

Governing Sustainable Waste Management

Designing sustainable waste management into the housing sector

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September 2005

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1 Introduction

In seeking to shift municipal waste policy towards sustainability, policy-makers at European, national and local levels are facing the challenge of how to engage householders in reducing, reusing and recycling their waste. This in turn means engaging with the arena within which day to day waste management activities are practiced – the home. In view of this critical relationship between waste policy and household practices, this research project¹ has sought to examine:

- the ways in which new infrastructures for managing waste are being ‘designed in’ to new housing developments and renovated kitchens in the UK and Europe;
- the barriers identified by key actors in the as impending the pursuit of a more integrated approach to housing design and waste management and how these might be overcome;
- examples of best practice currently being developed in the UK and their applicability in the context of the North-East of England.

The research project involved: extensive reviews of existing academic and policy literature; interviews with planning and waste officers at Stockton Borough Council; a survey questionnaire sent to private house builders, housing associations, architects and local authority officers; an analysis of the Eco-homes database of sustainable housing; and participant observation in the design of new kitchens (see Appendix 1).

The research reveals that despite increased interest in the concept of ‘sustainable housing’, the impact of housing design on waste practices is rarely considered by policy makers or housing practitioners, that few best practice examples of sustainable housing include new infrastructures for managing waste in the home, and that more sustainable ways of sorting and collecting waste within kitchens is rarely included in the design process. However, there are some examples of good practice which have relevance to the region, and to the UK more generally, and with the current changing legislative and policy climate, waste is likely to become a more important issue for the planning, housing and design sectors in the future.

The report is structured in the following way. Section 2 provides a background to the project, considers the changing policy context and the ways in which waste practices within the home can be considered, developing the idea that the home is an ‘interface’ for sustainable waste management. Section 3 outlines how this interface is currently configured, through building regulations, planning guidance, and voluntary codes. Although managing waste has recently become written into central government policies and codes for the built environment, it is as yet unclear how this will be worked through in practice. Section 4 considers the current challenges and future prospects faced by those wishing to reconfigure the housing/waste interface, both within new developments and in existing housing infrastructure through the lens of kitchen design. In conclusion, Section 5 identifies the implications for both housing and waste management policies of the findings from this research project.

2 Background

2.1 The changing policy context

Although municipal waste represents only 7% of the UK's waste stream, it is a highly visible and politically charged arena. The past five years has witnessed a period of considerable upheaval for municipal waste policy. Local authorities which until recently had to concern themselves with little more than the collection, planning and disposal of waste, and a relatively narrow range of

¹ This research project has been conducted as part of the Junior Research Associate scheme, run by the Faculty of Social Sciences, Durham University, and with additional support from Barratt Homes and Renew Tees Valley. We are grateful to these organisations for their support and to Stockton Borough Council for their assistance in the design and implementation of the research project. The project is part of a wider research programme, *Governing Sustainable Waste Management*, supported by H J Banks & Co. Ltd. through the Landfill Tax Credits Scheme, facilitated by Entrust. For details please visit the project's website via www.dur.ac.uk/geography/research/researchprojects/

regulations, today have a radically broadened agenda with progressive statutory performance targets for recycling and composting, as well as responsibilities for diversion of waste from landfill, recovery from waste and waste minimisation. Growing volumes of waste, coupled with restrictions on the physical and environmental capacity of landfill as a disposal option, have led to increasing pressure from the EU and national government to shift away from disposal to more sustainable waste management options. The 1999 EU Landfill Directive places targets for the diversion of waste from landfill on member countries. In response, the UK has introduced a raft of measures for local authorities in order to ensure compliance with these targets. These include: statutory targets for recycling and composting and other performance measures under the Best Value Performance Indicators (BVPI) framework; the introduction in 2005 of a Landfill Allowance and Trading Scheme, under which local authorities are set limits on the amounts of biodegradable municipal waste which can be sent to landfill; the 2003 Household Waste and Recycling act which stipulates that all local authorities must provide for the kerbside collection of at least two recyclable materials; and a host of funding schemes and policy guidance to enable local authorities to meet these targets.

