

Phase 2: Exploring the relationship between environmental regulation and competitiveness

A case study on Extended Producer Responsibility (EPR) and the UK Packaging Waste Regulations

A research report completed for the Department for Environment, Food and Rural Affairs by SQW Consulting

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TABLE OF CONTENTS

1	Introduction	1
2	Packaging Waste and the Extended Producer Responsibility concept.....	3
	Development of Regulations	3
	Use/implementation of regulation.....	4
	Flexibility in design of targets	6
	Consultation/engagement with industry	7
	International comparison.....	8
3	Effectiveness of policy	10
	Environmental effectiveness of EPR	10
	Effectiveness of enforcement.....	11
	Effectiveness of different policy instruments.....	12
	Effectiveness of Pricing	14
4	Evidence on the influence of regulatory form on innovation, productivity and competitiveness	16
	Innovation effects	16
	Productivity and competitiveness effects.....	19
5	Concluding statements	26
	Environmental impacts	26
	Productivity and competitiveness impacts.....	26
	Policy implications	27
	Annex A: List of Consultees	i
	Referees	ii

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Approved by:	Geoff White	Date:	August 2007
	Director		

1 Introduction

- 1.1 SQW were commissioned by DEFRA in 2006 to conduct a literature review of the available evidence on the relationship between environmental regulation and competitiveness to establish the robustness of the conclusions from the available evidence and their relevance to the UK. This study highlighted the need to conduct further research on the impact of regulatory design & implementation and regulatory form on competitiveness.
- 1.2 As a result, SQW were commissioned to conduct Phase Two of the research, which sought to 'gather and analyse evidence on the impact of the design of environmental regulation on competitiveness' through the undertaking of a set of case studies. The research examined the following policy issues:
- The impact of business design and implementation of regulation on SMEs as compared to larger businesses
 - The forms of regulation most likely to induce innovation
 - The importance of context in determining the extent of inducement effects of regulation on innovation.
- 1.3 This case study discusses the UK's implementation of the European Parliament and Council Directive on Packaging and Packaging Waste, through the Producer Responsibility Obligations (Packaging Waste) Regulations, first introduced in 1997 and revised in 2005 and 2007. These regulations set recovery and recycling targets, as a percentage of all packaging waste arising in the UK, to meet the requirements of the Directive. Through the introduction of these regulations, the UK Government introduced the concept of Extended Producer Responsibility (EPR) to the packaging chain as a forerunner to other EPR regulation.
- 1.4 The material used to produce the case study has been derived from an extensive review of the literature and consultations with individuals covering the areas of policy, industry and academia. More details on the sources of evidence can be found in Annex B.
- 1.5 The next section of the case study describes the Producer Responsibility Obligations (Packaging Waste) Regulations in more detail, the design and development of the regulations, and how they affect different elements of the packaging sector. Section three outlines any evidence on the effectiveness of the regulation to date in terms of environmental outcomes, enforcement and pricing, as well as a discussion on the effectiveness of different policy

instruments. In section four, the discussion focuses on the influence that the regulation has had on innovation, productivity and competitiveness. A summary of the case study and concluding observations are set out in section five.

2 Packaging Waste and the Extended Producer Responsibility concept

- 2.1 Waste streams are increasingly seen as a problem in the UK. Overall levels of household, commercial and industrial waste in England and Wales are estimated at over 100 million tonnes annually, and growing at around 3% per year¹. At the same time, areas identified for landfill (which presently accounts for around 90% of controlled waste in the UK) are rapidly running out of capacity, and during the next decade landfill costs are expected to double².
- 2.2 The amount of packaging entering the UK waste stream is estimated to be around 10.3 million tonnes in 2005, and set to increase to 10.8 million tonnes by 2008³. It is estimated that around half of this packaging waste comes from the commercial and industrial waste stream and half from household waste. 2005 estimates show the packaging waste stream is made up of various materials including paper (36%), glass (24%), plastics (18%), wood (14%), steel (7%) and aluminium (1%).
- 2.3 Environmental regulation has been introduced to tackle this growing problem, with the aims of increasing resource efficiency and encouraging the recovery and recycling of packaging waste. Further, as the cost of handling each tonne of waste has risen, Extended Producer Responsibility (EPR) policies can be implemented to help reduce the financial burden on municipalities⁴.

Development of Regulations

- 2.4 The European Parliament and Council Directive on Packaging and Packaging Waste (94/62/EC) ("the Directive") first came into force at the end of 1994 and has both environmental and single market objectives. The Directive aims to harmonise the management of packaging waste in the EU and tackle the impact that packaging and packaging waste have on the environment. Although the primary objective is to increase the recovery and recycling of packaging waste in a consistent way in all Member States of the EU (so as to avoid barriers to trade), priority is also given to reducing the amount of packaging used and the reuse of packaging. The Directive sets Member States mandatory recovery and recycling targets, the first of which were to be

¹ <http://www.defra.gov.uk/environment/waste/index.htm>

² <http://www.biffa.co.uk/publications/problem/opt3.php>

³ Defra, August 2005 ; <http://www.defra.gov.uk/environment/statistics/waste/download/xls/wrfg17.xls>

⁴ OECD, 2005

met in 2001. Definition of the mechanism for achieving these targets was left to the Member States.

- 2.5 A revised Packaging Directive (2004/12/EC) was published in February 2004. It sets new recovery and recycling targets, as a percentage of all packaging waste arising in the UK, to be met by 31 December 2008.
- 2.6 The United Kingdom adopted the EPR concept in its 1995 Environment Act. The government then passed the Producer Responsibility Obligations (Packaging Waste) Regulations in 1997 and the Packaging (Essential Requirements) Regulations in 1998.
- 2.7 Revisions to the Producer Responsibility Obligations (Packaging Waste) Regulations were made in 2005 and in 2007. The 2005 Packaging Regulations consolidated the original 1997 Regulations with all of the subsequent amending Statutory Instruments and they also incorporated the changes made to the Regulations in 2005 as a result of public consultation. Further consolidation of the regulations was put into force on 16th March 2007 (examined in overview in sections below).

