

WR1204

Household Waste Prevention
Evidence Review:

L3 m3-3 (D) – Impact of Household Waste
Prevention Interventions and Campaigns

A report for Defra's
Waste and Resources Evidence Programme

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L3 m3-3 (D) Impact & delivery of household waste prevention intervention campaigns (at the local level)

This module is concerned with understanding the impact of different intervention campaign approaches with respect to household waste prevention. The main topics covered are:

- Context and evidence reviewed
- Top line summary on impacts
- Top line summary on delivery
- Impact of intervention campaigns
- Delivery of intervention campaigns
- Barriers to progressing household waste prevention
- Opportunities for progressing household waste prevention

Modules providing further insight or detail in relation to monitoring and evaluation are listed below:

L1 m1 Executive Report	L2 m1 Technical Report L2 m2 Policy context L2 m3 Consumers - engaging L2 m4/1 Reuse & the third sector L2 m6 Monitoring & evaluation of household waste prevention	L3 m6/1 (D) Approaches to monitoring & evaluating household waste prevention L3 m5/2 (D) International review L3 m3/1 (D) Extent to which waste prevention behaviours are practised L3 m3/2 (D) Motivations and barriers L3 m3/4 (T) Attitudes & behaviour – food waste L3 m3/5 (T) Attitudes & behaviour – home composting L3 m3/6 (T) Attitudes & behaviour – reuse L3 m3/7 (T) Attitudes & Behaviour – everyday actions around the home
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(D) denotes a briefing paper providing more background detail; (T) indicates a short focused topic briefing

1.1 Context and evidence reviewed

Understanding how household waste prevention is delivered enables policy makers, local authorities and practitioners to identify the optimum approaches required to deliver effective behaviour change. This module discusses two contexts:

- The impact of local household waste prevention intervention campaigns in terms of tonnage data; and
- Local household waste prevention intervention campaigns delivered as a 'package' of measures used to 'enable', 'engage' and 'encourage' householders.

This module is not concerned with central government policy interventions, rather it discusses the measures designed and delivered at a local level to engage residents in waste prevention behaviours. The intervention campaigns discussed in this module have been delivered, in the main, by local authorities and Non-Governmental Organisations (NGOs). Only one intervention was a pilot project (Love Food Champions).

A selection of evidence sources were subjected to detailed review to understand the impacts of a range of intervention campaigns. In addition to practice reports and academic papers, the evidence includes a number of Defra WREP research projects which have recently reported on the impact and delivery of intervention campaigns on household waste prevention. It is this evidence which provides the most substantive and up-to-date evidence base on household waste prevention. Other UK and international examples have been found and cited. From the European perspective, a key evidence source was a synthesis review undertaken by the 'Analysis of municipal waste management practices in Europe'

(ACR+), 2008. This document provided a number of examples of impact data. For further information on international examples see [L3 m5/2 \(D\)](#).

Waste prevention behaviours can be described as:

- Preventing / diverting biodegradable municipal waste, via home composting and / or using green cones, and reducing food waste;
- Donating bulky waste and external reuse e.g. using Freecycle and charity shops;
- Waste prevention projects can also be described as delivering a 'package' of measures from intense project support to providing a broad campaign mix, including the promotion of shopping locally, buying loose goods and buying in bulk, buying with less packaging, using refillables, reusing carrier bags, buying from the milkman;
- Small changes in the home, e.g. private reuse such as reusing containers, jars and bottles;
- Reducing junk mail;
- Using cloth / reusable nappies.

1.2 Top line summary - impacts

A number of key findings on the impact of intervention campaigns have been identified:

Understanding the impact of waste prevention behaviours is a relatively new concept. The NRW Toolkit¹ set out the first context for local authorities and gave guidance on monitoring and evaluating the potential impact of waste prevention interventions. Whilst a number of projects, since that time, have yielded a source of impact data, it needs to be understood that the development of bespoke waste prevention interventions and campaigns with measurable impacts are in their infancy.

The examples given in Annex 1 ('Impact Table') illustrate some of the potential impacts behind the waste prevention measures. This provides details on project duration, sample size, amount of waste prevented and an estimate of the converted kg/household/week². However, it should be noted that the data presented in the table are drawn from a range of sources and information has been insufficient to accurately judge the level of robustness. Therefore, the quality of the estimates is likely to be highly varied.

Relatively few local authorities have so far undertaken large scale waste prevention campaigns and much of the data comes from small to medium-scale projects. As has been reported in previous studies (Waste Watch, 2006, WR0105; Brook Lyndhurst, 2006, WR0504; ERM, 2007; CAG Consultants, 2008), waste prevention has not often been evaluated robustly, survey and project design vary widely, and data are routinely presented in a way that makes it difficult to decipher what they refer to (including whether they include or exclude recycling).

The evidence has been pieced together from a range of literature and, while in aggregate they do provide some sense of what may be achievable, these data come with a strong health warning. It should also be noted that, in some instances, the projects discussed engaged with only a small number of participants and **the ability to assess their potential for replication and scale up may be limited**. Further detail on the monitoring and evaluation aspects can be found in [L3 m6/1\(D\)](#).

Furthermore, the data is compounded by underlying complexity making it difficult, if not impossible, to unravel the factors underpinning how it was derived. Most notably (among the waste prevention projects delivering a 'package' of measures) the underlying issues are:

¹ NRW (2004), Household Waste Prevention Toolkit.

² The wastes prevented have been converted into kg/household/week for illustrative purposes only (where this has been possible).

- The large variation in tonnage prevented (ranging from 0.5kg/household/week to 16kg/household/week);
- Lack of clarity as to whether recycling was included or excluded in the monitoring or data;
- Lack of consistency in monitoring methodologies (e.g. from self weighing to weight based monitoring);
- Different sample sizes (ranging from 4 to >3,600 participants);
- Different durations (i.e. the length of time given to deliver the intervention varies from 1 week to 3 years);
- Different levels of support provided (from working closely with households to providing a broad campaign mix).

