

**WR1403: Business Waste Prevention  
Evidence Review  
L4m4 – Critical Review**



A report for  
Defra

November 2011

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## Context of Project WR1403

Waste prevention is at the top of the waste hierarchy. A major priority of the coalition government is to move towards a zero waste economy, and an important element of this will be to encourage and increase waste prevention. This review aims to map and collate the available evidence on business waste prevention. It will help inform the preparation of England's National Waste Prevention Programme as required under the revised EU Waste Framework Directive (2008).

The focus is on aspects of waste prevention that are influenced directly or indirectly by businesses - it complements a previous evidence review, WR1204, which focused on household waste prevention. The definition of the term 'waste prevention' used here is that in the revised Waste Framework Directive:

*'Prevention' means measures taken before a substance, material or product has become waste, that reduce:*

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;*
- a) the adverse impacts of the generated waste on the environment and human health; or*
- b) the content of harmful substances in materials and products.*

Recycling activities or their promotion are outside the scope of this review.

## Context of this module

This module is one of a number of Level 4 modules that comprise technical annexes to the main report. This module deals specifically with the conduct of, feedback from and dealing with issues arising from the critical review of the findings by a panel of acknowledged experts in the field.

A full map of the modular reporting structure can be found within **L1m2: Report Index**.

# 1 Purpose of the Critical Review

Defra and the project team are committed to operating an open and inclusive process for this evidence review. Efforts have been made in the evidence-gathering phase to ensure that both known experts and the wider community of waste prevention specialists have been able to contribute to and provide balance to this work. The approach to this phase is described within **Appendix L2m1-A: Bounding the Scope of the Review** within the introductory module **L2m1: Introduction**.

With the report substantially complete, a second phase of detailed critical review of the work has been commissioned. A group of experienced practitioners has been invited to review both the **L1m1: Review Overview Report** and specific modules pertaining to their specialist areas.

This document anonymously aggregates their responses to the review questions and documents the team's responses and actions on the points raised.

# 2 Method of the Review

## 2.1 Panel

The following specialists, in alphabetical order, comprised the review panel:

- Barbara Morton, Independent Consultant
- Jane Gilbert, Carbon Clarity
- Martin Gibson, Speedy Services
- Professor Paul Phillips, University of Northamptonshire
- Roy Watkinson, Independent Consultant
- Professor Steve Evans, Cranfield University
- Veronica Sharp, Social Marketing Practice.

We thank them sincerely for their time and praise the quality of their responses.

## 2.2 Process

To simplify the procedure, the reviewers were asked to consider, using a proforma, some key aspects of the project. In brief, each detailed module of the report – related to Sectors, Interventions (mechanisms for action), Attitudes & Behaviours and Approaches (classification of actions taken by businesses) – presented its evidence followed by a Conclusions section. The conclusions comprised three elements: Learnings, the more strongly evidence findings; Insights, the less well evidenced or contextual commentary; and Research Gaps, where future work may be beneficial. Against this background, the reviewers were asked to consider the following:

- Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?
- Are there significant aspects of the topic absent, where they would significantly alter the Conclusions (either adding to, removing or amending)?
- Are the Research Gaps reasonable and would they be usefully addressed? Have these Gaps been addressed elsewhere, or are others indicated?
- Other comments.

With the proformas completed, signed and returned, the project team reviewed each, considering all points. Clearly, in a short period of review, the panel could not be expected to grasp the full background, context and detailed scope of the work. Accordingly, some comments, whilst fair on a stand-alone basis, could be dismissed as falling outside the remit.

- Some comments indicated useful points of clarification (often in relation to the role and scope of existing organisations and initiatives) with significant change of emphasis in one or more conclusions, and have led to modification of the reports.
- Other comments indicated new sources of material that had arisen after the close of evidence gathering. These have been indicated to Defra for ongoing update of its evidence base.
- Many further research gaps were identified and will largely be passed to Defra for consideration once the strategy and policy development is complete.

The considerations of the responses are indicated by Word track comments in the text. Responses are presented in the following section, in the order of report modules, and have been anonymised for each reviewer. For convenience, a truncated index of modules is provided below.

WR1403: Business Waste Prevention Evidence Review Report Index	Level 1	Level 2
	Executive Reports	Full Report
Description		
Executive Summary	L1m0	
Review Overview Report	L1m1	
Document Map	L1m2	
Full report modules comprising...		
Introduction (Report Framework)		L2m1
Approaches		L2m2
Behaviours		L2m3
Interventions Introduction		L2m4-0
Standards		L2m4-1
Labelling		L2m4-2
Procurement & Supply Chain		L2m4-3
Commitments & Voluntary Agreements		L2m4-4
Communications		L2m4-5
Incentives		L2m4-6
Business Support - Waste Minimisation Clubs		L2m4-7
Business Support - Other Business Support		L2m4-8
Sectors Introduction		L2m5-0
Construction & Demolition		L2m5-1
Food & Drink		L2m5-2
Hospitality		L2m5-3
Retail		L2m5-4
Automotive		L2m5-5
Office-Based Services		L2m5-6
Hazard Reduction		L2m6
Metrics		L2m7

Note that L1m0, L2m1, L2m4-0 and L2m5-0 were not distributed as part of this review process since they contain only introductory or derived materials from the other modules.

## 3 Reviews and Consideration of Issues Arising

### 3.1 L1m1 Review Overview Report

Module: L1m1: Executive Report (r3)
<b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b>
<p>The findings are generally justified but miss some of the high level issues that would really help to make a step change in policy. This document can make some very important points that will help Government to set policies that embrace true waste prevention. I have made comments on this in the next box.</p> <p>Regarding the Learning's and Insights: Section 5 Findings: Approaches Learning</p> <p>One major learning point that really should be brought out strongly at the start is that waste reductions should not be treated in isolation from material, water and energy reduction. Companies that have been most successful have taken a management approach that does not differentiate between these arbitrary boundaries. One of the clearest early examples of this was the Aire &amp; Calder Project. This project was initially focussed on water and effluent reductions but the results gave reductions in material use, waste generated and energy, as well. Read the initial Aire &amp; Calder report for confirmation of this. A number of Environmental Technology Best Practice Programme and Envirowise case studies show how a general approach to waste minimisation leads to water, energy, solvent and reduction and I have attached some early ones to help demonstrate this.</p> <p>The second paragraph in this is difficult to read and in a different style to other areas. Without seeing more detail it is also hard to judge its accuracy but it seems to be an oversimplification. Extending product life is undoubtedly a good thing but only if the product is used for an extended period. My anecdotal experience would suggest that we are using products for shorter and shorter periods of time. For examples, buildings from the 1960s and 1970s are often demolished, many goods are now considered consumables that used to be fixtures – for example, mobile phones as opposed to landline phones.</p> <p>Section 6 Findings: Behaviours and Attitudes Learning</p> <p>The first paragraph here is true but could be made more helpful. Surely, many businesses change approaches and processes for other reasons and these lead to waste prevention. It is likely that more waste is prevented as a consequence of other business improvements than as a direct consequence of 'waste minimisation' activities.</p> <p>'Engaging SMEs in waste prevention'</p> <p>This section plays to the misconception that SMEs are a business segment – they are not. Segmentation of a market is used to help classify companies by characteristics that make them easy to reach. As SMEs make up about 98% of businesses in all OECD countries, they are not a meaningful market segment. It is true that there are some characteristics that smaller businesses have in common but that does not help in marketing to them. If you want to engage SMEs in waste prevention, you need to segment them in a meaningful way and that is not by size.</p> <p>7.1 Standards Learning</p> <p>I think the second paragraph is not helpful. The first paragraph is undoubtedly correct. Another issue is that many auditors do not understand the environment or waste prevention but I don't know of any evidence for that other than experience.</p>

**Comment [DP1]:** Point made in summaries.

**Comment [DP2]:** But that is a deliberate norm in Japan, for example; it could be a great enabler of e.g. upgrading energy efficient housing. A question of perspective!

**Comment [DP3]:** True, but how do you unpick that!

**Comment [DP4]:** Point well made and reiterated in the L3 module.

**Comment [DP5]:** Checked. I think this provides useful background for policy.

### 7.7 Business Support: Waste Min Clubs

#### Learning

The first point is true but rather misses that fact that [Enviowise] specifically changed the name of clubs to resource efficiency clubs because the best business and environmental outcomes usually occurred when issues of material use, water use and energy use were treated together. [edited – for brevity].

