

Tenement special report

Managing food waste in Berlin



● How the German capital collects and recycles its food waste – and what lessons Glasgow can learn.
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Key Findings

- There has been an organised food waste collection in Berlin since 2002.
- All household waste in Berlin is managed by a company (BSR) which is wholly owned by the city authorities.
- 84% of properties in Berlin are rented and 30% of these are owned by municipal organisations such as housing associations.
- The food waste in Berlin is used to produce biogas which powers 50% of the refuse collection vehicles in the city.
- Berlin and Glasgow have similar recycling rates (27% and 26% respectively).
- In 2013, just 16% of all food waste estimated to be generated in Berlin was recycled.
- BSR ran three food waste publicity campaigns between 2008-2013.
- There are over 100 community gardening projects in Berlin with composting facilities.
- Unwanted (but edible) food can also be taken to foodsharing points around the city.
- There are three main barriers reported by residents that prevent them from using the food waste service: Hygiene and smell, lack of free indoor food waste containers and lack of clear information about food waste which reaches all residents.

Introduction

Glasgow City Council has begun to introduce food waste collections for multi-occupancy buildings across the city, as it has already done for houses, as part of its obligations under the Waste (Scotland) Regulations 2012. Residents in flats are already provided with communal bins for separate collections of mixed recyclables and residual (non-recyclable) waste.

The introduction of food waste collections in Glasgow has the potential to bring significant environmental, social and economic benefits, particularly considering that an estimated 29% of the waste currently disposed of in residual waste bins in the city is food waste¹.

However, the new food waste collection service is also likely to bring a number of challenges, particularly in high-density housing areas such as Govanhill where bin storage can cause health, security and logistical issues, and the relative 'anonymity' of the individual users of shared bins can increase the likelihood of their misuse. In addition, Govanhill has particular social demographic characteristics, for example relatively high levels of deprivation and large migrant populations, which can influence the relative success of how a new waste collection system is adopted.

This report seeks to outline the potential benefits and challenges of introducing a food waste collection service in Govanhill by focusing on the experience of another major European city: Berlin.

Social demographic overview

Berlin has a population of approximately 3.5 million people and is comprised of 12 neighbourhood areas. To provide an overview of food waste management from multi-occupancy buildings in Berlin that will be more meaningful in the context of food waste

collections in Govanhill this report focuses on the Berlin neighbourhood of Neukölln, south-east of the city centre, which has some broadly similar social demographics to Govanhill, albeit on a much larger scale (Table 1).

	Population and population density	Social demographic characteristics
Neukölln, Berlin	316,000 ² 7,000/km ² (3,900/km ² for Berlin as a whole) ²	22% of population are foreign-born (14% for Berlin as a whole) ² Large Turkish population Mean net monthly household income of €1,550 (Berlin average: €1,750) ²
Govanhill, Glasgow	14,412 ³ circa 11,000/km ²	33% of residents are from an ethnic minority (12% for Glasgow as a whole) ³ Known for its large immigrant population. 25% of people in Govanhill are considered to be in income deprivation (19% for Glasgow as a whole) ³

Table 1: Population and social demographic statistics for Neukölln and Govanhill



Image 1: Typical Neukölln tenement buildings

Like Govanhill, the predominant housing type in Neukölln is multi-occupancy tenement blocks (Image 1). Tenements are usually five storeys high and can be comprised of 10 or more individual flats. The cleaning and maintenance of communal areas in tenement buildings is organised by a 'Hausmeister' (caretaker) or management company.

Renting is the norm across Germany and in Berlin 84% of properties are rented rather than owner-occupied. Around 30% of these are owned by municipal organisations such as housing associations⁴.

Berlin waste management overview

Waste from households in Berlin is managed by Berliner Stadtreinigungsbetriebe (BSR) which is a statutory body wholly owned by Land Berlin (the city authorities) and one of the largest waste management companies in Europe. BSR is partly funded by fees paid by residents for waste collection, however it does not make a profit directly from fee payers⁵.