Due to these underlying factors, it has not been possible to identify the reasons behind why waste is being prevented. Nor has it been possible to disaggregate the individual waste prevention behaviours or measures which specifically influenced the uptake. This is because behaviour change has been supported by a number of 'enabling tools' and 'engagement promotions' – waste prevention measures have made a 'collective' rather than 'isolated' difference. An over-reliance of information provision alone is a limiting factor, however, delivering a package of interventions is important to achieving behaviour change: "an accumulation of campaigns is what will have the impact" (Dorset County Council et al, 2008, WR0116; Brook Lyndhurst, 2006, WR0504).

1.3 Top line summary - delivery

A number of key findings and lessons on delivering intervention campaigns have been identified:

Process

- Designing a marketing communication strategy or action plan at the outset is an important factor as is planning the monitoring and evaluation requirements at the design stage (Changeworks, 2008; Hampshire County Council and Brook Lyndhurst, 2008, WR0117; NLWA, 2009).
- The role of dedicated project support is deemed essential, as is the support of participating friends and neighbours and mentoring households. Enthusiastic champions are a key success factor as they maintain the groups' interest (GAP et al, 2008, WR0114; WRAP & the Women's Institute, 2008; Wickens, 2005; Brook Lyndhurst, 2006, WR0504). Well-trained doorstep teams have been well received by participants and residents (Changeworks, 2008 and Dorset County Council et al, 2008, WR0116). However, this needs to be well planned, particularly among larger audiences, so that the resource does not become diluted.
- The process of self-weighing was found to have the advantage of 'connecting' participants to their consumption practices, i.e. linked to the waste they produce, and provided personalised feedback to help reinforce their commitment. Enthusiasm was found to build momentum as participants saw a tangible decrease in their waste arisings as volunteer households are 'put in touch' with their own waste (GAP et al, 2008, WR0114; Hampshire County Council and Brook Lyndhurst, 2008, WR0117; Wickens, 2005). However, evaluation (in Hampshire) concluded that relying on self-weighing diary data carries too many risks and too high a resource cost for it to be recommended for local authority led waste minimisation projects, and that baseline plus follow up waste analysis offers a more secure option if it can be resourced.
- Partnership with other local authorities, council leaders, community and delivery organisations was found to be an essential part of the development stage.

Intervention campaigns

- In the way that slimming support schemes (e.g. Weight Watchers) do for dieters, the 'simple' formula of providing an integrated mix of information, support, encouragement, progress-monitoring and feedback has helped put people on the way to making a positive difference in their lives (Wickens, 2005; GAP et al, 2008, WR0114; Brook Lyndhurst, 2006, WR0504). This type of approach is designed to offer a structured, but informal approach to encourage feedback, own ideas and questions from participants (Wickens, 2005; Hampshire County Council and Brook Lyndhurst, 2008, WR0117).
- Total waste arisings can be reduced by delivering a supported doorstepping programme, based on individual lifestyles. This needs to be supported by a communications campaign that delivers clear messages (Changeworks, 2008 and Dorset County Council et al, 2008, WR0116). In this context, a tailored support programme of well-written and timed delivery of workbooks, guides, action plans, fact sheets, provision of training and equipment (e.g. free / subsidised and installation of home compost bins), appears to have been received well by most participants.
- Home composting and reducing junk mail provide a platform for easier to "sell" messages rather than generic waste prevention messages, e.g. 'smart shopping' (Dorset County Council et al, 2008, WR0116).
- Providing a large number of options, gives participants freedom to choose the easiest measures and ignore those they found too challenging – which could include the waste saving measures that would have the greatest impact. However, projects of this kind have to strike a difficult balance between directing participants to specific actions on the one hand, and wanting to maximise engagement on the other (Hampshire County Council and Brook Lyndhurst, 2008, WR0117).

Attitudinal

- In all cases, waste prevention has been a difficult concept to understand. It was usual to find that participants struggled to differentiate between recycling and waste prevention and were often motivated by other factors, such as saving money (Hampshire County Council and Brook Lyndhurst, 2008, WR0117 and Brook Lyndhurst, 2006, WR0504). The most significant barrier overall, though, was the general inability of participants to make a conceptual distinction between waste minimisation/reduction/prevention and recycling (Hampshire County Council and Brook Lyndhurst, 2008, WR0117).
- The focus on 'green' behaviour is a put off for those already (or perceived) to be taking part in these routines within their lifestyles (GAP et al, 2008, WR0114 and Hampshire County Council and Brook Lyndhurst, 2008, WR0117).
- Where this can be cited, there remains a disconnect between reported behaviour and actual participation (the value-action gap). This is largely based on matching the verbal commitment to waste prevention behaviour through self-reported data. There is also a lack of direct evidence to prove that such a discrepancy exists (Chung, S-S et al, Hong Kong). None of the projects went to any lengths to measure the disparity between declared and actual behaviour.
- Household waste prevention experience in Austria suggests that waste prevention developments only become viable if 15% of the population support them and if they involve a number of social groups (Federal Waste Management Plan, Austria, see [L3 m5/2\(D\)](#)).

1.4 Impact of intervention campaigns

This section provides a summary of the 'top line' impacts derived from waste prevention intervention campaigns and detailed discussions on impact data.

Top line impacts

In summary, the biggest impacts can be attributed to food waste prevention and home composting (1.5 kg/hh/wk through food waste prevention and 2.88/kg/hh/wk through home composting)³, as can be seen from Annex 1 ("Impact Table"). Impacts derived from two intervention campaign approaches (Changeworks, 2008 and Dorset County Council et al, 2008, WR0116) sustained a reduction in household waste arisings at moderate levels (0.5 and 0.98kg/hh/week respectively). These moderate levels are due to the collective impact of significantly larger sample sizes (circa 1,500 households) which include non-participating households. Projects involving small groups of participants tended to yield higher tonnage savings because they are based a small number of 'active' participants (e.g. from 14 to 127 participants). Is it, therefore, possible that the impact derived from Changeworks (2008) and Dorset County Council et al (2008, WR0116) is more realistic in terms of tonnage reduction than interventions targeting small groups? Furthermore, in Europe, four priority waste streams and initiatives have been identified by ACR+⁴ to help municipalities achieve waste reduction of organics, paper, packaging and reuse of between 70 – 140kg/individual hh/year (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

Using the above data as a benchmark, it could be estimated that intervention campaigns targeting a 'package' of measures could achieve around 0.5kg to 1kg hh/week reduction at source.