**Comment [Sam6]:** Point adopted.

### 7.8 Business Support - Other

#### Learning

The point about 'Waste prevention is not generally the main focus of relevant business support programmes' is not really correct. The Environmental Technology Best Practice Programme (ETBPP which became Enviowise) was set up to work from the top of the waste hierarchy down. [edited – personally identifiable info] What stopped more government programmes doing this was the policy focus on diversion from landfill. There were no inherent difficulties in supporting waste prevention. The ETBPP/ Enviowise ran for more than 15 years and over that time was probably the single largest business support programme other than the Carbon Trust. [edited – for brevity] Only recently has the remit of WRAP been expanded to the wider business audience.

The point about 'Business support has focussed on the food and drink, retail and construction sectors' is also not really correct. The ETBPP started out focussing mainly on manufacturing industries, including foundries, metal finishing, glass and rubber and plastics. It also produced generic guidance on waste minimisation and cleaner technology but this was mainly for manufacturing companies. (Please see my feedback on the L2m4 for more detail.)

**Comment [Sam7]:** Caveat included.

### 8.5 Automotive

#### Learning

Surely the automotive sector has had huge success with the extension of life of their products? Before the mid-1990, few cars lasted more than 10 years because they rusted so badly. Improved metal finishing has greatly extended the durability of vehicles.

**Comment [DP8]:** True. Metal finishing has been included.

### Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?

In case this fits better here, I will repeat it:

One topic that really should be brought out strongly at the start and that is that waste reductions should not be treated in isolation from material, water and energy reduction. [Comment edited, but continues to expand on this topic.]

I agree that the terminology is important. [edited – personally identifiable info] Talking about waste immediately reduces the scope of this issue in most people's minds and it is then dealt with once it has arisen as waste. [edited – comments beyond remit]

Something that has stuck me for a long time is that it is easy for people to understand and visualise the bottom of the waste hierarchy but much harder at the top. Indeed, the level of understanding of a step of the hierarchy varies inversely to its position on the hierarchy (perhaps the level of understanding is the reciprocal of the hierarchy position counting from the top down!).

**Comment [DP9]:** I think our framework reflects this

Finally, true waste reduction comes from focussing widely on the outcomes of a product or service. Businesses need to focus on how to obtain the desired outcome using the minimum materials, energy and water across the life cycle. Focussing, as has been the case, simply on diversion from landfill, gives unintended consequences across the rest of the life cycle. An example that I find useful is the transformation of music players over the last 30 years: they went from large stereo systems with records, through smaller CD systems to the MP3 players of today. The mass of material has greatly diminished but the outcome is the same.

**Comment [DP10]:** Adequately covered under PSI



<b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b>
I thought there was some merit in the research gaps, however, I think there is also merit in research to identify how waste prevention benefits from being treated together with energy and water efficiency.
<b>Other comments</b>

**Comment [DP11]:** Covered in the metrics section and elsewhere.

<b>Module: L1m1: Executive Report (r4)</b>
<b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b>
Summary. A very satisfying Module with very few issues that need addressing. Meets Defra requirements.
<b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b>
<b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b>
<b>Other comments</b>
<p>As this module is based upon the distinct content of the other Modules I think it best if I do not use the 4 headings but deal with it in a flow from 1 to 11.</p> <p>Some very initial points:</p> <ol style="list-style-type: none"> <li>It may be wise to consider a short initial section on horizon scanning and the likely developments in legislative drivers in the coming near future. This will help show that this work is based upon the analysis of the past context and that may well be transformed over a horizon of say 3 – 5 years. NetRegs of course has a good section on future legislation. Also considering the zero waste agenda by 2050 etc and the move towards increased synergy between MSW and C&amp;I this may help show the context.</li> <li>Do you need a very short section on best practice programmes early on?</li> <li>A short comment on economic conditions as many of the case studies used were in a time of less restraint. Near future prospects?</li> <li>Consistency. In some places values are used e.g. page 42 e.g. 39.4 million tonnes. In most other places this is not used.</li> <li>Care at times by being very sweeping and suggesting that nothing done on a topic etc. Best say very limited evidence of substantial work etc. Also consider the use of sometimes quaint phrase e.g. dog on page 11 in 4.1. Best change these types of wording.</li> <li>Good to see the international input as well. Makes stronger case.</li> </ol> <p>The main headings are of course spot on and you have made a very real contribution by meeting the brief from Defra in a most excellent way. This is very high grade and well researched work that is going to make clear contribution. The activities out of scope are correct and it is most helpful to see them.</p> <p>2. Analytical framework Spot on this section. Very clear and concise and says it all. Fits the remit very well. All section 2.1 onwards is valid and informative. Section 2.4 has the clear cement on which sectors and why – correct</p>

**Comment [Sam12]:** Out of scope

**Comment [Sam13]:** Covered in L4 module on historic context.

**Comment [DP14]:** Out of scope.

**Comment [Sam15]:** Point taken and variously implemented

### 3. Evidence review statistics

Extremely helpful and summaries so much in a short space. Very readable and helps frame the context for the reader. Shows the large extent of this research. It is an eye opener on how much studied and analysed. Major contribution to understanding the need of this project.

#### 1.5. Findings

Again spot on. Well described and summarises the very extensive situation extremely well. It makes the reader see that you have focussed and therefore have authority in what you have presented. In Approaches you have correctly identified that WM is more prevalent than Green products etc. Very good and very helpful in seeing way ahead.

The sections on Insights and Universities is open to question. Care. Widely taught in Universities needs thinking about. There is no strong evidence that this lead to a major input in say Resource Efficiency Clubs. Also the evidence that university staff are doing lots with companies is also open to question. Tone this down.

**Comment [Sam16]:** Point taken and modified

#### 6. Behaviour and Attitudes

A very clear section that contains so much of value. Very well researched and nothing more to say. Care. In research gaps we have the phrase `true waste prevention` - Hmmm? Take out true?

**Comment [DP17]:** No.

#### 7. Findings.

Bring in EMAS and ISO 14001 earlier on. Also the link to an EMS earlier on. The role of the Environment Agency in need for reporting?

Interesting to have a short paragraph on how say parts of Europe may differ and how this may affect say a small company here that is part of large multi-national in terms of its practice?

Care. In Learning section the bullet point starting with `Understand how lean` check wording

7.2 – labelling – coming UK and EU legislation here needed. Research gaps. The last one needs consideration. If consumers develop a trend then manufacture responds to that so it does lead to say new products that may have lower energy in production etc.

Care. On page 20 we have references with page numbers in.

7.3 – care. In insights (p 21) t says `waste prevention is rarely an`. Bit strong best say not very often. Page 21 we have only time a journal is mentioned. For London Olympics do you want to mention the BS for events management. Over ordering was and still is a major source of waste generation for many companies – evidence thin but it is there in practice.

**Comment [Sam18]:** No time, not enough data; note for later.

**Comment [Sam19]:** Out of scope

7.4. Commitments line 9 – yhis? Care again with references to page numbers. Insights – care - the smaller companies uptake is sector and ownership dependant so not all are less likely. So slower pace not always from an SME.

**Comment [Sam20]:** Already changed

7.5 Communications – bring in a bit more on WRAP and their training packs? Also it may be good to mention the models of psychology of behaviour Defra are using for householders to suggest how they can be used with industry.

**Comment [Sam21]:** Recognised elsewhere

**Comment [Sam22]:** Insufficient data

7.6 Incentives. Learning is a bit thin here. Each one can be expanded e.g. bullet point 2 by saying a value etc.

1.5 lines looks a bit thin needs padding a bit.

Bullet point 1 do you mean landfill mass / weight

Research gaps – bullet point 1 needs rewriting. Do you mean that the availability of awards does not make companies take up waste prevention? It does for those who apply.

**Comment [Sam23]:** Point taken & implemented

7.8 Business support – see my previous report last week.

#### 8. Findings sectors

An excellent section very well considered and written

Why references here on page 32?

Site waste management plans. A bit more on their success so far?

Page 35. A bit more on WRAP case studies on use of products that once went to landfill because misshaped and now are often used in other ways?

8.3 Hospitality. Great care about the increase in household incomes in last 3 years – make the point that that is open to question.

**Comment [Sam24]:** See module detail. More there.

**Comment [Sam25]:** Remove implied causality

Case studies from say Envirowise? – care: is it only a handful? Best be clearer here. Say limited.

**Comment [Sam26]:** Point taken & implemented

8.4 Retail – very good.

8.5 Automotive – again very good.

8.6 Office based – why values here in tonnes and not elsewhere. Very good section

9. Hazard: On page 46 it is vital that there is something on research gaps. It can be pointed out that there are few papers that report the savings on haz waste within a resource efficiency club. Also the role of the environment agency. The reduction of problems with haz waste being reported is vital to companies green image etc. A haz waste episode can have a marked impact on company sales in future etc.

