A global review of dry recycling and food waste collections and communications initiatives for flats and multi-occupancy dwellings, and a subsequent identification of innovative practices.

Revue globale des initiatives de collecte et de communication concernant le tri sélectif et les déchets alimentaires au niveau de l'habitat collectif, et identification des pratiques innovantes qui en découlent.

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Project Abstract.

The development of innovative systems to collect dry recycling and food waste from flats and multi occupancy dwellings (MOD's) has increased in recent years due to the ever pressing need to divert these valuable resources

from residual waste streams. Establishing the infrastructure to allow collections of these materials can be as challenging as developing communications strategies to ensure systems are used and there are many different approaches that have been established worldwide. The urbanisation of the world's cities also means that more and more people will be living in flats in the future so the waste management from flats is more important now than it has even been.

This project aims to explore what has been done in a number of countries worldwide to provide innovative dry recycling and food waste collections to residents in flats and MOD's. The countries examined with include Australia, France, Japan, Spain, USA and the UK. The project will then look in more detail at communication methodologies that have been developed in relation to increasing participation in recycling and food waste collection schemes operating at flats.

The project illustrates that whilst different approaches to providing dry recycling and food waste collections and communications have proved to be successful in a given country, there are many factors that need to be considered (such as cultural differences, operational capabilities and economic issues) when implementing schemes and subsequent communications. The conclusions made are that it is essential to implement schemes at a local level and studying the individual characteristics of particular properties and the residents should lead to higher levels of success

when developing dry recycling and food waste collections and communications for flats.

Résumé du projet

Le développement de systèmes innovants en terme de collecte des déchets recyclables et alimentaires dans l'habitat collectif s'est amplifié ces dernières années, en raison de la nécessité grandissante de détourner ces ressources valorisables des déchets ménagers résiduels. La mise en place d'infrastructures permettant la collecte de ces matériaux peut être un challenge tout comme le développement de stratégies de communication assurant le bon usage de ces systèmes, et il existe de nombreuses approches différentes ayant été appliquées à travers le monde. L'urbanisation des villes signifie que de plus en plus de gens vont vivre en habitat collectif dans les prochaines années, c'est pourquoi la gestion des déchets dans ce type d'habitat est plus importante qu'elle ne l'a jamais été.

Ce projet a pour but d'explorer ce qui a été fait dans un certain nombre de pays pour apporter des modes de collecte innovants de ces déchets aux personnes vivant en habitat collectif. Les pays étudiés seront l'Australie, la France, le Japon, l'Espagne, les USA et le Royaume-Uni. Le projet se penchera ensuite plus en détail sur les méthodes de communication ayant été développées pour augmenter la participation de l'habitat collectif au niveau du tri sélectif.

Ce projet illustre comment différentes approches de promotion du tri sélectif et de la collecte de déchets alimentaires ont prouvé qu'elles peuvent avoir du succès dans un pays donné, car il y a de nombreux facteurs à considérer (comme les différences culturelles, les capacités opérationnelles et les issues économiques) lors de l'application de ces méthodes et de la communication associée. Les conclusions faites sont qu'il est essentiel de mettre en place des démarches à un niveau local, et l'étude des caractéristiques propres à chaque type d'habitat et à leurs résidents devrait mener à de meilleurs résultats de tri des déchets en développant les méthodes de collecte et la communication pour l'habitat collectif.

Introduction

Recycling in flats and multi occupancy dwellings poses numerous problems not faced by conventional household kerbside recycling or through public bring sites, consequently levels of recycling are generally lower in these dwelling in both the UK and France. For the purposes of this report two story flats are excluded from the discussion as in the UK and elsewhere they invariably have the same type of collection service as houses.

The research team have targeted six countries UK, France, Spain, USA, Japan and Australia for investigation but will not exclude reference to specific example of interest from other countries where appropriate. The aim is to identify innovative practices that could be implemented universally to overcome the problems experienced in the UK and France.

The questions addressed by this report are:

- What dry and food waste recycling methodologies are used in flats in the targeted countries
- Do other countries have the same issue when trying to recycle dry and food recycling in flats and multi occupancy dwellings?
- If not what methods do they adopt to overcome any difficulties i.e. types of awareness raising etc.
- What are the elements that need to be considered when promoting dry and food waste recycling in flats and multi-occupancy dwellings

It is evident that from that based on the experience of the authors of this report that there are numerous issues that can influence the success of recycling in flats and multi occupancy dwellings, not least that unlike streets, it is often possible to classify them into one specific group that can be classified occupying these types of residents. Therefore when looking at recycling in flats and multi-occupancy dwellings the following factors will influence how it is done and the success of the process:

1. **Age Range**:

   What impact would the age of the people living in the flats impact on the success of recycling i.e. are the residents young, old, mixed?

2. **Socio-economic**:

   Are the people occupying the flats poor, wealthy (this may include gated communities) - financial class related to income (low/middle/high)

3. **Type of occupant**

   Single people, families, professional couples, students, ethnic minority etc

4. **Flat structure and surrounds**

   Age of property and the surrounding physical environment, building design, size etc

5. **Flat Location**

   Where the flat is situated within a town or city or rural location, space around the flat

6. **Block Management**

The quality of maintenance, control of waste management by owners of blocks, for example is there compulsory recycling

7. **Ownership**

   Are the flats rented, sheltered, leasehold (sometimes mixed)

8. **Individuals living in the flats**

   Participation rates, even when suitable facilities are in place they may not be used. Therefore do social pressures exist within the community?

9. **Cultural**

   This relates to the influences that culture may play in the receptiveness of a community living in the flats/multi-occupancy dwellings.

10. **Resource allocation**

    What can the managing agents/Local Authority afford to invest in recycling – also cost of retro fitting and any combination of the above

The changes needed to improve the recycling rates are not just restricted to the anomalies found in the structure, people and environs of flats and MOD's there are also wider issues that impact on all types of recycling:

- Markets for the recycled material
- National/International Legislation
- The cultural switch for waste organisations and their employees
- Local and National financial restraints

Section 1: Researched and Compiled by Alex Donley.

Innovations in Dry Recycling Collection Methodologies from Flats and Multi-Occupancy dwellings.

There has been a drive in recent years for local authorities and their equivalents worldwide to provide recycling collection services to flats and multiple occupancy dwellings (MOD's), as well as individual properties served by the usual kerb-side collection rounds. For example, approximately 20% of the housing stock in the UK is made up of communal dwellings so it is imperative for the recycling from these properties to be captured.

Using the UK as an example, it is not only legislation such as the Household Waste Recycling Act (which came into force in the UK in 2003) that has driven changes in this area. Providing recycling facilities to communal dwellings and applying innovative ways to understand the recycling behaviour of residents in this type of accommodation increases overall recycling rates, helps to meet targets in the reduction of residual waste and is essential to meeting Local Area Agreements on community improvement and sustainability issues (WRAP, 2010).

However, high participation rates in recycling schemes can be difficult to achieve. Historically, residents residing in flats and MUD's have been viewed as hard to reach and participation in recycling schemes has been lower than at individual properties (WRAP, 2010). The high turnover of residents, low levels of property ownership, lack of space to store recycling within flats and the difficulties of communicating with residents about what should go into recycling bins have all been noted as barriers to recycling at communal

dwellings. Recycling systems also need to be economically viable in terms of running costs as well as convenient for residents to use (Taylor, 2010).

With the urbanisation of the world's cities and lack of space for new development, more people will be living in flats in the future so understanding the best ways to encourage residents in flats to recycle is essential. There can also be conflicting requirements between the space needed for waste and recycling infrastructure and planning policies developed to protect the aesthetics of the urban environment (ADEPT, 2010), pushing further still the development of innovative recycling collections systems for flats.

The objective of this section of the report is to identify examples of innovative dry recycling collections from a number of countries around the world. Four different methods of collection will be examined and the will include door to door collections, collection points on each floor, bring schemes and chute systems (although not all countries have examples of all four methods). Operational aspects of the systems will be identified together with an evaluation of the positive and negative aspects of the different systems. The communication tools linked to flats recycling schemes will be discussed in more detail in a later section of the report. It is hoped that the examples worldwide will provide valuable insight to dealing with the problems of recycling collections from flats in the UK and France.

UK Dry Recycling Innovations.

Throughout the UK in the last 10 years many different schemes have been developed in an attempt to provide flats with user-friendly recycling collection systems. Early research in this area suggested that access to convenient

recycling facilities is one of the main precursors to achieving high levels of participation (Barr et al, 2001). Therefore, there was a trend towards making things as easy as possible for residents by implementing door-to-door collection services for high rise properties in many UK cities. Current developments in Health and Safety, planning policy and economic pressures have pushed this trend in the direction of bring schemes and chute systems. However, there are still examples of all types of dry recycling collections in operation that will be discussed in this section.

Door-to-Door Collections

Door-to door collections operate on the basis of a kerb side collection scheme. Residents are usually supplied with a box or plastic sack to store recycling within their property and then place it outside their door for collection on a weekly basis. Property managers or waste collection operatives are then responsible for transporting the recycling to the ground (either manually or using specially designed trolleys) where it is bulked up for collection. Co-mingled collections are usually in place to allow paper, card, cans, plastic bottles and glass to be collected in bags or boxes.

This type of collection has been implemented in areas where the housing stock is predominantly made up of high rise blocks of flats. The city of London and Tower Hamlets Councils both provide door-to-door collections for a number of blocks. The scheme in Tower Hamlets was initially run by a community organisation (Tower Hamlets Community Recycling Consortium). It was established to give residents in flats the same opportunities to recycling as individual properties. The high proportion of refuse shoots in the flats also reduced the likelihood of residents being used to transporting waste to

communal areas at ground level. There were also many blocks in the area with no available space to install alternatives such as bring schemes. (Waste Watch, 2006).

Door-to-door schemes have the advantages of being easy for residents to use, inexpensive to set up and have been reported to encourage participation (WRAP, 2010) However, residents may struggle to store recycling in their properties between scheduled collections. Blocking access routes and associated fire risks is also a major issue, together with the manual removal of materials to ground level. For example, Tower Hamlets are considering the removal of this type of service due to the high running costs and Health and Safety issues of manually handling the recycling to ground level. An article on Letsrecycle.com (2008) also states that the London borough of Hackney had to stop door-to-door collections on instruction from the London Fire Brigade. However, a report published by the Environment Agency (2010) highlights that Tower Hamlets approach to dry recycling collections from flats and their comprehensive communications campaigns lead to the borough being in the top three improving boroughs, increasing their recycling rate from 3% to 19% from 2001/2 to 2008/9.

Although door-to-door collections are not at the cutting edge of innovative recycling systems, I believe they display how the UK sought to encourage recycling between 2003 and 2008 with convenience as the driver. The schemes run by community groups or non-governmental organisations also appear to have been successful through having local people with vital local knowledge working within them. In many high rise blocks with no ground

space, there may not be an economically viable alternative to providing recycling collections.

Collection Points on Each Floor

Another innovative approach to dry recycling collection used by Councils in the UK has been to provide recycling drop-off points in strategic locations on each floor of High rise blocks. A good example of this type of collection is at the Clem Attlee Estate in Fulham (Prigg and Moore-Bridger, 2009), displayed in Photograph 1.

This type of collection allows residents to deposit bags of co-mingled recycling at any time and the banks are emptied approximately 2 times per week. The manual handling of materials is reduced using this system as is the obstruction of access routes within blocks (WRAP, 2010). The drop-off points can also be conveniently located for use by residents as part of their daily routines to increase capture rates. However, there is still a potential fire risk and transporting materials from large blocks of flats is problematic with current Health and Safety regulations.

Photograph 1. Recycling Drop-off Point Used on Each Floor of High Rise Flats (Prigg and Moore-Bridger, 2009).

Bring Schemes

The most common approach to dry recycling collection from flats in the UK is the provision of bring banks. These can be located in existing refuse storage areas or located within the grounds of a property where residents and collection crews can access them.

Operationally, bring schemes are cheap to run and have low capital costs. Residents can deposit materials at any time and the access/fire risk issues are significantly reduced (WRAP, 2010). The main drawbacks are the reliance on residents transporting materials significant distances (specifically a problem in blocks that have refuse chutes); sites may be open to abuse from non-residents if they are accessible to the public and controlling contamination can be difficult. Historically, bring banks have been located in areas perceived to be dirty and potentially dangerous places, reducing the likelihood of people using them.

Examples of the more innovative approaches to this type of system can be found in Hounslow and Vale Royal where a Hybrid bin system has been used (Waste Watch, 2006). These bins are made up of individual wheeled units designed to take specific materials that can then be collected as part of kerb side collection rounds. Another example can be found in North Lanarkshire where the Node bin system has been introduced (Taylor, 2010). These communal recycling bins have been designed to be easy to use; located in central areas; secure and pleasing to the eye. The communications on the bins also consists of pictorial information to allow all residents to understand what the bins are to be used for. Residents were also supplied with a receptacle to store and then transport their recycling to the Node bins in this case. The Node bins take newspapers, magazines, cardboard, plastic bottles and containers, food and drinks cans, tetra pak and textiles. A separate bin is supplied for glass.

No matter how aesthetically pleasing a bring bank may be, these systems rely on resident co-operation and regular circulation or implementation of communications. The style of bring bank supplied will also have to meet the needs of the collection system and vehicles and a bank that is successful in one location may not be in another. The strategic placement of the banks and innovative design are factors paramount to the successful usage.

Chute Systems

Chute systems have been predominantly used for the disposal of refuse in the UK. However, there have been developments in recent years in either installing or retro-fitting chutes for the collection of dry recycling. Chutes are designed to either collect co-mingled recycling in sacks that are collected in

bulk from the basement or have a rotating system that delivers specific materials to the correct bins. The City of Westminster installed a recycling chute designed to take sacks of a specific size that were supplied to residents (Letsrecycle.com, 2007). However, their current web page on recycling does not refer to chute systems leading to the conclusion that the scheme was not rolled out to all suitable blocks within the district. There are also vacuum chute systems that will be discussed in relation to their use in other countries.

Chute systems reduce manual handling significantly and do no cause access issues within properties. The presence of external bins in public areas is also removed allowing new developments to avoid difficult planning objections in relation to waste storage. They also reduce the distances residents have to transport waste and subsequently have been reported to increase capture rates (WRAP, 2010). The disadvantages are that they are expensive to install (especially in existing buildings), maintenance costs can be high, they are not always suitable for source separated collections and controlling contamination is difficult.

It is clear from the discussion of different methods of collection dry recycling from flats in the UK that all approaches have advantages and disadvantages. The individual characteristics of any block and the residents living there will affect the success of the scheme. These pros and cons will be similar in other countries that have implemented similar schemes. This report will now look at some countries that have applied innovative systems to the collection of dry recycling that may be of interest when considering the problems faced in the UK and France.

Spanish Dry Recycling Innovations.

Unlike the UK, Spain has opted for a comprehensive bring bank system to collect refuse and recycling from individual and multi-occupancy dwellings in most areas. Recently, many Spanish cities and large towns have also installed vacuum chute systems to collect domestic and commercial waste together. The research completed for this project could not find any examples of door-to-door collections or collections from each floor of blocks of flats. Focusing on Barcelona (using information published on the Ajuntament de Barcelona website, 2010), the city authorities provide separate bins for paper and card, food packaging (including cans, plastic food trays, plastic wrapping and cartons) and glass. The bins are designed to be easy to use with dual opening mechanisms for the lids and with specific pictorial information on them to communicate what should be deposited. Some bins also have apertures that will only allow the desired materials to be placed in them to reduce contamination. The Council claim that residents should not have to transport waste further than 100 metres to a set of bins. There are also a number of Green Zone Points throughout the city where residents can take items such as small electronic equipment, waste cooking oil and old clothing for recycling. Interestingly, the company who developed the green Zone Points have been in consultation with Norwich City Council (Faulkner, 2010) about possible installations in the UK.

With the absence of a separate kerb side collection service for residual waste, residents are used to transporting refuse from their properties to communal bins, and the system is economic due to the reduction in collection costs.

However, the communal bins need to be serviced more frequently. The recycling rate in Spain in 2009 was only slightly less than the UK so it can be inferred that the bring system is managing to divert dry recycling from other means of waste disposal.

Perhaps a more innovative approach to waste collections can be seen in the development of vacuum chute systems (predominantly Envac systems) that have been installed throughout Spain (and other European countries). These systems have a number of inlets either within buildings or at ground level where waste and recycling can be deposited. Storage tanks below the inlets are then emptied automatically and the materials are transported (fans create the vacuum needed to move the materials) along pipes to compaction units. The materials can then be removed by a collection vehicle (Envac, 2010). The same pipes are used to transport different waste streams and exchange valves are used to ensure the right materials end up in the required compaction units.

Photograph 2. Inlets Used in the Envac System in Barakaldo, Northern Spain (Envac Concept, 2007).

Photograph 2 illustrates what the inlets for the different waste streams look like in the city of Barakaldo in Northern Spain. There are 163 inlets that serve 4080 apartments in the city (Envac Concept, 2007). The system has undoubtedly improved the efficiency of waste collections and reduced the detrimental visual effects of on-street bins. However, the installation costs are high and may only be possible when major underground improvements in infrastructure and needed. Also, bring schemes that use on-street bins provide a perpetual reminder to residents of the amounts of waste that are being recycled and sent to landfill or incineration. This may encourage people to recycle more if the residual waste bins are full, whereas with underground systems this visual reminder is removed.

