products Regulation (2003)

The separate collection of biowaste in the UK has undergone a turbulent time over the last two years. Following the Foot and Mouth outbreak the composting of kitchen or catering waste was banned in 2001. Under the ban, green waste collected with kitchen waste was classified as kitchen or catering waste. At the time of the ban, a number of established and trial kerbside schemes that collected green and kitchen waste were advised to either suspend their operations, or send the material to landfill, and local authorities about to implement such schemes were told they should delay doing so (TCA, 2001). Following the ban there was considerable uncertainty as to which household biowastes would fall within the definition of catering wastes, and it was suggested that this could include green waste. The situation is now much clearer following the introduction of the Animal By-Products (England) Regulations in July 2003 (SI No. 1482/2003). The regulations specifies composting time/temperature ‘barrier’ (i.e. a minimum of all material reaching 60°C for 2 days or 70°C for one hour) depending on particle size. Green waste collected separately for composting is not affected by the regulations. For catering waste where meat has been excluded prior to collection, one barrier is required (plus a minimum of 18 days storage of finished compost). If meat has not been excluded two barriers are required (without any storage time limit). If this composted material is to be applied to grazing land, grazing bans of varying length must be applied dependant upon type of farm animal.

Charging

There is an increased trend in some Member States for differential and variable charging (DVC) for household waste to encourage a reduction in waste set out for collection and to provide incentives for participation in source separation and recycling (Eunomia, 2003). The UK is unique in Europe in that DVC is prohibited by law, and although it has been recommended that local authorities be given the power to introduce DVC (Strategy Unit, 2002), this has yet to be adopted by Government. Although no direct charge can be made for general household waste collection, local authorities can impose a charge for a few selected categories of household waste, including garden waste, and a number of kerbside collection schemes currently levy a charge for green waste collections.

2. The current state of biowaste collection in the UK

Overview

The Composting Association’s survey was the most comprehensive survey of separately collected and composted biowaste undertaken the UK. The survey

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predominantly focused on municipal waste for composting, and although it included some industrial by-products and waste, it did not specifically target industry sectors such as waste water treatment, forestry and mushroom farming.

The overall picture for collection of biowaste is one of continued expansion, as illustrated in Figure 1. Between 1999 and 2001 the survey recorded a doubling of separately collected bio waste, from 0.83 Mt to 1.66 Mt, and around 90% of this was collected in England.

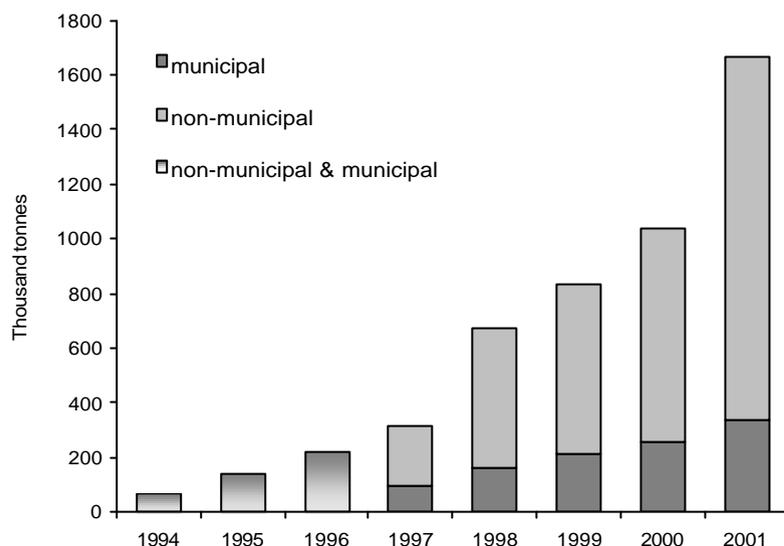


Figure 1 – Collection of Biowaste in the UK (municipal and non-municipal)

Of the 1.66 Mt of biowaste collected in 2001, around 80% was from municipal sources and 20% from non-municipal sources. Green waste accounted for virtually all municipal waste collected, and forestry by-products and green waste accounted for the majority of non-municipal waste.