**Comment [Sam27]:** Addressed elsewhere

10. Metrics – I have sent in a report on this. A very good section here no issues

11. There is nothing in cross cutting

**Module: L1m1: Executive Report (r6)**

**Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?**

I found the document impressive, with no obvious sources missed. The Findings are entirely reasonable (notwithstanding my detail comments), and the gradation between Learnings and Insights are appropriate.

**Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?**

There are no significant absences of understanding and none that affect the Findings.

Intervention-Standards: There is sparse evidence for the role of EMSes in WR, but maybe we are seeing the emergence of 'routines' or 'rules of thumb' from organisations such as IEMA which will provide more repeatability and more structure. Do these things need to be discussed somewhere? They are not standards as such but certainly IEMA think that they should be implemented on top of standards...

**Comment [Sam28]:** Included as a Gap.

**Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.**

I thought that the Research Gaps were particularly insightful (again, notwithstanding that I have made some small comments on them).

Attitudes& Behaviours: I would add that we have no methodologies for calculating what level of waste reduction is sensible/feasible. One outcome of this is that most companies think that they are doing well...they have no benchmarks!

Interventions-Commitments: I think it is would be good to learn how far the commitments have taken companies and compare that to some modelling of how far they would have gone anyway and how far is it possible to go. My fear is that the commitments are often too timid... and we need good data to help with this.

**Comment [DP29]:** For Defra perhaps to augment the Gap identified to determine best mode of engagement for VAs.

Interventions-Comms: The first gap statement does not sit well with previous ones about fragmented, etc...The whole section seems weaker than the others and maybe needs to be presented differently – otherwise it may drag the others down. Having said that I DO AGREE with the comments/findings! And they are relevant & important, just not well evidenced yet.

**Comment [DP30]:** We'll live with it

Interventions-Incentives: I would like to see better understanding of the success/failure of international initiatives (top runner being a prime example)

**Comment [DP31]:** For Defra - Future work?

Sectors-C&D: Given that many of the reported benefits are immediate and low- or no-cost to implement, I think that this is a critical sector to study to better understand why these obviously sensible activities were not being implemented independently by companies.

**Comment [DP32]:** For Defra - Future work?

General: Are you asking – somewhere in this report – for cross-sector research? For example – why does auto NOT need Courtauld type agreements?
<b>Other comments</b>

**Comment [DP33]:** Covered elsewhere

### 3.2 L2m3: Attitudes & Behaviours

<b>Module: L2m3: Attitudes &amp; Behaviours (r4)</b>
<b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b>
All is justifiable and very reasonable. No learning section here.
<b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b>
See other comments.
<b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b>
Yes very reasonable
<b>Other comments</b>
<p>Top class. Fit for purpose.</p> <p>This Module is a very scholarly, well researched contribution to the overall Project. It has carried out a very significant amount of analysis of main sources. There is in many cases evidence to back up most of the claims that are made. Evidence is key here and often it is difficult to find without the use a wide range of additional methods and time. Evidence has been provided. So very satisfactory in most respects. The headings are all appropriate and cover all key aspects. So the Module can be assessed and said to be a major contribution in coverage. Some points to consider:</p> <ol style="list-style-type: none"> <li>1. Need to consider a short section on timeline of this survey. There is an emerging literature but some work in UK – and more abroad – has occurred in past 10 years. A search by date of references will show and merging pattern over time. The question is why was UK slower than other EU countries? Maybe a short section on increased Defra interest and outputs and why now?</li> <li>2. Also timeline for best practice provision, e.g. Envirowise its dates etc. To show that there have been programmes for best practice since mid 1990s and there has been some work on attitudes but more since then – see Defra Landscape Delivery Review on this.</li> <li>3. Care. RECs have used any method to save money for all the hierarchy. So recycling was pushed by them as well as waste prevention. Rarely have they been purely based on prevention but have worked on most aspects for waste, energy and water. So recycling message has often got mixed up by the clubs as well as best practice.</li> <li>4. When non EU examples are given e.g. China you must remind readers that outside EU legislation it is very difficult to compare with companies in UK. So give that caveat.</li> <li>5. In horizon scanning also useful to signal up briefly the movement upwards towards Industrial symbiosis etc and that this is already in play with NISP but inter – company work becomes more vital in future.</li> </ol> <p>CARE: Check references as numbers in many are wrong e.g. page 14. Phillips (28) is not correct as are quite a few in all text</p>

**Comment [Sam34]:** Yes there is.

**Comment [v35]:** Noted. This would apply to all reports so covered elsewhere.

**Comment [v36]:** For Defra - future work?

**Comment [v37]:** Better placed in business support? DP to check.

**Comment [v38]:** Adequately covered in WMC module

**Comment [v39]:** See caveat in introduction

**Comment [v40]:** We were explicitly asked not to 'horizon scan'. Second point would better sit somewhere higher up, e.g. Exec report. DP to decide. DP: Not making judgements on 'direction'! Personally don't view it as core WP, so no.

**Comment [v41]:** Checked and correct in latest version

Specific comments:

1.Introduction.

Spot on. Fit for purpose.

2.Conceptual Framework

Top quality. Fit for purpose. Table 1 very useful indeed. Well designed.

However, need a reference to two here to back up general claims

3. Business Attitudes

Very extensive. Well supported claims. Good information e.g. page 5 to make the points. In some cases the paragraphs are a bit small and may need a bit of expansion e.g. first Para on page 6.

Care. 3.5. You say evidence on attitudes is weak. How does it compare with other aspects of business waste prevention? Is this absolute weakness or relative. I am not sure that weak is best. You can say scattered and diverse etc.

4.Business waste prevention behaviour

Fit for purpose. Very good.

1.4. Summary.

Care: best bring in that we cannot give a blanket view about prevalence as it will vary by size and sector and also regionally. So a micro in a high tec sector may be well down the line. A small in a high value food sector run by a dynamic owner may be well down the line as page 9- 10 talks about. You can of course touch on not just behaviour of companies but how many companies have say got in touch with Envirowise?

Probably not more than 20% of UK companies have taken up all best practice support so that shows about intention as well as behaviour. Those that have not taken it probably have not put that type of behaviour into practice.

5.Motivations and barriers

Very well deigned. Fit for purpose.

Table 2 very useful

Page 13 – remove the section on: We found one source in 5.1.1 - as too vague

Page 14. May consider enlarging section on champion as this is key driving force to make sure a company proceeds. It must be signalled up how vital this is – check references - and then change to Envirowise ones.

Page 17 – 5.1.3 – remove section on – Related to the previous points – as too minor.

Page 18 – Care with China case study. Give the caveat about non EU.

5.2. Barriers.

5.3. Table 3 very useful page 20.

5.4. 5.2.1 – Evidence – a reference or 2 here?

5.5. Page 24. Care: is there evidence that communications is likely to be issue in larger companies? I do not think the evidence for that is at all clear it just seems that you have used a bit of common sense but it is doubtful. Communications often a high priority in bigger companies that work on a system where the company is broke down into many units.

Page 24. Care. Resources are often not about the sum but issue like payback. A small company is liable to say spend £20 000 per annum on say 6 projects that have a payback under 6 months but not pay £10 000 on one with a payback of 1.2 years. It is the rate of return that matters not just the total sum.

Page 26. Do you need to break down a bit more who are customers? I think so. There is an evidence base that shows how green purchasing drives supply chain requirements. The trend is towards reducing all metrics so that annual reports can show progress in all areas for prevention.

Page 27. Care. – Lack of good quality advice. Do not think so. Best Practice programmes have been offering this since mid 1990s. The uptake of their services is the issue not the quality.

Page 28. Do not agree that SMEs constrained by costumer demand. In fact trend is opposite.

6.1 Learning

Page 29. The overall prevalence is “uncertain” not “unknown”. We do know quite a large amount that enables us to see gaps, so “unknown” is too strong.

Motivation not fully understood for business. Put is a small rider about the faster progress in England made on householder motivations. Make point that we are as a county moving ahead but slower in some areas not all.

Page 30. Business attitudes. – do not say businesses but perhaps say majority. Make point about large variation so we have segments such as page 10.

Page 30. Bring in horizon scan about move upwards to IS and IE? Future legislation in this area etc.

Future of best practice provision?

Comment [v42]: Done.

Comment [v43]: Not changed in line with keeping within guidance of length versus brevity.

Comment [v44]: Agreed and done.

Comment [v45]: Agree and added.

Comment [v46]: Covered in Comms module.

Comment [v47]: Done.

Comment [v48]: Section taken as far as evidence allows.

Comment [v49]: DP is the issue of ‘early adopters’ covered somewhere else? If not we would like to keep it here. DP: Retained.