Bring Schemes using underground storage developed in Portugal

Innovations in dry recycling bring bank collections using underground storage chambers has also changed the way recycling is collected in many places. An example of such a system is the one developed in Portugal by Sotkon. This uses inlets above underground containers and can be used to collect either segregated or co-mingled recycling (Bates, 2010). The system uses standard

refuse collection vehicles fitted with cranes to lift the containers to ground level. Again, the visual impact of bins on streets is removed and the movements of collection vehicles can be reduced. Notwithstanding the installation costs, this system would work well in areas where there is a need to improve the street scene due to a reliance on the tourism industry, for example. When considering new developments, ADEPT's (2010) guidance encourages developers in the UK to strike a balance between routes for walking, cycling and spaces for social use and space for waste storage and collection. A system of underground storage for all waste streams would assist in meeting this difficult balance of land usage. In fact this system of underground waste and recycling storage system is becoming popular worldwide.

Australian Dry Recycling Innovations.

The research conducted to compile this report did not highlight any specific innovations in dry recycling collections in Australia. Looking at Council website information for the major cities it can be inferred that the preferred method of collection for dry recycling from flats is to provide bring schemes using wheeled bins. The bins are predominantly stored within the refuse areas or in car parks at ground level.

The City of Sydney recycling Guide for Multi-Unit Dwellings (2010) explains that dry recycling is separated into 2 streams with 1 bin for mixed containers (glass, cans and plastics) and another bin for paper and cans. This is also the case in Melbourne (City of Melbourne, High Rise Apartment recycling, 2010). This webpage encourages residents to use recycling bins on the ground level

and not to dispose of recycling in the refuse shoots that are commonplace in block over 6 storeys high. Melbourne City Council have also researched the effectiveness of improving the signage above bins to inform residents exactly what can be recycled and provide a receptacle for residents to transport their recycling to the bins.

A best practice guide for the management of waste in MOD's (Department of Environment and Climate Change NSW, 2008. A) also displays how the Australian waste authorities would like developments to be set up in relation to dry recycling provision. This outlines that blocks of flats with 4 or more storeys should have interim recycling storage facilities by refuse shoot hatches on certain floors of the development as well as at ground level. However, this document is a guide only and it is not clear from the websites viewed how common the provision of recycling bins on each floor of blocks actually is. However, one example of collection points on each floor was found in Southerland Shire (Department of Environment and Climate Change NSW, 2008.A) where boxes are used to store recycling and these are then decanted into bins by a building manager and placed out for collection in a designated area. It appears that this particular block is upmarket and resident's service charges would incorporate this service. Research carried out by the Department of Environment and Climate Change NSW (2008.B) on recycling in multi unit dwellings does support the view that convenience and accessibility increase the usage of recycling facilities and may act as a driver for more flats to adopt recycling collections from each floor in the future.

Japanese Dry Recycling Innovations.

Through looking at information on the Environment Departments of the Tokyo area and other cities such as Nagasaki, it appears that dry recycling is collected in a manner of different ways from flats and multi-occupancy dwellings. Some districts do collect from designated collection points for flats and provide sacks for different types of materials such as plastic bottles. Residents are instructed to deposit other materials such as paper and card in bundles tied together with rope (Hachioji City Official Site, 2010). There are also a number of bring banks located around cities shown in Photograph 3.

Photograph 3: Recycling bring site in Japan (Wikipedia, 2010).

This type of collection appears to be uniform in other cities and other Environment Department websites publish the same information. The use of bins at blocks of flats is not documented on any of the websites looked at. Looking at the city of Nagoya as an example, there have been methodologies applied in Japan to unite residents, community groups and the authorities to

encourage recycling including passing legislation. Exploring the example of Nagoya in more detail may explain why Japan has achieved high participation rates in recycling schemes with a seemingly inconvenient and labour intensive collection methodology.

The city faced a crisis in waste disposal as the existing landfill site was due to be decommissioned and the residents managed to overthrow plans to develop what is now a nature reserve into a landfill site. The city government declared a Waste Emergency Declaration (Yoshimura, 2003) in 1999 in order to rally citizens to adopt new initiatives in separating waste for recycling. A Container and Packaging Recycling Law was also passed in 2000. Together with legislation there were also non-governmental organisations that established recycling collections and a comprehensive educational programme was set up by city government. The city united and managed to significantly reduce waste going to landfill. Rather than focusing on types of accommodation and implementing schemes on a site specific level, the city looked beyond this and focused on delivering communications to evoke a feeling of dealing with the waste crisis in residents that appears to have worked. The amount of waste recycled in the city rose from 151,000 tonnes in 1998 to 345,000 tonnes in 2001 (Yoshimura, 2003). Of course this success may be attributed to the issue of overturning the landfill site plans, legislation and cultural factors specific to the Japanese population. However, it is an innovative example of how in-depth communications and community spirit, rather than providing convenient recycling facilities (such as bring banks on each floor of flats or chute systems) can achieve success.

American and Canadian Dry Recycling Innovations.

The research conducted in dry recycling collections form flats in the USA did not highlight many innovations in actual collection methodologies that have not been discussed already in this report. A number of cities including New York have installed recycling chutes into high rise blocks capable of taking different materials to separate receptacles in the basements of buildings (Business Wire, 1995).

However, the most common system in place is bring schemes and there is a common trend for recycling to be mandatory in many states. It is also common in most states for residents to pay private waste contractors for refuse and recycling collections and unless recycling is mandatory building managers may not invest in recycling collections. However, in San Francisco the city Sanitation Department has made it mandatory for building managers to provide bins for recycling. The Environment Department do supply signage for bin areas and other communication tools to building managers free of charge and also provide advice on introducing comprehensive recycling facilities (sfenvironment.org, 2010). In other cities such as Los Angeles recycling collections are provided free of charge to residents living in flats (Sanitation Department of Public Works, 2010). The financial incentives to building managers of saving on refuse disposal by encouraging recycling can be inferred to increase participation in such schemes.

An innovative approach to ensuring building managers install and manage dry recycling collections effectively can be seen in the Peel region of Canada (Region of Peel, 2010). Recycling is mandatory and materials collected include glass, paper, card, plastic bottles and food trays, carrier bags, tetra

packs, aluminium foil and even polystyrene. Communications tool such as reusable bags to transport recycling to the bins are provided as are posters for bin areas. However, the innovative part of this scheme is getting building managers to apply for and agree to terms and conditions on the provision of the recycling collections. It is also common for residents in flats to have recycling as a condition in their tenancy agreement. This approach may be considered authoritarian in certain countries and also relies on their being a building manager present on a regular basis which is not always the case in many blocks of flats. It does display and approach to ensuring residents in flats recycle and may be more economical than implementing operationally intensive collection schemes.

All of the examples of dry recycling collections from flats and MOD's discussed above highlight that there have been many approaches implemented to tackle this issue worldwide. The UK has focused on providing convenient services for residents whilst Japan has complicated systems that require residents to work hard at separating their waste into specific categories. Spain appears to be adopting underground collection systems that remove bins from the streets and the USA are focusing on making mandatory recycling laws to reach recycling targets. I believe that an approach taking all these factors into consideration will achieve the best results. However, certain key principles that are discussed in the conclusion of this report have to be considered what establishing dry recycling collections from flats and MOD's.

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Section 2 – researched and compiled by Miranda Valenzuela

Innovations in Global Food Waste Collection Provisions for Flats and Multi-Occupancy Dwellings Part 1

Introduction

To understand the development of communications and promotional materials designed for flats and multi-occupancy dwellings it is critical to gain an understanding of the design of the collection schemes provided to these types of housing. Without this, the context behind the approach adopted, and the raison-d'etre of the innovative approach cannot be fully appreciated. This paper aims to identify a range of global case studies (via desk research and direct contact with local authorities) regarding the provision of food waste collections to flats and multi-occupancy dwellings, and in the process identify the most innovative approaches adopted.

A range of terminology has been used throughout the report, often reflecting the terms used in the country being researched. For ease of reference the vocabulary used has been summarised below:

Flats - unshared dwellings in purpose-built blocks, including maisonettes and apartments, and in houses converted to houses in multiple occupation (HMO).[1] Also referred to in Australia as units, multi-unit developments or dwellings, body corporate, or in the USA as multi-family properties, complexes or residential buildings, apartments, apartment buildings.

Garden waste- green waste generated in the garden such as grass clippings, prunings and leaves. Also referred to as green waste or 'yard' waste.

Communal collection facilities or bring schemes – 'containers located at central collection points on land forming part of the housing development'. [2] For the purposes of this paper this also includes containers located in the refuse areas or bin rooms

Near-entrance collection facilities/near-entry containers - recycling containers located close to the entrance, inside or outside, of individual blocks of flats.[3]

Kerbside collection - collection of materials from individual households where residents take recyclable materials in a container to the kerb or perimeter of the property.[4] No examples of such a scheme for flats could be found. Please note that Spain appears to use this term interchangeably with communal settings (see Section 3).

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[1] Crofts, Cathy, Claudia Kuss-Tenzer and David Birley. *Recycling for Flats- Case Studies of Recycling Schemes for Housing Estates, High-Rise Blocks and other Areas of High-Density Housing*. Waste Watch & the Safe Neighbourhoods Unit. Defra 2004. p.10
[2] Ibid
[3] Note 1 supra
[4] ibid

Door-to-door collection - collection of materials from individual households within blocks of flats where residents place materials at their front door.[5]

The case studies identified in this report are outlined in Table 1 below.

Country	Case Study
Australia	Moreland City Council- Composting 'hubs'
	Sydney- 'Chippendale Project'
	Indoor solutions- wormeries & Bokashi Bins
	City of Sydney
	Woollahra- 'Kitchen to Compost'
	Port Adelaide Enfield- Recycling Kitchen Organics
	Leichhardt Municipal Council
USA	New York City- The Lower East Side Ecology Centre
	New York City- Indoor composting
	San Francisco
	City of Portland
	Los Angeles- 'Multi-family' residential recycling
Spain	City of Tiana- Kerbside
	Pals Town Council- Communal
	Barcelona- El Centenedor Marron
	City of Cordoba- Neumatic systems
	Barcelona- Santa Caterina 'Ciutat Vella'
	Alava- Vitoria-Gasteiz

[5] Note 1 supra

Country	Case Study
Japan	Osaka Prefectural Government- 'Essentials for Living in Osaka'
	Arakawa City
	Fussa City- Kerbside
	Miyazaki Prefecture- Aya
	Yamagata Prefecture- Nagai City
	Iwate Prefecture- Shinami
UK	Royal Borough of Kingston-upon-Thames
	Newton Abbey
	Glasgow City Council- Waste Aware Glasgow
	London Borough of Hackney
	Rochford District Council
	Islington Council
	Preston Council
	Hackney Council
	London Borough of Lambeth
	Tower Hamlets
	Bristol City Council
	Elmbridge Borough Council
	London- Wembley City
	Wandsworth Borough Council- PyroPure
France	Nantes
	Paris
	Niort- Operation 'Col-Vert
	Gironde- composting scheme

Table 1- Summary of case studies researched

1 Global Food waste collections for flats/multi-occupancy dwellings- An Australian perspective.

1.1.1 Background

With the exception of South Australia, Western Australia and the Northern Territory, waste legislation at State level is in it's relative infancy, starting as recently as 2000[6]. The key legislation according to Zero Waste SA is the Local Government Act 1999. There appears to be no legislation which specifically addresses the reduction of biodegradable municipal waste to landfill or any legislation such as the Regulation (EC) No 1774/2002- transposed into UK law via the Animal By-Products Regulations (ABPR) 2005. Indeed, the Local Government Act 1999 does not obligate councils to provide a recycling service at all, and the result has been a move amongst a number of metropolitan councils to provide a three bin service focussing on dry-recycling, green waste only and residual waste[7].The main driver for food waste collections therefore appears to be one of policy, with the example of the Government of South Australia's Zero Waste SA identifying diversion of food waste from landfill as a priority for the local government sector.

In terms of national municipal waste composition, organic waste (which includes food and garden waste) represented 47% of the total municipal waste stream in Australia in 2005, however, 2005 data from the Australian Bureau of Statistics showed that less than half of households (46.7%) recycled or reused kitchen/food waste and a more respectable 61.6% recycled or reused garden waste.[8]

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[6] Gaillochet, Catherine. *World Waste Survey*. Veolia 30 November 2009. Print p. 323

[7] <http://www.zerowaste.sa.gov.au/just-ask-us/local-government-act> 11 Nov. 2010

[8] Supra note 6, p. 327

Number of households recycling or re-using waste streams		
March 2003	Number of households	%
Total households	7,605,200	100
Kitchen or food waste	3,551,100	46.7
Garden Waste	4,682,000	61.6

Table 2- Number of Australian households recycling or reusing by waste stream

Source: World Waste Survey p.328

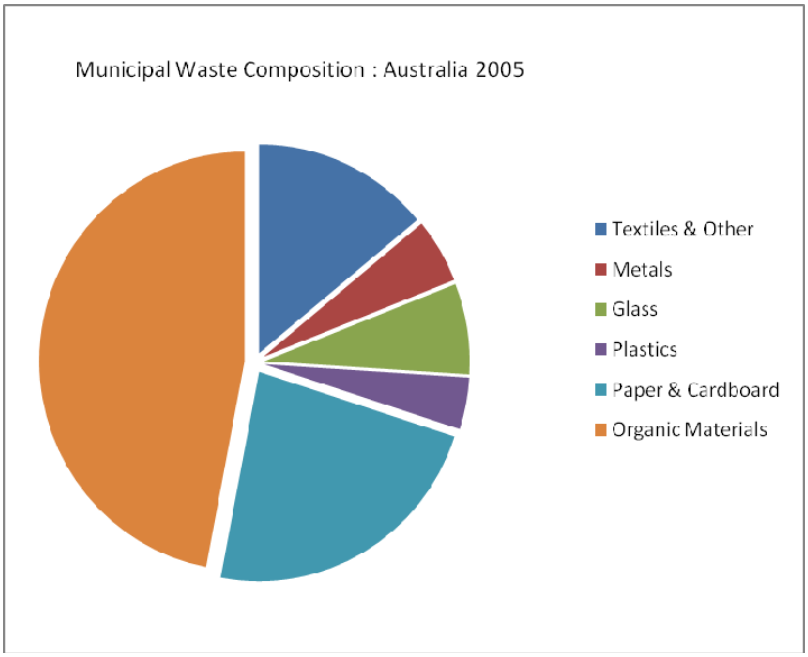

Figure 1- Municipal Waste Composition in Australia (2005)

Source: World Waste Survey p.327

What the *World Waste Survey* does not explore is how the kitchen or food waste is recycled or reused, and it would appear from the desk top research that it is perhaps not through separate collections provided by the local authority, but more to do with

in-home solutions such as wormeries, bokashi bins or home composting. Few examples of food waste collections for households could be found- implying that- separate collections for food waste is in its relative infancy.

Indeed, references in many documents exploring the issue of the feasibility of separate food waste collections refers to the 'experience in Europe' from which guidance can be drawn. Further still, experience within Australia itself varies depending on the state or territory in which a region is situated. For example, in regions in the states of New South Wales, or Victoria, the promotion of home composting and wormeries are the focal point for providing all residents, regardless of housing type, with advice for how to dispose of their food waste. In contrast, the Government of South Australia has allocated funding via Zero Waste SA- which has identified diversion of food waste from landfill as a priority for the local government sector- to support South Australia's Councils with the introduction of improved kerbside recycling collection systems and the development of a co-ordinated approach towards waste management in regional areas.[9] Local Councils can therefore also apply for funding to trial food waste collections in their area. As a result, there are a number of food waste collection trials, which include flats or 'units' in their sample area, which have been conducted or are operating in this area. Examples here include:
City of Norwood Payneham & St Peters, Campbell Town City Council, Salisbury City Council, Town of Gawler.

[9]< http://www.zerowaste.sa.gov.au/navigation/local-government> 4 Oct. 2010

Research by The Australia Institute conducted in 2009 reported that Australians are responsible for throwing away $5.2 billion worth of food every year, with Victorian households wasting $560 worth of food each year, or $214 per person[10].

Food and garden waste accounts for approximately 48% of the municipal waste stream in Australia and fruit and vegetables are the most commonly wasted of the food groups.[11] Further still, the decomposition of food waste in Australian landfill sites is accountable for 5.25 metric tonnes of carbon dioxide equivalent per year[12] (an emissions rate comparable to that of the manufacture and supply of iron and steel in Australia[13]) it is apparent why Australian local Authorities are responding to these pressures and increasingly considering ways in which this waste stream can be addressed effectively, especially from flats or 'units'.

1.1 Food waste collection provisions for flats

From researching the collection options available to residents in flats - referred to as 'units' in this section to reflect the terminology used in Australia- the range of options can be categorised as follows:

- Community Composting Schemes
- Indoor solutions- using wormeries and Bokashi bins.
- Communal schemes

1.2.1 Community Composting Schemes

<u>Moreland City Council Composting 'Hubs'</u>

Moreland City Council (MCC), a municipality located in inner north Melbourne (part of

[10] Moreland City Council. *Moreland Community Composting Program- Draft Research Report*. August 2010 p. 4
[11] Ibid
[12] Supra note 10, p. 2
[13] Ibid

the Victoria region), is developing a community composting project to assist residents who are unable to compost at home, perhaps due to a lack of space or a lack of knowledge. The project will involve a network of 'bring to' composting 'hubs' across the City of Moreland (Moreland) located in residential streets, apartment blocks and community gardens. These 'hubs' will be largely community-managed by groups from across Moreland - a pioneering project and believed to be the first of its kind in the Victoria Region.

