WR1403: Business Waste Prevention Evidence Review

L2m5-0 – Sectors Introduction

A report for
Defra

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This report has been prepared by:	David Parker (lead)
Checked as a final copy by:	Katie Deegan
Reviewed by:	David Fitzsimons
Date:	20 October 2010
Contact:	david.parker@oakdenehollins.co.uk
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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 2 modules that contain analyses of Approaches, Interventions, Sector Issues and other aspects of the review. This module deals specifically with the aspect of Sectors and provides a short introduction to the six chosen sectors. The module refers to the accompanying Level 2 modules, **L2m5-1** to **L2m5-6**, which detail and exemplify the full evidence for each of the sectors.

A full index to the report modules may be found in **L1m2: Report Index**, which also provides an overview of the analysis framework.

Contents

Glossary

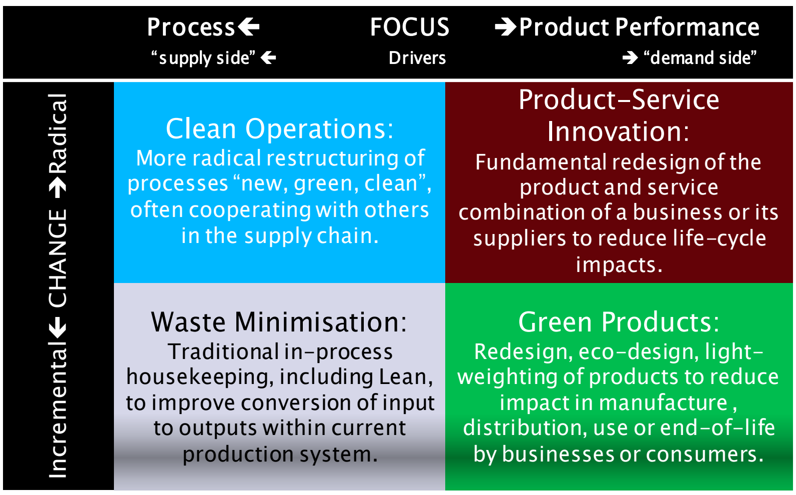
BIS	(Dept for) Business, Innovation and Skills (DBIS)	SCP	sustainable consumption and production
EPEAT	US Electronics Purchasing standard	SIC	Standard Industrial Classification (code)
GVA	gross value added	SME	small/medium enterprise (EU definition)
IT	Information technology	T/O	turnover
SBU	strategic business unit (a sector, product or service subdivision of a company)	WRAP	Waste & Resources Action Programme

Units Conventional SI units and prefixes used throughout: {k, kilo, 1000} {M, mega, 1,000,000} {G, giga, 10^9} {kg, kilogramme, unit mass} {t, metric tonne, 1000 kg}

Language used in this report

This report has used a framework for evaluating both the actions a business takes to prevent waste (the Approaches), and the mechanisms that have catalysed the actions (the Interventions). The detailed description of Approaches and Interventions may be found within the respective modules **L2m2: Approaches** and **L2m4-0: Interventions Introduction**, but a brief reference outline to the Approaches is given here:

Positioning of approaches in response to business drivers including waste



Source: Oakdene Hollins/Brook Lyndhurst

1 Introduction

This section of the review introduces the evidence for business waste prevention analysed by six sectors. As reported in the introductory module **L2m1: Introduction**, these sectors have been chosen for their importance to the economy, their waste arisings, their presumed state of knowledge and other factors such as proportion of SMEs.

Each sector has been examined first as a stand-alone entity, the scope of which is described in the next section. The prime framework for this review has been from the perspective of the individual business – the agent – motivated to take waste prevention measures, with its action characterised according to the approaches outlined in module **L2m2: Approaches**. Under these headings, the report describes the significant initiatives that have taken place within the approaches, catalysed by what mechanism. This draws on evidence that may be presented from different perspectives in other sections of the report – behaviours, interventions *et al*. Correspondingly, each module reports in the same structure:

- The nature of the evidence
- Context for the sector
- The evidence: Organised by approach to waste prevention
- Behavioural aspects: attitudes, behaviours, barriers and enablers of action
- Conclusions
- Bibliography
- Appendixes.

