

WR1204

Household Waste Prevention

Evidence Review:

L2 m8 – Waste Prevention Evidence

Gaps and Signposts

A report for Defra's
Waste and Resources Evidence Programme

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L2 m8 Waste prevention evidence gaps and signposts

This paper provides an overview of the current waste prevention evidence base and highlights gaps that were identified in this review of evidence for Defra, through the desk research and stakeholder engagement. It covers:

- The current evidence base
- Evidence gaps
- Further development of the waste prevention evidence base

Modules providing related information are:

L1 m1 Executive Report	L2 Technical report (section 6) L2 m7 Stakeholder engagement feedback	L3 m6/1 (D) Approaches to monitoring & evaluation L3 m7/1 (D) Stakeholder views on waste prevention L3 m5/2 (D) International Review L3 m8/1 (T) Waste prevention evidence map L3 m8/2 (D) Waste prevention bibliography	L4 m1 Scoping sources L4 m2 Evidence review summaries
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(D) denotes a briefing paper providing more background detail; (T) indicates a short focused topic briefing

In addition to material consolidated in this review, the waste prevention evidence map (L3 m8/1) illustrates the areas explored in the review and provides signposts to related topic areas.

1.1 The current evidence base

The evidence review drew heavily from Defra funded WREP¹ research projects, WRAP, other Defra programmes and EA (where available). The review also looked at government, academic, consultant and some practitioner and NGO work on household waste prevention. This included UK sources as well as taking lessons from the international literature (see L3 m5/2 (D) International Review).

The WREP projects reviewed cover many different aspects of household waste prevention and related behaviour change research. The WREP projects reviewed can be grouped under the following headings (some projects span across several headings):

- *Individuals, households and communities* – a group of projects which looked at different approaches to engaging individuals, households and communities in some aspects of waste reduction activities (WR0114; WR0117; WR0504; WR0510; WR0209; and WR0208). Within this grouping two projects undertook action research to investigate small group behaviour change approaches (WR0117 and WR0114).
- *Measurement tools to analyse waste data and behaviour change* – a couple of projects whose primary focus was either the development or implementation of different monitoring and evaluation tools (WR0105 and WR0116).
- *Future lifestyle trends and forecasting* – a few projects that investigated modelling in order to understand household waste prevention behaviour (WR0107; WR0104; and WR0112).

¹ WREP = Waste and Resources Evidence Programme; WRAP = Waste and Resources Action Programme

- *Supply chain policy interaction* – one project exploring the various national and local policy measures and their impacts in addressing household waste prevention (WR0103).
- *Social enterprises and community waste sector* – a group of projects looking at the role of the third sector in waste prevention (WR0502; WR0501; WR0211; and WR0506).
- *Resource use, retail solutions and product service systems* – a couple of projects investigating the potential of retail solutions and product service systems for waste prevention (WR0106; WR0113).
- *Consolidating the evidence base* – one early project whose task was to scope the way forward for behaviour change (WR0508).

Overall the WREP projects above provide a rich source of knowledge on various elements of waste prevention. In particular, the WREP evidence base offers a complete picture on the role and state of the third sector in waste prevention activities, with the potential exception of identifying its *reuse* contribution separately from recycling; and the scale of social return on investment from third sector waste prevention activities (Hines et al., 2008 WR0502; Resources for Change et al., 2008, WR0506; Brook Lyndhurst, 2007, WR0501). The Resources for Change project provides a starting point for other researchers wanting to explore social return on investment (SROI) further, reporting as it did many of the pitfalls to be avoided.

The WREP evidence also offers insight into consumer motivations, barriers and attitudes into waste prevention (in particular, Tucker & Douglas, 2006-7, WR0112 from a modelling point of view, and the other projects from a practical point of view). The Tucker & Douglas work is very rigorous and insightful and makes a significant contribution to the academic work in this area. WRAP's work provides a practical approach to understanding consumer behaviour more from a market research point of view, and provides a valuable resource, especially on food waste, retail innovation, and home composting. WRAP is currently filling the gap in comprehensive work on reuse.

The WREP projects also provide a few pointers on lessons from monitoring and evaluation of local initiatives (reported in L2 m6, L3m6/1 (D) and L3 m3/3/ (D)). Two WREP projects (AEA et al., 2008, WR0107; Brook Lyndhurst, 2008, WR0104) provide a platform for any future modelling and forecasting work on the household component of waste prevention (L3 m5/1 (T)).