Detailed discussions on impacts

The impacts are discussed in more detail on the following areas:

- **Preventing / diverting biodegradable municipal waste** – reducing food waste, Love Food Champions, home composting and green cones
- **Bulky waste (and reuse)**
- **Waste prevention projects providing a 'package' of measures** – a summary of eight projects delivering a 'package' of intervention campaigns
- **Junk mail**
- **Cloth / reusable nappies**

Within each area a 'snapshot' is provided on the level of participation achieved. Further detail on participation can be found in L3 m3/1 (D).

Preventing / Diverting Biodegradable Municipal Waste

Reducing food waste – Total food waste is calculated to be 5.3kg/hh/week which equates to 270kg/hh/year (6.7million tonnes a year). Of this 3.2kg/hh/week is avoidable (170kg/hh/year or 4.1 million tonnes overall). The average weight of **avoidable** food waste per person regardless of household size is 1.3kg per week (which equates to 70kg/year). Food wastage from households in the Brussels region estimates potential reduction of 4-7kg/individual hh/year (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

³ Based on revised estimates from WRAP which state that 150kg/hh/year can be attributable to home composting (forthcoming).

⁴ Association of Cities and Regions for Recycling and sustainable Resource management (ACR+), Brussels

Love Food Champions, a 4 month project involving between 40-80 participants (of which 38 households provided both before and after measurements), achieved a 50% reduction in food waste equivalent to 2.5kg/hh/wk (WRAP & the Women's Institute, 2008). In terms of behaviour change, participants classified as 'Committed Food Waste Reducers' (see below) increased from 5% at the start of the project to 29% at the end of the project (the national average is 14%). There is also anecdotal evidence that participants began to notice a drop in their food bills after the first of the monthly meetings, and by the end of the project one of the participants estimated their food bills to have decreased from around £100 to around £60/70 a week. Many said they had discussed the meetings and tips with family, friends, colleagues and neighbours.

WRAP has devised a new 'Committed Food Waste Reducer' (CFWR) metric. This is used by Local Authorities to provide a measure of those who are actively reducing food waste, i.e. as a baseline and to evaluate the impact of Love Food Hate Waste campaigns. In order to establish the metric, the following three survey questions are asked of households from which the potential for food waste diverted from landfill is calculated:

- How much uneaten food, overall, would you say you generally end up throwing away? [Response: 'hardly any' or 'none']
- How much effort do you make to minimise the amount of uneaten food you throw away? [Response: a great deal]
- To what extent, if at all, does it bother you? [Response: a great deal]

A CFWR wastes 1.5kg/hh/wk of total food waste **LESS** than someone who is not a CFWR. To qualify as a CFWR a respondent has to satisfy all three conditions.

In terms of food waste collection services, Resources for change et al (2008, WR0506) suggest that food waste collection can trigger behaviour change and stimulate a further 1kg/hh/week reduction in food waste.⁵

Home composting – The most extensive work has been undertaken by WRAP (2007c) to provide detailed estimates of 'new' and 'existing' home composting households. This work has involved two rounds of waste composition analysis, questionnaires and observational studies of compost bin use and land use in gardens, follow-up work to assess change in behaviour, a telephone survey of 20,000 households across Great Britain, a household questionnaire in Scotland, and a telephone survey of 6,000 home composters.

WRAP's home compost programme has distributed 1.7 million compost bins and has diverted 530,000 tonnes of biodegradable municipal waste from landfill. The latest from WRAP (to be published) estimates that 150kg/hh/year (equivalent to 2.88kg/hh/week) is attributable to home composting.

Other research on home composting in West Sussex diverted 20,000 tonnes of waste from landfill in 2005/06 (equivalent to 5.2kg/hh/week) (Woodard & Harder, undated). This five-year home composting campaign distributed 56,000 home compost bins and 18,000 Green Cones. In Hereford and Worcester, 76,500 compost bins were sold, preventing 21,500 tonnes of biodegradable waste from landfill (equates to 1.35kg/hh/week) (Salisbury, 2008). In a 2001 study, Tucker and Spiers report the amount of kitchen waste diverted through home composting was between 1.4 and 1.7 kg/hh/week (plus 5kg of garden waste/hh/week in the summer) (cited in Tucker & Douglas, 2006a, WR0112). In Dorset, home

⁵ For more information on evaporation and food waste collections see Resource Futures for WRAP (2008) Separate Food Waste Collection Trials. http://www.wrap.org.uk/downloads/FWT_Evaluation_-_final_report.3f601bd5.5883.pdf and Eunomia for WRAP (2007) Dealing with Food Waste in the UK. http://www.wrap.org.uk/downloads/Dealing_with_Food_Waste_-_Final_-_2_March_07.aef259f5.3603.pdf Both accessed 14.05.2008.

compost bin sales in the target area increased at nearly 10 per 100 households. However, bin sales in some areas slowed due to saturation (Dorset County Council et al, 2008, WR0116). In Flanders around 25% of households compost at home (mainly in rural areas). These households are supported by 'compost masters' who provide specific advice on composting at home. Promotion of home and community composting in the County of Landkreis Schweinfurt was found to cut organic waste by 60 kg/individual hh/year (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

Insights on participation – Of those who had bought a subsidised compost bin, 41.5% had no previous experience of home composting and 51.6% had been previously home composting (usually either home-made bin or heap) (WRAP, 2007a). However, point of sale data suggests that, out of those buying subsidised compost bins, the proportion of new recruits is higher (approximately 70-75%) rather than the 45% suggested by the survey. Early research (Gray & Toleman, 2006) suggest that the observed increase in home composting participation (between 1997 and 2000) is consistent with the pattern of subsidised compost bin distribution.

Green cones – Research into green cones is limited but has found that diversion levels vary from 1.7kg/hh/week to 3.9kg/hh/week (Swabey & Harder, 2006, cited in Woodard & Harder, undated).