Use/implementation of regulation

- 2.8 The policy instrument was implemented as 'Producer Responsibility' which is an extension of the 'polluter pays principle', and is aimed at ensuring that businesses take responsibility for the products they have placed on the market once those products have reached the end of their life⁵. Producers are required to ensure that a certain amount of recovery/recycling is undertaken to meet their obligations, and are subsequently issued with evidence of compliance. The UK system operates through a *tradable credit scheme* - to demonstrate compliance with the regulations, obligated companies must show that they have enough Packaging Waste Recovery Notes (PRNs) or Packaging Waste Export Recovery Notes (PERNs) to meet their recycling obligations. An obligated firm may purchase evidence of compliance themselves, or can join a registered compliance scheme which takes on the legal obligations for a business. PRNs and PERNs are traded from accredited re-processors and exporters, respectively, through to obligated companies and compliance schemes. An organised marketplace, the Environment Exchange, exists to handle trades, and an active (but limited) spot market has developed.

⁵ The principle of EPR, as stated in the OECD Guidance Manual (2001), is: "Producers of products should bear a significant degree of responsibility (physical and/or financial) not only for the environmental impacts of their products downstream from the treatment (recovery) and/or disposal of the product, but also for their upstream activities inherent in the selection of materials and in the design of products. The objective of EPR is to reduce the volume and hazard from products at the post-consumer stage"; as quoted by Smith (OECD, 2005)

2.9 The UK regulations divide producer responsibility into five categories – manufacturer, converter, packer/filler, seller, and importer – and then apportion the recycling obligations to each group.

- Manufacturers of raw materials for packaging (*'raw material manufacturers'*) are responsible for 6%
- Businesses that convert raw materials into packaging (*'converters'*) are responsible for 9%
- Fillers, who put goods into packaging, or use packaging to wrap goods (*'packer/fillers'*) are responsible for 37%
- Sellers who sell packaging to the final user or consumer of the packaging (*'sellers'*) are responsible for 48%
- Importers carry the obligations for the activities on packaging they import that were carried out before the packaging or packaging materials entered the UK. E.g. a pack/filler imports 100 tonnes of flat cartons which it will fill. As an importer, the pack/filler has the raw material manufacturing and converting activity obligations (6% + 9%), and these are referred to as the “rolled up” obligations.

2.10 The current targets (at the time of writing) that must be met by the UK by 2008 as part of the compliance requirements of the policy instrument, are as follows:

- Overall recovery - 60% ⁶
- Recycling 55% – 80% (of which minimum material-specific recycling targets are):
 - Glass 60%
 - Paper/board 60%
 - Metals 50%
 - Plastics 22.5%
 - Wood 15%

2.11 The regulatory body responsible accrediting reprocessors and exporters, as well as for the enforcement of the policy instrument is the Environment Agency in England and Wales; the Scottish Environment Protection Agency

⁶ The 'business' recovery target is somewhat higher, to account for small businesses excluded from the obligations

(SEPA) in Scotland and the Environment and Heritage Service (EHS) in Northern Ireland.

Flexibility in design of targets

2.12 There is some flexibility in the nature of the policy which accommodates differences in market circumstances in which regulated firms operate. For example:

- Targets differ according to different roles in the packaging chain and by sector (as above)
- The main target is larger businesses (a minimum threshold applies relating to both amount of packaging and annual turnover⁷); through removing the smaller businesses, the burden of enforcement is consequently smaller
- Three bands of compliance, including simplified regulations for firms dealing with smaller amounts of packaging⁸
- A choice of how to comply – either through a compliance scheme (more common) or directly with the Environment Agency (although this is cheaper, a firm must have the capacity to do this; however if obligated firms have the option to come up with innovative take-back strategies on their own, their incentives to minimise costs will help reduce the overall costs of the system)
- The PRN scheme itself gives added flexibility – the responsibility for collection of waste is taken away from individual companies (which is aimed to minimise costs and make the market function more efficiently). The presence of a spot market also serves as a hedge against the risk that a firm contracted for an insufficient amount of recycling⁹
- Certain sectors were provided with a greater level of support (e.g. financial incentives to the plastics sector).

⁷ Only those firms which handle more than 50 tonnes of packaging and have more than £2m financial turnover are covered by the obligations; obligated businesses made up around 86% of estimated packaging waste in 2005 (Defra, August 2005).

⁸ Those firms with a turnover below £2 million who handle less than 50 tonnes of packaging do not have to comply as the burden of proving compliance would be unduly large. Those firms with a turnover between £2 million and £5 million have to comply with simplified regulations. Finally, those firms with a turnover of £5 million plus who deal with large amounts of packaging are subject to the full regulation, which includes, for example, the requirement to produce a compliance plan, outlining the steps they intend to take to meet their recovery and recycling obligations.

⁹ Walls, 2006

- 2.13 The regulations are revised on a regular basis to reflect changing annual targets, to clarify policy, and to tighten up loopholes which become apparent. The 2007 regulations came into force in March 2007 and included clarifications on the definition of a 'small business' and what the threshold criteria are, as well as closing the loophole related to foreign ownership of business.

Consultation/engagement with industry

- 2.14 A consultation period took place as normal with new regulations. Initially, the Government planned that the regulation would be voluntary, but industry said they wanted regulation to stop free-riders. Whilst most countries opted for single point regulation (e.g. through regulating 'sellers' or 'fillers'), consultation with the industry in the UK indicated that the burden should be shared amongst all stages of the packaging chain. (This was seen by some as a manifestation of the power that retailers enjoy with Government, and particularly unfair on packaging 'converters', the least profitable part of the supply chain.)
- 2.15 The government strategy was to create a system that was supported by industry, and according to Valpak (the largest compliance scheme), the close collaboration between government and industry had a very positive influence on the design of the system. However, whilst Valpak praises the system for its low costs for industry, it is concerned with the system's complexity. According to SEPA, it is likely that the UK legislation would not have been so complex had the Government not tried to ensure that most sectors of industry supported the proposals. The Environment Agency adds that it took a huge amount of time for industry to agree on the structure of the system¹⁰.
- 2.16 The PRN concept had no statutory status at first, so the Government had initially to discuss with the EA, who then discussed with SEPA, on how to develop evidence of compliance. Consultation with industry followed, first through an Advisory Committee and then to wider stakeholders, especially re-processors and waste management bodies (e.g. consultation about ownership of PRNs, which was vested with re-processors).
- 2.17 Prior notice was given to the sector, supported by the dissemination of information by industry bodies (such as the Packaging Federation), and there was a considerable lead-in time. The regulations were introduced in 1997, but the introduction of PRNs was not until January 1998 (n.b. the Environment Agency who were tasked with management of this process was not in existence prior to 1996).