Comment [v50]: Added footnote signposting to introduction

Comment [v51]: No necessary as introduced the evidence

Comment [v52]: Noted & amended.

Comment [v53]: Good point and made more explicit

Comment [v54]: Covered in Procurement module.

Comment [v55]: Disagree. The evidence is strong on this as a potential barrier. The issue of limited uptake would fit more in Other Business Support.

Comment [v56]: Noted & amended.

Comment [v57]: Done

Comment [v58]: See introduction to conclusions.

Comment [v59]: But not evidenced.

Comment [v60]: Will this be gone after DP redraft?

R6.3 Research gaps. Link between householder and workforce employees in terms of behaviour. Does limited local authority message on recycling hold back development of waste prevention in workplace? Economic cycle and uptake of practice?

**Comment [v62]:** Good point. Also covered in OBS. Future work?

### 3.3 L2m4: Interventions

#### L2m4-1 Standards

##### Module: L2m4-2 – Labelling (r1)

Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?

The insights on measurement seem strong – but there was a comment in the version I have seen. How will final version read?

**Comment [DP63]:** Substantially unchanged.

Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?

Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.

Research might also address the influence across supply chains on the adoption of labelling. Certain sectors and certain supply chain relationships may lend themselves to the adoption of labelling and to waste prevention.

**Comment [DP64]:** Specific indication not found; but report advocates a sector based & supply chain approach

##### Other comments

From Research Gaps:

“Whilst we have found evidence to that labels can be used to reduce waste by purchasers, there appears to be little research on effectiveness of labels in preventing waste during manufacture.”

Has this sentence been checked?

**Comment [DP65]:** Well spotted; amended.

##### Module: L2m4-3: Procurement and Supply Chain (r1)

Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?

5.2 Insights:

The UK SP Task Force definition of sustainable procurement may not have made waste prevention explicit but that should not be taken as meaning that waste prevention was not at the core of the definition.

If they have been understood by business as “waste reduction” in a more general sense as this paragraph states, then this is probably because businesses have not undertaken what the public sector tends to call ‘sustainable procurement’.

This is compounded by the difficulties associated with accounting for waste prevented. Much of the activity undertaken by the private sector has until recently been invisible to external audiences. It is hardly surprising that case studies have not been written about internal savings made by companies through waste prevention measures – since these are commercial opportunities to be exploited by the powerful actors in supply chains.

**Comment [DP66]:** Agree, and acknowledged elsewhere.

This Module underplays the differences between the public and the private sector in terms of how waste prevention has been – and will be – reported.

**Para.5.2 Insights states: “Finally, it is worth reiterating that procurement seems an especially potent agent for change when adopted by large private or public sector organisations who have the power to create and sustain markets for new and less wasteful products and services.” While this is undoubtedly true, it is about waste prevention?**

**Comment [DP67]:** Why not if waste=cost?

**Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?**

The introduction quotes part of the SPTF’s definition of sustainable procurement:

*‘A process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment.’ Invalid source specified.*

It might strengthen the argument for the footnote to the definition to be quoted here too.

**Comment [DP68]:** Point taken & implemented.

**“Footnote:**

**Sustainable Procurement should consider the environmental, social and economic consequences of: Design; non-renewable material use; manufacture and production methods; logistics; service delivery; use; operation; maintenance; reuse; recycling options; disposal; and suppliers’ capabilities to address these consequences throughout the supply chain.”**

Although waste prevention may be implicit rather than explicit, the training and other activities that have followed the work of this Task Force (particularly internationally) include clear guidance on the opportunities to ‘re-think need’ to prevent waste.

The training has in the past made reference to the ‘waste hierarchy’ as a ‘procurement hierarchy’ to make this point.

Note that the training is being used by the Marrakech Task Force on Sustainable Public Procurement – and this training has been rolled out in a programme sponsored by Defra in recent months. WRAP, as Defra’s delivery body has administered the roll-out of MTF on SPP training through a National Sustainable Public Procurement Training Programme to local government in England, and through pilots to the health sector and the further and higher education sector.

The training programme does discuss waste prevention as part of Sustainable Public Procurement. It also discusses the role of public procurement in stimulating waste prevention throughout the supply chain.

**Comment [DP69]:** Point taken and included as footnote.

**Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.**

One aspect that seems to have received less attention than expected is the ‘perceived’ barrier posed – to Finance Directors in the public sector (and to some extent in the private sector) organisations by **leasing models and similar business models.** Analysis of these perceived barriers could usefully address the solutions already being adopted – through examples and case studies. This would involve investigation in aspects of finance and accounting models that may at first appear removed from procurement and waste prevention. But they may yet prove to be key to unlocking the potential for procurement to drive waste prevention through supply chains (as implied in the footnote to the Task Force definition of Sustainable Procurement).

**Comment [DP70]:** Addressed in Incentives.

<p>There seems to be an opportunity to research potential links between procurement’s role in waste prevention, the drive for cost savings and threats in global supply chains associated with material security. Security of supply is at the heart of procurement and supply chain management activity and the prevention of waste of finite and increasingly hard-to-source materials should be prominent on the agenda of business and of governments.</p>
<p>Para 5.3 states:</p> <p><b>As discussed above, little evidence was available from sectors other than retail, construction and food and drink. More research is needed on sustainable procurement by organisations within other in-scope sectors such as automotive, hospitality, office-based services require more research.</b></p>
<p>This sentence needs some review – if it has not already been amended.</p>
<p>Has the evidence from groups such as Envirolink North West been taken into account?</p>
<p>Is the research required on ‘sustainable procurement’ as a whole or on waste prevention specifically – since this is the subject of the study?</p>
<p>The Insights range over a wide range of topics. While many of the points made are valid, their scope is extremely broad – do they all relate to the subject of this review?</p>
<p><b>Other comments</b></p>
<p>Action Sustainability is by no means the only organisation seeking to make procurement and supply chain management more sustainable. Since the withdrawal of Defra funding, Action Sustainability has relinquished the task of coordinating of one the groups active in this field – the Strategic Supply Chain Group. This group started life in 1998 as the ‘Environmental Procurement’ Group (at UMIST) and in 2003 it became the SSCG.</p>
<p>The report suggests that the Strategic Supply Chain Group no longer exists. This is far from true.</p>
<p>The Strategic Supply Chain Group might be an appropriate forum for discussion of waste prevention in supply chains. Its focus is sustainable supply chain management and its members include senior procurement, supply chain and sustainability managers from both the private and the public sectors.</p>
<p>It seeks to address issues that are ‘just over the horizon’ for companies and public sector bodies i.e. those that are likely to be the issues of concern at board level in coming months and years. It has the ability to work through sub-groups to examine issue of particular interest and concern to members. [edited – personally identifiable information].</p>

**Comment [DP71]:** For Defra - Nice point; future work.

**Comment [DP72]:** Correct; it will be!

**Comment [DP73]:** Yes

**Comment [DP74]:** May stray more widely.

**Comment [DP75]:** Corrected in text.

**L2m4-4 Commitments: Deemed acceptable by (r7)**

<p><b>Module: L2m4-5: Communications (r7)</b></p>
<p><b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b></p>
<p>Yes.</p>
<p><b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b></p>
<p>No.</p>



**Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.**

Use of 'intermediaries' is a clear gap where evidence could not be found on guidance targeting them specifically. Envirowise has (or did have) a dedicated intermediary / stakeholder programme (Eleanor nee Morris). There may or may not be specific guidance but the programme provides/ed direct help and support to intermediaries working with businesses on waste minimisation. A literature review, however, may not have picked this up, but working with intermediaries was always considered an important part of engaging business and influencing their behaviour. It is likely that this would have been measured in some way.

**Other comments**

I did get to read the Executive Report fully.

I compliment you on your hard work. The review is very thorough and provides a sound way forward for Defra. Clearly there are a number of learnings, insights and research gaps to consider and these can seem overwhelming. This may well have been thought about, but is there any way in which these can be prioritised or at least identified as first, second and third cut opportunities for Defra to address – perhaps in relation to priority waste streams or policy drivers?

**Comment [v76]:** Slight amendment to stress that we mean intermediaries beyond business support organisations, i.e. LAs, banks etc.

**Comment [v77]:** Outside scope of what we were asked to do.

**L2m5-6 Incentives: Deemed acceptable by (r7)**

**Module: L2m4-7 – Waste Minimisation Clubs (r4)**

**Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?**

This Module is a scholarly and in depth in nearly every way. It has a clear grasp of the subject matter. A very well researched contribution in a difficult area – as the literature does vary in quality – to the overall Project. It has carried out a large amount of analysis of the best sources. There are of course many sources that are very difficult to obtain e.g. many landfill tax funded projects before 2004. So to obtain this literature is no small task and many types of sources are covered. It has managed to provide in many cases evidence to back up some of the claims that are made. Evidence is key here and often it is difficult to find without the use of a wide range of additional methods and time. So very satisfactory in many respects.