Municipal waste collections

There are two main types of collection systems employed in the UK, bring schemes – where householders are required to take their green waste (and other recyclables) to a central point; and kerbside schemes – where householders are encouraged to separate their waste for collection from outside the property.

Bring schemes

There has been widespread adoption of bring schemes, but most target dry recyclables. Bring schemes include small recycling centres such as those at supermarkets and other public places, as well as larger civic amenity (CA) sites. Bring schemes for household biowaste tend to be limited to green waste containers at larger CA sites. For instance, government statistics suggest in 2001/02 there were around 730 CA sites collecting green waste, compared to over 15,000 bring points for glass and 12,000 for paper. Taken across England, this equates to just one site collecting green waste for around 28,000 households. Despite the very low-density of bring schemes for green waste compared to dry recyclables, bring schemes continue to be

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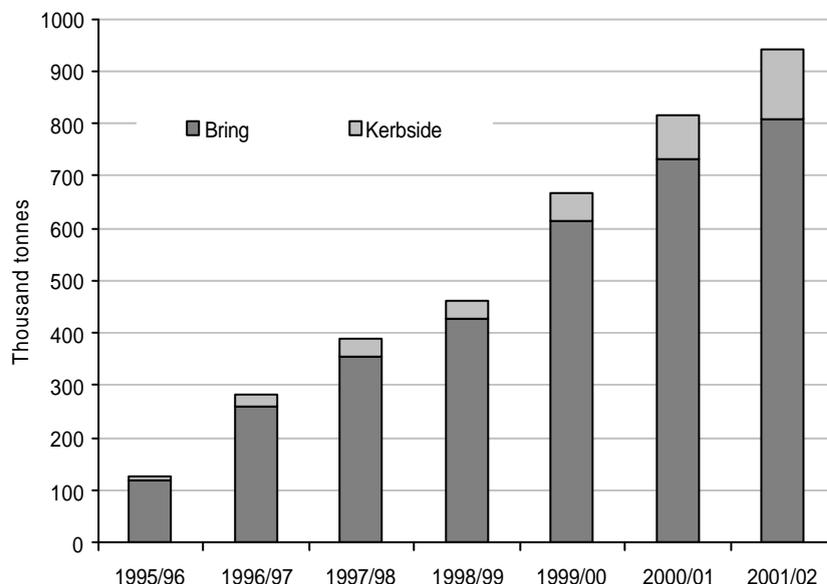
the dominant route for the collection of green waste, accounting for 86% of household biowaste collected in 2001 (DEFRA, 2002).

Quantities collected per household from CA sites will obviously vary depending on a range of factors, including density of sites, travel-time to sites, urban/rural demographics and kerbside collection provision. There are very few published sources detailing quantities collected per household for CA sites, which obviously makes it difficult to compare estimates and predict activity. One of the few sources available is from the Government, and their statistics suggest that CA sites collect an average of 39 kg/hh/yr (DEFRA, 2002). This figure is very low as it is based on the number of sites (730) and estimated for all households across England, and therefore will include rural areas where there are no CA sites in the local vicinity. Research undertaken by Integrated Waste Systems group at The Open University on behalf of Hampshire County Council observed an average 80 kg/hh/yr across the whole county area, and in districts that implemented a ban on accepting green waste in residual waste collections this increased to >120 kg/hh/yr.

Kerbside collections

Kerbside collections accounted for 14% of source separated household biowaste collected in 2001. Although there has been an increase in the number of schemes, it is estimated that just 15% of households are served by green waste collections, compared to over 55% served by schemes collecting dry recyclables.