¹⁰ EEA, 2005

- 2.18 The mini Regulatory Impact Assessment of Producer Responsibility targets for the period 2004 – 2008 also involved a reflection on industry viewpoints. It concluded that targets should be announced for the full 5-year period, because industry had emphasised the need for there to be a firm basis for them to develop forward plans for compliance¹¹.
- 2.19 Most recently, a consultation on proposed changes to the packaging regulations was undertaken between September and November 2006. One of the key changes to the regulations was closing the loophole regarding foreign ownership of businesses – (if a company introduces packaging waste to the UK waste stream, then it is covered by the regulation no matter where the company is based).

International comparison

- 2.20 The Packaging and Packaging Waste Directive was one of the first Producer Responsibility Directives, although the principle of EPR has been adopted in various high-profile waste management policy initiatives, starting with the German 'Duales System Deutschland' (DSD) in response to the German Packaging Ordinance of 1991¹². Policy instruments similar in nature have been implemented in many other countries. Walls (2006) describes and discusses EPR programmes in the Netherlands, which became the first country in Europe to introduce the EPR principle for a wide range of electronic and electrical equipment, and with regard to used oil in Western Canada, as well as with regard to packaging in the UK. These policies have all embraced the Extended Producer Responsibility concept.
- 2.21 Fifteen countries were subject to the initial EU Directive on Packaging Waste with 2001 as the first target year (although Italy regarded its first target year as 2002, and three of the original 15 countries had their targets extended to 2006. Greece is unlikely still to be achieving its targets, but Ireland and Portugal have caught up rapidly).
- 2.22 Other European countries have a Green Dot scheme, where a green dot is placed on packaging by the producer to identify the product as being part of the collective take back scheme (generally known as a Producer Responsibility Organisation – PRO). Thus, the green dot acts as a licence symbol to identify the products of companies participating in the PRO. Households are then expected to separate Green Dot packaging into a separate bin for collection by the PRO. In Germany there is a monopoly compliance scheme, where people pay according to type and quantity of packaging and this is used to fund take back. The scheme was somewhat

¹¹ Defra 2003, Mini RIA - Targets

¹² OECD, 2005

chaotic at the start as it generated significantly more material than anticipated and recycling capacity could not keep up. The monopoly aspect also meant that recycling costs were much higher than in the UK. An interesting effect was that people could leave packaging in supermarkets, which subsequently put pressure on suppliers to reduce packaging as they were getting overcome with waste. The Green Dot system also initially led to a problem with free riders when households disposed of non Green Dot items in the Green Dot bin. In this manner, non-participating producers were getting a free ride. This was initially a costly problem but has now been largely solved due to an increased flow of information to the public¹³.

¹³ OECD, 1998

3 Effectiveness of policy

Environmental effectiveness of EPR

- 3.1 There were two different original environmental aims of the packaging waste regulations, and effectiveness would include: success in reducing waste (through design changes and use of different materials), and success in achieving recovery and recycling targets¹⁴. In summary of the evidence we have reviewed, the latter has been successful, whilst the former has not been so successful.
- 3.2 The EPR regulation has been successful in terms of increasing recycling to meet more stringent recycling targets (all targets have been met except for glass). The original policy recommended low targets, as the Government was worried about meeting them. However, as targets have increased it is clear that the policy has enabled a move towards greater proportions of recovery and recycling. Overall, PRNs are likely to give an under-estimate of the true recovery and recycling figures, as not all small re-processors want to pay for accreditation (although this effect is likely to be small¹⁵).
- 3.3 However, the regulation has been less successful in terms of reducing over-packaging or tackling problems related to design¹⁶. It has not, for example, tended to encourage firms to look at the recyclability of the final product (see later on issues related to collective responsibility); firms are not encouraged to incorporate 'environmentally friendly' packaging design if they are willing to pay (through compliance schemes) to disperse their responsibility. In terms of achieving the environmental goals, a failing of the regulation is that it is weight-based. Anecdotal evidence and evidence from WRAP shows that there has been a general light-weighting of packaging goods (e.g. 30% lighter) over the last ten years¹⁷, although it is difficult to attribute this to the regulations. However, other issues such as the ease of recycling materials used in packaging need to be taken into account. Specific interventions by government-funded organisations are one way of stimulating environmental innovation. The WRAP programme, for example, provides grants for specialist equipment to make packaging more recyclable, as well as providing guidance on best practice in terms of environmentally friendly packaging.

¹⁴ It is difficult to quantify more specific environmental successes, as there is no direct link with indicators such as air quality or water quality, for example.

¹⁵ Anecdotal evidence suggest some issues exist, particularly in Northern Ireland

¹⁶ This appears to be a similar story across the EU where EPR has been adopted

¹⁷ See examples on WRAP website (www.wrap.org.uk)

- 3.4 Whilst the regulation appears to have been effective in diverting packaging waste from landfill, it is difficult to attribute this purely to the EPR regulation when other factors are also changing (e.g. Landfill Tax is consistently increasing). Similarly, there is a disconnect between what industry is expected to do (through EPR) and what Local Authority collection systems can cope with. With its focus on industry and commercial waste streams, recycling and recovery through EPR does not contribute to municipal waste recycling targets (which are arguably more important to the UK as they can attract fines for non-compliance under European law). Our consultations suggested that more joined-up thinking between these waste streams is needed, and that Local Authorities may need to be incentivised to do more to take more packaging waste out of the household waste stream. (Currently, Local Authorities are more interested, for example, in collecting and separating biodegradable waste - to meet their weight-based landfill diversion targets at the lowest cost - than plastics).
- 3.5 We have found little evidence on context-specific differentiation, although larger companies are generally more responsive to the regulation: not only are they over the compliance thresholds, but they are more likely to have both the economic incentives and management system in place to respond.

Effectiveness of enforcement

- 3.6 Consultees had mixed opinions as to whether the policy instrument had been effectively enforced. The Environmental Agency (EA) has monitored the scheme in England and Wales, and this is considered to have been effective¹⁸. The EA does not have the resources to follow up every case (instead a rolling sampling system, based on the data submissions, is in place); although without the *de minimis* approach limiting the number of firms to which the regulations apply, the scheme would have been “completely unenforceable”¹⁹.
- 3.7 Through joining a compliance scheme, businesses transfer the legal liabilities associated with the regulation (i.e. the implications of failure to recover and recycle). Until recently there was no effective way to discipline those schemes not achieving targets. In 2001 for example the UK narrowly failed to meet the Directive’s overall recovery target, in part due to the failure of one compliance scheme to discharge the recovery and recycling obligations of its members. Whilst the members were not legally responsible because of their membership of the compliance scheme, under arrangements at that time

¹⁸ In contrast, the Packaging Essential Requirements are enforced by Trading Standards, who only investigate if consumers complain

¹⁹ *pers. comm. Defra (March 2007)*

neither the 'scheme' nor the scheme operator specifically was subject to any penalty if it failed to meet its members' obligations (although the scheme operator could have been de-registered). This was changed as a result of the 2003 Mini Regulatory Impact Assessment (RIA), and scheme operators are now liable to enforcement²⁰; there have been approximately 300 prosecutions to date and in most cases people have left court with a fine greater than the savings from non compliance.