From the wider literature (UK and international academic), the review found many sources but on diffuse topics, generally driven by the interests of the authors rather than policy, and much of the evidence on any given topic was partial.

It is also worth noting that some of the most timely and useful information was identifiable in sources that would not score very highly on Defra's evidence hierarchy (i.e. in non-peer reviewed, self-reported, and sometimes partisan, sources).

Beyond WREP, a few really key sources were identified, for example:

- LCRN on reuse in London
- WRAP on consumer behaviours
- Defra funded consumer research on clothing and on approaches to behaviour change, including community action and applying behavioural theory

In addition to UK and academic sources, the international review [L3 m5/2 \(D\)](#) provided insights into suites of waste prevention policies and practices from abroad including:

- Waste prevention targets
- Producer responsibility
- Variable charging for householders' residual waste
- Communications campaigns

These topics were drawn from short case studies of practice in many European countries. Interesting examples from beyond Europe come from Australia, Canada, Japan and New Zealand.

The general picture, however, is of a mixed assortment of academic papers, consultants' reports, conference papers and presentations. This probably reflects the essentially diffuse nature of waste prevention and the current state of play of its development as an area of interest. There is an opportunity here for Defra (and WRAP, and the EA) to continue to take the research agenda forward – so we turn now to look at evidence gaps.

1.2 Evidence gaps

It is a commonplace in the time of 'evidence-based policy making' to refer to the notion of an 'evidence gap'. Superficially innocuous, the notion recedes under closer inspection: there are no definitions of an 'evidence gap', and there is no guidance on how much evidence needs not to be present before it can be declared a 'gap'.

For present purposes, we have taken an evidence gap to refer to a situation in which, in our judgment, the available 'hard data' is either an inadequate or insufficient basis for either answering a research question or developing a robust policy option. Given Defra's definition of evidence (see [L1 m1](#) and [L2 m7](#)) we are therefore relying upon 'analytical reasoning' to identify an evidence gap. We have relied on Defra's "Five Components of Robust Evidence"² in applying our analytical reasoning.

The notion of 'inadequate' refers to circumstances in which the available evidence is weak – it relies on small sample sizes, poor methodologies, unreliable estimates and so forth. Our judgment in these cases has drawn on cross-references and critiques within the literature; comparisons within the literature (where manifestly robust methodologies act as benchmarks); and the research team's experience.

The notion of 'insufficient' refers to circumstances where there is little or no evidence. In some cases this may mean there is no evidence at all; in others it means that, in comparison with other questions, there appear to be very little evidence. Our ability to reach such a judgment was critically dependent on the scale of the literature search, and its quality. In the case of the former, the total search space – more than 800 sources – is large, and was developed in a series of waves expressly designed to search in areas where earlier waves indicated apparent 'gaps'. In the case of the latter, a very large proportion of the literature reviewed had been peer-reviewed; while the WREP studies, in particular, represent a very significant and substantive body of work upon which we felt able to rely.

² <http://www.defra.gov.uk/science/how/documents/Wallchart.pdf>

Furthermore, and in the case of both inadequacy and insufficiency, we made explicit use of expert, informed opinion. Our engagement with stakeholders, our expert panel and our expert interviewees specifically focused on 'gaps', both to corroborate the judgments being developed on the back of the literature review and, where relevant, to plug 'gaps' through further reference to published material.

In this module, therefore, assertions that there is an 'evidence gap' are made primarily on the basis of the literature; and if the proposition that there is such a gap has come more directly from stakeholders (which might indicate either that we were unable to corroborate through the literature that such a gap existed; or which might indicate that a gap is more apparent than real) then this is clearly indicated in the text.

An overarching issue which arises across all aspects of waste prevention is the nature of the data available, in particular:

- low quality data
- lack of waste prevention data – both on the **amount of activity** underway and its **impact**

The evidence review highlighted certain gaps specific to the four entry points (or points of influence) in the analytical framework for the review:

1. monitoring and evaluation;
2. voluntary action by consumers/households;
3. external system drivers – services or products; and
4. policy measures

Key evidence gaps under each heading are identified as follows.

1 Monitoring and evaluation: gaps and issues

A significant proportion of the evidence gaps identified were to do with monitoring and evaluation. In particular, the evidence review highlighted a **lack of consensus and best practice** on how to do monitoring and evaluation (L3 m6/1 (D)). The following is a summary of the key issues picked up in the review.