Bulky waste (and reuse)

Impact data focuses on how much bulky waste is collected for reuse by third sector organisations. Only top line data is available that suggests 15% of bulky waste is directed for reuse by householders (Curran & Williams, 2007). London Freecycle groups reused approximately 0.65 tonnes per 1,000 members (LCRN, 2008). It is estimated that this could equate to 1,160 tonnes of waste being reused per year (if scaled up across all of London's Freecycle groups). Widdicombe and Peake (2008) cite an estimate that in the UK 100 tonnes of material could be reused per working day (25,000 tonnes per year).

Vandenbussche, 2008, cites the annual tonnage collected for reuse for the whole of Flanders was 3.15kg/hh/yr (reused), which is equivalent to 0.06kg/person/week. Promotion of second hand trade estimates that a 'repair work day' in Munich and information on second hand shops in Vienna can generate 5kg/individual hh/year (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

Insights on participation – ACS (2006) found that 94% of their survey respondents had donated to a charity shop or furniture reuse organisation and 81% had bought from these sources. Their research suggested that promotions such as charity shop leaflets and posters may have influenced people to do so, but the report cautions that the cause-and-effect relationship may in fact work in the opposite direction, with those who reuse more likely to come into contact with reuse promotions.

Waste prevention projects providing a 'package' of measures

As outlined above, waste prevention projects analysed as part of this evidence review, yield a range of impacts (from 0.5kg/household/week to 16kg/household/week), particularly those that provide a 'package' of measures. Research on community-led projects (waste prevention and recycling) could not derive impact in terms of kg/hh because the number of participants was not clearly defined. Not all the examples reviewed related to waste prevention, i.e. a number were more about recycling (Brook Lyndhurst, 2006, WR0504).

A summary of eight projects is provided in Table 1 below where impact data could be converted to kg/hh/week (for illustrative purposes). Further detail is provided in Annex 1.

Project	Impact kg/hh/wk	Duration & Context	No of Participants	Monitoring Approach	
				Self Weighing	Collection Round
Dorset	0.50	A 3 year intervention campaign delivering a 'package' of measures to engage households, e.g. home composting, avoid junk mail and smart shopping. Used doorstep teams, community events and waste reduction packs to support delivery	1577		✓
Armadales (Changeworks)	0.98	A 1 year intervention campaign delivering a 'package' of measures to engage households in home composting and in the home activities. Used doorstep teams, a toolkit, community events and workshops to support delivery	1150		✓
Finland WP Kit	0.53	A 2 year intervention campaign supported by a toolkit for enterprises, schools and households. The campaign included seasonal events, banners, newsletters, newspaper articles and web pages	14	✓	
EcoTeams	0.62	A 5-month behaviour change project working with small groups of households (EcoTeams) who weighed their waste and undertook targeted action to reduce it	3602	✓	
RoWAN	1.87	A 13 month step by step waste prevention programme with a dedicated project worker. The project was supported by a local waste guide, fact sheets, feedback charts, community events and free equipment	127	✓	
NLWA Campaign ¹	5.97	A 1 week campaign including a launch and recruitment event to engage households in a range of waste prevention measures including reducing food waste and reuse. The campaign worked with local schools, businesses and residents	125	✓	
Aberdeen Eco challenge ²	10.10	A 2 year step by step waste prevention project (including energy and transport). Volunteer households were provided with project support and issued with a waste guide, vouchers for home compost bins, a reusable shopping bag, weighing scales and workshops	92	✓	
The Village Initiative ²	16.00	A 3 year project to engage rural households in waste prevention. The project was supported by a dedicated project worker who visited and engaged households. Households were provided with home compost bins free of charge. Feedback was provided via newsletter.	50	✓	

Table 1 Summary of impacts of waste prevention intervention campaigns

¹Is is not clear whether the campaign included data on recycling.

²Did not have a kerbside recycling collection service. In both cases recyclables were not weighed separately. Therefore, it is not possible to measure the increase in recycling levels or overall waste arisings

Details on the monitoring and evaluation approaches used in Table 1 can be found in [L3 m6/1\(D\)](#).

Insights on participation – Changes in reusable bags, packaging and shopping behaviours - Dorset County Council et al, 2008, WR0116 showed a substantial increase in the reported use of reusable shopping bags as a result of intervention. Waste Watch (2007a, WR0105) reported that 93% of participants used a 'bag for life' or own a shopping bag. Following an awareness campaign in 8 supermarkets in Italy, approximately 200,000 plastic bags were reduced (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

In terms of reducing excess packaging, notable shifts were reported in behaviours: between 20 -30% of participants started to avoid packaging (Hampshire County Council and Brook Lyndhurst, 2008, WR0117); and NLWA (2009) reported that the most common change (49 out of 125 respondents) was to start buying goods with less packaging; avoiding products with excess packaging was among the top four behaviour changes among EcoTeams. In Wallonia, Belgium (between 1999 and 2005), the proportion of customers claiming to use disposable bags fell from 89% to 53%, while those claiming to use reusable bags rose from 26% to 43%. It was found that, where shops did not give away disposable bags, shoppers made alternative arrangements (CRIOC, 2005). In Charleroi, Belgium, 3% of the population appeared to have changed their purchasing habits (after stores had provided packaging information on products) (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

In terms of changing shopping behaviours EcoTeams reported changes in food purchasing behaviour and in buying local products; Waste Watch (2007a, WR0105) reported that those buying concentrated products increased from 2% to 53%.

Junk Mail

Households 'opting out' of direct marketing are estimated to prevent 73,570 tonnes of junk mail per year. A scheme (similar to that run in Brussels involving 'no junk mail' stickers with enforcement) is estimated to reduce junk mail between 112,500 to 187,500 tonnes per year in the UK (Eunomia Research and Consulting et al, 2007, WR0103). Previous studies estimate a reduction of 0.2 to 0.4% could be achieved through reducing (non-packaging) paper waste, including junk mail (NRWF, 2004, cited in Tucker & Douglas, 2006a, WR0112). If all households refused unaddressed advertising, 13.5 kg/person/year of paper waste could be prevented (Vienna, Salhofer et al., 2008). Unaddressed mail and/or junk mail in the Brussels Region achieved a reduction of 5kg/individual hh/year (Analysis of municipal waste management practices in Europe, ACR+, 2008, see L3 m5/2 (D)).