- 3.8 There have been examples of companies not taking the regulations seriously (believing that they would not be prosecuted if they did not comply). There have also been problems with differences in local interpretation, and some instances of fraud have also been uncovered (particularly in the plastics sector, most likely because of a plethora of smaller firms). The number of PRNs issued for wood and plastic grew substantially in 2002 with no apparent increase in the collection of these materials. Some reprocessors were suspected of issuing illegitimate PRNs, and this activity has been cited as contributing to the fall in plastic PRN prices in 2002. Walls comments that "with the value that PRNs have on the open market, the government will almost certainly have to be constantly diligent in preventing fraud and enforcing compliance within the system"²¹. The Environment Agency has carried out three specific investigations into allegations of inappropriate issue of PRNs and PERNs – for plastics, wood, and paper packaging waste²².
- 3.9 There were also initial problems with tracking export of packaging, but this has been tightened through the introduction of licensing for re-processors abroad (to issue PERNs), and – more recently – the closing of loopholes related to the obligations of foreign-owned business.
- 3.10 However, the vast majority of the movement of PRNs is genuinely sourced²³, and the system has become much tighter. A potential fixed penalty notice-type enforcement of administrative issues is being considered, which could make the regulation more streamlined.

Effectiveness of different policy instruments

- 3.11 On the whole, financial instruments are useful in achieving reductions in packaging waste, and PRNs have been somewhat successful in achieving this. Evidence suggests that both recycling and recovery rates have risen since the Packaging Waste regulations came in: the recycling rate from packaging was 28.2% in 1998 rising to 56.8% in 2006; recovery was 33% in

²⁰ Defra 2003, Mini RIA

²¹ Walls, 2006

²² Further details are available on: www.defra.gov.uk/environment/waste/topics/packaging/index.htm

²³ pers. comm. EA (February 2007)

1998 and 61.3% in 2006²⁴. It is difficult, however, to tell how much this is due to the EPR regulation and how much to other factors, such as an increase in doorstep collection and changing public attitudes.

3.12 Alternative instruments to EPR policy might include the following:

- End-of-pipe pricing for dealing with waste (e.g. Landfill Tax) is an alternative instrument to reduce waste; whilst this has proven very effective, it is a relatively blunt instrument when targeting particular waste streams such as packaging waste
- Variable household charging could have a bigger impact on the sector in terms of reducing its environmental effects – especially in terms of driving consumer demand for reductions in packaging (itself a key driver in delivering innovation in the sector)
- Overall bans (e.g. as with leaded petrol) can be most effective in terms of environmental outcomes. The UK could simply ban carrier bags for example, although this option is less politically feasible and may have unwanted socioeconomic side effects.

3.13 Our consultations suggested that the key is to implement a mix of tools, as well as ensuring that these are enforced (other regulation is not enforced as tightly as it should be, for example whilst fly-tipping is still relatively common, strengthening penalties on waste is likely to have adverse effects). At the very least it is important that the tools adopted do not contradict each other. There is scope for the Packaging Essential Requirements regulations to do more to support EPR²⁵, and producers should be persuaded more strongly to build Essential Requirements into their products at design stage. The 2003 Defra mini Regulatory Impact Assessment (RIA) suggested that consideration also needs to be given to the best way of investing in the development of end-use markets, which will increasingly be needed as recycling targets rise and as other producer responsibility schemes with recycling targets (WEEE, ELVs) come into effect²⁶.

3.14 Although around 30% of notes are PERNs²⁷, the international dimension to this regulation does not appear to distort the effectiveness of the policy in the UK. On the contrary, the UK could be seen as fortunate in having a viable population for dealing with some waste domestically (as compared with

²⁴ Source: <http://www.defra.gov.uk/environment/statistics/waste/download/xls/wrfg17.xls> ; pers. comm. Defra, April 2007

²⁵ An argument was put forward that Essential Requirements regulations, as administered by Local Authority Trading Standards Officers, ought to be stronger on minimisation of packaging

²⁶ Defra 2003, Mini RIA - Targets

²⁷ This varies significantly by sub-sector: minimal for wood; plastics well over 50%; metals around 50%; paper is rising rapidly; glass is limited

Iceland, for example), and strong trade links to deal effectively with other waste that we do not have the capacity to deal with.

- 3.15 End-of-pipe pricing, such as Landfill Tax, would not necessarily focus on packaging waste, although if the prices for waste in general were set, the market could work out which types of waste it would be most efficient to recycle. The effectiveness of individual policy instruments versus others may however require further research, so as to avoid a mix of policies simply becoming extra red-tape burden (e.g. if Landfill Tax achieved the same objectives as EPR).
- 3.16 It is also important to focus on the way that the regulation is put to companies – publicity is important (more than has happened at present) and there need to be fixed targets and obligations that are easy for firms to understand.

Effectiveness of Pricing

- 3.17 The tool is essentially an economic one, and is deliberately a market-based tool which relies on the market to dictate the price. It is therefore interesting to examine the effectiveness of the pricing in achieving the overall goals of the regulation.
- 3.18 The price reflects both how high the EPR target is for individual sectors, and how achievable it is. Initially (and unintentionally) the PRN values were virtually uniform at the outset, although now there is more differentiation between the sectors: wood has very low prices (targets are easily achievable); glass and metals are increasing in price (due to high targets). However, changes to the regulations (in particular to targets) over time have led to a lack of stability in the market, and therefore in prices.
- 3.19 PRNs in principle are a good way of encouraging more environmentally friendly companies to make additional profit over environmentally unfriendly companies. In terms of planning, this allows business-support organisations (e.g. Envirowise) to put a value on the implications of redesigning packaging, to which firms can more readily respond (Envirowise has recently helped a relatively large company make £100,000 savings by lightweighting their packaging). However, in practice, firms often view PRNs as a fixed cost they have to pay and do not consider the fact that they could take actions to reduce this cost.
- 3.20 The variability (and unpredictable nature) of PRN prices makes it difficult for reprocessors to plan income and, consequently, investment. It could be helpful therefore to implement some sort of price floor and ceiling for PRNs. In practice it would be difficult to devise anything more fixed in a competitive

marketplace, and the PRN market was established to be an independent market. We received several comments that, whilst the PRN mechanism is seen as a positive one, the PRN price needs to be higher than it currently is to encourage producing firms to cut back on packaging and change their behaviour.