The headings are all appropriate and cover so many key aspects. There is a wide coverage yet it has depth. So the reports can be assessed as being of a major contribution in this area.

There are a few areas that may be a bit stronger. At times too many general comments when it is possible to put in a value range e.g. 60-80% is better than saying a lot. Perhaps a bit more on all categories of savings e.g., water, energy.

A very main point is the historical trend that could do with a few lines. The first term was WMCs that then became Waste Prevention then became Resource Efficiency Clubs (RECs). This trend over time is important as the term waste minimisation was more based upon marketing simplicity and power than an exact description. The change to RECs took place over 10 years.

Learning's are stronger than Insights. Learning` s extensive. Maybe some more values in the section to make the case stronger e.g. 50% etc.

For Insights – care with first paragraph as that it open to question. There are cases where a significant amount can be said. Reword it to be less definite.

Benefit from low company membership – what does this mean? If the project has enough time built-in then no problems. Better to say that there is a base level amount of time required to support the average company, if they do not have it then some companies struggle and do not make much progress.

**Comment [Sam78]:** Out of scope.

**Comment [Sam79]:** Covered elsewhere.

**Comment [Sam80]:** Noted and changed.

**Comment [Sam81]:** Text amended.

<p>Best to also point out the future need for many more methods to probe for data and then process it. But what about future and funding – maybe that needs to come in here as well?</p>	<p><b>Comment [Sam82]:</b> Policy.</p>
<p><b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b></p>	
<p>There is a need to present more from the literature on outputs and especially in cost to savings. In the literature of Phillips et al there are many tables that report cost to savings ratio and then discuss the mean and median. There could have been a few examples in this area. A club may have say a cost to savings of 10:1. According to Envirowise 5:1 is sustainable. However this may mask the number of companies that have achieved high values and those that are very low indeed. In Hereford and Worcester club of mid 1990 some 3 companies provided the vast majority of the significant savings out of total &gt;15. So this distribution is vital. So even in very well managed WMCs there are clear case of best practice and also of poor practice.</p> <p>This would enable an analysis to be made of the factors that say underlie the case studies of successful clubs from Envirowise 2005 – 2008. So as well as looking at expert teams between clubs it would be possible to consider the reason underlying practice in poor companies in poor clubs.</p> <p>Coskeran and Phillips in mid 2000s produced a few papers – <i>Resources, Conservation and Recycling</i> on evaluation of WMCs. This may also be a contribution to consider the issues raised here.</p>	<p><b>Comment [Sam83]:</b> Useful: included.</p>
<p><b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b></p>	
<p>They are reasonable but additional ones to be considered may include:</p> <ul style="list-style-type: none"> <li>• Link of WMCs to E.M.S developments. Can was minimisation be met via uptake of an E.M.S by clubs clustered around local E.M.S?</li> <li>• Long term histories of clubs to monitor how they evolve over say 10 years of provision / production of different types of projects?</li> <li>• Role of partnership champion. The skills and attitudes required driving project development as well as delivery?</li> <li>• Landscape delivery changes and the implications of the reduction of best practice programme support?</li> <li>• The use of Supply Chain partnership – funded by Apex Company – to fund small scale future developments?</li> <li>• Regional variation in terms of uptake and also effectiveness. Causes of this variation. Regional barriers and success factors?</li> <li>• Link between WMCs and the movement towards industrial symbiosis. Is the gap too big for many companies especially Small companies? Future links with NISP?</li> <li>• Holistic links between MSW developments – e.g. zero waste places – and small WMCs. The impact of these partnerships to drive campaigns for behaviour change?</li> <li>• On line training for companies in waste minimisation. The future need for this low cost method?</li> <li>• Link to waste exchanges as means of supporting an aspect of minimisation at low cost.</li> <li>• The need to use a wide range of social methods e.g. interview – to complete information gathering on WMCs that have a long track record.</li> </ul>	<p><b>Comment [Sam85]:</b> For Defra - All these points tbc by Defra – they are very technical and should be judged in the light of the priorities of future policy towards WMC.</p>
<p><b>Comment [Sam86]:</b> Out of scope</p>	
<p><b>Comment [Sam87]:</b> See elsewhere</p>	
<p><b>Comment [Sam88]:</b> In L3</p>	
<p><b>Other comments</b></p>	
<p>Very good module.</p>	

**Module: L2m4-8: Other Business Support (r3)**

**Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?**

My feeling is that this section is weak because it lacks an introduction that gives an understanding of the constraints that business support programmes face. Without that, it is easy to draw the wrong conclusions.

[comment removed as prejudicial to the neutrality of the review]

In this section of the report, the list of case studies needs to have some introduction and is highly biased towards recent work. There is no explanation of why these particular case studies were chosen. Is a list of rather similar case studies of any use in the report? Could it be put in an appendix?

[comment removed as prejudicial to the neutrality of the review]

**Section 5.1 Learnings**

The point about 'Waste prevention is not generally the main focus of relevant business support programmes' is not correct. The Environmental Technology Best Practice Programme (ETBPP which became Envirowise) was set up to work from the top of the waste hierarchy down and did not promote recycling. Indeed, when running Envirowise, I lobbied long and hard to get elimination put at the top of the waste hierarchy and to try to reduce the focus on end-of-pipe diversion from landfill. What stopped more government programmes doing this was the policy focus on diversion from landfill. There were no inherent difficulties in supporting waste prevention.

The point about 'Business support has focussed on the food and drink, retail and construction sectors' is also not really correct. The ETBPP started working on sectors that included foundries, metal finishing, glass, engineering, rubber and plastics. It also covered cross-sectoral themes of cleaner technology and waste minimisation that predominantly focused on manufacturing sectors.

I think that the statement 'Even though businesses demand support in environmental matters, the response to the offered support programmes is generally low' is a gross oversimplification. Businesses often want help with legislative compliance and that is not what support programmes are usually set up to deliver.

I agree that companies don't like to fund their activities. If you want an example of a programme failure, you should try to dig out the detail on Schemas. This was a programme in the 1990's that aimed to help drive the uptake of Environmental Management Systems by offering 50% funding for a consultant. Take up was very poor. It was managed by NIFES and they may have some historical information on it.

**Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?**

Yes. The case studies that I have added should show that there has been a lot of work aiming to cover waste reduction:

- At all levels of the waste hierarchy
- In an approach that includes water, solvents and energy

The remits of the different programmes should be summarised, probably in a table. Despite there being concern of overlap between different programmes, the central Government ones had distinct remits that did not really overlap. Some regional initiatives did overlap with central Government programmes and often caused confusion at a local level. I think that stronger direction of how enquiries to Government should be handled would help guide companies to the correct support.

In section 4.2 about Barriers, a main barrier that has been missed is that responsibility for the cost of wasted materials is rarely clear in a business. This often means that the person driving waste reduction does see the financial benefits of their efforts. Also company management systems rarely complement a discrete waste reduction approach. I am sure that Oakdene Hollins will have some internal evidence of this.

**Comment [A89]:** We only need to review the evidence, not the policy.

**Comment [Sam90]:** Bias acknowledged; Defra requirement for illustration.

**Comment [A91]:** But the actuality was that WM was the focus, not WP. Evidence doesn't support this assertion.

**Comment [Sam92]:** Comment included in Historic module.

**Comment [Sam93]:** But the scope includes Business Link

**Comment [Sam94]:** For Defra – review later

**Comment [Sam95]:** For Defra – modules passed to Defra.

**Comment [Sam96]:** Not in scope (except solvents in haz red)

**Comment [A97]:** Nice but not necessary in this work.

**Comment [Sam98]:** Noted and included.

Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.
<p>Research into failures could be useful.</p> <p>If you want an example of a programme failure, you should try to dig out the detail on Schemas. This was a programme in the 1990's that aimed to help drive the uptake of Environmental Management Systems by offering 50% funding for a consultant. Take up was very poor. It was managed by NIFES and they may have some historical information on it.</p> <p>On Envirowise we ran a very successful approach for Supply Chain Partnerships but this did fail on one occasion because the mentor company that the project was based around was not trusted by its suppliers.</p>
Other comments