Insights on participation - There was a 0.9% increase in the number of people in North London registering with the MPS in October 2008 (1,908 residents did so in this month) compared to September 2008 (NLWA, 2009). Between 20 -30% of participants signed up to the MPS combined with other waste prevention behaviours (Hampshire County Council and Brook Lyndhurst, 2008, WR0117). Dorset County Council et al (2008, WR0116) found there was a near doubling of registrations to the MPS in the target area.

Cloth / reusable Nappies

If 10-20% of households started using reusable nappies and reduced their impact by 10%, this could lead to an overall reduction on waste arisings of approximately 0.5-1%; a 10% switch to reusable nappies alone could save around 0.2% to 0.3% of household waste (Tucker & Douglas, 2006a, WR0112). Woodard and Harder (undated) refer to WRAP data which suggests that in 2005/06, 22,954 tonnes of waste was prevented through the use of real nappies (number of participants not reported). In Vienna, it is estimated that if 10-20% of parents switched to reusable nappies, the quantity of residual waste could be reduced by 2kg/person/year (Salhofer et al., 2008).

Insights on participation - In October 2008, 114 real nappy vouchers were issued – representing a 61% increase compared to October 2007, or a 25% increase compared to September 2008 (NLWA, 2009).

1.5 Delivery of intervention campaigns

This section provides a summary of the measures used to deliver intervention campaigns, mainly in terms of the enabling and engaging tools used to support them. The delivery of intervention campaigns has been framed around the Defra 4Es behaviour change framework. This evidence-based framework tells us that with each behaviour there are many factors which need addressing simultaneously to facilitate change. Behaviour change interventions need to reflect this complexity by providing a 'package' of measures. The Defra 4Es Behaviour Change Framework (Darnton et al, 2006) focuses on the need to:

- Enable - People need help to make responsible choices, for example infrastructure, support, guidance and information.
- Engage - People need to be involved early on in order for them to understand and take personal responsibility. There is a need to get to know your audience, understand their issues, and how to target them effectively, in order to develop 'social norms'.
- Encourage - Consider the appropriate role of taxes, economic instruments and incentives. The benefits are important as is regular feedback which is a proven incentive.
- Exemplify - What can be done to exemplify the behaviour and reinforce commitment from others?

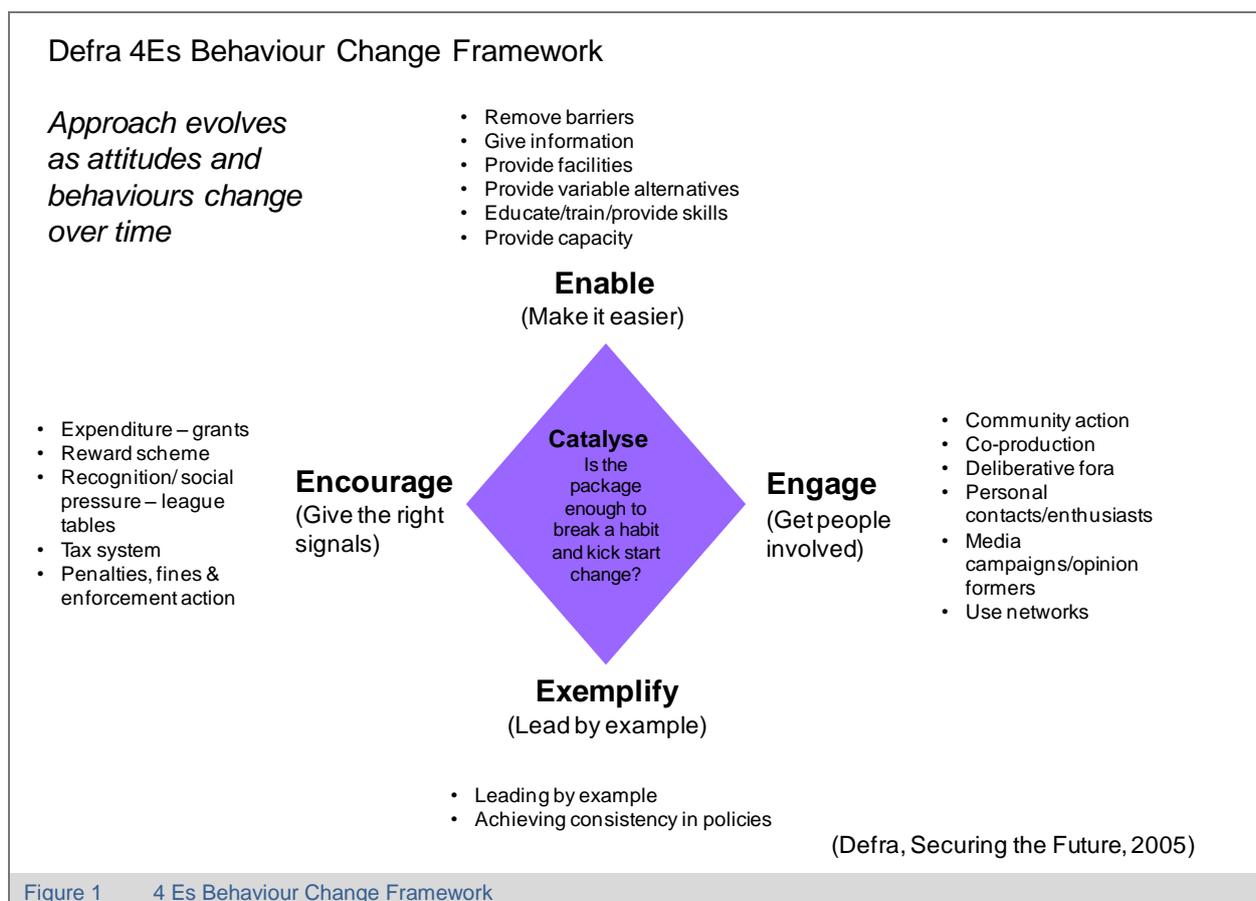


Figure 1 4 Es Behaviour Change Framework

Enabling Tools

A number of 'enabling' tools were developed to support the delivery of household waste prevention intervention campaigns. The resources provided (listed in Table 2) were designed to help motivate volunteer households and maintain commitment⁶.