- 3.21 On the other hand, the PRN was designed to be an evidence note, rather than to be used as a 'commodity'. However, whilst reprocessors are required by the regulation to reinvest PRN income into capacity-building (e.g. commercial collection, increased volumes, different types of waste), this is difficult to monitor and enforce and some reprocessors may simply view PRNs as an alternative income stream.
- 3.22 On the whole, there has been no reduction evident in the amount of packaging placed on the market. This suggests that the costs imposed by the regulation are not sufficient to persuade firms to reduce the overall amount/weight of packaging they produce. Further, by delegating all of their responsibilities to compliance schemes and reprocessors, producers may lose the incentive to improve environmental performance²⁸.

²⁸ EEA, 2005

4 Evidence on the influence of regulatory form on innovation, productivity and competitiveness

Innovation effects

- 4.1 The introduction of the compliance schemes to deal with PRNs could be seen as an innovative response to the regulation; whilst this approach was not new in the UK, the introduction of competing compliance schemes was. Indeed PRNs themselves were only introduced by the government after one such compliance scheme, Valpak, decided to contract out the collection of packaging waste to reprocessors and needed a 'common currency' for trading (Salmons, 2002).
- 4.2 Other innovations in the packaging sector include:
- lightweighting or reduction of packaging (e.g. thinner plastic for wrapping food in supermarkets)
 - use of new packaging materials (e.g. petrochemical companies such as Cargill Dow have created packaging from plant-based materials)
 - a switch from single-use cardboard containers at supermarkets to reusable plastic pallets and crates, spurred by the fact that the recovery obligation only applies to the 'first use' of packaging²⁹
 - the emergence of niche re-processors – for example, using used glass to produce 'antique-effect' glass
 - moves to use less mixed materials – e.g. bottles, caps and labels all made from the same polymer (with fewer polymers used overall)
 - the establishment of government bodies to advise businesses on reducing packaging and waste (e.g. Envirowise; WRAP).
- 4.3 However, whereas there is a clear link between some of the above with the regulation (e.g. PRN revenue has made the antique-effect glass re-processing operation more viable), other innovations (such as light-weighting through using less material and material substitution, or such as increased recycled content) are as much a reaction to competition in the marketplace and demand from further up in the packaging chain, and the use of new raw

²⁹ Walls, 2006

materials was described as “less than hoped for”³⁰. The introduction of biodegradable materials in packaging is not likely to be a direct reaction to the regulations, as PRNs are still required for these.

- 4.4 Our consultations suggested that – whilst the Essential Requirements in the legislative framework set out minimum expectations for packaging – consumer demand is the primary driver of innovation in the packaging sector, and this has been particularly true in recent years. This can be witnessed in the recent amount of publicity surrounding Marks & Spencer’s reductions in packaging waste. Other companies appear to be following suit because of the importance of public image. Marketing competition is therefore foremost in terms of innovation drivers for consumer-facing packaging (other types of packaging, such as transit packaging, face different pressures), along with (a more minor element of) health and safety considerations. There is a counterfactual evident: prior to the regulations being introduced, firms were already involved in light-weighting and increasing recyclability.
- 4.5 In terms of other potential drivers, raw material and resource prices haven’t changed much in this sector. However, static product demand, greater fragmentation and intensified competition in the product market have all had a direct impact on innovation³¹. Whilst regulation does have an impact on innovation, the targets do not appear to be high enough to have a strong impact. Further, the communal nature of the responsibility is less likely to lead to innovation on an individual basis (this is explored below).
- 4.6 Further, as the scheme is several years old now, many firms originally joined compliance schemes years ago, which have often negotiated long term deals for PRN/PERNs with reprocessors/exporters, and now view the EPR regulations as something they have to pay (i.e. firms do not think more widely about saving money on PRNs through light-weighting their packaging).
- 4.7 On the whole, our consultees thought that environmental policy was unlikely to positively influence innovation in the packaging sector³², although it is hard to tell from the outside whether that innovation which does occur is a response to policy or to consumer demand. One consultee representing the packaging sector went so far as to say: “No legislation in the world will create innovation in packaging – innovation is driven by the need to compete and survive!”.
- 4.8 Economic incentives not linked to the regulation tool itself have arguably led to innovation, such as the recent increased use of re-usable transit packaging

³⁰ *pers. comm. Defra (February 2007)*

³¹ Packaging Federation, 2006

³² Although it has stimulated innovation in terms of collection mechanisms, capacity building, etc.

in supermarkets, although the presence of the regulations has possibly emphasised the spread of such practices.

Collective responsibility and 'free-rider' effects

- 4.9 Although the PRN system is designed to encourage minimisation of packaging waste at source (because the producer pays according to the amount they produce), the presence of compliance schemes, who take direct responsibility away from firms (through buying PRNs), is not well arranged for innovation, in terms of minimisation or increasing product recyclability³³.
- 4.10 Firms tend to see the regulation as an additional cost (dealing with PRNs has been described as a tax by some), but there is no emphasis on design changes from the outset. It was felt that more information is needed to let companies know that redesigning packaging may reduce costs. Indirectly, some innovation may occur through firms seeking advice from organisations such as Envirowise on addressing the regulation. (Interestingly, we found that companies with environmental policies and environmental management systems are more likely to go to Envirowise for help with reducing packaging and therefore save money.)
- 4.11 However, regarding innovation in the packaging supply chain related to increasing the *ability to recycle* packaging at the end of its life (one of the environmental goals of the regulation), the situation can be summed up as follows:
- the costs of a specific innovation involved with making a product more recyclable would accrue to one firm, but
 - the benefits of using that innovation (i.e. in increased ability to recycle the packaging and therefore, potentially, lower costs) would not be directly received by that firm, but rather would potentially accrue across the sector as a whole.
- 4.12 Put another way, “with no brand sorting and no tracing of products’ recycling costs to producers, there can be no strong incentives for producers to increase recyclability” (Walls, 2006).
- 4.13 The situation does not, therefore, engender innovation in this way without some form of reward (albeit that a reward may come separately from consumer demand and marketing), and can therefore be seen as a kind of

³³ This is a theory supported by Smith: “... the incentives for a producer to design products that will have low waste management costs will be sharper if the waste management costs savings translate directly into lower contributions to the running costs of the Producer Responsibility Organisation (PRO) [compliance scheme]. If all firms share PRO costs equally, without regard to the waste management costs of their products, the incentive for an individual firm to make waste-reducing product changes may be small” (OECD, 2005)

market failure. This can lead to ‘free rider’ effects, similar to (but not the same as) the metaphor of ‘Tragedy of the Commons’, in that rational individual producers with collective responsibility of achieving an end goal (but without individual benefit in spending resource in trying to reach that goal) will not ultimately deliver it.