Responding to this agenda requires considerable changes in household infrastructures and practices for managing waste away from the dominant 'wheelie bin'. Kerbside collection services – and the range of containers which are used for this purpose - and reduced capacity wheeled bins are new collection and disposal technologies which are having some success (CRN 2002). Currently, 62% of households are served by a dual material kerbside collection service. Overall, the proportion of municipal waste sent to landfill has increased from 84% in 1996/7 to 72% in 2003/04, while the level of recycling/composting of household waste has increased from just 7.5% in 1996/7 to 17.7% in 2003/04 (DEFRA 2005a).² However, given national targets, as set out in *Waste Strategy 2000*, to recycle or compost at least 25% of household waste by 2005, at least 30% by 2010, and at least 33% by 2015, there is some way to go, and there is concern that the 'low hanging fruit' have now been picked so that achieving higher targets will be all the more challenging. In the North East, with one of the highest rates of growth in waste arisings and the lowest recycling rate, of just 12.3%, in the country, these challenges are all the more real.

2.2 Changing attitudes, changing practices

In order to increase levels of participation in recycling and composting activities, and hence meet local and national targets, public policy has focused on changing household attitudes through information campaigns, with the assumption that awareness of the waste problem will lead directly to a willingness to help alleviate the waste issue. The latest national waste awareness initiative is the £10 million 'Recycle Now!' campaign run by the Waste and Resources Action Programme, an agency funded by the Department for Environment, Food and Rural Affairs and the Department for Trade and Industry³. With the tag line 'the possibilities are endless', the campaign has involved a series of national media adverts which show materials being recycled into new goods/things, as well as a dedicated week, The Big Recycle, where the message is pushed, and information leaflets and publicity materials which are available to local authorities to use alongside their own information locally. Other campaigns, on specific issues such as 'real nappies' and home composting, have also been launched. WRAP has also made funding available to local authorities to undertake locally targeted awareness raising and communication initiatives.

However, research has shown that information alone does not necessarily lead to behavioural change. While knowing what to recycle and when plays an important part in decision making, other factors are also important. Maximising recycling provision tends to result in enhanced recycling behaviour. Equally, people who perceive they have time and storage space for recyclables are also much more willing to take part in recycling programmes (Barr *et al*, 2001; see also Darby and Obara 2005). Research from the *Governing Sustainable Waste Management* project also demonstrates that 'hands on' involvement in waste recycling,

² See: <http://www.defra.gov.uk/environment/statistics/wastats/mwb0304/index.htm>

³ See <http://www.recyclenow.com/index.html>

composting, re-use and minimisation schemes is critical in shaping new waste practices. Rather than focusing purely on information or moral persuasion as the basis for changing household waste practices, this research suggests that it is necessary to engage with the material contexts – the recyclables collected, the containers used, space for storage – within which household waste practices are shaped.

2.3 Making a material difference

These findings are supported by research which has examined the ways in which people respond to the material landscape within which we live (Jelsma 2003). People respond to cues, i.e. when they see a door handle they know the door will open (Rohracher 2003; Shove 2003). Relating this to waste management, currently the 'wheelie' bin, and the associated indoor infrastructures associated with it (one kitchen bin, rubbish sacks) acts as the cue for waste practices - people know a dirty, unwanted item can be disposed of in the bin and they never have to see it again. Rather than seeking to change knowledge or attitudes about waste, one important way to change a predicted activity, i.e. putting waste in the bin, is to change the cues which shape practices, by changing the micro-infrastructures (places for sorting, storing and disposing of wastes) within the home.

In so doing, it will be necessary to take account of that research which shows that processes of normalising waste practices are not only shaped by the material landscape, but by socially constructed notions of comfort, cleanliness and convenience (Shove 2003) and what 'waste' actually is (Hetherington 2004). At BedZED, a sustainable housing development in London, in-built divided bins were used in a kitchen unit; however, the Resident Satisfaction Survey (BedZED 2004) showed that residents require more or larger bins for refuse and recycling. Even those opting to live in sustainable housing, and with a significant degree of understanding the waste challenge, may not be persuaded to make use of new infrastructures if they are not seen to be convenient .