Limitations of monitoring and evaluation techniques

The review unearthed many different monitoring and evaluation techniques (self-weighing, surveys, compositional analysis, etc.) but there seems to be a lack of appreciation of the limitations and value of each of these techniques. The forthcoming update of the WRAP monitoring and evaluation guidance will draw on current evidence and practice to provide a better basis for common practice in future

Lack of knowledge about how to deal with common measurement issues

Working out attribution of impact to specific measures, and the use of conversion factors (e.g. items to tonnes, material to carbon) was another area where there was either a lack of transparency or lack of information. A notable exception is the FRN standard weights table (which is already flagged in Defra's best practice guidance on bulky waste).

Issues around operationalising techniques

The review suggests that there is a wealth of existing information on monitoring and evaluation available but the *experience* of doing it needs to be consolidated, and in a very particular way. Local authorities in particular need guidelines on how to operationalise techniques that are fit for purpose. Again the new WRAP guide may help bridge some of these gaps.

Data interpretation

Stakeholders and expert interviewees agree that the information on monitoring and evaluation exist but the problem is that practitioners may not have the time, know-how, resources, skills or interest to implement monitoring and evaluation techniques. Hands on support and training to projects undertaking evaluations may be indicated here (e.g. in Defra's Greener Living Fund model) and could occur through further developing the training already provided by WRAP.

Inconsistent quality of practice in data reporting

The quality of data reporting uncovered by the review also presents an evidence gap as it is not consistent across sources. Evidence gaps are at times due to issues with the reporting of the data rather than the data itself. For example, self-weighing as a technique is not a problem in itself but it is the reporting and recording of the data which could be problematic.

In addition to these high level issues relating to monitoring and evaluation the review also identified gaps and weaknesses in practice in relation to specific techniques, as follows (see also [L3 m6/1](#)).

Use of waste composition data

The evidence base seems to recognise the importance of compositional analysis but most times this is not assessed in conjunction with behavioural surveys. It is recognised that compositional analysis is expensive; however, local authorities would benefit from understanding the need for linking compositional analysis and tonnage data on the one side and attitudinal survey data on the other. The new WRAP guidance will help address this issue.

Flawed survey design

The evidence base also highlighted a lack of good survey design (e.g. ensuring question wording around actual behaviour rather than intention is used or using questions which address frequency rather than binary yes/no questions so that the intensity of the behaviour can be established). The development and up-take of the various WRAP metrics and the Defra EBU tracker will provide a useful survey resource, as will the M&E toolkit. A standard question bank or best practice guidelines on question design, together with information on how questions can be combined and results interpreted, would be useful.

Use of conversion factors to estimate weight reductions from proxy measures

The evidence base revealed gaps in the use of conversion factors as there is no standard practice (e.g. a specific case is relying on visual check on volumes to estimate reduction - compaction issues are introduced if relying on residents to estimate the fullness/volume of their bin). In areas where conversion factors have been developed (e.g. FRN standard weights for furniture or LCRN carbon measures) these may not be widely recognised and used.

Lack of data on the cost effectiveness of interventions

The evidence review also found a lack of data on the cost effectiveness of interventions. There is a need to consider the balance between reach and effectiveness when selecting programme strategies (Hampshire County Council and Brook Lyndhurst, 2008, WR0117). This evidence gap was also highlighted in the [International Review L3 m5/2 \(D\)](#) which found that waste prevention cost-effectiveness data were rare.

It is worth noting that the monitoring and evaluation evidence gaps identified in our review chime with those identified by the stakeholder engagement exercises (see chapter 7 of the technical report, or [L3 m7/1 \(D\)](#)). Specifically, workshop attendees identified a general lack of 'hard' (i.e. quantitative) data on both impact or potential benefits of waste prevention activities; and difficulties in attribution or pinpointing which specific waste prevention activity or promotion resulted in the quantitative outcome.

The international review highlighted the same issue. It found that waste prevention is hard to measure and it is difficult to demonstrate a consistent direct link between specific policy instruments and measurable waste prevention achievements.

2 Voluntary action by consumers/households: gaps and issues

The literature reviewed offered a well rounded picture of the waste prevention behaviours which are practised as well as the barriers and motivations behind these actions. However, some of the gaps identified include:

Consumer messaging and the impact of campaigns

There is generally a lack of knowledge on which kinds of waste prevention campaign messages inspire or engage the public (with the notable exception of some of WRAP's very detailed consumer work). As discussed in detail elsewhere in the review (e.g. [L2 m3](#), [L2 m6](#), [L2 m7](#)) little robust campaign evaluation data exists to quantify the outcomes of local authorities' work with the public.