The project was specifically designed to allow residents of medium to high-density dwellings to compost offsite[14]. This is as a result of a survey commissioned by Moreland City Council in July 2010 which found that 24.4% of respondents not currently composting cited a lack of space as being the main factor affecting their inability to compost[15]. Whilst Moreland City Council has a home composting program in place[16], Moreland recognised that this scheme did not provide adequately for a 'large section of the community living in units, flats or townhouses without gardens…'[17] The hope is that this composting hub project will provide potential to overcome these types of barriers and make composting at home more accessible to a wider audience.

The opportunities to participate in this initiative are three-fold, either as a:

1 User- the bins are effectively provided as a simple means for depositing the waste

[14] Worm farms and Bokashi Buckets are also promoted, although these must be purchased from private companies directly.
[15] Metropolis Research Pty Ltd. *Moreland City Council 2010 Composting Survey*. July 2010, p. 5
[16] Whereby residents can purchase 220 litre compost bins at a wholesale price with free delivery provided. Therefore, although no subsidy is in place, the price is generally more competitive than high street prices and the free delivery makes the scheme more affordable and attractive.
[17] Supra note 10, p. 3 Community

2 End-user of the compost

3 Volunteer- helping to manage and maintain the bins. Community groups hosting the hubs will provide an educational role alongside MCC. (MCC will also provide workshops and other educational materials such as brochures and websites.)

Participants in the project can request one kitchen caddy per household for organic waste, which they can then bring to the compost hub for disposal. Moreland has decided not to provide compostable bin liners as they believe that they disrupt the effectiveness of the composting process.

A network of five composting hubs are to be located throughout the City of Moreland, with each 'hub' housing 2 to 3 'aerobins' providing a capacity of 400 litres each. This provides the potential to compost up to 1 tonne of food waste per annum.
The trial stage of the project is estimated to prevent up to 51 tonnes of food waste from going to landfill and 45.9 tonnes in greenhouse gas emissions in its first year.
The compost will be made available for community groups and residents of Moreland to use on their gardens. There are no regulations affecting the application of the compost produced through the project due to its relatively small size. Regulations that do affect composting in Victoria relate to facilities with the capacity to process more than 100 tonnes of waste per month only.
Moreland reports very positive responses from community groups and residents who are interested in participating so far, and the project is reaching the final stages of implementation.

This initiative is the only option available to flats/units for the disposal of food waste, other than purchasing their own wormeries or Bokashi buckets.

<u>Sydney- The Chippendale Project</u>

Another example of this type of project can be found in Sydney. Referred to locally as the ‘Chippendale Project’ the project was originally designed to provide composting facilities to 500 terraced houses in Myrtle Street, Chippendale, and the surrounds. Due to the positive response the project has received since inception in 2008 it has since expanded to other areas of Chippendale, including public parks. Participation has been recorded by residents from as far a-field as two suburbs away and it has been recorded that a large proportion of users are residents of flats (body corporates) where composting is not allowed. Specific details regarding participation levels and types of users is unfortunately unavailable.The project is managed by six project leaders which have been specifically trained to manage the compost bins themselves, with a Waste Officer from Sydney City Council and the Project lead overseeing the project as a whole. To ensure that bins are used evenly at the park location, they are labelled with the day of the week to which they pertain.

1.2.2 Indoor Solutions- Wormeries and Bokashi bins

The majority of Councils in the Victoria and New South Wales Regions promote wormeries or vermiculture as a way of addressing the management of food waste collection in units as it is a solution for residents with limited space or no garden who wish to compost at home. Residents in units are advised that due to the small amount of space occupied by a wormery they can be kept on balconies or patios and that Bokashi bins are compact enough to store in kitchens.

The Region of Victoria, in it’s *Draft Best Practice Guide for Waste Management in Multi-Unit Developments*[18] suggests that in the design of developments consideration should be given to providing space to ‘home unit worm farms or compost bins to

[18] Sustainability Victoria. 2009. p. 25

allow residents to compost their own food scraps. Individual worm farms could be located on the balcony for example'[19].

Council's found to promote wormeries or worm farming as the method of choice for food waste for flats/units specifically are as follows:

Moreland City Council- Although the community compost initiative is being developed residents are also provided with information regarding wormeries and details of stockists for purchase.

Canberra- Department of Territory and Municipal Services- promotes worm farming and provides online fact sheets.

Albury City Council- supports the Love Food Hate Waste campaign as well as promoting home composting and wormeries.

Armidale Dumaresq Council and **Bega Valley Shire Council-** promote home composting and wormeries.

Bathurst Regional Council- promotes wormeries as 'ideal for those people who don't have room to compost but still want to reduce waste and help the environment' on its website. Residents are either encouraged to purchase a wormery or make their own.

Liverpool City Council- In this case, all household types are encouraged to manage their food waste in-situ using either home composting or wormeries where space is an issue for 'small gardens or [if you] live in a flat or town house'[20]. There is a rebate scheme in place for both methods.

Hurstville City Council - Worm farming is encouraged as 'ideal for people who live in units, villas or houses with small gardens.[21]'

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[19] Ibid
[20] <http://www.liverpool.nsw.gov.au> 3 Oct 2010
[21] <http://www.hurstville.nsw.gov.uk> 3 Oct 2010

Lane Cove Council- promotes home composting and worm farming as the method of choice for dealing with food waste for all residents. Interestingly, they provide all residential premises, including units with twelve green waste services per year, but do not accept food waste, which 'should be placed in your compost bin or worm farm.'[22]

North Sydney Council promotes worm farming for units with balconies.

Darwin City Council promotes home composting and worm farms providing a subsidy on the bins.

Brisbane City Council- promotes home composting, worm farms and Bokashi bins to all residents. Although units have access to a garden waste collection scheme, there is no food waste collection available.

None of the councils appeared to offer subsidy in any way, perhaps ultimately impacting on the number of users of these systems.

1.2.3 Communal schemes

The general trend here seems to be following one of two routes- where units are either treated completely separately from other housing types, or, in stark contrast are treated the same- incorporating them in with the standard kerbside collection scheme provided to everyone else.

Flats included on 'regular' kerbside schemes

City of Sydney

The City of Sydney produces a *Waste & Recycling Guide for Multi-Unit Dwellings* in which it is explained that Building Managers or the Body Corporate can book fortnightly garden organics waste collections. Although food waste cannot currently

[22] <http://www.lanecove.nsw.gov.au> 4 Oct 2010

be collected with the garden waste, there is potential for bolting a food waste collection onto this scheme assuming that the appropriate reprocessing facilities can be found. Indeed this is the approach which has been adopted by Woollahra (below).

Woollahra Municipal Council- 'Kitchen to Compost'

Woollahra has introduced a new organics recycling service called 'Kitchen to Compost' allowing food waste to be placed in the green garden waste bins originally for garden waste only. The scheme is open to unit blocks as well, who must contact Woollahra Council if they would like to participate so that the Council can 'help by providing all the necessary education materials for residents, strata managers and cleaners… and ensure that all residents in the block are aware and understand that green bins may now be used for recycling food scraps as well as garden refuse.'[23] Units are provided with 240L communal bins, and each unit receives a caddy referred to as a 'Kitchen Tidy Bin'- as are other households. Woollahra have commissioned an audit of the organics waste collection and found that 'of the participating single houses and unit blocks, 372 tonnes of food waste was recycled into compost for the year 08/09… We also found that the current participation rate (amount of households using the service) was 38%.... For single houses, 91% of green garden bins were composed of garden refuse and 6.6% food organics, whilst unit blocks presented 81% garden refuse and 15.2% food organics.'[24] The audit also found, in keeping with local authority experience in the UK, that the overall capture of food waste for units is lower than that of single houses, standing at 9.5% for units and 14.5% for single houses respectively. Specific tonnage data for flats is unfortunately unavailable as they are collected on the same rounds as households.

[23] <http://www.woollahra.nsw.gov.au> 4 Oct. 2010
[24] Woollahra Municipal Council. *Kitchen to Compost- Recycling Your Organics* Newsletter Issue 1. p. 2. April 2010 <http://www.woollahra.nsw.gov.au> 4 Oct. 2010

Port Adelaide Enfield

In May 2010, a new 'Recycling Kitchen Organics' scheme was rolled out to all households in the Port Adelaide Enfield area[25]- an add on to the garden waste collection scheme already in place. Correspondence with officers there has confirmed that all households, regardless of housing type, have access to this scheme and have been delivered a small kitchen "bio basket" and a roll of compostable bag liners.

The 'biobasket', or kitchen caddy, allows residents to recycle all types of kitchen waste by ultimately depositing the waste in the original 240 litre green organics wheeled bin. The bin is emptied fortnightly.

Around 13% of Port Adelaide Enfield's housing stock is comprised of unit and flats (which equates to approximately 5100 according to 2006 census figures). Officers at Port Adelaide Enfield envisage that the majority of units and flats will ultimately use the organics bins in a communal capacity[26] as they currently do with the dry recycling facilities already provided.

Since the scheme was rolled out the Council has observed an increase in participation every two weeks, which is certainly a early indication of the success of the scheme. A doorstepping campaign is due to be conducted imminently in a specific collection area and flats will be included in this.

[25] http://www.portenf.sa.gov.au/site/page.cfm?u=1806 13 Nov. 2010
[26] Email from Port Adelaide Enfield, Waste Management Officer, 27 Oct. 2010

Flats treated completely separately from other housing types

Leichhardt Municipal Council

Leichhardt Municipal Council[27] promotes worm farming, home composting and Bokashi bins to all of their residents as the method of choice for addressing food waste. However, the interesting issue surrounding Leichhardt's approach is that it provides weekly communal food waste recycling for units of 10 or more **only**[28]. No other households are provided with this option. Units are provided with an aerated 'kitchen bench top bin' and compostable liners. The scheme is 'managed' by the building managers or body corporates where applicable.

In 2010-11 units diverted 120 tonnes of food waste from landfill- a quantity which can solely be attributed to the efforts of residents of units as the collection round is entirely dedicated to them.

2 Global Food waste collections for flats/multi-occupancy dwellings- A U.S perspective.

2.1 Background

The United States Environmental Protection Agency 2008 figures indicate that organics comprise 33% of the national waste stream[29] with paper at 31%, glass 5%, plastic 12%, metals 8% and 11% other.

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[27]< http://www.leichhardt.nsw.gov.au> 3 Oct.2010
[28]< http://www.leichhardt.nsw.gov.au/What-can-I-put-out-for-collection.html> 3 Oct 2010
[29] McCary, David. *Solid Waste Management Department Presentation:*

Multi-Family Recycling Proposed Ordinance. Solid Waste Management Department. p.4

< http://www.sanantonio.gov/swmd/pdf/MFCommunityMeetingPresentation.pdf> 15 Oct. 2010

As there are no national laws governing recycling or composting requirements in the USA, it is up to the state and local governments to mandate how collections take place. They can also set specific recycling targets which go beyond those which may have been set by the Environmental Protection Agency. For this reason there is a huge variation in the types of kerbside collections provided to householders, especially with respect to flats and 'multi-family properties' (MFP's). Indeed, it would appear that it was only in the last few years that local governments have implemented ordinances requiring owners or managers of developments to provide recycling facilities to MFP's. This is reflected by the media coverage in this area, as outlined in an article from the American City & County dated 15th September 2010 where kerbside food and yard waste [garden waste] collections from MFPs is described as 'the next frontier' for municipalities and that 'finding a solution which works for everyone can be tricky'.[30] The reason appears to be a common (from a global point of view) combination of both logistical and political 'barriers' :

'Some private haulers currently offer the service to multifamily complexes in Iowa City, and some landlords contract with them to collect the food waste. So, Iowa City officials must settle the issue of whether all landlords must be required to offer separate food waste collection, and whether that service should be public or private. Then, they must determine where residents should store the separate waste until pickup day. Single-family homes receive special compost bins from the city that they can haul to the curb for pickup. But would a 12-unit complex, for instance, need a dozen bins, or just a single Dumpster? Does the landlord have to give up parking spaces to make room for the receptacles?' [31]

The development of food waste collection schemes from MFP's also seems

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[30] Giusti, Autumn. *Local Governments Extend Food and Yard Waste Collection to Multifamily Dwellings.* The American City & County 15 Sept. 2010 <http://americancityandcounty.com/admin/compost-multifamily-dwellings-20100915> 12 Oct.2010

[31] Ibid.

hampered by the fact that most collections are arranged privately between the manager of the building/development and a private waste contractor. A City or Department then places collection requirements- stipulating the minimum level of provision – as well as reporting requirements on the responsible parties. If the minimum level of provision does not include food waste collections then it is unlikely that this will be pursued by the MFP management as it may come at an additional cost and involve an increased administrative burden as the reporting requirements need to be met.

However, there is an example of successful implementation of a mandatory composting scheme in San Francisco- this will be explored later on in this document. Thus there are relatively few examples of food waste collections from MFPs which can be drawn upon, but the lack of experience in this field makes the examples of successful applications all the more interesting and appropriate examples of innovation in this field as the local governments seek solutions to the political and logistical dilemma that confronts them all.

2.2 Food waste collection provisions for flats

As with the Australian experience, examples of the way food waste- referred to typically as ‘organics’ on local government websites- is managed in MFP’s can be split into the following categories:

- Community Composting Schemes
- Indoor Solutions
- Communal schemes
- A new frontier

2.2.1 Community Composting Schemes

The Lower East Side Ecology Centre (LESEC)- New York City

This Centre, founded in 1987, was one of the first organisations to offer community based composting programs in New York City. The project provides innovative drop-off centres at two locations, allowing local residents to compost materials like kitchen scraps that they would otherwise not be able to. The facilities are strictly for residential use only and accept the following materials at two drop-off locations:

- All fruit and vegetable peelings
- Non-greasy food scraps and leftovers
- Rice, pasta,bread,cereal
- Coffee grounds and tea leaves
- Hair and nails (animal and human)
- Egg and nut shells
- Cut and dried flowers
- House plants and potting soil

Materials which are not accepted include meat, chicken, fish, cheese, greasy food scraps and coconuts.

The material collected is transported to a local In-Vessel Composting facility where it is composted and the end product is sold on.

Although the information available on the LESEC website does not specifically state that the scheme is used by flats it is safe to assume that it is open to all types of dwellings and that it is likely, in a city such as New York, that a high proportion of

users will be from MFP's, as is the experience in Chippendale- Australia. Appendix A outlines the housing characteristics of the New York Metropolitan Area, indicating that a vast proportion- 61.7%- of dwellings in that area (of which New York City is a part) are of 2 units or more, making flat dwellers a significant group. Indeed, units of 50 or more represent the second highest proportion of the total residential housing stock at 23.8% indicating that waste management solutions for these facilities have to take into account the significant density of these populations.

This is where the LESEC and it's Community Compost Program comes into it's own as it provides solutions for housing types which would otherwise be difficult to provide a food waste collection to.

To compliment this Program, Compost Projects have also been set up in all the boroughs (Bronx, Brooklyn, Manhatten, Queens, Statten Island) of New York City which provide education, support and workshops for residents undertaking 'indoor' or outdoor composting.

And finally, a composting 'network' has been pioneered, encouraging anyone who might have their own composting site to add it to the 'green map'[32] The concept is to provide a solution for anyone who might generate material suitable for composting- who can subsequently take it to those listed on the map. How successful this concept is remains unclear, but the principle seems sound, with the potential to create a community composting network throughout New York City.

[32]<http://www.greenmap.org/greenhouse/en/node/137> 12 Oct. 2010

2.2.2 Indoor Solutions

New York City

New York City suggests indoor composting as a solution for food scraps for all units which do not have access to an outside space, and involves the use of a worm bin which is usually home made[33]. A guide is produced, and available online, specifically targeted at apartments called 'Indoor composting with a worm bin- A guide to composting in New York City apartments'[34], provides guidance about how to build a worm bin, which worms to use and how to feed them, troubleshooting and using your vermicompost. A list of worm suppliers is also outlined on the back of the leaflet.

2.2.3 Communal schemes

San Francisco

San Francisco has passed a recycling and composting law to increase the capture rate of dry recyclables and compostables to achieve a 75% diversion from landfill by 2010. They have also set a stringent 'zero waste' target by 2020.

Waste audits show that 36% of waste sent to landfill was compostable (mostly food scraps) and 31% recyclable (mostly paper).[35]

Apartments in San Francisco are treated the same as any other housing type- information is made available to apartments under the 'residential collections' area of the website.[36] San Francisco, as mentioned earlier on in this document, is one of the few areas to provide a kerbside collection of food waste to its 335,000 households including MFP's- collecting almost 300 tonnes per day.

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[33] <http://www.nyc.gov/html/nycwasteless/html/compost/edu.shtml> <http://www.lesecologycenter.org/index.php?option=com_content&view=article&id=7&catid=1&Itemid=34> 12 Oct. 2010

[34] http://www.nyc.gov/html/nycwasteless/downloads/pdf/materials/wormbin.pdf 12 Oct. 2010

[35] <http://www.sfrecycling.com>

[36] <http://sfrecycling.com/residentialCompost.htm >

In the case of MFP's, property managers or owners of apartment buildings can obtain a 'composting cart'- a 121 litre (32 gallons) wheeled bin- by calling their service provider. 'Kitchen pails'- or caddies- can also be requested, as part of the service, for each unit in the property. The green cart is located in a specified area for communal use by the units and the kitchen pail facilitates the transport of the materials to the communal bins. Bags clearly marked as compostable can be used. Table 3 shows the extensive range of materials which can be collected.