The following modules provide stand-alone evaluations of each of the sectors:

- L2m5-1: Construction & Demolition Sector
- L2m5-2: Food & Drink Sector
- L2m5-3: Hospitality Sector
- L2m5-4: Retail Sector
- L2m5-5: Automotive Sector
- L2m5-6: Office-Based Services Sector

2 An Overview of the Sectors

This review has concentrated on the learning available from six sectors, two of which (**Construction & Demolition** and **Food & Drink**) were mandated by Defra. Amongst others, the following general criteria were used as a guide to selecting candidate sectors:

- *Absolute size of the waste stream* – The current waste position can provide guidance for where attention may be focussed in future.
- *State of learning* – The current waste position may not be a good indicator of impacts where resource measures have already been effectively implemented.
- *Supply chain position* – Drivers and barriers will vary according to how basic, how near the consumer or relative strength within the supply chain of the relevant agents.
- *Transferable learning* – Could the lessons derived be reasonably applicable or applied to businesses in similar environments? This might also include a sector rich in SMEs to better reflect the general structure of the economy.

With these in mind, the following four sectors were chosen to supplement the first two:

- **Retail** – This is an important sector both from the volume of activity, the high profile within the consumer's eye; in the case of large retailers, there is clear evidence of its power to force change back up the supply chain through Lean initiatives and purchasing power. It is also amenable to voluntary approaches to change, and shows the power of labelling, such as ecolabel and energy rating (plus a plethora of international initiatives such as EPEAT, Nordic Swan…). Retail cuts across a number of materials and product manufacturing supply chains, representing the point of delivery of these to the purchaser or user. It is an important target of study because of the often considerable power that is wielded at this point.
- **Hospitality** – Hospitality is, like Retail, the point of delivery of a number of services, including some delivered from the Food & Drink sector. However, it is wider than this, representing not only restaurant services, but also business and corporate catering, event management, hotels and others. Hospitality and Retail have been identified by WRAP and its agents as important targets for change, resulting in significant numbers of waste management initiatives and prototype procurement standards.
- **Automotive** – This is a large sector with an intense focus on in-process efficiency driven by cost. Many prevention measures have been implemented including platform design, Lean manufacturing and chemical waste management. The large automotive brands are relatively close to consumers, but also wield considerable power over the behaviour of the supply chain. This sector is likely to be rich in successful case studies of varying and quantified waste prevention approaches.
- **Office-Based Services** – This sector contains a high proportion of the SMEs in the UK economy and is representative of the knowledge-based and other 'back office' functions prevalent in service economies. It therefore provides an element of benchmarking for the progress of waste prevention practices in this area.

Table 1 outlines the critical characteristics of these six sectors.

Table 1: Justification of the sectors chosen with semi-qualitative assessment of characteristics

	Food & Drink	Construction & Demolition	Retail	Hospitality	Automotive	Office-Based Services
Scope	From harvested food to exit of processors	Excludes quarrying and raw material generation	Limited to customer-facing sale of goods: food, pharma, stationery, clothes	Includes B2C: food and drink serving establishments, hotels; B2B: catering services; event management	Includes component, vehicle assembly; excludes dealerships and servicing	Include legal, consultancy, IT, estate agency *et al*. (excluding asset-related wastes).
(SIC)	**C:10-12**	**F**	**G**	**I**	**C:29-30**	**K**
Dimensions	Priority sector	Priority sector		Allied to F&D priority sector		
T/O [£M]	91,000	223,000	1,230,000	68,000	74,000	274,000
GVA [£M]	24,000	85,000	157,000	32,000	19,000	133,000
Waste [Mt]	7.9	110	17	4.5	1.7	>5
SMEs	Low	20%	10%	>5%	Low	>15%
Potential	High	High	High	High	Medium	Unknown
Advancement	Midfield	(UK) Lagging	Midfield	Lagging	Leading	Unknown
Evidence availability * WRAP interests	Good *	Good	Good *	Good *	Good (non UK) *	Unknown *

N.B. Qualitative judgements expressed here are those that pertained prior to the review.