Redesigning the interface between the waste collection and disposal process and the home is clearly critical in shaping both what counts as 'normal' behaviour around waste, and in re-shaping the micro-infrastructures through which waste is practiced. If the 'traditional disposal' approach to managing municipal waste relied simply on households placing their wastes (all of their unwanted household items) in a single container, to be taken away in a single vehicle, and deposited at a single site, seeking to manage waste sustainably is more multiple – at the least it depends on individuals reclassifying their unwanted items, sorting and storing them in different containers, making them available at different times for different collection vehicles, which in turn take the materials to different sites. This in turn means that in trying to shape the cues to waste practices, there is a need to intervene beyond the backdoor – to enter into the arena within which wastes are created, sorted and stored.

3 Configuring the waste/housing interface

As set out above, the home is a critical interface for municipal waste policy as it is in this arena that routines are established and cues become important. This section examines how the interface between housing and waste is currently configured by examining current regulations and guidance shaping the building of new homes, the role of voluntary standards, and the implications of the introduction of the Code for Sustainable Buildings.

3.1 Building regulations

The design and siting of new housing is shaped by building regulations (which determine the nature of individual dwellings) and planning guidance (which shapes the location and nature of development). Part H of the Building Regulations (2001) sets out clear guidelines for the capacity, design and siting of household waste disposal facilities (Building Regulations 2001). While the key matter addressed by the regulations is the size and access of the facilities, the

guidelines make it clear that in order to meet the requirements of Part H, solid waste storage must be:

- a) designed and sited so as not to be prejudicial to health;
 - b) of sufficient area having regard to the requirements of the waste collection authority for the number and size of receptacles under Sections 46 and 47 of the Environmental Protection Act 1990;
 - c) sited so as to be accessible for use by people in the building and of ready access for removal to the collection point specified by the waste collection authority under Sections 46 and 47 of the Environmental Protection Act 1990.
- ODPM, Part H, Building Regulations 2001⁴

As the document goes on to state:

The waste collection authority has powers under section 46 (Receptacles for household waste) and section 47 (Receptacles for commercial or industrial waste) to specify the type and number of receptacles to be used and the location where the waste should be placed for collection. *Consultation should take place with the waste collection authority to determine their requirements.*

The Requirements of the Building Regulations do not cover the recycling of household and other waste. However H6 sets out general requirements for solid waste storage. Guidance is included in this section (H6) regarding arrangements for separate storage of waste for recycling should it be necessary. This is to support requirements which may be made under Sections 46 and 47 of the Environmental Protection Act 1990 and to support national initiatives on recycling and waste reduction.

ODPM 2001, Part H, Building Regulations

In effect, while the Building Regulations do not mandate that space be provided for new forms of micro-infrastructure for managing waste sustainably (the separate storage of waste for recycling), it does provide a key lever with the potential for reworking the waste/housing interface, as the Regulations place emphasis on the fact that consultation must take place with the local authority in order to ensure that their requirements are met. This provides an opportunity for the local authority to stipulate the sorts of facilities which are required.

3.2 Planning guidance

Although municipal waste policy involves both the management of wastes – their collection and disposal – and the planning of sites where waste can be disposed safely, there has historically been a lack of integration between the waste planning and waste management functions of local authorities. In the past, planning guidance for waste was primarily concerned with the siting and construction of facilities to process/dispose waste, and with the wastes arising from the development process (construction and demolition material), rather than with the ways in which the design of new housing would affect the collection of waste in the first instance. While the *1999 Planning Policy Guidance 10: Planning and Waste Management*⁵ states that the developer must “ensure that opportunities for incorporating re-use/recycling facilities in new developments are properly considered”, there is little else in the document which explains how this is to take place, or reinforces the message. However, the newly released *Planning Policy Statement 10: Planning for Sustainable Waste Management*⁶ provides much more robust guidance on the need to integrate new infrastructures for managing waste within new developments:

Good design and layout in new development can help secure opportunities for sustainable waste management, including for kerbside collection and community

⁴ See: http://www.odpm.gov.uk/stellent/groups/odpm_buildreg/documents/page/odpm_breg_600283-08.hcsp#P2023_138337

⁵ See: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_606925.hcsp

⁶ See: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/divisionhomepage/039993.hcsp

recycling as well as for larger waste facilities. Planning authorities should ensure that new development makes sufficient provision for waste management and promote designs and layouts which secure the integration of waste management facilities without adverse impact on the street scene or, in less developed areas, the local landscape.

ODPM 2005, Planning Policy Statement 10, p.15⁷.