Aspects of instrument design to incentivise innovation

- 4.14 It is possible that changes in the instrument design and form could incentivise innovation in the future. Many companies have been members of compliance schemes for several years and view it as a (relatively fixed) cost to bear. A more strategic view could be taken by reminding firms that they could save money by redesigning their packaging, through a concerted marketing approach (an approach taken by WRAP and Envirowise).
- 4.15 Alternatively, better targeting of PRN receipts could ensure that a proportion was collected for distributing to develop innovative ideas in re-use (such as the glass recycling idea)³⁴. Indeed, the original intention of the scheme was for any profits made by re-processors from PRNs to be re-invested into capacity building. In practice this may not have been effectively enforced.
- 4.16 Another (more challenging) suggestion was to change targets from being weight-related to environmental-impact related. This would, however, require a lot of research and may be unfeasible due to difficulties in administration. There may also be issues around the transparency of a ‘carbon-based’ system versus a weight/volume based system of measurement.

Productivity and competitiveness effects

Cost to firms

- 4.17 EPR has transferred a large part of the costs of waste management ‘upstream’ from the public sector (municipalities) to the private sector³⁵. Businesses have incurred higher costs as a result of the packaging regulations, and the lack of stability in PRN prices has meant that it is difficult for firms to predict this. Firms have costs related to compliance, but also associated with collecting the data (this varies from company to company, depending on how many types of packaging they deal with). Our consultations suggest that firms have – in some instances – been able to pass on costs to the consumer.

³⁴ However this would have to be carefully managed to make sure no state support laws were breached. Additionally, it may ‘look like’ an additional tax, which would be a difficult idea to sell

³⁵ OECD, 2005

- 4.18 Costs of accreditation for issuing PRNs and PERNs have been borne by re-processors and exporters, rather than producers, since 2005. Whilst this is an effective barrier to entry to many smaller companies, it is also important administratively for the EA in terms of managing its enforcement function.
- 4.19 The UK system allows any company to apply to become an accredited compliance scheme. As a result, 21 compliance schemes have been established, ranging from geographically-based schemes (e.g. PENNINE-PACK) to industry-specific schemes (e.g. Difpak for the Dairy industry³⁶). This has a cost attached to it for member firms, but removes the burden of organising their own storage, collection and transport to reprocessors, as well as much of the complex paperwork. While competition among schemes helps to keep prices low (meaning the financing need per tonne of packaging waste recovered is low compared with other countries), it may – through increasing the complexity of the system – have reduced the transparency of obligated companies and increased their administrative costs³⁷.
- 4.20 The financing need amongst the packaging supply chain fluctuates widely from year to year due to PRN price fluctuations. These fluctuating prices make it difficult to conclude whether or not total costs of the scheme are increasing. Meeting the 2008 targets will require much more separate collection of packaging waste from households than is the case today (currently the main focus is on commercial waste which is a relatively homogenous and clean, and thus cheap, waste stream to recycle) which will increase the cost of the entire system. However this should also bring disproportionately large benefits in terms of public education and awareness.
- 4.21 Overall however, the costs are relatively insignificant compared with the overall costs related to producing packaging (notably rising energy prices and costs of raw materials), and particularly insignificant relative to the overall cost of the final product within the packaging. Consequently, numbers of businesses in the sector have remained relatively stable and the regulation has not had the effect of causing inefficient firms to ‘exit’ the market.
- 4.22 On the other side of cost impact, firms can also realise financial benefits from the regulation, if it encourages them to use less material in producing the packaging, for example. Furthermore, the internal market aspects of the European Packaging Directive define rules that (in effect) prevent costs to business arising by removing barriers to trade, and preventing new barriers

³⁶ (NB: This scheme is not registered for 2007)

³⁷ EEA 2005

from arising. It is expected that these provisions would bring a positive economic value but it has not been quantified³⁸.

Enhancing competitiveness

- 4.23 It is hard to say whether the regulations have been effective in enhancing competitiveness and productivity in the packaging sector; it depends in part on the efficiency and organisation of individual companies. It seems, however, that productivity is driven more by internal factors and the need to compete internationally, rather than by regulation.
- 4.24 In looking across the supply chain, our research suggests that retailers ('Sellers') find it relatively easy to fulfil their obligations (and that they have more power to shape the regulations to suit themselves), whilst 'Packers' and 'Fillers' tend to bear much of the cost of the regulation. The influence on competitiveness is likely to be greater for 'Manufacturers' of packaging and raw materials and 'Converters' (e.g. through the need to make packaging lighter and contain recyclate). For 'Fillers' and 'Sellers' consumer demand is a much stronger driver and the regulations do not present a major competitiveness issue. (NB: this is reflected in the relative activity obligations; see Section Two).
- 4.25 Across all sectors, monitoring and enforcement needs to be effective to create the correct competitiveness environment. If the policy was more strongly enforced it would be more likely to lead to the exit of inefficient firms. However, the packaging regulations (with relatively modest financial impact currently) are probably not as significant as other factors in this sector.
- 4.26 In terms of firm size, smaller firms may be more ready to adapt to meet the regulatory requirements. On the other hand, the regulations are likely to have a stronger impact on smaller businesses (e.g. where the MD is also the environment representative) – "regulations are a daunting prospect for smaller companies, especially if they have a big range of product lines, seasonal products, etc.". The administration of record-keeping (e.g. collecting and providing figures to a compliance scheme) can be a particular burden for small firms. (Small firms can still elect to use the "allocation method", which means they do not have to collate and provide data each year³⁹. However, if a business does not choose this route, there is a larger administrative burden associated with calculating the obligation. This highlights a lack of understanding / knowledge of the Regulations despite the age of the regime.)