Source: Oakdene Hollins; Dimensions estimated from 2007 SIC codes, 2008 Annual Business Inquiry, 2006 Waste Survey and 2008 BIS SME Distribution.
Note: SMEs in sector expressed as a fraction of total UK SMEs.
Note: More detailed SIC codes may be found in the individual L2 sector modules.
Note: Office Services data estimated from classes: Other Services, Real Estate, Admin & Support and Social Work

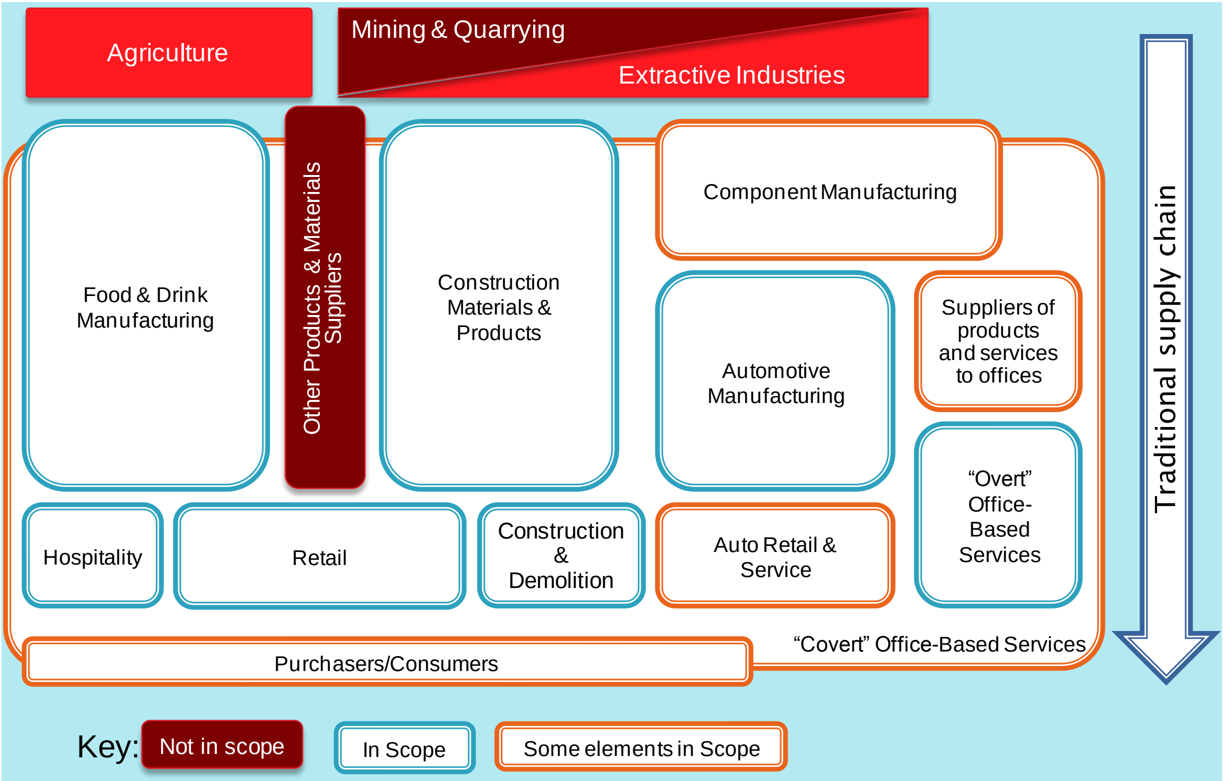
The descriptions of scope in the table outline broad intentions for search criteria. In practice, there can be substantial overlap of the sectors themselves because of supply-chain relationships and shifting business models that do not neatly fit these categories. For example, it is not possible to discuss packaging waste in Food & Drink without considering actions by packaging materials suppliers; in considering Office-Based Services we came across relevant examples from the back-office functions of manufacturing companies.