In most cases increasing recycling was built-in to the waste prevention intervention campaign and, where deemed necessary, recycling sacks, storage bags, dual waste kitchen bins and recycling points, were provided (The Village Initiative, Aberdeen EcoChallenge, What Not to Waste – found in Brook Lyndhurst, 2006, WR0504). In some cases, other pro-environmental behaviours were addressed as a part of the 'package' of waste prevention measures, e.g. energy and transport issues (EcoTeams, Aberdeen EcoChallenge and Maldon Waste Away Challenge – found in Brook Lyndhurst, 2006, WR0504).

Positive lessons about communicating waste minimisation messages included the importance of enabling action through practical, achievable, lifestyle tips (rather than a general exhortation to reduce waste); and engaging participants' attention through repetition. Focusing on lifestyles rather than waste also conveyed a sense of helpfulness (rather than exhortation or instruction). Resources for Change et al. (2008a, WR0506) investigated a number of case studies, one of which was Wiltshire Wildlife Trust who strongly believed that promoting waste minimisation as part of a wider "package" of sustainable lifestyles increased participation and helped to reach more people than would be the case if their work simply focused on waste⁷. Drawbacks to the lifestyles engagement approach were also identified (e.g. in Hampshire County Council and Brook Lyndhurst, 2008, WR0117).

Love Food Champions provided a 'package' of measures. Participants were provided with workbooks, information, and kitchen caddies for measuring their waste (by volume) and were asked to rate their own abilities on the different aspects of planning, shopping, cooking and storage. A training day was held for the 'champions' who were provided with resources to hold meetings. The enthusiastic champions were a key success factor as they maintained the groups' interest. As a result many went on to discuss the project and the tips with family, friends, colleagues and neighbours (WRAP & the Women's Institute, 2008).

Engagement Tools

A number of engagement tools (promotional activities) were used to recruit and / or support intervention delivery. This involved a range of promotional tools including doorstepping, community talks, and use of media. The engagement tools are listed in Table 3⁸.

Hampshire County Council's Small Changes Big Difference (Hampshire County Council and Brook Lyndhurst, 2008, WR0117) branding provided a common identity and call to action, which avoided a general exhortation to "reduce waste" in favour of a lifestyle message. Branding is similarly central to WRAP's Love Food Hate Waste, where the call to action is clearly communicated through a brand that responds to the behavioural drivers and barriers identified through consumer research.

In addition, the Small Changes Big Difference (Hampshire County Council and Brook Lyndhurst, 2008, WR0117) campaign in Hampshire found two aspects which were especially liked and broke into participants' habitual thinking: drip-feeding information at regular intervals (rather than one-off contact at the start of the project); and providing specific tips on action that could be taken, supported by signposts to local services or other sources of help.

⁶ The list of enabling tools identified from the evidence does not mean that all the tools should be delivered or that they were necessarily successful, either individually or collectively.

⁷ See the evaluation of Defra's Environmental Action Fund for further discussion of the strengths and weaknesses of this kind of lifestyles approach http://randd.defra.gov.uk/Document.aspx?Document=EV02004_7823_FRP.pdf

⁸ The list of engagement tools identified from the evidence does not mean that all the tools should be delivered or that they were necessarily successful, either individually or collectively.

Enabling tools	Support provided
Dedicated project support or community outreach (acting as a first point of contact for participating households)	Dedicated project supervisor or officer or resource outreach advisor Specific community outreach officers either in the local authority or through a third sector partner Volunteer mentor households Outreach and business development support to third sector groups
Waste prevention guidance and support	Waste prevention toolkits, personal organiser, start up packs, challenge pack Information booklets and fact sheets, a waste reduction pack (containing information on reducing junk mail, smart shopping) Directories of local reuse and recycling centres or local waste guides Home visits Installation service, e.g. food waste digesters Repair Guide, Rental Guide, Second-hand shopping guide
Small group challenges and action plans	Activity pack or suggestions focused on e.g. school term time, new parents, work place, home, garden, children, community
Monitoring and feedback	Diaries, feedback sheets or waste monitoring forms or charts Weighing scales Weigh sacks and pin numbers Web-based database Customised feedback (responding to participant requirements), e.g. via newsletters Consistent 'hand-holding'
Special events – training and workshops	Workshops and training, e.g. home composting and reducing food waste. Youth workshops. Monthly or quarterly meetings with volunteers. Day out / visits to material recycling facilities and landfill sites. Guest speaker events. Drop in sessions. Fashion swap, give and take days, real nappy events, bag amnesties Junk exchange and repair network
Doorstep teams	Specialist or trained advisors used to deliver messages, pledges and conduct surveys – repetitive feedback
Directories - paper and online	Signposting to local services to support waste prevention, for example, reuse centres, repair services etc.
Telephone helpline	Used to support participating households
Newsletters	Regular (monthly) project bulletins or newsletters to provide information and feedback to participants
Equipment (including freebies, cash backs schemes, samples and vouchers)	Free and subsidised equipment, e.g. home compost bins, green cones, wormeries, kitchen caddies, shared shredders, weighing scales, junk mail stickers, reusable shopping bags, soap nuts, money off and incentive vouchers

Table 2 Enabling tools developed for waste prevention intervention campaigns

Engagement tools	Promotional activities
Branding	In some cases interventions were branded and used their own logo
Printed literature	Branded clothing Shopping bags Pop up banners (used for events) Posters Envelope reuse labels
Events	Launch events, fashion show, local artistry, galas and fetes, local shows, supermarket open days, talks at community events, local libraries
Intermediaries	Delivery organisations, working with schools and local businesses, compost or waste minimisation champions
Website	Websites and e-mail
Media and PR	National and local articles, press releases, and editorial coverage

Table 3 Engaging tools developed for waste prevention intervention campaigns

Encourage

The main forms of **encouragement** identified were financial incentives. In the UK incentives focused on specific waste prevention behaviours – such as subsidised home compost bins or nappies. Other examples included the provisions of ‘freebies’ (e.g. cloth shopping bags) or pledges, competitions and prize draws. The latter was sometimes administered by doorstep teams (see also L2 m3).