³⁸ GHK 2006

³⁹ Defra, The Scottish Executive, The National Assembly for Wales, 2003

- 4.27 Defra's Mini RIA concluded that increasing targets for the recycling and recovery of package waste may result in some change in the structure of the market if those manufacturers whose output is on the edge of the obligation were to reduce their output in order to fall within the 'de minimis' exemption and thereby avoid costs. However, this effect is not expected to be other than small⁴⁰.
- 4.28 Material specific targets may cause a distortion in the market for particular types of packaging. An example of this is the market for bottles where glass will face a considerably higher recycling target than plastic. This recycling differential could put glass manufacturers at a disadvantage, for example when fillers are selecting the container for their goods, although plastics have greater difficulties in terms of collection, sorting and end-use markets. This could reduce competition if glass manufacturers were to cease trading as a result of the new targets. However, it was anticipated in Defra's RIA that the increased cost of this regulation will be small in relation to a glass manufacturer's total costs, and they do not therefore believe that competition will be significantly affected in either this or other sectors with potentially high or differing recycling rates, such as in the aluminium and steel markets.
- 4.29 In terms of the recycling sector, setting targets for recycling of particular materials has increased the demand for recycling services from reprocessors and exporters and provided them with an extra source of income through the PRN system⁴¹. This could lead to new entry in the market and increase competition in recycling services. An increase in recovery and recycling targets would lead to increased PRN prices which should subsequently lead to investment in the necessary recycling and recovery infrastructure⁴².
- 4.30 On the whole, the evidence we have examined suggests that market-based instruments are considered to be more effective in enhancing productivity (although NB: this particular regulation was not designed to enhance productivity). Using a framework approach rather than a prescriptive approach aims to ensure that the right conditions are provided to support innovation and competition through commercial, rather than prescriptive, drivers. However, there is not much comparison of regulation in packaging, except for a small amount related to Health and Safety.

⁴⁰ Defra 2003, Mini RIA

⁴¹ Although a question remains as to whether the system should incentivise exporters with PRN money as this leads to a lot of money leaving the UK

⁴² Defra 2003, Mini RIA - Targets

- 4.31 It is difficult to make conclusive comments from the experience of different member states, although the Directive reportedly⁴³ had most impact in those countries where packaging recycling systems were less well developed in the early 1990s. The Green Dot system, as used in Germany, offers insights into the effectiveness of another policy instrument which is very 'front end' in its implementation (and consequently more onerous and higher cost to deal with), whereas PRNs are a more 'end-of-pipe' system. The German model is 15-20 times more expensive for businesses; it achieves more, but at a significantly higher cost.
- 4.32 Ecolas (2005) identified several characteristics of policy instruments that are most appropriate for enhancing productivity and innovation:
- **Policy Stability** - Where businesses focus on the short term, this can act as a barrier to innovation, because innovation is risky – the success rate tends to be low, it is an investment which typically takes several years to pay off, in which time market conditions may change dramatically, and it is a sunk cost which cannot be recovered should the innovation project be withdrawn. The policy implication is that policies need to reduce this risk as much as possible - this requires long term stability of policy signals or at least predictability of their changes.
 - **Encouraging Dialogue** - Regulation will be most effective in stimulating innovation where it encourages early dialogue and collaboration between relevant stakeholders. There are often opportunities to pool and share experience which, in turn, helps to optimise recycling outcomes. Such opportunities can be brought about through financial incentives which encourage cooperation or by the anticipation of impending regulation.
 - **Utilising market forces** - Public perceptions are of growing importance in stimulating environmental innovation and have a particular role in providing market pull (e.g. through demand for products with a recycled component). Regulations in related areas can exploit this effect by ensuring that policy levers are designed to operate in synergy with pressure from consumers and other customers. Therefore, it is important to develop policy instruments to build on and reinforce the pressures on industry derived from public perceptions.
 - Further, **financial considerations** are a critical factor influencing innovation in business. Thus, policy mechanisms which adjust the

⁴³ e.g. Institute for Environmental Studies, 2006

economic framework or market conditions could play an important positive role in stimulating recycling⁴⁴.

- **Different Instruments** - taxes are more effective at inducing innovation than standards – when using a standard; no additional effort is needed once the standard requirements have been met. Whatever the environmental progress already made by the polluter, he continues to pay the tax on residual waste, therefore there always exists an incentive to make further progress.
- 4.33 It is also important to consider all the implications of policymaking if the desired outcome is to be achieved. Instruments which encourage recycling but take no account of the demand (or lack thereof) for recycled materials are unlikely to be successful in the long term. Conversely, where there is demand, this can act as an important lever to stimulate action and innovation earlier in the supply chain. This highlights the importance of ensuring that the full recycling supply chain, including demand for recycle, is considered.
- 4.34 We had a mixed response to the question on whether changing the design of the EPR regulations could increase competitiveness effects on the sector. EPR obligations are seen as a first step, and would be most effective if backed up by media campaigns (particularly in trade media, e.g. about how to redesign packaging to reduce costs of meeting the regulation as well as overall costs), as well as by stronger pressure from the end-consumer (e.g. raising public awareness that they can complain to Trading Standards about over-packaging).
- 4.35 Provision of a long-term planning horizon is also crucially important, i.e. setting targets well in advance and that do not change over time (for example, the 2004 regulations were supposed to be fixed until 2008, but had to change at the end of 2004. The assumptions behind the targets were incorrect and targets therefore needed to be adjusted. However, this was counter-productive to firms who had planned to meet different targets). There is, therefore, a need for better research prior to targets being set.
- 4.36 In principal, introducing Individual Producer Responsibility (where firms would be responsible for their own goods, rather than collective responsibility for collective output would further encourage innovation amongst the main players, as well as the exit of the most inefficient firms from the market, and increase competitiveness in the sector as a whole. This would not necessarily disadvantage small companies; small companies may have more flexibility (although they would most likely need access to support for innovation through other mechanisms, e.g. seed capital). However, in practice, “for a

⁴⁴ Buchinger 2000

good such as packaging it would be prohibitively costly to have a system where brands are sorted”⁴⁵.

⁴⁵ Walls, 2006

5 Concluding statements

- 5.1 The EPR regulation has now been in place in the UK for almost ten years. The difficulty with evaluating this regulation with regard to its effect on productivity and competitiveness however is firstly - as Walls notes - that it is difficult to identify changes taking place on a sector basis and secondly - as noted by Smith - that it is then hard to link these changes to the regulation⁴⁶.

Environmental impacts

- 5.2 There were two different original environmental aims of the packaging waste regulations, and effectiveness in terms of its environmental goals would include both success in reducing waste (through design changes and use of different materials), and success in achieving recovery and recycling targets. However, in practice the EPR regulation does not really target packaging minimisation, focusing instead on packaging recovery; a small incentive to produce less packaging exists through lowering the overall costs of buying PRNs, but on the whole the price for these is relatively low and the focus is therefore on recovery. Both recovery and recycling rates have risen since the regulations came in. However, it is not clear that EPR regulations are more effective than alternative fiscal instruments (e.g. Landfill Tax) in achieving the same environmental end-goal.