While there are no detailed specifications as to what this would entail, i.e. how many m² are acceptable/necessary for recycling facilities, whether this is outdoor or indoor space and so on, and the focus on recycling alone may be rather narrow in the current context of needing to address the biodegradable fraction of the waste stream, it nonetheless provides local authorities with a guide that the provision of some such facilities is to be expected. At the same time, DEFRA's guidance notes on the implementation of the Household Waste Recycling Act suggest that good practice of the Waste Collection Authority might include "incorporating provisions for recycling and composting into planning considerations" (DEFRA 2005b), further reinforcing the message that there is potential, and growing expectation, that the design and development of new housing enables more sustainable waste management practices.

In order to capitalise on this potential, it is clearly essential that there is joined up working within local authorities, between the waste management and planning divisions in particular, which have historically been located in separate areas of responsibility. One means of making the local authority's intentions with respect to these new provisions clear, and indeed the specific way in which they will be locally interpreted, is through the production of supplementary planning guidance. Supplementary planning guidance is used to guide developers as to local expectations for developments and could be a way to ensure that consideration is given to for the storage and separation of different wastes at the household level. An advantage of using supplementary planning guidance is that it clearly sets out local expectations with respect to waste – this is all the more important given that national guidance is loose. The disadvantage is that the guidance is just that – guidance – and can not be considered as a 'material consideration' within planning inquiry processes. One example of how this tool has been used is that provided by the Forth Valley, in their *Supplementary Development Advice Note: Managing Waste in Housing and Commercial Developments*. This sets out clear guidelines for the provisions of waste management infrastructures within the design of new housing:

- Space is required for multiple waste storage bins and containers at each property, requirements will vary across property types.
- The minimum size of waste storage area required per household is approximately 2m x 1m, this space should be sufficient to accommodate the equivalent of 3 x 240 litre wheeled bins.
- In new build dwellings the developer should provide space inside the property to store 55-60L recyclables boxes – these should be convenient to the kitchen or utility room.
- Home-composting areas should be designed into all new housing developments as part of the garden, a suitable sized composter should be provided with the 2m x 1m area.
- As the householder is responsible for moving bins/recycling boxes from the storage space to the collection point there should be no obstacles such as steps for safety reasons.

As the new PPS 10 is interpreted at the local level, it is likely that the further use of supplementary planning guidance will take place among local authorities in this area, and this could be a useful and effective means of changing the micro-infrastructures provided for waste management, provided it gains sufficient acceptance among developers and the planning process as a whole.

⁷ See: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_039215.pdf

3.3 Voluntary standards

One sign that there may be a willingness on the part of developers to engage with new means of 'designing in' sustainable waste management at the household level is the increasing adoption of voluntary codes for sustainable buildings. EcoHomes is the most popular and widely recognised voluntary code. The code is produced by Buildings Research Establishment (BRE) (a government agency) and is taken as standard by a number of organisations, such as GreenStreet and WWF, who have used it as a basis for their One Million Sustainable Homes campaign⁸. EcoHomes is based on a credit rating system with credits available for different environmental measures which are integrated into the building design, such as resource efficiency, passive solar heating and so on. One of the main objectives of EcoHomes is raising awareness amongst home buyers, occupiers, social housing providers, designers and developers of the benefits of building to best environmental practices standards (Rao *et al*, 2003). A number of publications are produced and disseminated, including *EcoHomes: The environmental rating for homes*, in order to publicise the scheme and independent assessments of new developments are undertaken to see how they comply with the scheme.

In terms of waste, credits are given for the provision of storage space (including composting bins) to encourage the recycling of household waste (Rao *et al*, 2003). In the *EcoHomes Guidance 2005* 6 credits are given for providing full recycling facilities of internal and external storage. For the internal provision, maximum points are awarded for 3 storage bins which have a minimum total capacity of 30 litres, where no individual bin is smaller than 7 litres, and where all bins are given space in a dedicated position. Externally, maximum credits (3) are given where there are either three external bins with a minimum total capacity of 180 litres, where no individual bin is smaller than 40 litres, and all bins are giving space in a dedicated position (within 10m of the external door); or where a local authority collection scheme for recyclable material exists (BRE, 2005).