Food Scraps (anything that used to be alive)

Bread, grains and pasta	Fruit (pits and nuts too)
Coffee grounds	Vegetables
Dairy	Eggshells
Leftovers and spoiled food	Meat (including bones)
Seafood (including shellfish)	

Yard Trimmings

Branches and brush	Flowers and floral trimmings
Grasses and weeds	Leaves

Tree Trimmings (less than 6 inches in diameter and 4 feet long)

Extra yard trimmings must be boxed, bundled or placed in brown paper bags less than 40 lbs per item and placed next to the green cart for collection

Soiled Paper

Coffee filters	Greasy pizza boxes
Paper cups and plates	Paper bags, napkins, tissues and towels
Paper ice cream containers (metal rim is okay)	
Paper take-out boxes and containers	Paper tea bags

Waxy paper milk and juice cartons (no foil)

Other

Cutlery and plastic clearly labeled "Compostable" (green stripe or sticker to allow for easy identification)
Small pieces of lumber or sawdust from clean wood only (no plywood, pressboard, painted, stained or treated wood)
Vegetable wood crates (metal wire is okay)
Waxed cardboard and paper

Table 3- Acceptable 'green cart' items- San Francisco

Source: <http://sfrecycling.com/residentialCompost.htm >

The Department also offers free waste assessments for buildings so that ways of increasing recycling and composting can be explored, and suggest a customized tenant outreach program for the building.

The City of Portland, Oregon, is conducting a pilot kerbside food and yard waste pickup program with the intention of extending it to homes citywide and eventually apartments.

2.2.4 A new Frontier

In contrast to the previous examples, there are many Cities for which the collection of food waste from flats is a completely new frontier, in spite of the fact that comprehensive recycling collections may already be in place.

The City of Los Angeles

The City of Los Angeles' Bureau of Sanitation is supported by Solid Resources Citywide Recycling Division (SRCRD) to provide 'multi-family' residential[37] recycling facilities and information.[38] Registered multifamily residential buildings (of 5 units or more) are provided with a comprehensive (all plastics, glass, cardboard, cans , chipboard and paper) dry recycling collections but no food waste provisions are made. There appears to be no advice for multi family buildings with respect to dealing with this type of waste.

The City of San Antonio

San Antonio runs a multifamily recycling project for its 150,000 residents who live in MFP's. Currently the City does not provide MFP's with recycling collections and the

[37] Defined as apartments, condominiums, cooperatives and mobile home parks
[38]< http://www.lacitysan.org/solid_resources/recycling/services/apartment.htm>

City Council has therefore directed the Solid Waste Management Department to ensure that recycling provision is made to these types of property.[39] This is a new project (presented to City Council on 29 September 2010) and places the responsibility for establishing recycling collections firmly with the property owners and managers of the properties. It will be interesting to see how this project develops.

3 Global Food waste collections for flats/multi-occupancy dwellings- A Spanish perspective.

3.1 Background

Waste legislation in Spain started to adopt a more rigorous approach with the transposition of related European Directives. The main laws relate to packaging (1997), waste management (1998) and integrated pollution prevention and control (2002)[40]. The relevant bodies, such as The Spanish Ministry of the Environment and the Office for Climate Change have responsibility for transposing European Law into Spanish Law and developing strategies. The autonomous regions, of which there are 17 such as Catalunya and the Basque region, are consulted during the process of legislative drafting and the responsibility for implementation of environmental policies has been transferred to these regions.

As a result of European Union Directives, Spain has developed National plans, such as the Plan Nacional Integrado de Residuos 2008-15 (Integrated National Plan for Waste) which has been developed to meet the requirements under the Ley 10/1998 de Residuos, in which composting has been recognized as a viable option for the

[39] <http://www.sanantonio.gov/swmd/pdf/MF_PB_Summary.pdf> 12 Oct. 2010
[40] Supra Note 6, p.108

treatment of organic wastes in these plans.[41] Objectives for composting are outlined in this plan such as:

- The development of a quality standard
- Optimisation of efficiency of biological treatment
- Creation of incentives for research programs
- The promotion of composting
- The enhancement of source separation schemes for biowastes[42]

The plan also meets the requirements of the Landfill Directive by outlining a strategy for the reduction of biodegradable waste sent to landfill.

Other legislation also impacting on food waste collections in Spain (as well as in other EU Member States) includes the Animal by-Products Regulation (EC) No. 1774/2002 which would have been transposed into Spanish Law via Royal Decrees (Real Decretos).

Local municipalities in Catalonia (one of the autonomous regions) which have waste management functions are responsible for determining the system used for collecting dry recycling and organics in their area. The 'Agencia de Residus de Catalunya'[43] summarises the general collection systems in place throughout the region as follows:

- 'Over ground' containers- the term used for bring banks or communal wheeled bins
- Underground containers
- Kerbside (puerta-a-puerta)

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[41] *European Compost Network* http://www.compostnetwork.info/index.php?id=44 15 Oct. 2010

[42] Ibid

[43] <http://www20.gencat.cat/portal/site/arc/menuitem.0b722e55d906c87b624a1d25b0c0e1a0/?vgnextoid=2b547205052d6210VgnVCM1000008d0c1e0aRCRD&vgnextchannel=2b547205052d6210VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default> 15 Oct. 2010
The ARC provides Catalan municipalities with access to waste related resources and communications templates for the promotion of new services.

- Pneumatic systems

Overground and underground containers are therefore not considered to be part of a kerbside collection, but more of a 'bring bank' style situation.

Kerbside collections are a relatively rare collection system in Catalonia and the concept is very much in it's infancy. Although it has become increasingly popular due to the recognition that it increased capture of recyclable materials only a handful of municipalities have adopted this method of collection- in 2008, 60 out of the 937 municipalities in Catalonia provided a kerbside collection in some form.[44] The preference historically has been to provide communal recycling and waste collections to the majority of dwellings in urban environments. Approximately 59 per cent of municipalities now provide an organic waste collection to their residents in some form.[45] And this figure will continue to increase as local municipalities now have a duty to collect organic waste from their householders and will incur penalties if they do not. Many new initiatives being rolled out to separately collect organic waste come in response to the review by the Catalan Parliament of the original law- Ley 6/1993- that required all City and Town Councils with a population of more than 5000 inhabitants in Catalonia to provide their residents with separate/segregated organic waste collections. In 2008 this was reviewed and the law adapted to require organic waste collections to all households, regardless of the number of inhabitants in an area. Catalonia aims to collect 55% of organic waste by 2012- and increase of 34.5% compared to 2009.

From the 1st January 2010, any municipality that fails to provide a separated organics collection has to pay an additional 10 euros per tonne of residual waste sent to its final destination.

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[44]Coll I Gelabert, Enric, et al. *Manual Municipal de Recollida Selectiva Porta a Porta a Catalunya, First Edition Feb. 2008. p. 25*

[45]< http://ecoticias.com/residuos-reciclaje/18979/noticias-de-medio-medio-ambiente-medioambiente-medioambiental-wwf-oceana-Greenpeace-verdes-renovables> 15 Oct. 2010

3.2 Food waste collection provisions for flats

The types of food waste collections provided in Spain can be categorized slightly differently to those of Australia and the USA, as there were no examples of Community Composting Projects or indoor composting initiatives which could be found.

Instead, the schemes can be classified according to the following:

- Communal schemes using 'overground' containers
- Bring schemes- using overground systems
- Bring schemes- using a pneumatic, underground system

3.2.1 Communal schemes using over ground containers

Catalonia

The organic fraction is generally collected in over ground containers throughout the region in two-wheeled bins (referred to as 'cubes' with wheels) with a smaller capacity than the 'igloos' and other modular's used for the collection of dry recyclables. Indeed, this system is the most extensive throughout Catalonia.[46]

The Association of Catalan Municipalities for Door to Door Collections (*Associacio de Municipis Catalanes per a la Recollids Porta a Porta*[47]) reports that collection solutions have been explored for flatted dwellings, resulting in them typically being provided with communal wheeled bins for the deposit of their organics and dry

[46] http://www20.gencat.cat/portal/site/arc/menuitem.60fb2478680e61fd624a1d25b0c0e1a0/?vgnextoid=58857205052d6210VgnVCM1000008d0c1e0aRCRD&vgnextchannel=58857205052d6210VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default 16 Oct. 2010

[47] <http://www.portaaporta.cat> 16. Oct 2010

recyclable fractions. It is important to note that the terms ‘kerbside’ and ‘communal’ appear to be used relatively interchangeably, as the property is deemed to be on the kerbside collection even if it is transporting the material to a ‘communal’ container. This may be because houses also use communal containers in the majority of cases, which therefore constitutes part of their regular ‘kerbside’ collection.

Tiana was one of the first villages in Catalunya to implement a kerbside collection of organic waste in 2000. Although the village is not densely populated, it still has a number of flatted properties of a maximum of 3 floors. The kerbside system provided to houses is also provided to these flats but in a communal context (as opposed to providing each dwelling with a kerbside collection caddy of either 10 litre or 25 litre). The organic collections is provided using 120L wheeled bins and these are located at a convenient location for all residents in the block to use. Organic bins were collected 3 times per week, with residual waste being emptied only twice.

A similar system has been adopted by Pals Town Council- or Ayuntamiento de Pals- in the municipality of Girona. In this case all households (totalling a population of 2799 for 2009[48]) have communal facilities for organics and residual waste, with access to a network of recycling bring banks throughout the area for the collection of dry recyclables. Flats are also provided with this and the organics bin is usually located in the communal bin stores or areas with the residual waste bins. Flats must then use the network of bring banks for the deposit of their dry recyclables.

Figure 2- Flat bin store with communal organics and residual waste bins

[48] http://www.idescat.cat/territ/BasicTerr?TC=5&V0=1&V3=863&V4=435&ALLINFO=TRUE&PARENT=1&CTX=B&V1=17124&VOK=Confirmar 16 Oct. 2010

Source: Playa de Pals, Spain. Personal Photograph by the author October 2010

Figure 3- Example of unit dwellings in Pals Town Centre

Source: Pals, Spain. Personal Photograph by the author October 2010

Communal bins, of 240 litres, are located either near bin stores, at the end of roads, at near-entry locations, or with recycling bring banks. The frequency of collection is dependant on a number of factors, namely the concentration of the population in the area the bins are targeting and the time of the year. During the summer months the organic waste is collected up to five times per week, and during the winter this is reduced to three.

To help residents transport their food waste to the communal bins, and hence encourage participation in the scheme, 5 litre kitchen caddies were supplied free of charge to all households. They can purchase their own compostable liners if they so wish, or are advised to wrap materials in sheets of newspaper or use cardboard boxes. Appendix B outlines the details of the tonnages of organic waste and residual waste collected since the roll out of the scheme in 2006. Figure 4 below shows the total organic waste collected by month from 2006 to 2009.

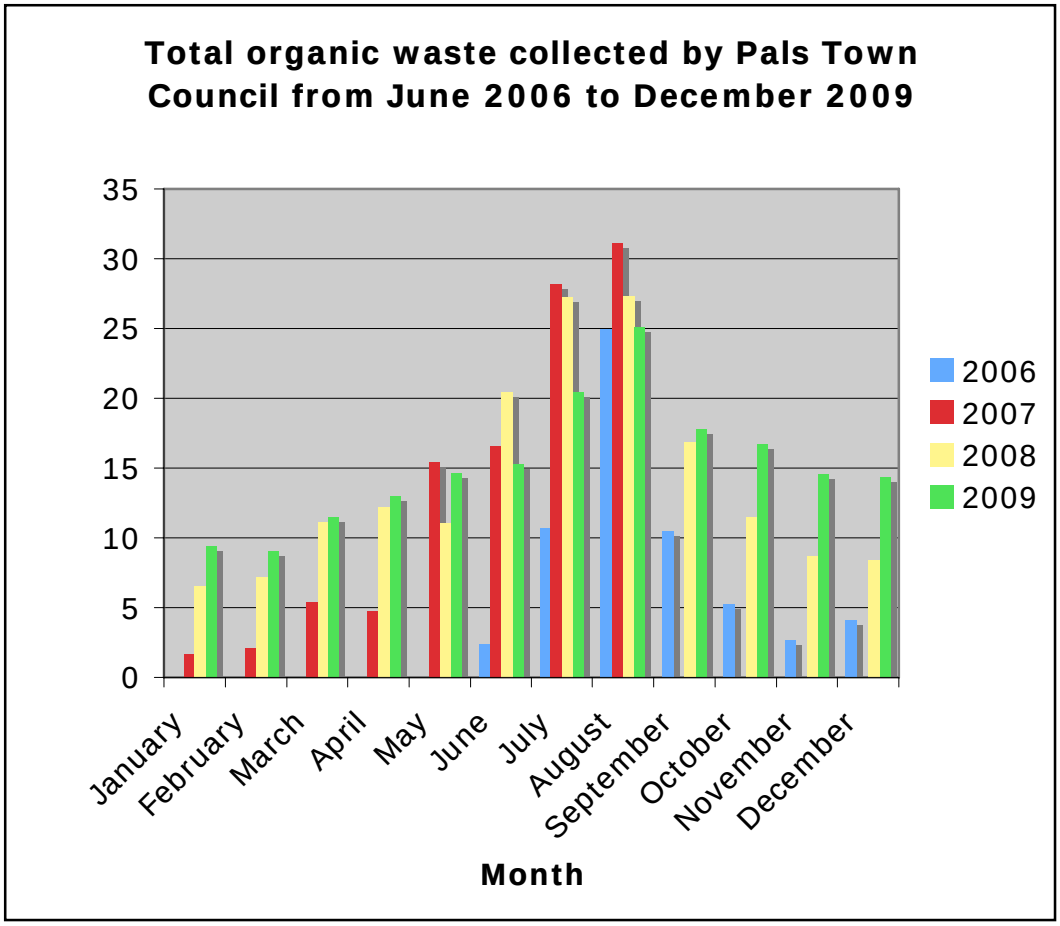

Figure 4- Total organic waste collected in Pals Town from June 2006 to December 2009

Source: Ayuntamiento de Pals, October 2010

Unfortunately it is not possible to extract the flats tonnages from this information as they are integrated into the regular collection rounds. However, the trend typical of the majority of food waste collections can be seen where tonnages increase over the first year of the scheme, but soon taper off as users either become aware of the quantity of food they are wasting and change their behviour, or are 'switched' off for some reason, usually to do with scheme design.

3.2.2 Bring Schemes- using 'overground' containers

Barcelona- El Contenedor Marron[49]

All households in Barcelona have access to the same recycling and waste collection schemes. On the 1st November, the range of materials collected will be expanded to include organic wastes.

Source: Screen shot from Barcelona website http://www.bcn.cat/neta/ca/

The aim is to provide one container per 260 households, and the containers will be located next to the grey residual waste bins already located throughout the City.[50]

The brown 2200 litre bins will allow residents to recycle meat, fish, bread, fruit, vegetables, egg shells, seafood shells, nut shells, corks, tea bags, coffee grounds, kitchen paper, and green wastes.

Part of the waste is sent for composting, with the rest being used for gasification to produce electricity for the City.

Residents are advised to use biodegradable compostable liners, although this is not deemed to be critical- perhaps because of the sorting process allowing material

[49] <http://www.bcn.cat/neta/es/gestionresiduos-reciclaje.html> 16 Oct. 2010

[50] <http://ecoticias.com/residuos-reciclaje/18979/noticias-de-medio-medio-ambiente-medioambiente-medioambiental-wwf-oceana-Greenpeace-verdes-renovables> 16 Oct. 2010

unsuitable for composting to be diverted to gasification applications.

Similar to Woollahra Municipal Council in Australia, flats are in this case treated in the same way as any other household. Indeed, the majority housing type likely to be being served by this scheme will be flats due to the urban context.

3.2.3 Bring schemes- using pneumatic systems

Cordoba- Ros Roca pneumatic system

The City of Cordoba is currently rolling out a pneumatic waste collection system for 4 material streams- organics, food and drink containers, mixed paper and residual waste- in the three main central areas of the town. By 2016 it is hoped that the system will also be incorporated into a new developments with the aim of collecting 117.6 tonnes of food waste per day from a total population of 110,471. This is compared to 58.2 tonnes for food and drinks packaging, 13 tonnes for mixed paper and card and 188.8 tonnes of residual waste.[51]

The pneumatic system allows residents to deposit waste in either a street bin or in chutes incorporated into a building, and for that waste to travel directly to a storage facility via an extensive network of pipes. The waste is stored and can then be transported in bulk to its relevant reprocessor. The advantages of the pneumatic system mean that, because waste is transported to a centralized location, there is a reduction in the need for heavy transportation in an area, making it a viable solution for historic areas where the visual impact of waste collections can be kept to a minimum, as well as for busy areas, where a reduction in vehicle movements has clear advantages. An additional advantage is that recycling provisions can be made to areas where this may otherwise be difficult. The system, invented by Ros Roca

[51] <http://www.rosroca.com/es/instalaciones__cordoba> 16 Oct. 2010

(www.rosroca.com.es), is similar to the Envac system which has been used in Santa Caterina (Barcelona) and Vitoria- Gasteiz (Alava).

Barcelona- Santa Caterina Envac System

Santa Caterina, part of the 'Ciutat Vella'- an old historic city centre- opted for the Envac system[52] due to the narrow streets and density of the area. This system allows the collection of organic waste and residual waste from the local food market, shops, bars as well as the surrounding residential flats. It is currently collecting from 4500 dwellings, with the hope that this is expanded to cover 18,000 via the provision of 130 outdoor inlets installed in the streets. The Envac system uses a network of pipes and a vacuum to transport the deposited waste to a centralized location, again, benefiting from a reduction in the need for heavy waste transportation in an area as discussed above. The system therefore provides recycling facilities to flats which may otherwise have been difficult to reach operationally.