Realistic estimates of potential participation

The evidence reviewed did not address reaching behavioural saturation points with certain waste prevention activities (e.g. home composting), or what would be a realistic 'capture' rate of activity in any particular behaviour.

Gaps in knowledge for specific waste prevention behaviours

WRAP has undertaken a wealth of research on waste prevention behaviours, most notably on food waste, but also nappies and home composting. There are still gaps, however, notably in relation to detailed understanding of consumer attitudes to different kinds of reuse³, such as for appliances, furniture and so on (as has been done for sustainable clothing in Defra's consumers division to complement work on sustainable product roadmaps, for example).

How cash incentives work and their limitations

The evidence highlighted a lack of knowledge on how incentives work for individual waste prevention behaviours⁴. For example, there is little knowledge of the impact of incentives for activities like

³ WRAP has recently undertaken work to understand attitudes to reuse generally to inform its own messaging work.

⁴ Some evidence on incentives e.g. "Evaluation of local authority experience of operating household waste incentive schemes", AEAT for Defra (2005), and "A brief evaluation of pilot household waste recycling incentive schemes", Harder (2008) focussed on recycling and therefore fell outside the purview of this review.

providing a cash incentive for reusable nappies or a subsidised bin for home composting. It would be worthwhile to investigate the impact of these incentives on kick starting these projects as well as what happens when they are withdrawn. The impact of these financial incentives on commitment and motivations would also be worth investigating. This links to other projects carried out by the Environmental Behaviours Unit at Defra⁵.

Modelling waste prevention behaviour – addressing the limitations of existing models by investigating specific waste prevention behaviours separately

It is worth remembering, as Tucker and Douglas (2006b, WR0112) and Barr (2007) point out, that approximately 70% of behaviours go unexplained (see L3 m5/1 (T) for a discussion of models). There are significant gaps in the explanatory power of the models. A natural question which follows is 'are the right variables being used as input?'

There might be a need to investigate individual waste prevention behaviours as many will draw on different variables (e.g. consumption patterns will be relevant for smart shopping but not necessarily for home composting). The evidence review hints strongly that there is no such thing as "waste prevention behaviour" from a consumer point of view and that to be understood properly it needs to be examined in its constituent parts.

The evidence base is also thin, and sometimes conflicting, when it comes to ranking the motivations which encourage consumers to take part in waste prevention behaviours.

Relationship to recycling – negative spillover of attitudes or habits as a possible block on participation in waste prevention

The evidence base reviewed did not address the possible negative spillover effects in waste prevention activities. For example it may be worth investigating further if/how recycling acts as block to the uptake of waste prevention behaviours and the possible rebound effects from consumers saving money by doing waste prevention activities (i.e. the possibility that having saved money by undertaking a waste prevention activity, a consumer spends the money saved on an activity that in turn produces waste, thus reducing the net effect). A small number of academic papers have addressed this issue (e.g. Tonglet et al., 2004; Thogerson, 1999) but it has only begun to be explored at a practical or consumer level (e.g. in Brook Lyndhurst, 2008, WR0117).

Ethnographic research and longitudinal study

There is a need for more observational research into 'what consumers actually do rather than what they think'. Virtually no-one⁶ has yet undertaken longitudinal or ethnographic research on waste prevention (probably because it is very expensive) but observing how consumers actually deal with waste in the home, over a period of time, might provide highly useful insight on the context of lifestyle and the lack of visibility of many waste prevention behaviours. OVAM (2008) suggests research should also be conducted in retail environments (what they call "the shopping floor"). This could be a way of investigating consumer attitudes to retail solutions and refillables, for example.

Long term tracking is equally important to know whether behaviours are sustained (e.g. as is now commonly the case with local authority participation monitoring of recycling).

⁵ University of Surrey for Defra (forthcoming), Investigating motivations - focussing on specific segments and behaviours. EV0407. and Brook Lyndhurst, Open University and University of Surrey (forthcoming), Exploring catalyst behaviours. EV0508.

⁶ A notable exception is Catherine Alexander at Goldsmiths London University.

3 External system drivers – services or products: gaps and issues

As discussed previously, the WREP evidence base offers a wealth of information in terms of the third sector's role in waste prevention. However, the data generated is quite poor and disparate, both in terms of the extent to which **reuse behaviours** are practised and the **overall impact** in terms of diversion of waste tonnages for the reuse sector. The data reviewed varies significantly across sources and there are questions around the validity and robustness of certain data sets.