Overall, while waste considerations have been included within the EcoHomes standard, there is less emphasis on this element of sustainability than on energy or water issues. Further, by awarding the same number of credits for either the provision of dedicated external space for waste sorting/storage or the presence of a local authority scheme – which has little to do with the development process – it could be argued that this particular, and dominant, voluntary standard does little at present to further the cause of sustainable waste practices.

3.4 The Code for Sustainable Buildings

Following the recommendations of the Sustainable Buildings Task Group, the government announced in 2004 that a new voluntary Code for Sustainable Buildings (CSB) is to be introduced in 2005/2006. which will set a single sustainability standard for different types of buildings (Sustainable Homes 2005). The ODPM are in discussion with the Building Research Establishment (BRE), who produce the EcoHomes rating, and it seems likely that the environmental aspects of the CSB will be based on EcoHomes, therefore building on widespread sector recognition of the standard (Sustainable Homes, 2005). At present there is no concrete information about the ways in which the CSB will work or the issues which it will take into account.

4 Current practice and future challenges at the waste/housing interface

4.1 Experience from across the UK

In order to get a picture of how waste issue were being taken into account in the development of sustainable housing, the project analysed case-studies on the EcoDatabase, created as part of

⁸ See: <http://www.wwf.org.uk/sustainablehomes/index.asp>

the Sustainable Homes project, funded by the Housing Corporation and based at the Hastoe Housing Association.

EcoDatabase contains 173 sustainable housing and business projects. Of these 61 developments had implemented some form of sustainable waste management measure. Of these 61 case-studies, 40% had a composting system, 35% had a kerbside recycling collection, 21% had a recycling scheme within the housing project, 29% had waste paper recycling and 43% had a waste storage bin (see Table 1). For the 35 developments which had only one sustainable waste management measure most common were the recycling collection and recycling scheme. Only 9 developments had implemented 3 or more measures. This analysis of EcoDatabase has shown that waste management is not considered a priority, even within those housing projects which label themselves, or are defined as, 'sustainable' developments. This is also reflected in the literature on building sustainable homes and academic analyses of sustainable homes, which tend to focus on energy and water (Barton 2000; Haughton and Hunter 2003). However, it should be noted that on the database a number of developments are still in the process of being built so it is not possible to analyse how successful these projects are at present or whether further waste management options will be added in at a later date.

Table 1: Waste management measures on the EcoHomes database

Waste management measures implemented	No. of projects
Composting system only	8
Recycling collection only	9
Recycling scheme only	6
Waste paper recycling only	6
Waste storage bin only	6
Composting and recycling collection	3
Composting and recycling scheme	1
Composting and waste paper recycling	2
Composting and waste storage bin	3
Recycling collection and recycling scheme	1
Recycling collection and waste paper recycling	0
Recycling collection and waste storage bin	2
Recycling scheme and waste paper recycling	0
Recycling scheme and waste storage bin	1
Waste paper recycling and waste storage bin	3
Composting, recycling collection and waste storage bin	2
Composting, waste paper recycling and waste storage bin	3
Recycling collection, recycling scheme and waste storage bin	1
Recycling collection, waste paper recycling and waste storage bin	1
Composting, recycling scheme, waste paper recycling and waste storage bin	1
Recycling collection, recycling scheme, waste paper recycling, waste storage bin	1

4.2 Waste management and housing in Stockton

The research project examined those measures which were being undertaken by Stockton Borough Council to integrate waste management and planning. The Council currently has an internal consultation process to discuss the links between waste management and planning. There is considerable new development underway in Stockton, some of which is taking place on council-owned land, and as a result the provisions which must be made for waste management can be specified. In these areas, collaboration between the planning, landscape planning, and waste management teams is leading to the design of an external bespoke unit that will contain a wheeled bin for waste but also make provision for recycling. However, where the Council does not own the land, planning policies for integrating waste management into the design of housing and new developments do not exist, because of a concern that in placing more additional tasks

on developers, which are perceived to be expensive, the area would be at a comparative disadvantage and may lose out on securing new housing development. Nonetheless, all householders moving into new housing are provided with a compost bin and a kerbside collection box, to get the message about the council's waste services across.