Alava- Vitoria-Gasteiz

The same approach has been adopted by Vitoria-Gasteiz, the capital of the Alava province in the Basque country of Northern Spain. This example[53] uses a system of pipes spanning 4.3 kilometres to provide organics and residual waste outlets to 4550 dwellings in the Vitoria Casco Historico- the medieval centre of the town- again providing a collection system to flatted dwellings which may otherwise have been difficult to reach. In January 2010, the press (elcorreo.com) reported the launch of a food waste trial for 527 houses and 677 flats elsewhere in Vitoria-Gasteiz. This trial provides food waste collections from communal bins with orange lids, locked so that only trial participants can access them using the key provided.[54] There is no mention

[52] <http://www.envacgroup.com/web/Start.aspx> 16 Oct. 2010
[53] <http://www.envacgroup.com/web/City_Centres.aspx> 16 Oct. 2010
[54] <http://www.elcorreo.com/vizcaya/20100128/alava/programa-piloto-recogida-residuos-20100128.html> 17 Oct. 2010

of how participants take their food waste to the communal bins and no further information could be found on the authority's official website.

4 Global Food waste collections for flats/multi-occupancy dwellings- A Japanese perspective.

4.1 Background

There are 47 prefectures in Japan. Four of these have 'special status'- Tokyo as a metropolis, Hokkaido as a 'circuit', and Osaka and Kyoto as municipal prefectures. Each prefecture is then divided into municipalities.[55]

Due to increasing pressures to reduce waste to landfill- primarily due to space limitations and the resulting increasing cost of landfill- Japan's waste policy has increasingly addressed issues relating to technological developments in incineration, plastic recycling and the separation of materials for recycling. The Food Recycling Law, passed in 2001, requires producers, distributors, consumers, businesses as well as local governments (prefectures) to 'endeavour to control waste generation, promote recycling and reduce waste volume.'[56] Nevertheless, food waste diversion has not increased, and according to Sustainability for Japan this is because

'very few local governments collect household food waste separately from other waste, although it would be an essential step to promote the recycling of this waste.[57]'

[55] Barrett, Brendan F.D., and Therivel, Riki. *Environmental Policy and Impact Assessment in Japan.* London: Routledge, 1991.p.15
[56] Japan for Sustainability. *Food Waste Recycling in Japan*. Newsletter No.51. November 2006. http://www.japanfs.org/en/mailmagazine/newsletter/pages/027817.html 30 Oct. 2010
[57] Ibid

Waste in Japan is separated into the following categories:

- Combustible (or 'burnable')- refers to food waste, paper, cardboard, wood clothing, nappies, bags, plastic containers (although in some areas plastics are considered to be non-combustible), polystyrene, etc.
- Non-combustible (or 'non-burnables') – refers to ceramics, foil, aerosol cans, light bulbs, batteries, etc
- Recyclable- refers to PET plastic bottles, white polystyrene foam food trays, newspapers, magazines, cardboard boxes, milk cartons, etc, glass gottles and jars, and food and drink cans.
- Bulky waste- refers to large appliances and TV's.

The recovery rate for food waste in Japan is relatively low as the majority of household food waste in Japan is incinerated.[58]

During the desktop research, no distinction between flats and other housing types was observed. What is clearly different from other countries researched is the emphasis by all local authorities that you must comply with the rules on waste separation, and must not present waste before collection day so as not to cause a problem with your neighbours. Respect for the neighbourhood and community lies at the heart of all communications surrounding waste collections, and the onus is very much on the resident to ensure that they comply with the waste collections in place:

For example, in Osaka Prefectural Government's *Essentials for Living in Osaka - Living Information Guidebook*[59] residents are advised that:

'If you do not follow the rules or proper method regarding garbage disposal, it may

[58] Mizutani, Y. *Waste Biomass Utilization in Japan*. Regional Workshop on Waste Agricultural Biomass Global Environment Centre Foundation presentation. 4th March 2010. p.16 20 Oct. 2010

[59] <http://www.pref.osaka.jp/en/life/general/index.html> 30 Oct. 2010

cause you to get into trouble with your neighbors.'[60]

Arakawa City also makes this point in its collection day leaflet, informing residents that 'All people living in Arakawa City are supposed to follow Arakawa's regulation…deposit waste by the designated time indicated on the sign at your collection point. Cooperate with neighbors in keeping your collection point clean…'[61]

4.2 Food waste collection provisions for flats

In spite of the lack of differentiation between flats and households, the types of collections provided can be categorized according to the following:

- Communal schemes
- Kerbside Collection

4.2.1 Communal Schemes

In the majority of the Metropolis of Tokyo's municipalities (Bunkyo City[62], Edogawa City[63], Katsushika City[64] , Hachioji City, amongst others) and most other areas researched (Suita City in the Okinawa Prefecture[65], Okinawa Prefecture as a whole, and Sapporo City, the capital of the Hokkaido Prefecture) residents must take their

[60] Supra note 56, p.22
[61] http://www.city.arakawa.tokyo.jp/kurashi/gomi/wakekata/dashikata.files/eigo1.pdf 30 Oct. 2010
[62] <http://www.city.bunkyo.lg.jp/english> 31 Oct. 2010
[63] <http://www.city.edogawa.tokyo.jp/foreign/e/3/garbage.html> 30 Oct. 2010
[64] http://www.city.katsushika.lg.jp/jimu/somu/bunkakokusai/e_benrichou_pdf/tips_en.pdf 30 Oct. 2010
[65] <http://www.city.suita.osaka.jp/home/_37477/_37524.html> 30 Oct. 2010

separated waste to designated points. Communal collections are effectively in place for all residents in all housing types, so the 'barrier' often experienced by other countries when it comes to flats and multi-occupancy developments is not an issue. Again, this extrapolates back to the responsibility being on the resident themselves to ensure that they comply with waste and recycling requirements, and the strong cultural respect for your community and neighbourhood:

'Separate and bring waste to the specified site for collection by 8:00 a.m. on the collection day. If waste is left before the day of collection, food waste will be eaten by dogs, cats, and crows and will create a nuisance for the neighborhood.'[66]

This approach also removes the issue of missed waste and recycling collections.

Whilst food waste is not collected separately, it is part of the combustible waste category and is used for energy from waste.

Waste Management World describes in it's article *People Power*[67] how these types of collections work in practice:

'Household waste is collected at kerbside 'refuse stations' where 20-30 households take their waste on a designated day of the week. Citizens are supposed to separate waste according to the city's rules. However, improper separation of waste (such as combustible waste in recyclables) and violation of the designated time or day occur frequently, causing disputes among community members. Because residents in apartment buildings are the main people blamed for these problems, mandatory placement of refuse stations in front of apartment buildings is proposed in the revised SWP.'

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[66]< http://www.city.suita.osaka.jp/home/_37477/_37524.html> 30 Oct. 2010

[67] <http://www.waste-management-world.com/index/display/article-display/289607/articles/waste-management-world/volume-8/issue-2/features/people-power.html> 31 Oct. 2010

Chiba City

A pilot project is being conducted in four areas of Chiba City, covering 2750 households, providing a separate food waste collection. Residents must separate their food waste using yellow bags, and present these at the communal refuse points. Flats are also included in this trial. The project has been undertaken in order to provide a feasibility study to gauge:

- Public acceptance
- Food waste contamination levels
- Impacts of smell and vermin

Results from the trial will be reviewed in 2011.[68]

4.2.2 Kerbside collections

Fussa City

One of the few city councils to provide a kerbside collection from each property is Fussa City however, unfortunately, there is no mention of flats and multi-occupancy dwellings (http://www.city.fussa.tokyo.jp/englishguide/88vtda000000hbdf.html).

Aya

In the town of Aya, in the Miyazaki Prefecture, the local authority has in this case provided a separate food waste collection to it's 7600 residents. Unfortunately no reference could be found as to whether these collections were also available to flatted accommodation, but this is nonetheless an interesting example. Each household is charged 100 yen and commercial businesses are charged 200 yen per month for the collections. The collected food waste is then taken for composting and

[68] Supra note 55, pp. 20-22

used for local agricultural purposes. This closes the recycling loop in the local community, who then have the opportunity to purchase the produce from the local farmers. Unfortunately the only information relating to this scheme was found in the Japan for Sustainability e-Magazine[69], and no reference could be unearthed from Aya Town's official website[70].

Sustainability for Japan refers to a couple of further examples in this article:

City of Nagai and the Town of Shinami

Both the city of Nagai (Yamagata Prefecture) and the town of Shinami (Iwate Prefecture) are composting the food waste generated in both households and businesses. Unfortunately it does not outline how the food waste is collected, and no further details could be gleamed from the respective official websites. However, the size of Nagai (29,959 population)[71] and the population density (140 per square kilometer) implies a possibility that food waste collections may be taking place from multi-occupancy dwellings.

Sapporo City

Sapporo City (Hokkaido Prefecture) encourages residents to compost using cardboard boxes. The composting method requires only a cardboard box, soil conditioner purchased at a gardening store, a shovel, a thermometer, and a scale[72]. Again, no reference to this could be found on the official websites[73]

[69] Sustainability for Japan <http://www.japanfs.org/en/mailmagazine/newsletter/pages/027774.html> 31 Oct. 2010
[70] <http://www.town.aya.miyazaki.jp/ayatown/english/Aya%20Town08-04-04/Homepg.htm> 31 Oct. 2010
[71] Wikipedia accessed 29-10-10 <http://en.wikipedia.org/wiki/Nagai,_Yamagata#External_links> 31 Oct. 2010
[72] http://www.japanfs.org/en/mailmagazine/newsletter/pages/027774.html 31 Oct. 2010
[73] Sapporo City <http://www.city.sapporo.jp/city/english/> 31 Oct. 2010
Sapporo Cleaning <http://www.city.sapporo.jp/seiso/ > 31 Oct. 2010

It is therefore evident that there are very few examples of separate collections of food waste encountered- with the food waste simply grouped together with the other ‘combustible’ wastes. However, if the intentions of the Food Recycling Law are to be completely fulfilled, it would be essential that local governments begin to provide separate food waste collections. This may well be the future of waste management in Japan, and with trials like that of Chiba City taking place, these may be an early indication of the trend that other local governments will follow.

5 Global Food waste collections for flats/multi-occupancy dwellings- A U.K. perspective.

5.1 Background

The majority of waste legislation in England is governed by European legislation, as will be the case for other member states such as Spain and France. The key pieces of legislation in the UK include:

The EU Waste Framework Directive- providing the overarching framework for waste collection, transport, recovery and disposal in member states

The Landfill Directive sets targets for the reduction of “biodegradable” waste. These targets are based on the amount produced/recorded and land-filled in 1995, with target years:

- 2010 - reduction to 75% of 1995 level
- 2013 - reduction to 50% of 1995 level
- 2020 - reduction to 35% of 1995 level

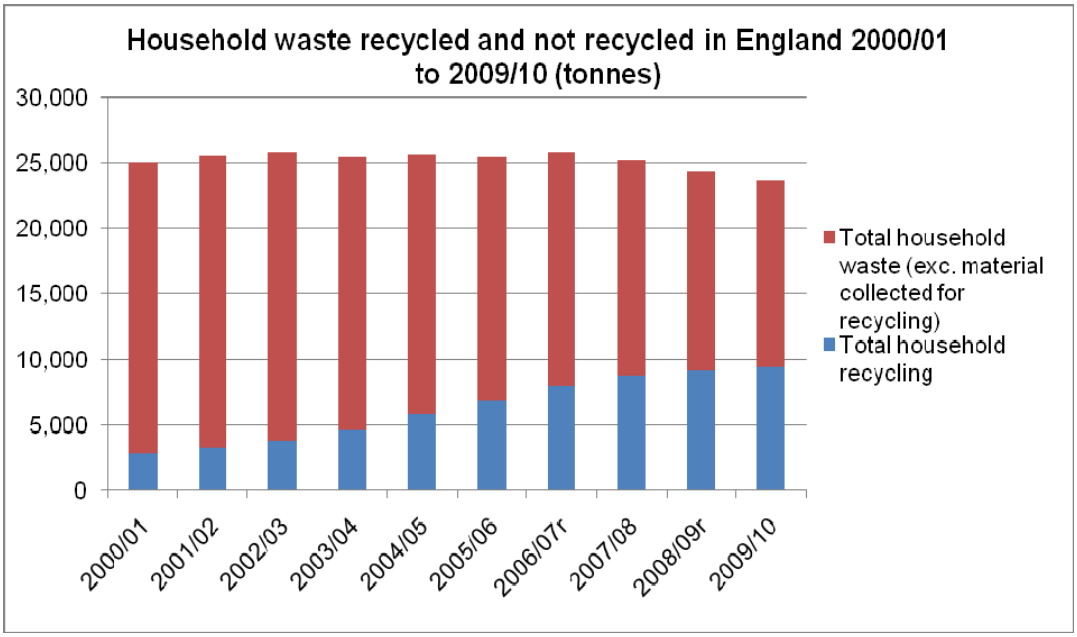
The National Waste Strategy for England 2007 (currently being reviewed) has set requirements for England to recycle and compost at least

- 40% of household waste by 2010
- 45% of household waste by 2015
- 50% of household waste by 2020

Other key pieces of legislation include the Environmental Protection Act 1990, The Environment Act 1995, Waste Minimisation Act 1998, and the Animal By-Products Regulations 2005 (SI 2347/2005).

In 2007-08, 25.3 million tonnes of household waste was collected in England, 34.5% of which was collected for either recycling or composting[74].

The 2009-10 national household waste recycling rate for England was 39.7%, an increase from 37.6% in 2008-09, 34.5% in 2007-08.



[74] Department for Environment, Food and Rural Affairs, http://www.defra.gov.uk/evidence/statistics/environment/waste/kf/wrkf15.htm 12 Nov. 2010

Figure 5- Tonnes of household waste recycled and not recycled in England 2000/01 to 2009/10 Source: Defra Municipal Waste Statistics 2009-10[75]

Interestingly, the composition of household waste has changed dramatically over the years, with paper and card the most significant waste fraction in 1997/8- at 37%, followed by organic waste at 20%. This has now reversed and in 2007-8 organic waste was the most significant waste fraction- at 36.1%- followed by paper and card at 18.1%.[76]

The increasing significance of organic waste- or compost (food and garden waste) means that collections of this material stream provided by local authorities has seen a significant increase, and flats- deemed as notoriously difficult for providing recycling collections to- have moved increasingly up the agenda to ensure adequate recycling provision is made for them.

5.2 Food waste collection provision for flats

In many respects the English experience has been a broad one and there are a number of examples of collections of food waste from flats and multi-occupancy dwellings. Having said this, the concept is still in its relative infancy and some local authorities are but recently considering the roll-out of food waste collections to their flatted properties. Examples of provisions have been noted from England, whereas little provision appears to have been made in Wales (with the exception of two local authorities out of the 22 - the Vale of Glamorgan and Cardiff), Northern Ireland (total of 26 local authorities) or Scotland (with the exception of Glasgow City Council). However, within the case studies found, the types of services provided can be categorized as follows:

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[75] <http://www.defra.gov.uk/evidence/statistics/environment/wastats/bulletin10.htm >12 Nov. 2010
[76] http://www.defra.gov.uk/evidence/statistics/environment/waste/kf/wrkf15.htm 12 Nov. 2010

- Kerbside- door to door
- Communal schemes
- Underground systems
- New technologies

5.2.1 Kerbside- Door-to-door

Royal Borough of Kingston-upon-Thames (RBKT)

The RBKT took part in a food waste collection trial supported by WRAP in 2007-08 looking at different collection options for food waste from flats and multi-occupancy dwellings. Over four thousand households in the trial area were provided door-to-door collections from 25 litre caddies with compostable liners - some of which were high rise and some low rise from a mix of council and private ownership. In contrast to many other schemes, smaller kitchen caddies were not provided. The yield at the end of the trial stood at 0.42kg/hh/wk, a reduction in the yield seen during the first half of the trial (0.50kg/hh/wk).[77]

Interestingly, during 2010, RBKT has been rolling out a food waste collection to all flats in the Borough, but the design of the scheme differs from the WRAP trial. Blocks are provided with communal bins into which food waste, collected in the kitchen caddies provided to each unit, can be deposited. Thanks to the completion of individual surveys for each block of flats in the Borough, RBKT emphasizes on it's website that recycling provision will be tailored to the block of flats in question, with space being the primary influence on the number of bins provided. Households are

[77] Waste & Resources Action Program. *Food Waste Collection Trials- Food Waste Collections from Multi-Occupancy Dwellings.* 2007-08. p. 2 <http://www.wrap.org.uk/downloads/Case_study_-_multi-occupancy_housing.bf0c6c1c.5879.pdf>

also provided with a kitchen caddy and biodegradable liners, in contrast to the trial scenario, to increase participation in the scheme and subsequent yields.

Newtonabbey Borough Council

Newtonabbey Borough Council also partook in the WRAP trial, providing the households in the trial area- comprised of a total of 1552 households in an urban area and a mix of high and low rise multi-occupancy housing, including 6 blocks of high rise flats- with a weekly door-to-door collection of food waste. The containers provided were 25 litre kerbside collection bins and 7 litre kitchen caddies with one roll of compostable liners. Door-to-door collections from the high rise blocks employed the use of a slave bin into which the collection crew emptied the 25 litre container which had been presented for collection. Collections started from the top floor, working down the building. For low-rise premises, communal bins were trialled. Interestingly, there is currently no mention on the Newtonabbey website regarding food waste collection from flats so it is unclear whether the schemes have continued or been rolled out to further locations.