In the small group behaviour change models, group working was found to act as a means of encouraging behaviour change (e.g. GAP et al, 2008, WR0114). Self-weighting of waste and reporting back to the group provides an effective tool to encourage participation (and also had the benefit of making waste prevention activity visible).

Exemplify

Very few examples were found. They existed mainly in the form of campaign feedback provided to households or participants in waste challenge type projects. In Hampshire County Council and Brook Lyndhurst (2008, WR0117) staff in the local authority were recruited as one of the participating groups, to exemplify the county and waste officers’ commitment to waste prevention to the other groups in the project.

1.6 Barriers to progressing household waste prevention

Drawing from the evidence on motivations and barriers, there is a need to differentiate prevention from recycling and to promote greater awareness of practical waste prevention measures that can be taken. In general, waste prevention behaviour and options need to become more visible. People need help to identify what they can do, and how to do it well. The importance of moral or pro-environmental motivations needs to be given careful and further consideration with respect to messaging. It is important to remember that environmental motivations were identified in the literature as primary drivers of recycling behaviour before there was mass adoption, whereas now the literature shows more diversity in motivations. Nonetheless, the notion of ‘care’ – for things, the environment or the wider world - emerged as a potentially potent force (which is exemplified in the “Love Food” element of Love Food Hate Waste). The main barriers are:

- The extent to which it has not been possible to identify the reasons behind why waste is being prevented.
- The extent to which the impact of specific (or individual) intervention or campaign measures remains little understood.
- The inability of participants to make a conceptual distinction between waste prevention and recycling.
- A new and different way of intervening, targeting and messaging will be needed in order to engage new audiences, i.e. those not currently pre-disposed to waste prevention.

1.7 Opportunities for progressing household waste prevention

Performance from small group interventions and special challenges can be much greater than for blanket geographical campaigns but there are questions as to how far they can be scaled up, and at what cost. These measures, and other community outreach approaches, have been shown to provide a useful supporting role to wider campaigns (e.g. WRAP & the Women’s Institute, 2008; Worcester’s Waste Challenge Team – found in Brook Lyndhurst, 2006, WR0504). The key opportunities are:

- To consider the role of a dedicated project worker and understand what this role comprises and how training and development could be provided to extend this.
- To clarify and improve the current guidance on the use of doorstepping and how this technique is used in relation to waste advisors.
- Further work is needed to understand the usefulness and impact of guidance and information based on a similar formula to 'slimming support schemes'. Although this needs to be set within the context of a wider intervention mix.
- Self-weighting has an important role in motivating participants and connecting them to their lifestyles and waste. The lessons from this work will help to inform Defra's work on 'Unlocking Habits' whereby self-weighting provides the 'cue' to disrupting an existing habit (interventions support embedding a new one).

1.8 Researchers' recommendations

The recommendations that can be drawn from the evidence review are summarised below:

- Careful planning is needed to consider the timing and how the project fits with the local calendar and any funding constraints; and to ensure partners' expectations and operational matters are clarified at the start of a project. In this respect, potential tensions between project partners with differing objectives need to be taken into account.
- Further public engagement is needed to get across the need for reduce and reuse.
- A project officer's time is a valuable resource and resources need to be organised to maximise resource.
- Community development can provide local ownership of a project.
- Engaging with households, not initially receptive to waste prevention messages, requires concerted effort and should be enhanced by using intelligence from Council Leaders and other staff who are dealing with household waste.
- Consider ways that show householders their own contribution to reducing waste in the community.
- An enthusiastic champion is needed, but will need to be supported by the managing organisation. Mentoring systems need to invest more resources into training and enthusing mentors, ensure greater scrutiny of applicants for mentor roles, define mentor role and tasks from the outset and maintain regular contact with regard to mentor tasks.
- Promote campaigns by topic (specific waste prevention behaviour) rather than the more generic term of 'smart shopping'.
- Provide a knowledgeable doorstep team that can convey wider initiatives and support for waste prevention.

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Basis of this report

The material in this paper is derived from a large scale evidence review of household waste prevention conducted by Brook Lyndhurst, the Social Marketing Practice and the Resource Recovery Forum for Defra's Waste and Resources Evidence Programme.

Annex 1 - Impact Table

Impacts of household waste prevention behaviours						
Project / activity	Duration	Sample size	Waste prevented	Kg/hh/wk	Source	
BIODEGRADABLE MUNICIPAL WASTE						
Green cones	Unknown	Not given (assume multiple studies)	1.7- 3.9kg/hh/week	1.7 – 3.9	Swabey & Harder, 2006, cited in Woodard & Harder, undated	
Home composting	Unknown	Not given	1.4-1.7kg of kitchen waste/hh/ week (plus 5 kg of garden waste/hh/week, in summer)	3.5 – 3.8 (5 months garden)	Tucker and Douglas, 2006a, WR0112	
Home composting (WRAP)	N/A	Based on WRAP's latest estimates	150kg per household per year	2.9	WRAP 2009a	
Herefordshire and Worcestershire	Four years (between April 2004 and March 2008)	76,500 (assuming one compost bin/hh)	21,500 tonnes of biodegradeable waste diverted		Salisbury, 2008	
Community composting sector in the UK	2007	170 composting sites	21,500 tonnes composted		Slater et al, WR0211	
Food waste prevention – Committed Food Waste Recycler (CFWR)	N/A		1.46 kg of total food waste per week LESS than someone who is not a CFWR	1.46	WRAP, 2009b	
Love Food Champions	Four months	60-80 participants	2.5kg/hh/week	2.5	WRAP and the Women's Institute, 2008	
West Sussex	At least 5 years	74,000 (18,000 Green Johanna and Green Cones, and 56,000 home compost units - (assuming one cone or composter/hh)	20,000 tonnes of waste diverted in 2005/06	5.2	Woodard & Harder, undated	