4.3 Possibilities for new housing design

The survey conducted for this research project (Appendix 2) showed that housing developers, waste managers and planning officers want to see a variety of facilities provided in new housing developments (Table 2). The most popular were the introduction of limited capacity wheeled bins for general waste alongside kerbside recycling boxes, home composting bins and a wheeled bin for the collection of green waste. There is certainly a willingness amongst some key actors to engage with changing housing design to accommodate waste concerns, but also a reluctance on the part of each type of actor to 'go it alone', without the back up of legislation, uniform standards, and a 'level playing field'.

Table 2: Integrating new facilities for managing waste in new developments

Measures to integrate waste management into new design	Respondent				
	1	2	3	4	5
Wheeled bin for general waste					
Limited capacity wheeled bin for general waste					
Kerbside recycling box for dry recyclates (paper, glass and tins)					
Wheeled recycling container for dry recyclates					
Kerbside collection box for green waste					
Wheeled container for green waste					
Home composting bin					
Reusable recycling bags					
Internal tiered recycling cabinet					
Kitchen caddy for kitchen waste					
3 in/3 out – 3 internal boxes with corresponding external bins/boxes					
Other					

4.4 Reworking existing infrastructures

New housing accounts, of course, for only a small proportion of the UK's housing stock. In order to really address the problem of rising levels of household waste and to increase levels for recycling, composting, re-use and minimisation, it is necessary to engage with the existing housing stock. A critical point in the production and sorting of waste is the kitchen – particularly with regard to packaging and biodegradable waste. In order to assess the potential for intervening in kitchen spaces to change waste management practices, the research project undertook participant observation through the design of 'ideal' kitchen at four of the major kitchen suppliers in the UK (Homebase, Magnet, B&Q, Ikea). In none of these cases was the possibility of including facilities for recycling and composting waste within the kitchen mentioned. When asked what the options might be for these activities, in-store designers were confused or

dismissive. This was even the case for one store, Magnet, which does indeed offer a divided bin for new kitchens.

There are, however, products on the market which could be used. For example, at BedZED a small under-the-sink bin for kitchen waste has been built into the design of the kitchen. In Figure 1, the divided bin fits into a cupboard so is out of sight but by being divided into three compartments it encourages recycling for the three common recyclables: paper; glass and tins. If the kitchen came with this bin and a user guide, then the cue of putting waste automatically in the 'bin' has been changed. There are also several different 'stand alone' bins which are now available on the market, though usually from specialised (online) stores. In terms of biodegradable waste, kitchen caddies could be provided, or an 'insinkerator' used to dispose of green waste. People want convenient and clean ways to dispose of waste (Shove, 2003), and it is clear that micro-infrastructures which can achieve this are available on the market, though are far from being the norm for kitchen designers.

Figure 1: Divided bin in kitchen unit (www.cabinetstorage.com)



Figure 2: Stand-alone divided bin (www.homerecycling.co.uk)



5 Implications for Housing and Sustainable Waste Management

We suggest that these findings have four key implications for housing and sustainable waste management, which we outline below.

5.1 Enhancing the profile of waste measures within voluntary standards

- At present sustainable waste management has a low profile within voluntary standards for sustainable housing
- For example, it is possible to get a 'very good' rating from EcoHomes and not have any provisions for sustainable waste management.
- Also the focus is on recycling rather than a broader range of waste management options – especially composting
- Enhancing the level and weight given to sustainable waste management indicators within voluntary codes could be a relatively straightforward means of increasing engagement with this agenda

5.2 Translating guidance into action

- Introduction of new guidance and provisions within building regulations are potentially useful levers for local authorities seeking to enhance provision in new build for SWM
- However, there is a need to translate this into practice on the ground, and in practice without greater weight being given to these considerations within the planning system as a whole and across the building industry sector, it is likely that the measures will not be adopted
- Increasing use of voluntary codes is one means of raising awareness and changing practice – and the CSB code assist in this regard, also implications of the Sustainable and Secure Buildings Bill 2004
- Use of SPG is also a useful tool, in particular because of the need to translate the general guidance offered into specific standards and criteria
- In order for local authorities to feel confident in taking such measures, need to link up and share experience, and to work in partnership with building organisations to reach agreement on possible first steps along this path

5.3 Engaging the public in design processes

- In order to ensure that the specific designs of micro-infrastructures both inside the kitchen and outside are used within day to day household practices, there is a need to understand how waste is practiced in these spaces at the moment and the sorts of changes which would be welcomed by the public
- Research has shown that the factors of comfort, cleanliness and convenience (Shove 2003) are critical in shaping everyday practices, and more research is needed to understand how these factors shape waste behaviour
- Local authorities and housing developers could engage with local communities in existing 'new' build housing to examine what works and what does not work in terms of the space provided for storage, sorting and disposal of wastes as it interfaces with current local authority waste management services
- In addition, as part of the design phase of new developments, public participation in the design of new 'sustainable' kitchen/outdoor spaces could be written into planning briefs.
- Given that large volume house builders use similar designs (and presumably the same fitting companies), a relatively small number of actors might need to be involved in making quite significant changes to the facilities provided for waste management in the home.