Glasgow City Council- Waste Aware Glasgow

Glasgow City Council worked in partnership with Community Recycling Network for Scotland (CRNS) to trial the collection of food waste from 6 blocks of flats in the Kingsway Court Estate (Dumbarton Road, Glasgow) from September 2008 to September 2009. The total number of households involved in the trial was estimated, due to the transient nature of the population, to be in the region of 600.
Households were each provided with a food waste recycling container for the collection of all food wastes, which is then reprocessed in a local in-vessel composting facility.

Initially the arrangement was made for the food waste collection bins to be left in the chute room the evening before the scheduled collection day, however, this proved to be unpopular with residents (manifested by a low participation rate and a number of empty bins), and the arrangement was altered to a door-to-door collection. This change immediately proved successful as both quantities collected and participation rates trebled. Collections started off as weekly but have now increased to twice-weekly.

Table 4 summarises some of the data gathered during the trial.

Trial Survey results	86% of respondents could suggest no improvements to the scheme 30% of respondents admitted to changing their food purchasing habits as a result of using the scheme
Number of households which signed up initially to the scheme	345
Number of household signed up by the end of the scheme	274
Number of household participating at the end of the trial	169
Participation rate	28%
Total food waste collected during the trial	19.152
Average kg/hh/wk	2.6-3.0
T/hh/y	0.16
Trial annual tonnage	31.2
Table 4 Source: *Food waste collection & composting pilot project- Scotland*, Association for Organics Recycling[78]	

[78]< http://www.organics-recycling.org.uk/index.php?option=com_content&view=article&id=800:food-waste-collection-a-composting-pilot-project-scotland&catid=1:latest-news&Itemid=18 > 6 Nov. 2010

The participation rate at the end of the scheme is calculated based on the total number of households in the block of flats, not on the number of households which signed up to the scheme. The reduction in numbers signed up to the scheme can be attributed to the transient characteristics of this population, and perhaps less so to problems with the scheme itself as 86% of respondents to the survey, which was conducted 6 months into the scheme, seemed happy with the scheme design.
It would appear from the Waste Aware Glasgow website that the trial is still in progress.[79]

5.2.2 Communal Schemes

Rochford District Council

Rochford District Council provides multi-occupancy dwellings with communal food waste collections from 140L wheeled bins. Households are provided with a 7L kitchen caddy and a roll of 50 biodegradable liners. Once these have run out then householders must purchase their own. Bins are located with the existing communal recycling bins- i.e. either in the bin store, or at a convenient alternative or near-entry point location[80].

Islington Council

Islington provides some estates with communal/bring scheme facilities for food waste. Residents are provided with a kitchen caddy and a supply of compostable liners to facilitate the collection of food scraps in the home. Once the supply of liners has been used up residents are provided with a list of stockists in order to purchase further liners. The communal food waste collection bins are located with the other recycling and waste collection facilities- usually in a bin store or by the recycling bring

[79] http://www.wasteawarescotland.org.uk/glasgowFoodTrials.asp 10 Nov. 2010
[80]< http://www.rochford.gov.uk/environment/recycling/recycling_for_flats_-_faq.aspx >4 Nov. 2010

banks on an estate. The Borough is fairly unique demographically as, although it is the third smallest local authority geographically, it nevertheless has the second highest residential density in England and Wales, with 40% of the proportion living in estates and flats.[81] Capacity provided is based on one bin (of either 120L or 240L) per 30 households. During 2010-11 Islington have obtained funding from WRAP to expand the communal scheme to 10,000 properties.

Preston City Council

Preston makes a refreshingly bold statement regarding the provision of services to flats and shared dwellings where the kerbside box collection may not be suitable: 'Preston City Council can provide tailored services to suit your needs. There is a recycling solution for every type of property.'

In Preston all flats are assessed individually to make sure that we provide the most appropriate recycling solution.' [82] However, food waste collections are not currently in place.

Hackney Borough Council

Hackney generally seems to include blocks of flats of 25 units or less on the kerbside collections scheme for households (as indeed is the case for Hounslow which uses the cut-off point of 16 units).[83] Hackney Council is currently trialling food waste collections from 5000 households in estates and private apartments. Householders are provided with a 7 litre aerated kitchen caddy and compostable liners which when full can then be taken to the 'food waste recycling bin located on site.' The communal

[81] Hughes, Jean. *Recycling Food Waste in Islington*. Recycling & Waste Management exhibition presentation. 15th Sept. 2010. <http://www.rwmexhibition.com/files/jeanhughes_islington.pdf> 10 Nov. 2010

[82] http://www.preston.gov.uk/rubbish-waste-and-recycling/household-waste-and-recycling/flats-shared-housing/ 10 Nov. 2010

[83] Crofts, Cathy, Claudia Kuss-Tenzer and David Birley. *Recycling for Flats- Case Studies of Recycling Schemes for Housing Estates, High-Rise Blocks and other Areas of High-Density Housing*. Waste Watch & the Safe Neighbourhoods Unit. Defra 2004. p. 16.

receptacle used by Hackney is referred to as an 'onsite food waste container', which is designed in such a way so as to lock in smells and prevent access to vermin. The bins are emptied twice a week and cleaned on a regular basis.[84] The scheme is reported to have yielded 0.32kg per household per week over a sustained period.[85] The London Borough of Camden has adopted a similar approach to that of Hackney, providing 1800 households in estates and high-rise towers with communal outdoor food waste containers for the collection of cooked and un-cooked food waste. The container is similar to that of Hackney's in that it accommodates a sealable lid which prevents the escape of odours. Households are provided with a kitchen caddy and liners, which can then be transported to the outside container for final disposal.

London Borough of Lambeth

Lambeth has rolled out food waste collections to some estates, and continues to increase the number of estates this is made available to. During 2010 the aim is to increase from 15 estates for whom the scheme is available to 21. Estates are provided with communal food waste bins, with locked lids and rubber apertures through which compostable liners can be deposited, located next to or near to the refuse bins. Each property receives a kitchen caddy and liners. Bins are emptied weekly and cleaned regularly.

Bristol City Council

Bristol provides all flatted dwellings, 30,000 spread throughout the city in 500 blocks[86] with 'mini recycling centres' for dry recyclables.[87] During Spring 2010 they have also been rolling out food waste collections as an addition to this service.

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[84] http://www.hackney.gov.uk/Assets/Documents/estates-food-waste-recycling-leaflet.pdf 10 Nov. 2010

[85] RWM Special: Food Waste. *Aiming High*. Materials Recycling Week Sept 2010. Print.p. 86.

[86] Supra note 82, p. 85

[87] It would appear that in the past small blocks of flats were in receipt of kerbside recycling collections using the black box collection. Supra note 80,p. 16

Properties are again provided with 5 litre caddies and liners. Bins are termed 'near-entry containers' are emptied once a week and will be cleaned periodically. 240L bins where space permits, otherwise 140L with apertures. Householders can source additional liners for free from libraries, and where space permits, from small designated bins next to the near-entry containers. Bristol emphasizes, in the *Aiming High* article, that there is no one-size fits all solution and every effort is made to identify the specific requirements of a particular block so that these can be factored in to the scheme roll out. Bristol also emphasises the importance of communication. Table 5 below provides an outline of some of the key data relating to Bristol's scheme:

Number of households with access to near-entry food waste containers	5000
Maximum diversion rate achieved	1.0kg/hh/wk
Minimum diversion rate achieved	0.39kg/hh/wk
Average output across all locations	0.99kg/hh/wk
Total cost of full roll out of scheme - bin, caddies and liners	£186,000 (including cardboard recycling roll out)
Total communication cost	c. £186,000

Table 5

Source: Materials Recycling Week, Aiming High p. 86

Other communal schemes

Elmbridge Borough Council[88] provides communal bins based on one 140 litre bin per 10 properties. Households are provided with a 7 litre caddy and 1 roll of compostable liners. Cherwell District Council also provide communal food waste recycling facilities, as well as caddies and liners. This started to be rolled out during September

[88]< http://www.elmbridge.gov.uk/envcare/recycle/flatsfood.htm> 7 Nov. 2010

2010[89]. The London Borough of Bexley, Vale of White Horse District Council, and Vale of Glamorgan all provide communal food waste collections. Southend-on-Sea borough Council has trialled communal food waste collections from flats, providing communal bins with apertures, and caddies with liners. The results of these trials are due shortly and continued roll out to other flats in the Borough is scheduled.

5.2.3 Underground Systems

London- Wembley City

Similar to Vitoria-Gasteiz and Barcelona, Wembley City has also adopted the Envac system for the new development surrounding the new stadium. The development will ultimately house 4200 flats, and the Envac system was selected again due to the advantage of reducing vehicle movements in the area. At this development four waste-fractions are segregated- residuals, dry-recyclables, organics and cardboard. The system provides residents and visitors 252 outlets in which to deposit their waste, and comprises a network of 2.5 kilometres of piping. Once again, waste travels via vacuum through the network to a centralized point, where, when full the collection container is removed. Initial results show that between 40 and 45% of waste is recycled by current users of the development.

5.2.4 New Technologies

Wandsworth Borough Council- PyroPure system

At the time of writing this paper, Wandsworth Borough Council completed a trial using on-site pyrolysis technology to collect and process waste generated from a fifteen-story block of flats managed by the Council. Householders in the block already

[89] *Flats join food recycling scheme*, Oxford Mail http://www.oxfordmail.co.uk/news/8372034.Flats_join_food_recycling_scheme/ 6 Nov. 2010

had access to separate dry-recycling collections, but no food waste collections. Wandsworth was keen to trial this technology to establish whether cost saving could be made using pyrolysis on site and hence saving on collection, disposal, communications and related scheme roll-out costs such as caddies and liners if they had provided a segregated food waste collection scheme.

The technology was used to convert the carbon-based fractions (such as the organic waste) to a carbon ash which could subsequently be flushed into the sewerage system on site.

Residents simply deposit their waste in the chutes on their floor as normal. A mechanical handling system intercepts the waste once it has reached the bottom of the chute and divides the waste into 8 kilogram ‘bales’, which can be fed into the PyroPure unit. The process reduces the waste to an ash which can then be flushed into the sewerage system. Any metal and glass, which can withstand the pyrolysis process and remains intact at the end, can be removed manually and recycled.

Wandsworth Council report that this trial has been successful, saving an estimated £4849 for the trial block. Early projections indicate that rolling this out to all 17,045 households represents a potential saving of £1.24 million in collection and disposal costs per annum. It has also allowed them to reach properties which would otherwise be deemed ‘hard to reach’ and achieve high recycling rates at these locations, as the recovery of the non-combustible recyclables added between 5 and 6% to the recycling rate. Cost savings were also achieved via the absence of a need for transport and therefore a reduction in related operational costs.
Perhaps the most attractive advantage regarding this method is that there is no need for a change of behaviour on the householder’s behalf, and therefore no costs related to communications activities to promote the scheme- other than to encourage the

continued use of the dry-recycling facilities. There were also no complaints or issues raised by the households, who supported the initiative. For further information regarding the scheme please see *Win Case Study November 2010- Wandsworth Borough Council trial new on-site pyrolysis technology to dispose of waste from high rise flats*.[90]

6 Global Food waste collections for flats/multi-occupancy dwellings- A French perspective.

6.1 Background

The development of Waste Management Policy in France has taken the direction of 'the prevention of waste production...development of treatment of the organic fraction, optimisation of energy recovery, capture of landfill site biogas, enhancement of selective collection, control of hazardous domestic waste and cost control.'[91]

The selective collection of bio-waste is provided to 30% of the population in France.[92] Compare this to 98% of the population which have access to dry recyclables collections, and 93% with a separate glass collection[93], it is clear that the separate collection of biowaste is in its infancy in France. It is therefore perhaps unsurprising that few examples of food waste collections provided to flats could be found for the purposes of this report.

European legislation also impacts on food waste collections in France (as we have observed is the case for all other EU Member States), with a key piece of legislation in the context of food waste collections being the Animal by-Products Regulation (EC) No. 1774/2002.

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[90] Waste Improvement Network, Wandsworth Borough Council. *WIN Case Study November 2010: Wandsworth Borough Council Trial New On-site Pyrolysis Technology to Dispose of Waste From High Rise Flats.* November 2010<http://www.win.org.uk >. November 2010.
[91] Supra note 6, p.130
[92] Supra note 6, p.133
[93] Ibid

6.2 Food waste collection provisions for flats

Unfortunately, few examples of food waste collections for flats ('collectivites' or 'immeubles') encountered in France. There were, however, a range of examples of community composting schemes. Ironically, the lack of examples of other types of collection provisions for capturing food waste from flats (such as kerbside schemes, communal collections, door-to-door previously discussed in this document) makes the examples of community composting schemes all the more innovative as they are clearly a new approach adopted by a handful of French local authorities to resolve the dilemma of making food waste collection provision available to flatted properties.

6.2.1 Community Composting schemes

Nantes

Nantes is one of the pioneering towns in terms of community composting schemes, and has set up communal composting areas on the grounds of a number of blocks of flats- referred to as 'at the foot' of the blocks or 'au pied de barres d'immeubles.'[94] Residents in the blocks simply take their kitchen waste suitable for composting to the communal facility and hand it over to a volunteer who is responsible for the site. At one of the locations (Residence Beaulieu, L'Ile de Nantes) 6 months after the scheme was launched 60 households out of 480 were participating and 1.5 tonnes of organic waste was composted.[95] However, Pascal Retiere, the president of the Composting Association, and involved in the implementation of the scheme, emphasizes that it is not only about tonnages but also about the community spirit

[94]Schepman, Thibaut. A Nantes, le compostage pousse au pieds des immeubles. 7th June 2010. <http://www.terra-economica.info/compostage-collectif-en-ville,10816> 13 Nov. 2010.
[95] Ibid

which is developed. Similar schemes are being developed in Rennes, Toulouse, Nancy and Paris.

A video showing the scheme in practice can be viewed on the Terraeco website at http://www.terra-economica.info/compostage-collectif-en-ville,10816

Paris

The Paris Mairie has launched an initiative to provide on site composting facilities- for the collection and processing of organic waste (both food and garden)- to a number of flatted developments throughout Paris. This project is a result of the Mairie's waste prevention strategy as well as, inspite of average waste per head figure falling from 371 kilograms per household in 2005 to 357 in 2008, the fact that the organic waste fraction constitutes an increasing proportion of the general waste stream. It is in fact estimated to constitute up to half of the average Parisian's residual waste.[96] Based on the calculation that the average French home produces between 50 and 70 kilograms of organic waste every year, the Mairie estimates that on a typical development of approximately 20 to 30 flats, between 1 and 2 tonnes of organic waste could be captured and processed each year.[97] To date there are 50 locations which have composting facilities and the aim is to increase this to 70 by early 2011, and to 100 by 2013.

To take part in the scheme, the location has to fulfill the following requirements:

- Have a green space large enough to house the composters (of either 400 or 600 litres in capacity), well away from the building itself, and in which the resulting compost can be used.

[96] Newsletter- Paris- Mairie de Paris http://www.paris.fr/portail/pratique/Portal.lut?page_id=5434&document_type_id=5&document_id=88487&portlet_id=11682

[97] Newsletter- Paris- Mairie de Paris http://www.paris.fr/portail/pratique/Portal.lut?page_id=5434&document_type_id=5&document_id=88487&portlet_id=11682

- Permission must be sought from the managing agent, owners and the residents association if (applicable).
- Participants must commit themselves to only using the composters for the permitted materials i.e. fruit and vegetables and peelings, egg shells, coffee grounds, tea bags, flowers, cuttings, etc and not meat, fish, cheese, bread or any other food types which may attract animals.
- There must be enough households per location who are willing to use the scheme, with someone willing to act as 'representative' or champion for the block.

If all this criteria are satisfied, then the block can apply to become involved.
It is interesting to note that, similarly to local authorities in Australia and the USA, the Mairie recommends wormeries to those locations that are interested in home composting but do not have the green space available to house the composters.

6.2.2 Kerbside Collections

Niort- Operation 'Col-Vert'

The Mairie of Niort, which was one of the first French local authorities to trial food waste collections in 1992 developed a kerbside organic collection for households on a voluntary basis. This was expanded to the 'whole city' by 1997 under the project name "Operation Col Vert'. From information on the community website for the region (CAN- Communaute d'Agglomeration de Niort- http://www.agglo-niort.fr/-Le-traitement-des-dechets) it is clear that this scheme is still in operation[98].

Gironde- composting scheme

[98] <http://www.agglo-niort.fr/-Les-collectes-en-porte-a-porte-><ttp://www.agglo-niort.fr/La-collecte-des-dechets> 13 Nov. 2010

The European Commission reported in 2000, in it's publication 'Success stories on composting and separate collection', that the 'Sud-Bassin' District has rolled out a separate food waste collections for four communes in the District- Arcachon, La Teste de Buche, Gujan-Mestras and Le Teich.[99] The scheme was at the time rolled out to 20,000 households, with 15,000 benefiting from a 'direct' collection.[100] Households in the trial area were provided with a dual-compartment kerbside container for dry recycling and residual waste collection, whilst the previous residual waste container underwent a 'change of use' to become the compostable container. Although at this stage flats were not included in the scheme, the publication outlines that this was a defined objective for the programme, as well as extending the service to the city centre.

Information on the community website (COBAS Communaute d'Agglomeration Bassin d'Arcachon Sud at http://www.agglo-cobas.fr/article.php3?id_article=15) outlines the launch of an improved version of this scheme in January 2010 . The scheme has been adapted slightly[101]- with a 120 litre wheeled bin for dry recyclables (for cans, plastic bottles, and paper), a wheeled bin for residuals- a move away from the compartmentalized container- and a wheeled bin and kitchen caddy ('bio-seau') for food waste. Unfortunately it would appear that this scheme is still only available to houses ('habitat individuel') as no reference could be found to provisions made for flats.