**Comment [Sam99]:** Agree and already included in the Gaps.

Module: L2m8: Other Business Support (r4)
Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?
<p>This Module is a scholarly, very well researched contribution to the overall Project. It has carried out a large amount of analysis of the best sources. This is no small task and many types of sources are covered. It has managed to provide in many cases evidence to back up some of the claims that are made. Evidence is key here and often it is difficult to find without the use a wide range of additional methods and time. So very satisfactory in many respects.</p> <p>The headings are all appropriate and cover so many key aspects. So the reports can be assessed as being of a major contribution</p> <p>There is a need though for the report to avoid the very general and attempt to use a value range if possible e.g. p4 – savings are quite large? Maybe add a value range? e.g. in region of x % of turnover or yEs to zEs. This means that the general has been removed and if no values then further study can deduce that there are no values available. The same applies to 5.1 – Learning which may consider adding some evidence to support the position stated – e.g. How many reports?</p> <p>There is a need to also briefly consider the historical transformation of waste minimisation (as an initial marketing slogan) to resource efficiency and also the future possible transformation into industrial symbiosis, or not.</p> <p>The Learning's are sound but would benefit from references and values to support them. The values can be economic such as cost to savings ratio etc. This is vital as they are the cornerstone in this Module. The claim that the Business Support focussing on food and drink, retail and construction needs to be carefully checked and supported by clear evidence as the case is not that obvious.</p> <p>There is a need to consider some other aspects that may be placed into the Learning's. A very key one is Landscape Delivery Change and future programmes and funding and what may be emerging.</p> <p>Another one is the need to consider in future Government Departments working together to avoid disparate, unconnected funding streams. Often in England lack of co-ordination has led to duplication.</p> <p>Insights. Again need to place in values or references to support the claims. Care with the 4<sup>th</sup> paragraph. Drivers move companies forward and business support is the catalyst to promote the change. So they are different – is business support a Driver? Hmm? Does it mean there is insufficient resolution to determine each contribution?</p> <p>Learning is stronger than insights</p>

**Comment [Sam100]:** Tricky.

**Comment [Sam101]:** Covered elsewhere (Behaviours)

**Comment [Sam102]:** True. Noted by others. A bias of the search scope.

**Comment [Sam103]:** Not in scope

**Comment [Sam104]:** Policy!

**Comment [Sam105]:** No an enabler; checked in text.

Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?
<p>There is a lack of literature from the side of business / economics. This I agree would require a large time load for this Module. However, it is important to signal up that often in research areas in topics such as learning and company transformation there are case studies that impinge on this topic but they are not as quick to locate as say from waste management journals. But to signal that up is important.</p>
Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.
<p>There are a number of areas that may be considered here to be signalled up in the Gap analysis. These include:</p> <ul style="list-style-type: none"> <li>• Cost benefit analysis of economic data to provide more detailed studies with a rigorous methodology.</li> <li>• Cascaded impact of a company taking up business support on other local companies or those in a network. In some cases often associated with a place, word of mouth can enlarge the number of companies adopting best practice without there being evidence as no party raised the question.</li> <li>• The role of consultancies. Often their impact on a place is not monitored and so in a give place the number of companies involved may be far higher as the consultancy support is not recorded.</li> <li>• Regional variation in practice across England and its underlying reasons.</li> <li>• Role of champions in a community who work with groups of companies to prompt them to apply for support. Their characteristics. Their place in the partnership that delivers.</li> <li>• The impact of E.M.S on uptake of business support service.</li> <li>• Holistic. The impact of business support, via successful take up of practice on a place, and the dissemination of this on waste and environmental behaviour of the public.</li> </ul>
Other comments
<p>A very satisfactory Module</p>

**Comment [Sam106]:** Agree; check with BL

**Comment [Sam107]:** For Defra – Unable to determine which of these is core and which would survive depending on policy.

**Comment [Sam108]:** A genuine gap; included

**Comment [Sam109]:** See Standards

### 3.4 L2m5: Sectors

Module: L2m5-1: Construction Sector (r5)
Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?
<p>Generally yes these hit the mark. In one case I was looking for more evidence to support the assertion that aggregate from crushing on-site material was a less preferable environmental outcome than re-use. This may be more finely balanced (cf the disposable nappies debate).</p> <p>The Insights suggest that reuse is more environmentally sustainable than aggregate – some more work on LCA might be appropriate to demonstrate that statement.</p>
Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?
<p>The scope needs some clarification. The background in Section 1.1 led me to believe that transport infrastructure would be covered and hence issues such as road recycling might come under consideration. It does not.</p> <p>Section 3 could do with some clarification It is headed Prevention and then 3.1 is about minimisation. This juxtaposition may cause confusion in the reader's mind. Is minimisation a subset of prevention?</p>

**Comment [Sam110]:** Recycling not in scope, as per intro. Marginal activity.

**Comment [Sam111]:** Covered in introduction.

<p>Attention to classification - Section 3.7 states that plasterboard is hazardous waste. It is not although its landfilling requires special treatment ref Waste Acceptance.</p> <p>Section 4.1 refers to special waste – outdated term.</p> <p>I found few references to BRE work in this area. I would have expected more. Perhaps the authors could confirm these are the key ones from BRE.</p> <p>The inference from this document may be made that designers and builders are not maybe too interested in waste prevention as it is a small part of their budget and they are not strongly driven (apart from SWMPs perhaps) and the metrics do not appear to have been clearly designed to tell us the answer. Yet specialist major exhibitions for the construction industry suggest a different story about attention to waste and savings – see “Ecobuild”.</p>
<p><b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b></p>
<p>Consider LCA work on reuse vs secondary aggregate production on site</p>
<p><b>Other comments</b></p>
<p>None</p>

**Comment [Sam112]:** Well spotted; corrected

**Comment [Sam113]:** There are substantial materials from BRE.

**Comment [Sam114]:** Good point, but it is generally the private builder who leads the way in the field! The role of legislation and incentives should not be underestimated!

**Comment [Sam115]:** Point taken. Work by CRR suggests for example that this is the case for bricks. BRE identifies significant lost value in this field. BRE ref included.

<p><b>Module: L2m5-2 – Food &amp; Drink Sector (r2)</b></p>
<p><b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b></p>
<ol style="list-style-type: none"> <li>The evidence appears to be characterised by poor data and a lack of performance metrics against which waste and its prevention can be effectively and consistently measured throughout the supply chain. It is noted in the report that there is a general reluctance of companies to participate in information sharing (e.g. with the FDF), which limits effective “benchmarking”. For example, the report cites trends in waste (page 6, ref a), but notes that datasets were not on a like-for-like basis. I feel that this aspect, although covered in the report, could be strengthened in the findings, and proposals made that measures be looked into in order to improve standardised data collection for benchmarking purposes (where practicably possible).</li> <li>The report indirectly refers to training of staff (Table 3). (The retail report also notes that managers rarely stay in their jobs for more than two years), and this is probably true in this sector. The report suggests (in at least one case study) that training staff helped reduce waste, which has wider implications, especially in low skilled occupations, where turnover is likely to be high. This element could be given greater strength.</li> <li>The Insights section notes that most of the work in waste prevention appears to be carried out by a small number of large companies. It could be inferred that these organisations are better resourced to employ or contract specialist skills to identify and implement waste prevention measures than smaller companies (especially micro SMEs). This element and possible skills gaps and training needs could be usefully carried out.</li> <li>The evidence (as acknowledged in the report) is based on self reporting by companies and delivery bodies, and as such there is the need for better independent scrutiny. This could be strengthened.</li> </ol>
<p><b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b></p>
<p>The evidence could usefully be categorised as either direct or indirect, and perhaps qualitatively assigned to key topic groupings within the report. (Although I do realise that this may involve a lot of work at such a late stage in the project!).</p> <p>The role of compostable packaging (certified to EN 13432) hasn’t been mentioned (other than briefly on p. 23, unlike conventional packaging). Although this may fall in the “grey” area and classed as recovery, it has potential to reduce packaging waste on spoil perishable food items, when sent for recycling (composting or AD) (i.e. they do not require de-packaging and disposal).</p>

**Comment [Sam116]:** Noted; a general deficiency that is common to all modules.

**Comment [Sam117]:** Noted; Gaps modified to account.

**Comment [Sam118]:** Noted as above.

**Comment [Sam119]:** Global issue. Noted elsewhere.

**Comment [Sam120]:** Correct, but tangentially mention in L3 Reuse module.

<b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b>
<p>As discussed above, they could include:</p> <ol style="list-style-type: none"> <li>Better provision of performance metrics for benchmarking purposes</li> <li>Incentives to increase participation by businesses</li> <li>Training and skills gaps, especially for small organisations</li> <li>Independent assessment of how to change “culture” in the sector to one of WP</li> <li>Improved independent scrutiny and identifying the failures as well as the successes.</li> </ol>
<b>Other comments</b>
<p>Figure 2 – are these the same diagrams? Table 2 – perhaps it would help to disaggregate the Examples column into “What” the causes were and “Why” they occurred.</p>

- Comment [Sam121]: Global
- Comment [Sam122]: See Incentives
- Comment [Sam123]: See Att & Behav
- Comment [Sam124]: See Att & Behav
- Comment [Sam125]: Global

Comment [Sam126]: Too late.