On this note WRAP has commissioned AEA Technology and Resource Futures⁷ to investigate the potential of the reuse sector, and Brook Lyndhurst to explore consumer understanding of reuse. These projects will help consolidate the available data on the impact of the reuse sector and establish a robust estimate of the overall tonnage diversion impact of the reuse sector, based on Defra's latest research on the composition of municipal solid waste.

There needs to be ongoing commitment from government and other stakeholders to the timely collation of accurate and comprehensive evidence on reuse activities (including hard data on activity as well as consumer attitudes) if the UK is to develop an effective reuse economy.

4 Policy measures: gaps and issues

The evidence gaps identified in the review with regards to policy measures can be divided into two types:

- those related to options to encourage stakeholders;
- and those aimed at households directly via local authority collection services

In relation to policies to encourage stakeholders the main evidence gaps identified were:

Lack of impact data for high level policy options

There is little secondary evidence on the attribution of tonnes of waste prevented to specific policy measures (e.g. voluntary agreements); what is known mainly comes from Eunomia's WREP project (Eunomia et al., 2007, WR0103). The International Review L3 m5/2 (D) echoes this point as it was very difficult to demonstrate from the literature a consistent direct link between specific policy instruments and measurable waste prevention achievements. Primary research would be required to collate impact evidence on specific policies – but a key issue here is that policy implementation can change so quickly that evidence may become out of date quickly.

Conceptualisation of how to measure waste prevention

Furthermore, there is a lack of 'theory' on what would need to be known, or seen, to know if a policy option has made a difference (e.g. how to conceptualise the impacts on product lifespan with regards to extended product warranties).

Transfer of data and insight into different international contexts

The evidence also highlighted that different waste definitions at member state level makes the transfer of knowledge from one country to another difficult. The recent implementation of the Waste Framework Directive may help address these issues.

⁷ AEA et al. for WRAP (forthcoming), Waste Re-use Drivers – Activities and Opportunities for WRAP.

With respect to policies to encourage changes in household waste prevention behaviour, the gaps identified at this level related to:

Direct variable charging

The review included evidence sources that reported on direct charging of households for waste services (see L2 m5). The evidence base suggests that the data on the impacts of charging varies greatly depending on the type of charging implemented. Furthermore the impacts generated by charging are not easily translated to the UK context (Dunne et al., 2008; Eunomia Research and Consulting, 2006; Skumatz, 2008; Gordon Mackie Associates Ltd, 2007).

Waste prevention officers

An evidence gap also exists in terms of understanding the influence and impact of a local authority (or, indeed, any other stakeholder) having a waste prevention officer and/or a dedicated outreach resource. The question worth answering would be: *'Is it cost effective to have such a resource in terms of the wider participation and tonnage benefits?'* There is a suspicion that the answer is yes (see, for example, recommendations in Brook Lyndhurst, 2008, WR0117) but there is no convincing, consolidated, evidence available to make the case either way. Subsidiary questions – such as where could such an officer best be located, and what additional resources ought to be at their disposal – could reasonably be part of further investigation.

Strategic planning for waste prevention

Local authorities are in need of best practice guidance on how to develop strategic plans and targets for waste prevention. , However, this gap is being partially bridged by WRAP's Waste Prevention Toolkit and its supporting training programme.

Role and effectiveness of local authority/stakeholder partnerships

Further investigation is needed on the types of agreements and partnerships between local authorities or the third sector and retailers in existence, and what needs to be in place to make them work. There is some emerging practice (e.g. M&S/Oxfam⁸; Belfast City Council⁹) and this evidence needs to be captured. This might take the form of the development of a 'how to' guide with best practice case studies illustrating strategic level relationships between local authorities and retailers to support household waste prevention.

Whether waste collection arrangements result in waste prevention behaviour

The evidence base reviewed did not address the impacts of different waste collection system designs on waste prevention. However, as mentioned previously, Defra WREP has commissioned Resource Futures to do an in-depth investigation into the impacts of scheme design on waste growth.

Relative performance priorities

There is also a lack of evidence on the relationship between costs, waste diversion and carbon at local authority level-. This is an issue which requires attention at the national waste strategy level, where it would be possible to develop methodologies that – for example – took full account of embedded carbon in calculating the relative cost/diversion/CO₂ costs and benefits of different waste prevention options.

⁸ <https://www.oxfam.org.uk/donate/shops/marksandspencer.html>

⁹ http://www.wen.org.uk/NappyPartnerships/Nappypartnerships_Belfast.htm

Both regional workshop attendees and stakeholder respondents to the second electronic survey identified a lack of knowledge of the carbon impacts of stakeholder priority actions (information and partnership working, third sector capacity building and household incentives).