	Project / activity	Duration	Sample size	Waste prevented	Kg/hh/wk	Source
BULKY WASTE						
	Reuse – private giving / selling & charity collections	Unknown	Not given	15% directed for reuse by hh 269,000 tonnes diverted		Curran & Williams, 2007
	Reuse – amount dealt with through Flanders reuse system	Annual tonnage 2007	Data collected for the whole of Flanders	6.5 kg/inhabitant/yr collected 3.15kg/hh/yr reused	0.06 /person/wk	Vandenbussche, 2008
	Reuse – estimated total amount reused by third sector organisations in London	Annual tonnage 2007	Data collated for the whole of London from surveys with reuse organisations	0.1 to 3.7 kg/hh/yr 3,777 tonnes for London in total	max 0.07	LCRN, 2008
	Bulky Waste – Freecycle	Unknown	Not given	100 tonnes/working day (equivalent to 25,000 tonnes/year)		Widdicombe & Peake, 2008
	Bulky Waste – Freecycle	One month	Bexley and Enfield Freecycle groups in London (sample unknown)	0.65 tonnes per 1000 members per month (if scaled across London)	0.15 per member	LCRN, 2008
WASTE PREVENTION PROJECTS PROVIDING A 'PACKAGE' OF MEASURES*						
	Aberdeen Eco-Challenge, Aberdeen Forward	Two years	92 households	63% reduction in <u>residual</u> waste Weight of waste to landfill declined from 16.11kg to 6.04kg/wk. Composting increased from 31% to 45% Recycling increased by 5.85 to 12.54 items/person (nb no k/s recycling or weighing of recyclables)	10.1	Brook Lyndhurst & Waste Watch, 2006, WR0504
	The Waste Wise Armadale Project, Changeworks Waste Prevention Team		Target area of 1150 households	6.1% diversion from landfill equivalent to a <u>total household waste arisings</u> reduction of 0.98kg/hh/week.	0.98	Changeworks, 2008 & SISTech, 2008
	Big Lottery Transforming Waste Programme	Three years	296 projects	23,000 tonnes of furniture reused 22,000 tonnes of waste composted	-	ERM, 2007
	Dorset County Council Household Waste Prevention Activity in Dorset	Three years	Target area of 1,577 households	0.5kg per household per week (based on <u>total household waste arisings</u>)	0.5	Dorset County Council et al., 2008, WR0116

	Project / activity	Duration	Sample size	Waste prevented	Kg/hh/wk	Source
	EcoTeams, Global Action Plan	1-5 months	3,602 (the total number of households EcoTeams has worked with to date)	Average <u>total household waste arisings</u> : Before participation 9.42kg/hh/wk After participation 8.79kg/hh/wk (kg/hh/wk is based on total household waste arisings, i.e. residual waste reduced by 0.85, recycling increased by 0.23) <i>Potential to achieve 125kg reduction in residual waste in 1 year</i>	0.62	GAP, 2008a and Nye & Burgess (GAP, 2008b), WR0114
	Espace Environment (Belgian NGO) home composting and reduce packaging (combined with variable rate charging)	Unknown	Not given	Reduction of over 50% in waste from 282kg/pp to 137kg/pp	-	Enviros, 2004
	Small Change Big Difference, Hampshire County Council	2.5 years	Potential audience of 4,700 people, of which 9% (406) signed up for active involvement. 56% of participants said they reduced their waste (18% a lot). Equates to 2% - 5% of the total potential target audience reducing their waste.	7% reduction in <u>total household waste arisings</u> equivalent to 2kg/hh/wk <i>NB this data cannot be generalised. It was robust waste composition but conducted on a trial of 4 households selected from the 406 participants</i>	2	Hampshire County Council and Brook Lyndhurst, 2008, WR0117
	North London 'Watch Your Waste Week' challenge, NLWA	One week	125 participating households returned evaluation sheets	5.97kg/hh/week (nb not clear whether included recyclables)	5.97	NLWA, 2009
	Waste Free Households, RoWAN	13 months	127 households recruited (50 regularly returned monitoring forms)	22% reduction of <u>total household waste arisings</u> equivalent to 1.87kg/hh/wk	1.87	Wickens, 2005
	Waste Prevention Kit, Viikki-Latokartano, Helsinki, Finland Waste Prevention Strategy	Two years	14 households	11kg/inhabitant/year	0.53	Wasteprevkit, 2007
	'What not to Waste', Western Riverside	Six weeks	16 households started (14 completed the project)	<u>Total household waste arisings</u> reduced by 60kg, from (approx.) 175kg/wk to (approx.) 115kg/wk <i>It is not clear if this is based on 14 participants</i>	4.3	Waste Watch, 2007a, WR0105

	Project / activity	Duration	Sample size	Waste prevented	Kg/hh/wk	Source
	Wiltshire Wildlife Trust	Three years (2005/06 – 2007/08)	Unknown	Prevented a total of 8,485 tonnes (Y1 3,168, Y2 31,156, Y3 2,161 tonnes)	-	Resources for Change et al., 2008c, WR0506
	Maldon Waste Away Challenge - working with volunteer families to undertake monthly tasks	Five months	9 families (five with 2+ children - with a pro-active attitude to waste)	Reduction in <u>total household waste arisings</u> from: (a) 127kg/hh/mth to 89kg/hh/mth or (b) 127kg/hh/mth to 109kg/hh/mth <i>The impact figures have been taken from two evidence sources and it is not clear which source is correct</i>	(a) 8.8 (b) 4.15	(a) Tucker & Douglas, 2006a, WR0112 & (b) Brook Lyndhurst and Waste Watch, 2006, WR0504

* NB In some cases, tonnage are averaged across whole populations (e.g. Dorset); in others they relate to direct participants only, especially the small scale/small group projects where self-weighing has been used. Only 2 projects used collection round data (Dorset and Armadale).