<b>Module: L2m5-3: Hospitality Sector (r3)</b>
<b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b>
<p>I generally agreed with this section. I have made a couple of comments below regarding editorial issues.</p> <p>I think under the Learnings, it is worth mentioning that the most visible waste reduction activity at hotels is over the laundering of towels. Most hotels ask customers to reuse towels, if appropriate and this will lead to water, energy and detergent savings, albeit that the only solid waste reduction may be the reduced use of detergent powder and this wouldn’t enter the solid waste stream. There are two important points about the reuse of towels:</p> <ul style="list-style-type: none"> <li>It emphasises the point that solid waste reduction should not be treated in isolation from energy and water (I have made this point in comments on other sections).</li> <li>Although visible and a sign of commitment, in my experience, the policy is rarely policed internally and is rarely carried out – if you leave your towels on the towel rail, they are usually replaced with new ones when they shouldn’t be. This suggests that other issues are seen as more important than the reuse of towels.</li> </ul>
<b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b>
<p>I am surprised that linen and towels are not a major waste in this sector, given the high use of these by hotels. I am also surprised that waste from refurbishment is not mentioned. This may be included in construction and demolition waste but the driver for generating it in hotels and restaurants is from hospitality sector managers.</p> <p>Fats, oils and greases can cause major waste disposal issues from catering but can be either effluent or solid waste, depending on how they are collected. The lack of information on this here seems to me to be an important omission – can you get data on this?</p>
<b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b>
<p>The research gaps given ring true. However, I think research into attitudes to portion size in the restaurant sector could be very useful at helping companies not to give portions that are too large. Perceptions and attitudes in this area seem to have little factual basis.</p>
<b>Other comments</b>
<p>Not sure of the point of Box 6 in this section. Most of what has been done is more relevant to construction and demolition. Anything in the hospitality area is aspiration at present.</p>

Comment [A127]: Built into metrics.

Comment [A128]: Anecdotal.

Comment [A129]: In C&D.

Comment [Sam130]: Too late

Comment [A131]: Observation??

Box 5 – the last bullet point here is misleading. McDonalds has good internal communication systems that mean it passes on lessons learnt internally but many large companies do not do this. Size is less important than good management in this respect.

**Comment [A132]:** Noted; case study modified.

**Module: L2m5-4 – Retail Sector (r2)**

**Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?**

- The evidence appears to be characterised by better data than the Food & Drink sector, and much higher profile initiatives by key retailers (e.g. Courtauld Commitment), although it appears that this sector also lacks standardised performance metrics against which waste and its prevention can be effectively and consistently measured for benchmarking purposes
- Overall, the conclusions section could be better supported by a clearer categorisation of the variables discussed in previous sections (especially the behaviours section). There is a good in-depth analysis of the issues, but the messages tend to get lost (at least to me) in the detail. Perhaps the suggestion (below) to categorise and summarise the evidence a bit more concisely would help.
- The high turnover of staff is mentioned as a barrier (p 31), and this could be elaborated further in the learnings section

**Comment [Sam133]:** Good point, but no time.

**Comment [Sam134]:** Don't have enough info to elaborate.

**Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?**

The evidence could usefully be categorised as either direct or indirect, and perhaps qualitatively assigned to key topic groupings within the report. (Although I do realise that this may involve a lot of work at such a late stage in the project!).

The role of compostable packaging (certified to EN 13432) again is not mentioned, unlike conventional carrier bags. (Although this may fall into the "grey" area and classed as recovery). In 2009 the Co-Operative in the North West introduced compostable carrier bags at some outlets detailing information about how to dispose of them through home composting or food waste collection schemes. Biodegradable bags have also recently been introduced in Italy (probably out of the time frame of your data collection; end of 2010) and this could be mentioned.

**Comment [Sam135]:** Correct.

Overall, the price of raw materials (which are often linked to the \$ price of crude oil) does not appear to have been mentioned. The impacts of international commodity prices and how this affects the efficiency of manufacturing (and the extent to which waste is prevented) doesn't appear to have been documented (based on the info I read). A macro economic analysis could therefore shed light on some of the WP issues. A sharp increase in the price of oil may well be the catalyst for radical change within this and other sectors.

**Comment [Sam136]:** Have considered; a red herring; costs are what they are; they drive prices and behaviours.

**Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.**

As discussed above and in the food and drink sector, they could include:

- Better provision of performance metrics for benchmarking purposes (as for food and drink?)
- Incentives to increase participation by businesses
- Training and skills gaps, especially for small retailers
- Independent assessment of how to change "culture" in the sector to one of WP
- Improved independent scrutiny and identifying the failures as well as the successes.
- Economic assessment of the impacts (past and projected) of changes in commodity prices

**Comment [Sam137]:** Global. See elsewhere.

**Comment [Sam138]:** Not a Gap.

**Comment [Sam139]:** Global. See Behaviours.

**Comment [Sam140]:** Global. See elsewhere.

**Comment [Sam141]:** See above – pointless.

**Comment [Sam142]:** Explained by added value of retail step.

**Other comments**

Page 6. Waste prevention measured at £627 / t, but in the Food and Drink report it is quoted as £500 / t (p. 9).



Module: L2m5-5: Automotive (r6)
Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?
I found the document impressive, with no obvious sources missed. The Findings are entirely reasonable (notwithstanding my detail comments), and the gradation between Learnings and Insights are appropriate.
Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?
§3.3: re light-weighting: Not accurate. Light-weighting of cars is for energy gains (CO2). One common technique is to replace heavier materials – eg aluminium for steel – where it is unclear what the material reduction might be (if any at all). A VERY common technique is to reduce weight by either co-moulding two different materials (in the same mould at the same time) or by gluing (avoids the weight of nuts & bolts...). The car ends up lighter but harder to recycle at end of life, the impact on production waste is uncertain and is not put forward as a strong argument in the industry (they do constantly mention that light-weighting hurts the EOL targets)
Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.
Section 1: (re effects of Lean et al.) Is there no explanation in the SMMT report itself? This is strange. I wonder if the act of collecting the data means that they now know it is there and are beginning to count it more accurately. Maybe this should be a 'small' research question?  One of the unusual characteristics of the auto sector is just how similar their factories are. This means that comparison research can be especially powerful. I would like to see more research on the range of performance across the VMs and also on the depth of take-up in the Tier 1 suppliers. (In my own experience this is really variable, which is a bit of a shock.) The fact they are so competitive, and lean thinking drives aspects of waste reduction, means that they think they do it anyway... NOT TRUE! Ask Toyota ☺
Other comments
§3.4: re examples from industry: Successful examples quickly become commercially sensitive – the supplier does not want other companies to know how much is saved, as they will be worried about the 2 <sup>nd</sup> company demanding the same cost reduction but without the commitment to helping the supplier achieve it. The results do get mentioned by the vehicle manufacturers in their larger scope CSRs for example.

**Comment [Sam143]:** Agree, but not well written. Revised to show complexity.

**Comment [Sam144]:** For Defra - Noted but not auctioned.

**Comment [Sam145]:** Added to gaps

**Comment [Sam146]:** For Defra - CSRs largely not examined, but noted as follow-on in Steering Group.

Module: L2m5-6 – Office-Based Services Sector (r1)
Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?
Para 5.2 reads “Given the potential role of procurement in driving waste minimisation down the supply chain, this is an area of likely opportunity.” The focus of the review is on waste prevention and there may in fact be opportunities for procurement to drive prevention rather than merely minimisation.
Public procurers may have prioritised activity and focused on more ‘obvious’ sectors, such as construction, but there may also be barriers in terms of perceptions of relevance and proportionality in supplier selection and/or bid evaluation processes. This aspect may lend itself to further research.

**Comment [DP147]:** Agree! The text needs rephrasing.

**Comment [DP148]:** For Defra – Noted but not included. Seems to be a procurement issue, which is not the main thrust here.