1.3 Further development of the waste prevention evidence base

Overall, the evidence review has highlighted a general lack of *consistent* data both in terms of impacts of waste prevention policies and behaviours as well as the extent to which these policies and behaviours are practised. In particular, the review has identified a need to consolidate the data available and highlight best practice case studies. The challenge going forward will be to put in place processes that:

- can capture the practice data in 'real time' (rather than retrospectively which has been the case up until now)
- continue to use central resources to develop consumer insight on key activities that can then be disseminated to local authorities
- will develop a suite of best practice guidance on aspects of waste prevention; and are capable of tracking both consumer and tonnage trends.

Table 1 outlines possible avenues for future research developed from the gaps identified in the evidence base. Given the breadth of the 'evidence gap', the number of entries in the table is high. Different stakeholders will, of course, have different priorities: and whilst in our view all of the items listed need attention, the research team's recommended short list of priorities for consideration by WREP is highlighted.

Entry point	Possible research options	Possible guidance options
Monitoring & Evaluation	<ol style="list-style-type: none"> 1. Feasibility of using compositional analysis in local campaign evaluation 2. Waste prevention behaviour tracking (Defra EBU survey) 	<ol style="list-style-type: none"> 1. M&E guidance¹⁰ 2. Standard survey question bank (e.g. develop WRAP question bank) 3. Standard metrics for impact (e.g. LFHW, home composting)
Voluntary action by consumers	<ol style="list-style-type: none"> 1. Consumer research on attitudes/behaviours to different reuse actions (e.g. appliances as part of Defra road map work programme) 2. Modelling – adoption curves for behaviours & saturation limits 3. Centrally co-ordinated consumer research specific to individual behaviours, repeated over time, and disseminated to stakeholders 4. Negative spillover from recycling and ways to overcome (small scale qualitative research) 5. Observational/ethnographic in-home study of waste prevention action to identify lifestyle behaviour change levers 6. Longitudinal follow-up of selected campaigns, with robust method, to quantify sustained behaviour change resulting from interventions 7. Cost-benefit of dedicated waste prevention officers and/or outreach 	<ol style="list-style-type: none"> 1. Best practice guidance on campaign messages, including case studies that have worked 2. WRAP toolkit – plan for continuing dissemination & profile post launch, including training for local authority officers and others
Stakeholders	<ol style="list-style-type: none"> 1. Commitment to continual improvement of data on bulky waste and the reuse economy – WRAP/Defra liaison 2. Case study research of reuse partnerships with local authorities, how they work, model service contracts, impacts, benefits and ways of overcoming barriers (including overseas examples) 3. Case studies of retailer/stakeholder partnerships for reducing household waste, to support best practice guide 	<ol style="list-style-type: none"> 1. Dissemination ‘fact sheets’ from WRAP retail innovation programme aimed at the public– to help LAs engage the public on waste prevention and counter personal responsibility barrier regarding packaging (see section 2) 2. Best practice guide for LAs on reuse partnerships based on research insights 3. Best practice guide to local authorities on working with retailers to prevent household waste
Policy measures	<ol style="list-style-type: none"> 1. Modelling – relative benefits of recycling and waste prevention, and priorities for waste/costs/carbon, to support local authorities in making the business case for waste prevention 2. Examination of case studies of ‘early adopter’ local authorities of strategic waste plans & prevention targets, identifying factors for success and risks. 3. Modelling & scenario testing extended product warranties; consumer attitudinal research on warranties in context of product lifespan 	<ol style="list-style-type: none"> 1. Continuing update of Best Practice guidance to local authorities on how to develop strategic plans and targets for waste prevention (already part of training support to WRAP toolkit)
Cross cutting	<ol style="list-style-type: none"> 1. Role of financial incentives (<i>NB excluding direct charging</i>) in supporting waste prevention, including scoping options as part of research. e.g. <ul style="list-style-type: none"> ◦ impact of credit crunch on consumer attitudes to prevention ◦ product subsidy, impact of withdrawal or tapering (e.g composting) ◦ reuse - employment subsidy, tax treatment of repair etc. 	

Table 1 Evidence gaps for household waste prevention

¹⁰ These options will be covered in the forthcoming revisions to the WRAP monitoring & evaluation toolkit.

1.4 Bibliography

The following are references to **Defra WREP** and **WRAP** sources and papers by others that are specifically mentioned in this paper. A full bibliography for the whole evidence review can be found in module **L3 m8/2 (D)**.

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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.