Image 2: A typical tenement back court with communal bin area



Image 3: A 180 litre BioGut bin

Residents in tenement blocks share external recycling and residual waste bins which are usually stored in a communal rear courtyard of the block (Image 2). Approximately 90% of tenements in Berlin are currently provided with a food waste collection service, referred to as 'BioGut' which was rolled out prior to 2008⁵. The service consists of a brown-lidded wheeled bin (Image 3), usually 120, 140 or 240 litres but sometimes 1,100 litres for larger buildings, which is emptied by BSR once every two weeks, except during summer when it is emptied once per week to minimise smells and hygiene issues in warmer weather.

Food waste is transported to a biogas plant (Image 4), which opened in summer 2013 at Ruhleben in the western suburbs of Berlin. Prior to the opening of this plant, food waste was taken to a composting facility. At the biogas plant micro-organisms digest the food waste in a dry-fermentation process which generates biogas. This gas is identical to natural gas and so is fed into the gas supply where it can be used to power BSR's fleet of natural gas-powered waste collection vehicles.

How the BioGut service works



Image 4: The Ruhleben biogas plant⁵

Owners of flats in tenements which are included in the food waste collection service pay a yearly fee (as well as for the collection of residual waste) directly to BSR based on the number of occupants in their flat. Tenants of rented flats usually pay a fee which is included within their rent payments.

This payment system for waste is unique to multi-occupancy buildings. For houses in Berlin and across Germany, residents pay a 'pay-as-you-throw' fee

according to the size of their bin, and the fee for the food waste bin is around half that of the residual waste bin. This creates a direct financial incentive for residents in houses to divert food waste away from the residual bin to be recycled. However, this incentive is not present for residents in multi-occupancy buildings who share bins.

Residents in tenements included in the BioGut service are not provided with an indoor food waste container or biodegradable food waste bags as part of the service. Instead, residents have the option of either purchasing one directly from BSR, which it actively promotes through its website and using public advertisements (Image 5), or using their own container.



Image 5: Food waste container promotion poster (June 2016)

A trial was carried out in 2011 which provided 21,000 residents in tenements in two Berlin districts with biodegradable bags and indoor containers for their food waste. This trial increased the amount of food waste collected from these areas by at least 10%, and 80% of residents were satisfied with the service⁶. However, the issuing of free biodegradable bags for Berlin residents on a wider scale has not become policy, most likely due to the costs involved.

The BioGut service is intended for all food waste: cooked and uncooked leftovers; bones; out-of-date food (without packaging); fruit and vegetable peelings; coffee grounds, tea bags and egg shells; old plants and flowers; and newspapers and other waste papers.

How residents are informed about the BioGut service

BSR has produced three communications campaigns to publicise the BioGut service, from 2008 to 2013⁷, which can be viewed at www.bsr.de/18426.html. These campaigns used posters on billboards, bus stops, shopping trolleys and waste collection vehicle advertisements and articles in the local press (including one about what happens to a burnt sausage after it is thrown in the BioGut bin), a YouTube video, and leaflets and postcards sent directly to residents. The primary messages of these campaigns have been to

raise awareness of the range of wastes that can be put in the BioGut bin, such as leftovers and old flowers, and that the food waste is used to generate valuable biogas.

Outwith these campaigns, BSR has a website which provides information such as what happens to the food waste after it is collected and what types of waste can be put in the BioGut bin⁸. Some, but not all, communal bin areas in tenement back courts also have a colour-coded notice which outlines what types of waste should be put in each bin (Image 6).



Image 6: Notice displayed in some communal bin areas

Other local options for dealing with food waste

Most tenement back courts in Neukölln are small, often paved over and can be heavily shaded by surrounding buildings so do not lend themselves well to gardening. Therefore it is unlikely that many residents, save for the keenest gardeners, have home composting facilities.

One option for residents who do want to grow their own food and also compost, but don't have space at home, is to get an allotment at one of the four allotments in the vicinity of Neukölln. However, there is usually a cost for renting a plot and it is not clear whether or not there are waiting lists.