7 Conclusions

It is clear from the range of case studies analysed that a range of solutions have

[99] Directorate General for the Environment-European Commission. *Success Stories on Composting and Separate Collection.* Luxembourg: Office for Official Publications of the European Communities, 2000. pp 31-33

[100] The assumption here is that this refers to a kerbside collection, whilst the remaining 5000 had access to a bring scheme of some kind, although this is not specified in the publication.

[101] <http://www.agglo-cobas.fr/IMG/pdf/16_pages_bat.pdf> 13 Nov. 2010

been sought for the provision of food waste collections to flats and multi-occupancy dwellings. From community composting schemes in Australia, the USA and France, through to door-to-door collections in the UK the range of solutions illustrates the fact that a 'one-size fits all approach' is not the correct approach in the majority of cases. What is evident, however, is a similarity in the types of collections provided to flats and multi-occupancy settings. The report shows a congruence between different countries in the types- or 'categories'- of solutions which have been sought, for example with kerbside collections, communal/bring systems and community composting schemes evident in a range of countries. Perhaps the exception to the 'one size fits all' rule is Japan, where cultural and societal pressures mean that little differentiation is made between flats and other housing types- requiring all householders regardless of where they live to separate their waste according to the local prefectures' requirements and deposit them at communal collection points. The onus is very much on the householder to comply with the requirements, and in many ways perhaps this, whilst onerous on the householder, is an effective way of overcoming some of the barriers experienced by local authorities in other countries. However, it is clear that it is not coincidence that such a range of solutions have been developed globally, and that there are a number of factors which influence the innovations in this field. Further discussion regarding these influences will be discussed in the conclusion of this report.

APPENDIX A

Housing Characteristics for New York City Metropolitan Area

Characteristics		Percent (%)	Total percentage of flats (2 units or more)

Total	4,849,800	100	
Units in Structure			
1 detached	1,435,400	29.6	
1 attached	405,600	8.4	
2 to 4	800,100	16.5	
5 to 9	234,600	4.8	
10 to 19	213,500	4.4	
20 to 49	590,900	12.2	
50 or more	1,153,500	23.8	61.7
Manufactured/mobile home or trailer	16,100	0.3	

Source: American Housing Survey for the New York City Metropolitan Area in 2003

U.S. Department of Housing and Urban Development and U.S. Census Bureau p. 1

Appendix B

Separately collected food waste tonnages –Ajuntamiento de Pals

Tonnes

	2006	2007	2008	2009
January	0	1.72	6.51	9.41
February	0	2.13	7.17	9.09
March	0	5.43	11.12	11.49
April	0	4.71	12.2	12.96
May	0	15.44	11.04	14.65
June	2.37	16.59	20.48	15.27

July	10.74	28.21	27.23	20.47
August	24.96	31.09	27.34	25.07
September	10.52	-	16.82	17.78
October	5.23	-	11.47	16.72
November	2.71	-	8.66	14.58
December	4.15	-	8.45	14.34

Source: Ajuntamiento de Pal. Oct. 2010

Residual waste tonnages Ajuntamiento de Pals

	Tonnes			
	2006	2007	2008	2009
January	99.96	114.16	109.16	100.36
February	104.86	109.74	116.76	84.56
March	140	141.48	153.72	132.54
April	228.78	206.5	152.3	165.54
May	221.8	211.8	189.54	159.78
June	279.62	260.12	248.36	235.62
July	464.32	456.54	402.82	416.98
August	568.74	530.16	529.84	580.22
September	264.22	-	230.44	218.68
October	179.7	-	132.66	141.48
November	120.86	-	106.36	94.34
December	120.74	-	96.52	98.26

Source: Ajuntamiento de Pals. Oct. 2010

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Australia

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Section 3 - Compilé by Elodie Lapointe

: Revue des différentes actions de communication et de sensibilisation mises en place dans divers pays

Introduction

C'est une obligation du Grenelle de l'environnement : augmenter le volume et le tonnage des déchets recyclables comme le carton, le plastique, le papier, l'aluminium, le verre, etc… L'habitat collectif pèse très fortement sur les conditions de mise en œuvre des collectes sélectives qui seules permettront d'atteindre les objectifs de valorisation des déchets des ménages.

En matière d'optimisation de gestion des déchets, les zones d'habitat collectif figurent parmi les gisements où les progrès possibles sont encore très importants.

En effet, si le déploiement de la collecte sélective en habitat collectif est une réalité, il y existe encore de nombreuses pistes d'optimisation techniques et financières, sans oublier que des territoires urbains entiers restent à conquérir ou à reconquérir compte tenu des contraintes spécifiques à ce type d'habitat : multiplicité des acteurs, difficultés techniques liées au manque de place dans les logements et espaces communs, quartiers sensibles…

La communication et la sensibilisation au sein de ces types d'habitat nécessitent donc d'être très adaptées afin de lever les freins et résistances rencontrés.

Nous identifierons tout d’abord ces derniers, puis nous étudierons les principales actions menées dans différents pays, et enfin nous nous intéresserons à quelques méthodes de communication innovantes.

I/ Freins et résistances

Contrairement à certaines idées reçues qui prévalent encore en certains lieux, les locataires ou copropriétaires vivant en habitat collectif, sont globalement aussi réceptifs que d'autres à l'idée de participer au tri des déchets. Plus d'une personne sur deux se dit prête à le faire si on le lui demande. Si l'on devait résumer le sentiment général on pourrait dire "ne nous considérez pas comme un public spécial, mettez à notre disposition les outils nécessaires, utilisables facilement, en quantité suffisante, avec une sensibilisation régulière nous ferons l'effort correspondant, d'autant plus facilement que l'image du quartier aura été améliorée". Pour passer de cette déclaration d'intention à l'action effective, nous avons identifié un certain nombre de freins, de contraintes qui doivent être dépassés.

- La qualité du cadre de vie

Elle est le plus souvent évoquée. Il est difficile en effet de se sentir directement concerné et en état de faire l'effort nécessaire, lorsque les entrées sont dégradées, les espaces extérieurs non aménagés, l'entretien pas ou mal fait, les travaux prioritaires à l'intérieur des logements jamais réalisés, etc.

- Le sentiment d’insécurité et de mal de vivre

C'est un obstacle, et la façon dont on semble quelquefois vouloir le résoudre risque d'aggraver la situation en imposant des mesures et des charges supplémentaires aux habitants. De même, l'appropriation des parties communes des immeubles par les habitants joue un rôle.

- Les questions de coût

Selon le type de collecte, de matériel utilisé, le coût d'entretien et de maintenance sera directement répercuté sur les charges locatives ou de copropriété, et une part de l'investissement sera imputée sur les loyers. L'intégralité de l'un et de l'autre étant supporté par le copropriétaire résidant. Les circuits de distribution des aides financières (qu'elles soient publiques ou en provenance du dispositif Eco-Emballages) sont inadaptés au secteur de la copropriété qui est le plus gros parc d'habitat collectif, et dont la situation financière se dégrade.

- Le sentiment de ne pas être écouté et consulté

Décider la fermeture du vide-ordures (qui plus est sans réduire la surface corrigée...), changer les heures et les moyens de collecte, mettre en place de nouveaux outillages, modifier l'implantation des matériels, sans une concertation poussée, "de pied d'immeuble" , peuvent mener à l'échec ou rendre plus difficile une collecte de qualité.
Associer les gardiens, agents d'immeuble, syndics à la mise en place des procédures de pré-tri et de collecte est une condition nécessaire mais non suffisante à l'implication des habitants. Le pari de la réussite du tri ne se gagne pas à 2 mais à 3 parties, avec les représentants des locataires et des copropriétaires.

- L’égalité des citoyens

Les habitants aspirent à être considérés de la même façon par les pouvoirs publics, les professionnels, quel que soit le quartier où ils habitent. La différence de traitement (type de matériaux et équipements mis en place, d'organisation et de fréquence de collecte et d'entretien qui ne seraient pas

justifiés par des raisons techniques objectives, etc…) entre les différents quartiers d'une ville est mal vécue.

- Les règles « statutaires »

En copropriété, imposer par la réglementation ou la loi des mesures qui mettent en cause la souveraineté de l'assemblée générale produit un effet "dévastateur". En secteur locatif, changer les règles du jeu, apporter des modifications sensibles à "la chose louée" et à son utilisation, sans respecter les règles contractuelles peut provoquer des conflits durs.

La bataille du tri en habitat collectif se gagne donc au porte à porte, chaque jour et par des actions pérennes. Il faut, en fait, transformer les freins en leviers ; il s'agit de sensibiliser, valoriser les potentiels existants, convaincre, faciliter la vie, en améliorer la qualité, en se basant sur une véritable démocratie au quotidien.

II/ Principales actions menées dans différents pays

- L'enquête

Comme nous l'avons vu précédemment, la concertation avec les habitants est une étape clé pour la réussite d'une action, quelle qu'elle soit. A ce titre, il convient donc d'étudier le contexte dans lequel s'inscrira cette action, par des enquêtes locales ou nationales, afin de comprendre les attentes et difficultés, les contextes sociaux et surtout la relation au tri.

A titre d'exemple, voici les résultats d'une enquête effectuée par Eco-Emballages fin 2006 :

En matière de comportement :

25,8% des habitants en habitat collectif considèrent que trier ses déchets et emballages ménagers au quotidien n'est pas un geste facile (32,3% pour ceux qui habitent un immeuble de plus de quatre étages)

Moyenne nationale : 19,8%.

A noter que 39,7% des habitants en habitat collectif ne vont jamais à la déchetterie

Moyenne nationale : 21,9%

En matière de perception des dispositifs mis en place par la collectivité :

31,3% des habitants en habitat collectif se disent insatisfaits par la collecte et le tri des déchets et emballages de leur collectivité (35% parmi ceux qui habitent un immeuble de plus de 4 étages)

Moyenne nationale : 23,5%.

En matière de perception de la communication autour du tri sélectif :

35% des habitants d'un immeuble de plus de 4 étages se disent mal informés sur le tri sélectif des déchets et emballages ménagers

Moyenne nationale : 26,1%

A noter que 51,5% des habitants en habitat collectif considèrent que la communication autour du tri sélectif n'est pas suffisante et pas assez régulière

Moyenne nationale : 40%

Ces résultats montrent qu'il existe en moyenne un écart de 10% en défaveur de l'habitat collectif de plus de 4 étages lorsque l'on s'interroge sur la facilité du geste de tri ou le niveau de sensibilisation.

Des efforts restent donc à faire en termes de communication. Ils impliquent une remise à plat et parfois une remise en cause des supports déployés jusque là. En tout état de cause, la communication générique ne tenant pas compte du type d'habitat doit évoluer.

Lorsque les conditions techniques et une bonne sensibilisation sont réunies, les performances en habitat collectif peuvent atteindre des niveaux supérieurs à la moyenne du milieu.

- Le partenariat avec les publics relais

L'amélioration du tri sélectif en habitat vertical nécessite un travail de terrain fréquent et régulier. Bien que les collectivités aient certains moyens pour effectuer des actions de porte à porte comme nous le verrons plus loin, les agents dédiés ne peuvent assurer une présence constante dans chaque groupe de logements. C'est pourquoi il semble aujourd'hui indispensable d'impliquer des « publics relais », qui sont le plus souvent les gardiens d'immeubles, mais qui peuvent également être des locataires ou copropriétaires bénévoles et désireux de « faire passer le message ».

Des formations ou livrets d'accompagnement à destination de ces publics relais se multiplient donc depuis quelques années (annexe 1).

Eco-Emballages propose notamment un CD-Rom de formation à destination des gardiens (voir annexe 2). La ville de Cannes a lancé une opération visant à former l'ensemble des gardiens d'immeubles de la ville au tri sélectif. Présentée comme une première à cette échelle en France, cette campagne de formation s'effectue en partenariat avec le Syndicat mixte de coopération intercommunale pour la valorisation des déchets (Sivades), l'un des sites vitrines nationaux d'Eco-Emballages. « L'objectif est de former ces gardiens à devenir de précieux relais d'information au sein des habitats de type immeubles et résidences », précise Julien Baesa, chargé de communication au Sivades. La formation se déroule sur deux jours. Elle porte autant sur les aspects réglementaires et environnementaux de la démarche que sur le type

de communication de proximité à déployer dans les immeubles, ainsi que sur des consignes très concrètes de tri à appliquer. A la ville de Cannes, on espère que former ces « éco-gardiens » fera grimper de quelques points le taux de déchets triés dans la municipalité.

Outre les gardiens d'immeuble, les publics relais peuvent également être des citoyens impliqués et volontaires pour « passer le message » ; en effet, rien n'est plus efficace parfois que le bouche-à-oreille. Ainsi, des associations se forment dans des quartiers ou des villes, comme la Cheltenham Community Recycling Champions du Gloucestershire, qui tient notamment un blog d'information ; au Japon, on trouve aussi des volontaires mais qui cette fois font davantage de répression que de prevention, en surveillant le contenu des poubelles de leur quartier.

- L'implication des bailleurs

Il est important de créer un lien avec les bailleurs et de s'assurer de leur engagement dans le projet.

A Montpellier, un partenariat entre la collectivité et le bailleur le plus important de l'agglomération a permis de mener une opération pilote visant à évaluer les performances de tri sur quatre secteurs, après des modifications techniques et de communication. Cela a permis d'identifier les objectifs convergents des différents acteurs et de valoriser les actions menées, tout en assurant un suivi efficace grâce à la remontée d'informations (annexe 3).

Dans le département du Val d'Oise, le syndicat Emeraude (site vitrine d'Eco-Emballages), une convention a été passée entre la collectivité, la commune et le bailleur, afin d'engager chacun dans des responsabilités d'investissement et de fonctionnement. Le syndicat Emeraude propose à chaque bailleur un

état des lieux puis un diagnostic d'amélioration du dispositif de gestion des déchets, en réunissant les parties prenantes. Cela permet de poser des bases de coopération et d'améliorer conjointement les dispositifs. Dans le cas d'un changement vers des bornes enterrées (investissement lourd), une convention engage le syndicat et le bailleur sur la répartition des investissements et du fonctionnement futur. Pour une durée d'un minimum de 10 ans, les responsabilités et les bénéfices d'un système gagnant-gagnant sont ainsi répartis.

Eco-Emballages propose un logiciel, « E-collectif », permettant aux bailleurs de trouver des solutions efficaces afin de mieux gérer leurs déchets (annexe 4). Cet état des lieux, ayant été effectué de façon globale en 2007 par Eco-Emballages et l'Union Sociale pour l'Habitat (annexe 5), est un préalable nécessaire à toute action pour améliorer les performances de tri.

- Avoir une équipe dédiée à la communication de terrain

Afin d'augmenter les performances de tri en habitat vertical, un accord a été signé entre Eco-Emballages et l'Union Sociale pour l'Habitat : cet accord prévoit la réalisation et le suivi d'outils techniques, de modules de formation pour les personnels, la capitalisation d'expériences, l'organisation de manifestations et le soutien au déploiement du dispositif permettant aux bailleurs d'employer des ambassadeurs du tri. Un accord signé en mai 2007 prévoit d'en recruter 500, dans le cadre de conventions signées avec les collectivités locales (annexe 6).

Apprendre aux habitants à trier ou à mieux trier, intervenir dans les écoles : voilà quelques-unes des missions essentielles des ambassadeurs du tri.

Ils sont reconnus comme les meilleurs vecteurs pour convaincre la population, » car ce sont des communicants de proximité, chargés de promouvoir, principalement par oral, la collecte sélective et le tri des emballages ménagers auprès des habitants. Animations, porte à porte, interventions dans les réunions publiques, actions vers les publics relais et interventions dans les écoles : autant de missions pour trois enjeux de taille, trier plus, trier mieux et maîtriser les coûts.

Trier plus

Par leurs actions de proximité auprès des habitants, les ambassadeurs du tri permettent d'améliorer l'information pratique sur les consignes de tri. L'objectif est de conforter les trieurs réguliers, d'encourager les trieurs occasionnels et de convaincre les plus réticents, ceux qui, par manque d'information, pensent que trier ne sert à rien.

Trier mieux

Les ambassadeurs du tri ont également pour mission d'opérer un contrôle qualité du tri effectué par les habitants, puis dans les centres de tri municipaux. Des campagnes de contrôle sur le terrain leur permettent de repérer les principaux dysfonctionnements et de mieux orienter leurs actions pour corriger les erreurs de tri. Par ce type d'interventions, les ambassadeurs du tri influent directement sur la qualité des matériaux triés et donc également sur le coût de leur gestion.

Maîtriser les coûts

Les coûts de gestion des déchets ménagers sont en augmentation régulière, notamment en raison de l'évolution des techniques d'élimination, des normes et de la réglementation, indispensables pour mieux préserver notre environnement, mais aussi de la raréfaction des sites de traitement et notamment d'enfouissement. Pour

les collectivités territoriales, il est impératif d'optimiser leur programme de collecte sélective. Acteurs du lien social, les ambassadeurs du tri sont les mieux placés pour expliquer ces changements et convaincre les usagers mais aussi tous les intervenants de la vie de la cité tels que les gardiens, les bailleurs ou les associations, des décisions prises par les élus.