A better feel for the supply-chain relationship of these sectors can be seen from the graphic of Figure 1. This is by no means a complete view of the entire economy, but it shows the broad relationship of the sectors covered by this report, those that are not in the scope and those which have been included to some extent.

The reasons that some sectors have been partially represented include:

- they are supply-chain agents for the chosen sectors
- they are involved in 'closed loop' activities
- it is impossible to disaggregate their contribution to the chosen sectors by nature of the reporting of the evidence, or because the business activities are diverse
- we found interesting and pertinent incidental learning or opportunities during the review.

Figure 1: Overview of relationship of sectors covered with respect to each other and supply-chains



Source: Oakdene Hollins/Brook Lyndhurst

The arrow on the figure marks the traditional supply-chain flows. This is an intentional description: It reflects much of the conventional view of supply-chains and the trap of compartmentalised thinking regarding waste and resource generation; this report challenges that thinking in two ways:

- Our consideration of approaches embraces the concept that adjacent supply-chain partners can act in concert to devise better solutions – **Clean Operations** – beyond what might be achieved by one company alone.

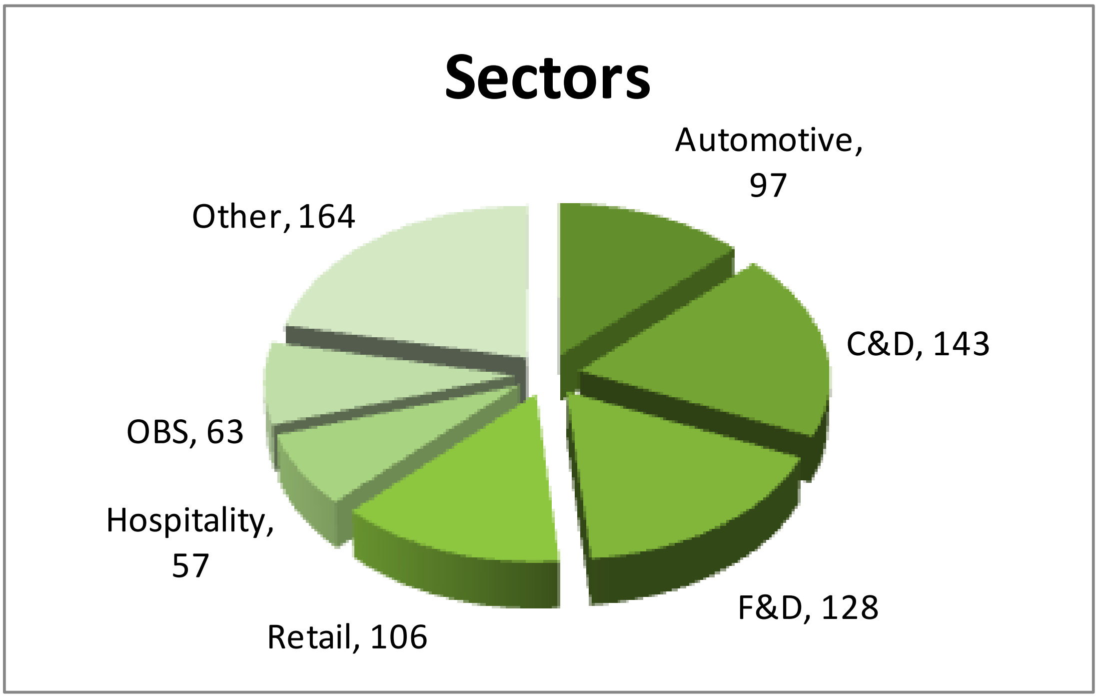
- We also consider the wider concept of product flows from their end-of-life through rejuvenation for a second or third service life. These benefits are harder to examine because they tend to have a high service content, and do not cross traditional waste measurement boundaries. In addition, it is inappropriate to ascribe the benefits wholly to the purchaser or the supplier, because each is co-operating. Within this evidence review, they appear as **Product/Service Innovations**. This treatment is consistent with our methodology outlined in Section 2.