Berlin is also a hive of community-level action and there more than 100⁹ community-organised gardening projects throughout the city. In Neukölln, there are 15¹⁰ projects set up and run by groups of residents on vacant land, including one on the now defunct Templehof airfield (Image 7) which has over 250 raised beds tended to by more than 500 local residents¹¹. These community gardens generally have compost heaps or bins where residents who are keen to compost their food waste can do so, even if they don't have a plot in the community garden.



Image 7: Templehof community garden (June 2016)

Another option for dealing with food waste is Foodsharing.de. This is a Germany-wide online platform through which people can arrange to share edible food that is surplus to requirements (either from their own household or out-of-date stock donated by supermarkets) with others in their neighbourhood. In Neukölln surplus food can be taken to one of four locations, known as Fairteiler ('fair sharers', Image 8) which are mostly equipped with a fridge, and stored there until someone else comes along during the opening hours of the Fairteiler and decides to take it home.

It is difficult to estimate how many residents make use of community composting or food



Image 8: One of the many food sharing points in Berlin

sharing facilities and therefore how much food waste is diverted from the BioGut bin to these options. However, these facilities are run by volunteers so have very limited capacity when it comes to raising awareness of their existence. The reality is that residents who are already very interested in composting and reducing food waste will seek out such facilities and use them, but it is likely that this is a small proportion of the population.

How effective is the BioGut service?

Environmental benefits

The BioGut service captured 63,296 tonnes of food waste in 2013. This is estimated to be 16% of the total food waste generated in Berlin, based on an analysis of bin contents carried out in 2008¹¹. This indicates that many residents are not using the BioGut bin for their food waste. Of the food waste that is captured, a relatively small amount (4%) is rejected by screening techniques prior to entering the biogas process¹². This rejected material is likely to be packaging and other materials disposed of by residents into the BioGut bin that would disrupt the biogas process. This indicates that a small proportion of residents using the BioGut service are confused about what waste they should put in the bin or don't understand why certain types of waste should be left out.

The BioGut service contributed to an overall recycling rate for Berlin of 27% in 2013¹². It should be noted that Germany has a deposit-return system for plastic and glass bottles (consumers receive a small deposit back when they return bottles to collection points) and this recyclable material is not included in Berlin's overall recycling rate i.e. its recycling rate would be higher if this material was included. For comparison, Glasgow's recycling rate was 26% in 2014¹³.

The biogas from food waste is fed back into the gas network and is used to power 150 BSR refuse lorries (50% of its fleet). This displacement of the 250 million litres of diesel that would otherwise be used by these lorries, along with avoidance of emissions from food waste that would otherwise be sent to landfill, is estimated by BSR to prevent the release of 12,000 tonnes of CO₂ per year⁵. In addition to biogas, the fermentation process also generates a digestate which can be used as a fertiliser.

The resident experience

Feedback was gathered specifically for this research from a small number of residents (eight). In addition, an EC study into separate recycling collections in the cities of EU member states also outlined useful feedback from residents.

The main feedback reported by residents to BSR about the BioGut service relates to concerns over hygiene issues, especially during summer. Consequently, BSR has run pilot projects to test the acceptance of BioGut bins with carbon filters to reduce smell, and foot pedals to reduce the need for residents to handle the lid. The results of these pilots are not yet available.

One resident said that they 'tried using the brown bin when [BSR] first gave them out. But I can't handle opening them, especially in summer, because of the smell'. Another resident said that 'I don't use the food waste bin because I don't like the thought of it sitting in the back court for a week. It would be all right if it was picked up every two or three days'. However, another resident thought that the BioGut service was 'great' claiming that 'our regular black bin never smells any more'.

Another reason given for residents not using the BioGut service was the perceived lack of indoor storage space for a food waste container. One resident said that 'I don't have anywhere to put the thing'. Another didn't see this as an issue, however, as 'it's not as though there's a big wheelie bin sitting in your kitchen'.

The lack of free biodegradable bags or containers for indoor storage of food waste was also cited as a barrier, with one person saying that 'I don't want to pay for those biodegradable bags. And I don't buy newspapers that some people suggest to use either'. Another resident said that 'while it doesn't quite break the bank, I don't particularly like having to spend a euro or two for each roll of biodegradable bin bags'. Another resident said that they didn't have a problem with the lack of free bags as they use simple solutions such as an old ice cream tub lined with newspaper for indoor storage of food waste.