5.4 Mainstreaming new waste infrastructures within kitchen design

- In addition to the focus on new build, this research recommends that a process of engagement needs to take place with the designers of new kitchen spaces, which are replaced at an increasing rate.
- This process lies outside the scope of single local authorities, but is within the province of the LGA and central government bodies. As local authority schemes for recycling and composting are rolled out, it is likely that there will be an increasing demand from consumers seeking kitchen spaces to store their wastes in ways which make compliance with these schemes 'clean and convenient'. As such, a dialogue between government and the kitchen design sector could prove fruitful for both parties.
- Again, the involvement of kitchen users in the redesign of kitchen spaces will be important, and the points made above with respect to the means of engaging the public in the process of design are relevant here.

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Appendix 1: Methodology

An extensive review of existing academic literature and policy documents regarding housing and waste management was undertaken.

Semi structured interviews were conducted with 3 members of Stockton Borough Council, a local authority in the North East. The waste officer, a planning officer and a landscape architect are all involved in an internal consultation process regarding sustainable waste management.

A survey questionnaire was sent to more than fifteen key actors in the region. Questionnaires were returned from:

- Regional office of Taylor Woodrow Developments a private house builder
- Regional office of Barratts, a private house builder
- Office of Places for People, a social housing developer
- Planning policy team officer, Durham County Council
- Environment department of Taylor Woodrow
- Waste officer, Durham County Council

The Sustainable Homes website contained a database of 173 sustainable projects (EcoDatabase). Each project had details of every sustainable facility/practice designed into the development, I went through each entry and made a list of projects which contained waste disposal facilities/practices. I put these entries into a database of my own and then worked out the percentages of each of the five options.

Kitchen plans were obtained from Homebase and B&Q for a kitchen approximately 3.6m by 2.3m. This is the size of a kitchen in a 3 bedroom terraced house. At first the kitchen planner designed what they considered to be an ideal kitchen based on the space available. When that plan was completed I then brought up the issue of waste disposal, the best option available would be a basic under-the-sink bin, not segregated. When recycling was brought up there were no facilities available.

Online kitchen plans were obtained for a kitchen sized 3.6m x 5.4m. This is taken to be a large kitchen based on the size of the kitchen mentioned above. Magnet and IKEA offer online planning tools. As these designs were done online it was not possible to get planning advice, however there were a number of options available.

Appendix 2: Questionnaire

1. How much priority do you give to sustainable waste management when planning/advising on new housing developments? Please rate on a scale of 1 to 5, (1 being the highest, 5 being the lowest)

1 2 3 4 5

2. Currently is there enough being done to encourage recycling and composting by incorporating facilities in new housing developments?

Yes No

If yes, please give some examples:

3. Which facilities for managing waste do you think should be provided in new housing developments?

- Wheeled bin for general waste
- Limited capacity wheeled bin for general waste
- Kerbside recycling box for dry recyclates (paper, tins, glass etc)
- Wheeled recycling container for dry recyclates
- Kerbside collection box for great waste
- Wheeled container for green waste
- Home composting bin
- Reusable recycling bags
- Internal tiered recycling cabinet
- Kitchen caddy for kitchen waste
- 3 in/3 out – 3 internal boxes with corresponding external bins/boxes
- Other (please specify)

4. Should specific consideration be given to providing alternative household waste management facilities planning guidance and/or the building regulations? If so, what form do you think this should take?

5. Do you have any recommendations for designing alternative household waste management facilities into new housing developments?

6. Please give details of any policies that your organisation currently promotes or implements with regard to sustainable waste management or sustainable housing.

Any other comments

Do you wish to be contacted for a short telephone interview?

Yes No