3 About the Evidence

Evidence has been obtained predominantly from UK sources and English language publications from Anglophone countries as well as pan-EU materials. However, with native foreign language speakers in our team, we have also accessed and reviewed a significant number of reports from Germany, France, Finland and elsewhere.

In advance of reading the evidence review of individual sector modules, this section provides an overview of the balance of evidence indicated by numbers of reports located in the search. Figure 2 refers to classification of review materials obtained by 19 November 2010, the primary research phase and reflect total numbers of reports, retained and reserved, referencing the named sector. As might be expected given the weight of interest by numerous parties, Construction and Food Sectors show highest counts, with Retail and Automotive close behind. Office-Based Services and Hospitality are much more poorly represented.

Figure 2: Sector reference frequencies (retained + reserved)



Source: Oakdene Hollins/Brook Lyndhurst

The statistics of Table 2 are in respect of the higher quality[a] reports that have been retained or reserved for further analysis. In particular, this breakdown shows the cross-cutting theme of our analysis, that of **Approaches**.

[a] The definition of higher quality in this work can be found in the L2m1: Introduction module. This accounts for the differences between these numbers and the raw frequency counts of the prior text.

Some general observations on this data are pertinent:

- Overall, the reports are, as expected, heavily weighted towards Waste Minimisation, with Clean Operations and Green Products equally represented. It should be noted, however, that the Green Products reports play heavily on a limited number of very similar instances replicated from a few core initiatives in, for example, light-weighting of packaging in Food & Drink and Retail. They do not show the diversity that might be expected based on the promise of headline techniques such as eco-design.

- Product/Service Innovation is the least represented. This is unsurprising and could be attributable to a number of reasons which are identified in the relevant reports. It should also be noted that a number of Product/Service Innovation examples are not strictly examples from operators in the sectors of the modules but instead from ***suppliers*** to those sectors. To be rigorous, we would have classified these as Waste Minimisation, but this would have not given fair recognition to the Product/Service Innovation category ***when considering the broader economy***.

Table 2: Frequency of approach classification of higher quality evidence review documents

Sector	Approach			
	Waste Minimisation	Clean Operations	Green Products	Product/Service Innovation
Construction & Demolition	19	9	5	6
Food & Drink	6	14	13	1
Hospitality	7	3	3	1
Retail	3	7	12	5
Automotive	8	6	4	3
Office-Based Services	6	9	0	2

Source: Oakdene Hollins/Brook Lyndhurst
N.B. This diagram is replicated within the ***L2m2: Approaches*** *module.*

The data are commensurate with expectation in that the more basic, materials-oriented industries are dominated by Waste Minimisation approaches, whereas the more sophisticated product and services sectors show greater use of Operations and Product options. There appears to be little pattern in the use of Product/Service Innovations which may reflect low numbers of good examples, but most probably that we have been generous in including examples outside the sectors but which supply beneficial services to them. These should strictly be classified as Waste Minimisation or Clean Operations approaches.

Oakdene Hollins Ltd
Pembroke Court
22-28 Cambridge Street
Aylesbury
Buckinghamshire
HP20 1RS

T: +44(0)1296 423915
E: admin@oakdenehollins.co.uk
www.oakdenehollins.co.uk
www.remanufacturing.org.uk

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