Productivity and competitiveness impacts

- 5.3 Within firms, producer responsibility legislation is intended to drive efficiency improvements (particularly through packaging minimisation) but, to date, the evidence is limited as to the extent to which this occurs. At industry level, our theoretical model suggests that raising the level of environmental 'goods' required of firms in the industry will lead to some firms dropping out of the marketplace. However, the Directive was deliberately interpreted in the UK to minimise disruption to businesses; the *de minimis* element means that only larger (and therefore more resilient) firms are subject to the regulation.
- 5.4 Secondly, it is important to examine whether firms have responded by innovating or changing processes to increase either their productivity or competitiveness, or both. Our consultations suggested that the majority of firms divest their responsibility (and thus their incentive for improving environmental performance) through compliance schemes and that the PRN

⁴⁶ Walls, 2006 ; OECD, 2005

price – whilst an additional cost to packaging producers – is, ultimately, too low to initiate the effects as above (other than a few instances in lightweighting).

- 5.5 We are aware of innovation within the packaging industry (such as the use of biodegradable starches in food packaging), but this is largely driven by consumer demand and end-user marketing, and is thus filtered down the packaging chain from the top. Significant developments in lightweighting were already evident in the packaging chain prior to the regulation and we did not find instances of innovation being explicitly driven by the regulation.
- 5.6 The main sources of increased productivity and competitiveness appear to be amongst reprocessors and exporters, who have been able to use the increased income, in some instances, to develop processes and recycling capacity. The regulations are also more likely to have a greater competitiveness effect in the earlier stages of the packaging supply chain.
- 5.7 The unintended consequences of the UK system (shared producer responsibility) appear to be the cause of some of the biggest problems (e.g. with legal issues around shifting responsibility). Some of these problems have been addressed in the most recent iteration of the regulations, such as clarification of definitions and coverage, and closing loopholes linked to foreign-owned firms.

Policy implications

- 5.8 Various amendments have been made to the regulations over the last nine years, both in targets, but also to the ‘rules of the game’. Compliance scheme operators are now liable to enforcement, for example, and definitions have been tightened to close loopholes (as above). A fixed-penalty notice type of arrangement is being considered to tighten up on administrative failure/error.
- 5.9 We conclude that if the regulation could do more to encourage changes in packaging design, it could be more effective in terms of its environmental outcomes and it could also provide innovative companies with a competitive advantage, particularly in a market which is increasingly driven by environmentally-aware consumers.
- In theory, this could be encouraged through assigning Individual (instead of group) Producer Responsibility (i.e. give producers responsibility for collection and recycling of their own goods, or at least design EPR so that “individual producers bear a financial burden that directly reflects the costs of waste management *for their own* products, fully-reflecting the characteristics of their products that would affect

waste management costs”⁴⁷). Currently firms tend to “operate on the lowest common denominator” with regard to design (and in particular ‘recyclability’). However, whilst IPR is at the forefront of current discussion⁴⁸ (e.g. WEEE and ROHS), this would be difficult to deliver⁴⁹ and almost impossible to enforce effectively

- Under the current system, fixed targets and obligations that are easy for firms to understand will make it easier for firms in the packaging supply chain to plan ahead
- A tighter PRN market where prices rise to a high level may encourage a greater degree of innovation (such as lightweighting and moving between materials)
- More stable (if higher) PRN prices would allow reproprocessors to plan income and, consequently, investment. This could be achieved, for example, by implementing price floor and ceiling for PRNs
- Another (more challenging) suggestion was to change targets from being weight-related to environmental-impact related. This would, however, require a lot of research and may be unfeasible due to difficulties in administration.

5.10 Overall, our research suggests that implementation of a mix of tools is likely to be more successful in achieving both environmental and economic goals⁵⁰. The effectiveness of individual policy instruments versus others may however require further research, so as to avoid a mix of policies simply becoming extra red-tape burden (e.g. if Landfill Tax achieved the same objectives as EPR). A range of other actions to tackle waste are cited in The Strategy Unit Report ‘Waste not, Want not’ Recommendations⁵¹. Further supporting measures for the EPR however could include the following:

- Specific interventions by government-funded organisations are one way of stimulating environmental innovation. The WRAP programme, for example, provides grants for specialist equipment to make packaging more recyclable, whilst Envirowise seeks to alert firms to the savings that can be made through redesigning packaging

⁴⁷ OECD, 2005

⁴⁸ 12 member states have already installed both Individual and Collective Responsibility

⁴⁹ See, for example, Walls 2006

⁵⁰ NB: Theoretical research concludes that “no single alternative instrument can be identified as a substitute for EPR” (OECD, 2005)

⁵¹ Defra, July 2005

- The policy can be strengthened by investing in the development of end-use markets, as suggested in Defra's mini RIA, to support the demand for recycled products
- Better targeting of PRN receipts could ensure that a proportion was collected for distributing to develop innovative ideas in re-use
- Media campaigns aimed at stimulating consumer awareness, and hence demand for packaging, are particularly likely to have an effect on packaging design
- Strengthening the implementation of Essential Requirements through Local Authority Trading Standards Officers, particularly on the requirement that "packaging must be the minimum subject to safety, hygiene and acceptance for the packed product and for the consumer"⁵². This could be, for example, through regularising investigations by officers into packaging design
- Through Defra and EA, working more closely with Local Authorities to link Local Authority goals with EPR goals. Local Authorities may need to be incentivised to do more to take packaging waste out of the household waste stream. (EPR in the UK focuses on the industry and commercial waste streams – it does not cover recovery from the consumer's home, which is harder to tackle). This would be much more costly, but should also bring significant benefits in terms of public education and awareness.

⁵² Defra, The Scottish Executive, The National Assembly for Wales, 2003

Annex A: List of Consultees

Table A.1: Stakeholders consulted as part of the case study

Name	Organisation
Dorothy Maxwell, Consultant (Global View Sustainability Services)	Defra
James Vause, Economist (Waste & Recycling Economics)	Defra
Jeff Cooper	Environment Agency
Adrian Harding (Policy Advisor, Waste Policy Team)	Environment Agency
Peter Askew, Senior Policy Advisor (Eco-Design and Product Regulation Team)	DTI
Ian Atkinson	Defra
Jenni Rosser (Cleaner Design and Packaging Programme)	AEAT / Envirowise
Dick Searle, CEO	Packaging Federation
Margaret Walls, Senior Fellow	Resources for the Future

Referees

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