- L’édition et la distribution de guides du tri

La communication à destination des habitants passe également par l’édition et la distribution de guides du tri qui reprennent de façon simple les consignes à suivre. Ces guides sont édités soit par les villes, les communautés de communes, les syndicats de traitement, ou plus largement par les entreprises et organismes nationaux tels que VEOLIA et Eco-Emballages, par exemple.
A ces guides s’associe parfois la distribution de sacs de « pré-collecte », afin que les habitants puissent trier leurs déchets chez eux dans un contenant prévu à cet effet, afin de n’aller les déposer dans les conteneurs collectifs qu’une fois le sac plein (la limitation des déplacements, et donc de la contrainte, facilitant le geste de tri). A titre d’exemple, on peut retenir l’action du Royal Kingston Council, qui distribue des sacs de « pré-tri » et des bacs pour les déchets alimentaires, accompagnés d’un guide du tri très précis qui explique également aux habitants le devenir des déchets recyclés (annexe 7).
On retrouve le même modèle de guide très détaillé en Australie, pour le Kiama Municipal Council (annexe 8).

L’ensemble de ces actions est indispensable pour assurer une bonne sensibilisation au tri sélectif ; à titre d’exemple, en annexe 9, l’expérience menée par la ville de Cannes montre comment ces différents moyens et outils

peuvent être associés afin d’obtenir une efficacité optimale.

III/ Quelques actions innovantes testées dans différents pays

- France

Pas-de-Calais Habitat, soucieuse du respect par les locataires des règles du tri sélectif, a organisé un « café conversation » dans une ville regroupant 750 logements, ce qui représente un enjeu important. Préserver l'environnement et réduire le tonnage des déchets sont deux objectifs du bailleur. Il s'agissait donc bien de faire passer le message à travers des questions autour d'un café et de biscuits.

Une initiative innovante a été prise dans le nord de la France : un site expérimental de gestion des résidus urbains en habitat collectif, une sorte de « micro-déchetterie », qui constitue une première en France pour un bailleur social selon ses promoteurs, a été présenté le 23 novembre 2009 à Seclin. Mise en place sur l'espace communal de « La Mouchonnière » (541 logements collectifs) à Seclin, près de Lille, cette expérience consiste à faire trier par les habitants une dizaine de déchets différents : cartons, bois, déchets électroniques, ferrailles, déchets industriels, textiles, lampes, déchets ménagers… « Nous avons mis en place une sorte de micro-déchetterie en demandant aux locataires d'assurer le tri et nous avons pris contact avec un certain nombre de prestataires qui viennent récupérer les déchets. C'est une réussite » a déclaré Alain Cacheux, président de l'office public de l'habitat Lille Métropole Habitat (LMH). « C'est une première en France pour un bailleur social », a-t-il assuré. « Cela améliore la propreté : les encombrants étaient mis un peu partout, dans les halls, sur les paliers, et cela permet le recyclage des encombrants. La mobilisation des locataires les a rendus acteurs de la propreté » a-t-il souligné. En six mois, la collecte a permis de

récupérer 6,6 tonnes de bois, 4,5 tonnes d'appareils électroménagers traités et dépollués, et 26 m^3 de cartons revalorisés en nouveaux cartons. L'objectif de ce dispositif est que l'ensemble des gisements collectés soient valorisés et qu'ils ne nuisent plus à l'environnement. Auparavant, l'ensemble de ce qui était habituellement collecté était enfoui au centre d'enfouissement technique. Le but de LMH est d'étendre ce dispositif à l'ensemble de son patrimoine, sachant qu'il a coûté 250 000 € à Seclin.

En fonction depuis février 2008, la Betty-Box de la société BTI est une véritable tirelire magique. D'un côté, on plante ses vielles bouteilles en plastiques et autres canettes sur des piques. De l'autre ressort un virement bancaire ou des bons d'achats. En fait de magie, il s'agit plutôt de technologie : une série d'instruments de mesures vérifie au préalable la nature des objets apportés. Inventée par Gérard Briane, la Betty-Box est proposée à la vente aux collectivités pour 65 000 Euros (services et fonctionnement non compris). BTI annonce un retour sur investissement en trois ou quatre ans (annexe 10).

- Japon

Le tri est très contraignant au Japon, chaque jour ayant son déchet strict, les sacs doivent être transparents afin de permettre aux éboueurs de contrôler le contenu…Facilité pour les services de ramassage, qui se focalisent sur un type de déchets par jour, difficulté pour les ménages, qui doivent accumuler 4, 5 ou 6 poubelles différentes. Il faut être organisé, rodé à l'exercice. Partout, le tri sélectif est organisé, et les sanctions strictes. Si vous vous trompez, les déchets vous sont ramenés.

En France, l’argument choc du tri sélectif est la conséquence économique. Si les déchets sont triés en amont, le coût de la collecte n’en sera que moins élevé. Mais au Japon, à Kamatura par exemple, un système de récompense a été mis en place : pour les abonnés au journal local, tous les 15 jours, il suffit de déposer sa pile de vieux journaux devant la maison et dans la matinée, l’entreprise de ramassage l’échange contre du papier toilette ! Plus généralement, dans tout le Japon, le journal Asahi Shibun, grand quotidien japonais, fournit des sacs en papier où on empile les journaux lus pliés en quatre et un petit carton pour stocker les revues. Au Japon, où la consommation de plats à emporter et autres boissons dans la rue est légion, le tri se fait à la sortie des magasins, où des conteneurs, comme ceux de tri sélectif en France, sont placés. Afin de mieux informer les citoyens, la ville de Yokohama a remis à ses résidants un livret de 27 pages pour leur expliquer comment trier leurs ordures ménagères. Au total, le document contient des instructions détaillées pour 518 articles, classés en 10 catégories.

- Royaume-Uni

A Bristol, le projet « Recycling in flats everyday » a été mené. Le but de ce projet est de favoriser l'utilisation des « mini centres de tri » de la ville et d'augmenter la participation des résidants vivant dans des copropriétés et des immeubles dans la ville de Bristol.

Depuis 2003, Resource Futures a fonctionné avec le conseil municipal de Bristol pour faciliter l'utilisation des mini-centres de tri par les riverains. Leur travail inclut l'évaluation des emplacements afin d'en faciliter l'accès, la communication avec les propriétaires pour identifier de nouveaux emplacements, le contact avec les gardiens et les agents de gestion pour éliminer des difficultés techniques avec les sociétés de collecte.

Ils entreprennent également des actions de communication et des activités promotionnelles pour encourager l'utilisation de ces centres. Ceci inclut des interventions aux réunions du comité, la distribution de brochures avec des sacs de pré-tri (particulièrement conçus pour stocker les recyclables et pour les rendre faciles à emmener au mini-centre de tri), et la prospection en porte-à-porte pour engager des résidants à employer ces centres. La tactique spécifique a été employée notamment pour atteindre les minorités sociales ; par exemple, dans les immeubles avec de grandes populations immigrées somaliennes, un ouvrier local et des volontaires somaliens ont été employés pour sensibiliser leurs voisins au sujet du recyclage.

Etats-Unis

Quelques communautés de communes françaises pratiquent déjà la redevance incitative au poids. Leurs citoyens payent donc l'enlèvement de leurs ordures ménagères non recyclables en fonction de leur masse. Au Etats-Unis,

RecycleBank, une société privée, propose une solution inverse. Elle pèse les déchets recyclables et rémunère les habitants avec des bons d'achats ou de réduction. La formule cartonne ! Les taux de tri ont bondi de plusieurs dizaines de pourcent en quelques mois.

Le concept de RecycleBank, fondée en 2004 par Ron Gonen, est original. Dans les communes proposant le service, chaque habitant reçoit sur simple demande une puce électronique (RFID) nominative autocollante qu'il appose sur son bac. Les camions poubelles, équipés de lecteurs de puces, et munis de bras « balances » pèsent le bac lors de la collecte. Plus la poubelle est lourde, plus l'utilisateur recevra de points sur son compte, accessible sur le web. Les points peuvent ensuite être transformés en bons d'achats, en bons de réduction, ou en dons à des associations caritatives ou environnementales.

Tout est prévu pour pouvoir dépenser facilement ses points. Ron Gonen a déjà convaincu plus de 2000 enseignes : des grandes marques comme Coca-cola, FootLocker ou Evian, mais surtout une myriade de magasins locaux. Une boutique en ligne sur le site de RecycleBank permet également d'acheter des voyages, de l'électronique grand public, des articles de sport, etc…

Présent dans plus de 20 états américains et au Royaume-Unis depuis mi-2009 (un test avec Veolia est en cours à l'ouest de Londres), RecycleBank compte déjà plus d'un million d'utilisateurs et prétend atteindre les trois millions en 2010. Il faut dire que l'offre est alléchante : une famille pourrait facilement gagner 250 $ par an.

Les clients sont donc ravis et les partenaires commerciaux s'offrent une bonne pub verte à peu de frais. Mais qu'en est-il des collectivités ? Et bien ce sont les grands gagnants de l'affaire ! Partout où RecycleBank a posé ses puces, les volumes de déchets recyclables ont grimpé en flèche. Jusqu'à être multipliés par deux dans des

villes jusqu'alors récalcitrantes. Dans le même temps, les quantités d'ordures ménagères non recyclables ont fortement baissé. La conclusion est évidente : le taux de tri augmente.

Financièrement, l'investissement initial des communes (équipement des camions et puces RFID) est remboursé d'une part grâce aux économies d'incinération ou d'enfouissement, et d'autre part via les ventes supplémentaires de déchets recyclés.

Quant à RecycleBank, elle apporte gratuitement le système d'information, se fait payer par ses partenaires commerciaux, et prends un pourcentage sur les économies réalisées par la ville lorsqu'elles excèdent le retour sur investissement.

Conclusion

La collecte sélective dans les immeubles est un levier d'optimisation fort pour les collectivités locales et un vecteur de valeurs de propreté, citoyenneté et lien social pour les bailleurs sociaux. Se plaçant au coeur des préoccupations environnementales, économiques et sociales, la collecte sélective est un véritable projet de développement durable.

La nécessité d'associer locataires et copropriétaires aux décisions qui les concernent ne relève pas seulement d'une démarche participative, elle est économiquement indispensable. Il s'agit non seulement d'éviter les conflits inutiles, mais de produire des réalisations qui répondent à des besoins, qui améliorent les conditions de vie, qui contribuent à une meilleure solvabilité des ménage en situation difficile, et qui permet une évaluation en cours de réalisation et un retour d'expérience irremplaçables.

Il faut prendre conscience que seule une démarche globale qui intègre les principes de développement durable, permettra de sortir l'habitat collectif de l'impasse dans lequel il se trouve. Rendre les immeubles plus agréables, faciles à vivre, économes, favorisant la vie sociale et la citoyenneté active est le meilleur moyen de réduire les inégalités et de lutter contre les exclusions.

Dans ces zones de plus forte densité de population, il n'existe pas une, mais de nombreuses solutions techniques. Bien sûr, des principes fonctionnels communs à toutes les solutions doivent être suivis :

- lieux de stockage accueillants et faciles d'accès comme d'usage ; c'est en effet là que se joue la performance de la pré-collecte ;
- adaptation aux contraintes de collecte de la collectivité.

A partir de là, il convient de choisir la solution technique la plus adaptée aux contraintes du site : densité de population, sécurité, existence de locaux intérieurs de taille suffisante …

Au-delà des aménagements techniques, la réussite de la collecte sélective en habitat collectif passe donc par un partenariat avec l'ensemble des acteurs (bailleurs ou syndics, représentants des habitants, gardiens…) et la mise en œuvre d'une communication adaptée et renforcée notamment grâce aux ambassadeurs du tri.

Références :

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www.ecoemballages.fr

www.localtis.info

www.lavoixdunord.fr

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www.epa.gov

http://betty-box.com

www.resourcefutures.co.uk

Conclusion:

Given such a range of variable factors influencing the success of dry and food waste recycling in flats and multi-occupancy dwellings (MOD's) it is not surprising that solutions are many and varied. The important lesson is that with the exception of new build where technical installations can be installed, each block needs to be seen as an individual community. So in practice recycling in flats and MOD's can only be successful by taking account of a range of influencing factors. As a result the best solutions have tended to lead to adopting a flexible approach to recycling, tailored to meet the need of the people living in the block and dealt with on a case by case basis.

That said, certain rules or considerations seem to be applicable across all the studies if not in every study:

- If the option is a mini recycling centre, it should be situated close to the flats and in a prominent position.
- Ensure that the facilities are kept clean, well signposted and paying special attention to health and safety issues
- Community engagement is critical to understand the social dimension of the people living in the flats, this best done by liaising or recruiting champions in each complex. The same issue applies to factors like ethnicity and language both in terms of communication and signage (A note of caution when recruiting champions, just because they are keen to take the role on it does not mean they will be popular with other residents)

- Tailored promotional activity that personalises the recycling message so that people in the flats and MOD's feel the benefit of the activity and thus feel the task of recycling is worthwhile.
- It is counter productive to store recyclables in the common access areas, it can also be dangerous and in some instances illegal
- In many instances conventional kerbside collection is not fit for purpose in high rise flats and MOD's and even when tried have a poorer outcome in terms of output compared with houses (partly due to the space available compared with houses). However, with the right approach flats can lead to similar participation rates
- The state of the local environment has an impact on the success of recycling and this links with a range of socio-economic factors. If the local environment is aesthetically poor engagement in new services like recycling are hampered.
- Most incentive schemes to recycle only work for a short period of time However if they give a long term financial rewards seem to have a lasting impact. For example US style reward schemes that offer 'reword points' seem to work and are being trialled in the UK because the reward points are available in perpetuity and can be redeemed for goods and services in the local businesses community.
- In some countries like the UK making use of planning gain is used to ensure that facilities for recycling in flats are provided by developers in the development phase of new buildings. In the UK Section 106 (S106) of the Town and Country Planning Act 1990 allows a local planning authority (LPA) to enter into a legally-binding agreement or planning

obligation with a landowner to for example establish recycling facilities in association with the granting of planning permission.

- Many of the solutions have demonstrated a holistic approach to overcome both physical and psychological problems (particular establishing recycling as ‘normal’ behaviour) and illustrate the importance of open thinking.

For many years, particularly after the switch of focus from ‘Bring Sites’ collection to kerbside collection, recycling in flats and MOD’s has lagged behind the participation levels found in houses. There is anecdotal evidence to suggest that this was because the operators of recycling schemes saw flats and MOD’s as lower priority because of the projected volumes of recyclables produced when the main emphasis has been to reach centrally set weight based targets. I suspect the reality is related more to do with the fact that it is difficult to communicate with residents and set up suitable infrastructure in flats and MOD’s. What the report shows that flexible innovative solutions are now available and have been shown to work providing authorities are prepared to take the time to develop them. This is the crucial lesson when implementing recycling in flats and MOD’s.

It is also evident that the simple practice of just offering recycling cannot deliver a successful scheme and invariably after the initial enthusiasm participation wanes. For example, in some countries peer pressure can influence the behaviour but not everywhere or everyone so there is always scope for developing new fresh ideas in order to maintain and improve levels

of recycling. One fresh approach has already indicated that it can have a significant impact on improving recycling, particularly (although not exclusively) in flats and MOD's using bring sites. This is the behaviour change process known as 'Fun Theory'.

Fun Theory is the field of knowledge that deals in questions such as "How much fun is there in the universe?", "Will we ever run out of fun?", "Are we having fun yet?" and "Could we be having more fun?" http://lesswrong.com/lw/xy/the_fun_theory_sequence/

Fun Theory is dedicated to the thought that something as simple as fun is the easiest way to change people's behaviour for the better. Be it for you, for the environment, or for something entirely different, the only thing that matters is that it's change for the better

In 2009 Volkswagen set up a competition, the 'Fun Theory Awards' the http://www.thefuntheory.com/fun-theory-award) challenge was to show how fun could change behaviour through taking mundane activities and transforming them into positive feelings of actions. One example illustrated how fun theory could increase the use of a bottle bank. During one evening a 'fun' bottle bank was placed in a community. It was used by one hundred people that evening compared with another site close by that had two visitors. Similar approaches have been used to change peoples behaviour using sound effect for litter bins, obeying the speed limit and to improve peoples fitness (using stairs instead of escalators). Interestingly the only reward is a

good conscience and you also get to smile but fun seems to be a powerful tool for changing behaviour.

This study has shown that there is a universal understanding of the need to recycle and about what recycling actually 'is' has resulted in the growth and prominence of recycling in peoples psyche and could be claimed a success story. There is general 'buy in' from people on a global scale and it is important to ensure that people in flats and MOD's are treated equitably.

In many ways the support for recycling is a reassertion of former times, before the profligate consumption that grew as a result of industrialisation and reached a zenith post 1945. However, is it time for us to start looking at backing more radical solutions to the management of waste?

Perhaps the real issue is not expounding more effort in engaging people in ever more complex systems and costly solutions for recycling but changing people's behaviour towards waste reduction?

Although reducing waste has been around for decades it has only recently been placed centre stage in places like Australia, USA (Zero Waste Campaign[102] (http://www.zerowaste.org/), New Zealand and the UK. In the UK this is typified by WRAP's food waste campaign 'Love Food Hate Waste' (http://www.lovefoodhatewaste.com/) that has begun to have a considerable

[102] The term *zero waste* was first used publicly in the name of a company Zero Waste Systems Inc (ZWS), which was founded by PhD Chemist Paul Palmer in the mid 1970s in Oakland California)

impact on large numbers of people in the UK, it is hoped that it will continue. Where local authorities have pursued this campaign and other similar campaigns (e.g. home composting) there has been a significant drop in waste produced per household. On the European scale there are the packaging regulations that have begun to see a shift in manufacturer's approaches to the quantity, type and afterlife of materials generated.

Recycling and waste reduction, tick all the sustainability boxes. The challenge is to ensure that everyone is fully engaged with theses practices, there has been much progress but with issues like Climate Change looming for future generation time is short.