Figure 2 shows the increase in total household green waste collected for composting. Although kerbside collection accounts for a small proportion, this has increased from around 11% in 2000 to 14% in 2001.



Source DEFRA (2001, 2002, 2003) and National Assembly for Wales (2003).

Note 1995/96 to 2000/01 relates to England and Wales, and 2001/02 relates to England only.

Figure 2 – Quantities of household green waste collected from bring sites and the kerbside

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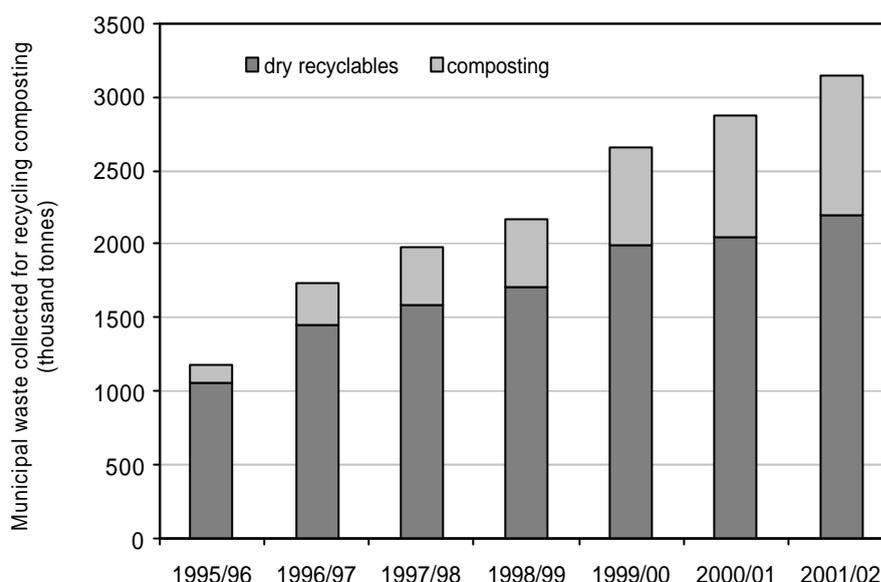
The Composting Association survey recorded 65 local authorities who operated a kerbside collection scheme in 2001, and 60 of these were based in England, this represents a ratio of around 1 in 5 authorities responsible for collection. Although there are a number of different approaches based on collection frequency, container type and size, participation type (opt-in or opt-out) and cost (free or charged), most schemes are a free opt-out fortnightly collection service using wheeled bins and collecting green waste only. Analysis of the different collection variables in relation to quantities collected suggest that there is no significant difference between the different approaches and quantities collected per participating household. However, certain design variables, particularly opt-out participation and free collections attract a greater number of participants and hence lead to greater quantities collected per household served (Slater, 2002). Some commentators observe that widespread and free kerbside collection schemes for green waste can lead to an increase in overall waste arisings (Andrews and Mansell, 2003), although it is not clear whether this is a result of green waste diverted from CA sites and home composting, or from ‘new’ waste attracted into the system.

The survey results showed that on average around 180kg/hh/yr was collected per household covered, and 13 councils collected between 200-300kg/hh/yr, and 10 councils collected >300kg/hh/yr. This supports previous research undertaken in the UK which showed that half of councils reviewed collected >190kg/hh/yr (Mansell, 2001), and the higher quantities collected are similar to findings from a number of recent trials, e.g. Southampton City Council (Slater *et al*, 2003), Bexley Council (Bexley, 2003), and Bath and North East Somerset (Andrews and Mansell, 2003).

3. The contribution of the green waste to the recycling and composting targets

Although recycling and composting in the UK is not as established as in some Member States, it is becoming more developed and continues to grow steadily. Over the last few years the quantity of source separated and separately collected household waste for recycling and composting has increased almost three-fold, from 1.1Mt in 1995 to over 3.1 Mt in 2001. Figure 3 shows that the quantities collected for composting have grown at a faster rate than for dry-recyclables, with the result that the contribution to overall recycling and composting has increased from 10% in 1995 to 30% in 2001.