<p>Prioritisation of procurement spend may currently be leading procurers to overlook the waste prevention potential of office based services. Certainly the way in which resources are allocated and accounted for in the public sector – and to a large extent in this case in the private sector too – makes it difficult to measure and track direct and indirect savings from waste prevention activities. This is in spite of the fact that they have a positive impact.</p>
<p><b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b></p>
<p>See comments on Executive Report relating to resource allocation and ‘silo’ budgeting.</p>
<p><b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b></p>
<ul style="list-style-type: none"> <li>“A roundtable of large and medium size companies to identify opportunities for encouraging greater paper reduction, furniture and WEEE re-use, and collaboration with PSI suppliers, which might form the basis of guidance or case studies to office based services more widely.”</li> <li>The Strategic Supply Chain Group might be an appropriate forum for such a roundtable. Its focus is sustainable supply chain management and its members include senior procurement, supply chain and sustainability managers from both the private and the public sectors. [edited – more of same; personally identifiable info]</li> </ul>
<p><b>Other comments</b></p>

**Comment [DP149]:** Noted; but prioritisation is a necessary activity for any business. Covered in Intro on sector priorities.

**Comment [Sam150]:** Dealt with elsewhere.

**Comment [Sam151]:** See CRR website!

**Comment [DP152]:** Noted and added

### 3.5 L2m6: Hazard Reduction

<p><b>Module: L2m6: (Hazard Reduction) (r5)</b></p>
<p><b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b></p>
<p>On findings – please see the next section. I am concerned that although some may be appropriate there needs to be a little more support and confirmation – examples are given below.</p> <p>On Learning I find it hard to judge from this how far down the track of hazard reduction we are, but it would be useful to have some idea. The section suggests that much that should be done has been done and it has “levelled off” but it is not clear. The emphasis there is on larger companies – SMEs may have some way to go. If not then this may be another topic for further research in Section 6.3.</p> <p>It is also noteworthy that the paper starts by indicating that the focus of the study as set out in the introduction was on voluntary measures but concludes that regulation and bans are effective as 6.1 and 6.2 state. Could more examination of this help because it must as a result play a greater part in motivating factors.</p>
<p><b>Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?</b></p>
<p>There may be context missing. I appreciate that a complete history of the work on hazard reduction and waste prevention is not desirable but I would have started with some reference to the DoE pre-Envirowise Environmental Technology Best Practice Programme which formed the basis. I know a lot of it was water and energy saving but it heralded a lot of work in this area. It certainly predated Hazred by over a decade and helps to place the activity in your search field (back to 1990). The advent of IPC would also suggest there should have been increased awareness of hazard reduction drivers through the 1990s.</p>

**Comment [Sam153]:** Point taken and included

**Comment [Sam154]:** Not within scope but well noted by Defra

**Comment [Sam155]:** We can use this passage in the intro, thank you.

<p>In Section 2 at the bottom of the page underneath Figure 1 I would have been more explicit about the drivers for waste disposal changes. The reduction on landfills taking hazardous waste was occasioned by the Landfill Directive implementation banning UK co-disposal techniques and was a powerful incentive to ensure waste classification was accurate with respect to hazardous or non hazardous.</p>
<p>In sections 3.2 and 3.4 I was looking for evidence of whether the UK had been an innovator in this area . S 3.4 seems to suggest the answer is no. I would have wanted to see some corroboration of this for example by some indication of the level of original or novel ideas developed that could be protected as Intellectual Property. Some small analysis or comment on patents taken out would be one indicator. There are American examples.</p>
<p>Following on from that I was generally concerned about the preponderance of references to US/North American literature, where in some places in the text it would also help to indicate that the experience is drawn from there. But the concern is that it may appear to the reader that not so much by contrast has been done in the UK. That may be taking it a little far but at the moment there does seem to be a non UK bias in the examples and references where I believe more is available that is closer to home and relevant. Even more European studies would help to redress this. If the answer is that US experience was the driver over the last twenty years then the text can be explicit about – there is more on the UK on which to base the findings than this currently indicates.</p>
<p>Section 4 on impact suggests no overview study is available on UK experience. I think that is worth confirming.</p>
<p>Section 5 refers to customer awareness – would this relate also to Corporate Social Responsibility initiatives?</p>
<p><b>Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.</b></p>
<p>No research gaps are identified in section 6 of the paper. This is surprising especially as the tendency is for more wastes to become classified as hazardous.</p>
<p>The revised Waste Framework Directive of 2008 now includes an additional criterion (H13 sensitizing) and a re-ordering of the Hazard criteria such that H15 (yields another substance after disposal) is now subject to H14 – Ecotoxic. This may extend the range of hazardous wastes and hence the scope for hazard reduction. This needs to be examined.</p>
<p>One further example is the potential impact of nanotechnology – such as carbon nano-tubes – now becoming more widespread in manufactured product. Some assessment of their hazard in end of life waste may be appropriate here.</p>
<p>See also my comment on Learning (above).</p>
<p><b>Other comments</b></p>
<p>None</p>

**Comment [Sam156]:** More useful background.

**Comment [Sam157]:** Doesn't necessarily mean uptake to implement in the UK though.

**Comment [Sam158]:** For Defra - Not within search scope, but a useful addendum that has been included in the Insights.

**Comment [Sam159]:** Time for search was limited, as was the emphasis given to this aspect of the work. This can be used as Nature of Evidence.

**Comment [Sam160]:** For Defra – Noted.

**Comment [Sam161]:** May be picked up under self-motivation.

**Comment [Sam162]:** These are legislative drivers which are technically out of scope, but may provided useful framing for future policy. Include in Gaps.

**Comment [Sam163]:** Nano has not occurred within the search scope. Being new, I doubt there is much evidence of reduction. There are severe issues of measurement too. It's also too diverse a topic area to put out a blanket statement like this. Product toxicology and EPR OUGHT to be addressing these issues for all products and it will be, I suspect on an application by application basis.

### 3.6 L2m7: Metrics

<p><b>Module: L2m7 – Metrics (r4)</b></p>
<p><b>Are the Findings reasonable, justified and of sufficient strength? In particular, are the Learnings clearly stronger than Insights?</b></p>
<p>This Module is a scholarly, well researched contribution to the overall Project. It has carried out a significant amount of analysis of the useful sources. Many types of sources are covered and those selected are very appropriate. There is in many cases evidence to back up some of the claims that are made. Evidence is key</p>

here and often it is difficult to find without the use of a wide range of additional methods and time. So very satisfactory in many respects.

The headings are all appropriate and cover so many key aspects. So the reports can be assessed as being of a major contribution in coverage and reporting.

There is a need to give slightly more emphasis for whom the metrics may be required. Often companies only provide a skeleton of metrics to meet all legislative requirements. Within projects often metrics are required to meet funders' demands. They may be say for annual environmental reports etc. It may be wise to touch a bit more on the wide range of external bodies that require the company to use metrics.

**Comment [Sam164]:** Noted. Some extra graphs included. And a bit more text.

No sections on Learning's and Insights

**Are there significant aspects of the topic absent, where they would significantly alter the Findings (either adding to, removing or amending)?**

The recent paper by Mattsson, Read and Phillips (2010) – *Resources, Conservation and Recycling* – does cover more recent work on RECs than the Firmin 2008 report. Useful reference as it draws upon an unpublished later Envirowise report. No significant aspects missing.

**Comment [Sam165]:** In DB.

**Are the Research Gaps reasonable and would they be usefully addressed? Please tell us if, in fact, these Gaps have been addressed elsewhere, or others are indicated.**

There is no section with the title Gap in but I would recommend that there is a need to signal up the possible research / development agenda here. Some areas include:

- Metrics used by multi-national companies and how in UK this has driven the uptake of a wider set of metrics.
- Need for horizon scanning. There is a gradual evolution of metrics and new ones are arising such as water footprint. In England we need to have a high level horizon scan to be aware of the rapid development of new metrics and to inform what may be happening soon. There has been rapid change in metrics such as for Local Authority work with BVPI then National Indicators and it is not that apparent the benefits of all this. Is this a role for the Waste Management Strategy Board at Defra?
- Metrics by sector?
- Time horizon has been mentioned but more work required on the decline or not over say a 5 or 10 year horizon in performance and how the metrics can be evolved to deal with this.
- Costs associated with say a typical SME complying with all requirements to provide accurate data and information that is often required in projects. Often this has not been quantified and so companies with small funds are expected to provide information at a cost that may well rival the savings. This can inform in future what a given amount of funding can be expected to procure.

**Comment [DP166]:** Beyond scope of search.

**Comment [Sam167]:** Roadmapping recommended elsewhere.

**Comment [DP168]:** Insufficient data available.

**Comment [Sam169]:** For Defra - Other work in progress??

**Comment [Sam170]:** For Defra – work was done by OHL in the BREW Metrics scoping to determine cost of conformance for businesses, I think.

**Other comments**

A very useful Module that has managed to incorporate so many key areas and cover in some depth. Maybe a number of key recommendations are required to help chart a way ahead.

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