A lack of information, or confusing information, on what waste goes in which bin was also cited as an issue for residents that could potentially prevent them from using the BioGut service. For example, one resident said that 'I can't for the life of me figure out the recycling. There is a detailed notice posted in our courtyard explaining which items are to be placed in which coloured bins, but the actual bins don't match the notice'. Another said that 'I'm keen on recycling so I found out about the food waste by looking online to see what I need to put in there as there are no signs about this in the stairwell or on the bins. But from what goes in the bin I don't think some of my neighbours are sure what goes in there. And not everyone in my block uses it'.

Conclusions

Berlin and Glasgow have very similar recycling rates (27% and 26% respectively). Although Berlin's rate does not include the plastic and glass bottles that are recycled through the national deposit-return scheme, and Glasgow's rate does not include food waste, it is likely that these figures reflect the challenges that both cities face in terms of managing waste from very diverse populations living in high-density, multi-occupancy housing.

Berlin's food waste collection service, BioGut, has been in existence since before 2008. Despite this and widespread publicity campaigns run by BSR to raise awareness of the service, usage of the BioGut service appears to be low: in 2013, just 16% of all food waste estimated to be generated in Berlin was captured and recycled.

There are three main barriers reported by residents that prevent them from using the BioGut service at all or more often. The perception that a dedicated food waste bin can smell and that food waste is unhygienic to store for more than a couple of days is very prevalent. Many people do not appear to like the thought of having to see and handle their food waste more than once.

This factor may be exacerbated by the second main barrier: lack of provision of free biodegradable bags or indoor food waste bins. These can help to 'sanitise' food waste recycling by keeping food waste relatively well contained, out of sight and smell-free.

The third barrier is the lack of clear information which actually reaches all residents on why and how they should use the BioGut service and what practical steps can be taken to alleviate concerns about poor hygiene or smell. In particular is the difficulty in communicating these aspects to the large immigrant communities in areas such as Neukölln. Many of the signs in public amenity spaces in the area are written in both German and Turkish which indicates that for many local people Turkish is their first, and possibly only, language. There is also likely to be a wide variety of other languages spoken by people in the area.

However, there is little evidence of any of the food waste communications campaigns or material making any provision for this. The exception is the notices that are displayed in some communal bin areas which feature a simple outline image of an apple core on a brown background to represent food waste. Consequentially many people in the immigrant communities in Neukölln, and the rest of Berlin, for whom German is not their first language may not be aware of how to use the BioGut service.

There are also other aspects of living in multi-occupancy buildings that are likely to contribute to the low usage rate of the BioGut service. For example, the waste disposal behaviours of individual residents living in multi-occupancy tenement blocks with communal bins are relatively anonymous. Therefore, there tends to be higher incidences of dumping of bulky waste and use of the bins for the wrong waste types in areas where multi-occupancy buildings are prevalent because there is less accountability and social pressure on individual residents.

Another issue is the lack of a direct incentive for residents in multi-occupancy buildings in Berlin and across Germany to properly sort their waste, as the amount they pay for waste does not change whether they sort it properly or not, unlike residents living in houses. This is also the case for the UK where waste charges are paid for with council tax, which depends on property value rather than the amount of waste generated or properly sorted. Some cities across Europe have implemented communal bin systems that use smart-cards to unlock a bin-access chamber in which the resident places their waste and a record of the amount and type of waste disposed of is made so that they can be charged individually¹⁴. Such a system would be expensive to implement but experience indicates that direct incentive systems do work in improving waste sorting and reduction.

Overall, it appears that the effectiveness of Berlin's food waste collection service is heavily influenced by the level of support provided to residents to use the service. Lack of clear and consistent information on the service that reaches all residents, as well as a lack of focus on addressing the barriers to food waste recycling identified in this report, appear to have resulted in a low food waste capture rate. These are lessons that Glasgow can hopefully learn from.

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