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Source DEFRA (2001, 2002, 2003) and National Assembly for Wales (2003).

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Figure 3 – Quantities of household waste separately collected for recycling and composting

Latest compositional figures suggest that green waste and kitchen waste account for 20% and 17% of household waste respectively (Parfitt, 2002), which equates to almost 11 Mt of household biowaste produced in 2001. Compared with other Member States, the UK separately collects and composts only a small fraction of its potentially recoverable household biowaste, i.e. a capture rate of around 9% for total green and kitchen waste available, and 16% of green waste available.

The statutory recycling and composting targets for England are outlined in Section 1 above. If composting were to continue to contribute 30% in meeting the recycling and composting targets, the capture rate needs to increase to around 38% of green waste available by 2005, and 50% by 2015. Given the current low capture rates, and following the trend illustrated in Figure 3, it is likely that the composting contribution to overall recycling and composting may continue to increase for several years before levelling out. Assuming a 50% contribution from composting to the targets increases the capture of green waste to 63% in 2005, rising to 83% in 2015. This shows that growth in the sector to achieve a 30% contribution to the targets could be sustained with continued reliance on green waste, although more intensive collection systems would be required, i.e. higher-density of bring sites and/or more extensive kerbside collections. However, capture rates for green waste in excess of 80%, as required under the 50% contribution scenario, are unlikely to be achieved, and more kitchen waste would need to be collected and composted to sustain this level of growth.

4. Future Trends?

Although the source separation and collection of green waste has continued to expand over the last few years, the capture rate of total green waste available is relatively low at around 16%, and there remains considerable scope for industry expansion based on the continued reliance on green waste. This reliance has fostered a composting sector

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dominated by relatively low-technology small-scale open-air windrows, typically processing around 5,000t per annum.

To-date the UK has not developed the separate collection of kitchen waste, although this represents a relatively large fraction of household waste (17%). This may be partly due to the ban on collection and composting of kitchen and catering waste following the foot and mouth outbreak. Although this ban has now been lifted, there are strict regulations surrounding the composting of kitchen waste which requires the industry to develop enclosed systems, with more sophisticated monitoring systems than is currently the norm in the UK. However, there is evidence to suggest that this is starting to happen, as the quantity of waste composted using in-vessel systems increased five-fold from 1999 to 2001, from 31,000t to 170,000t (Davies, 2003), and a number of trials have, or are in the process of being carried out to assess the feasibility of collecting kitchen waste. Some of these trials focused on collecting green waste with all kitchen waste (e.g. Bexley Borough Council), and some have considered green and kitchen waste, and kitchen waste only (e.g. Bath and North East Somerset).

At present, composting is the main technology used to process separately collected biowaste in the UK, however the demand for alternatives to landfill is likely to promote the emergence of other biowaste technologies, and the Government are currently carrying out a consultation exercise with regard to widening the definition of composting to include anaerobic digestion for the purposes of qualifying towards the targets. This demand is also likely to promote a change in the profile of the composting sector, with the proliferation of small-scale sites composting green waste with larger-scale sites capable of processing a range of biowastes.

A large expansion of collection infrastructure will be necessary to meet this demand, and there are currently several initiatives underway to promote source separation and collection of biowastes. For instance, funding is available from the Department of the Environment, Food and Rural Affairs (DEFRA) and the Waste Resources and Action Programme (WRAP) to support collection infrastructure. In particular WRAP are looking to rapidly enhance garden waste collected at bring sites, and have set up a technical team to advise on kerbside collection of household biowastes. In conjunction with these collection initiatives, WRAP is also undertaking a home composting programme. Given the pressure on local authorities to meet the recycling and composting targets and the range of initiatives set up to assist this, the source separation and collection of biowaste looks set to expand considerably over the next few years.

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