



PackFlow 2008

UK compliance with the 2008 targets of the
European Packaging & Packaging Waste Directive

Summary Report & Recommendations



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Introduction

The PackFlow report

This Executive Summary and Recommendations is supplemented by the two volumes of the PackFlow project report. Volume 1 is the full report on the project. Volume 2 is series of Appendices providing more detailed supporting material.

Readership

This report is directed primarily at decision makers in organisations familiar with the European packaging and packaging waste directive and directly involved in its implementation in the UK. However, the report will show that UK compliance in 2008 is critically dependent on the recovery of greatly increased tonnages of packaging waste collected by local authorities from the household waste stream.

Local authorities and the public they serve are not obligated under the UK regulations, nor do local authority recycling and composting targets dovetail closely with the packaging directive targets. The targets set for local authorities are driven principally by UK compliance with a quite different directive, the EC landfill directive. Nevertheless local authorities represent an extremely important secondary readership for this report.

EC Directive on Packaging and Packaging Waste

Early in 2004 the Directive was amended to set higher recycling and recovery targets. EU Member States are now required to recycle between 55% and 80% of packaging waste and recover a minimum of 60% by 31 December 2008.

The 2004 Directive also sets differential material-specific targets for each of the principal packaging materials. It requires minimum materials-specific recycling rates (by weight) to be met by no later than 31 December 2008.

The PackFlow 2008 project and its partners

The PackFlow 2008 project was initiated by Valpak in May 2004 to provide a strategic overview of the steps the company would need to take to ensure compliance in 2008.

Its membership was almost immediately extended to include the recently-formed multi-materials group, representing the combined interests of a number of the different packaging materials sectors, and formed principally to promote and support local authority recycling collections and the contribution they make to meeting the packaging directive targets.

Valpak has acted as lead partner and has also funded the greater part of the project, but with contributions from other participants.

The project has been co-ordinated and managed by David Davies Associates, which has also been responsible for collecting the data needed for the project and the development of the detailed packaging flow projections.

Review meetings attended by the project partners have taken place at monthly intervals between June 2004 and March 2005.

Terms of reference

The agreed aim of the project has been:

- To conduct a detailed 'bottom-up' analysis of the likely increase in packaging recovery from all sources, but with particular reference to packaging recovery from households via local authority recycling programmes via individual assessment of all 433 local authority recycling programmes;
- To compare these projections against existing 'top down' assessments at the national level, and
- To use these results to carry out a compliance 'gap analysis' over the period to 2008.

Executive summary

Principal conclusions

If the UK is to meet the 2008 directive targets the tonnage of packaging waste collected by local authorities will need to grow by 13% per annum, from 978,000 tonnes in 2003/04 to 1.784 million by 2008/09.

The two main barriers to achieving this are:

- the strengthening of the PRN system and in the availability of PRN funding to help deliver the directive targets;
- discrepancies between local authority recycling/composting targets and those set by the EC packaging waste directive.

Projected compliance gap

Projected growth in packaging recovery made under existing assumptions as part of the PackFlow project suggest that without further direct intervention there is likely to be a shortfall in the tonnage of packaging recycled compared with that needed to meet the 2008 targets:

	Estimated shortfall – tonnes			
	2005	2006	2007	2008
Household packaging				
Glass	103,000	-91,000	-144,000	-185,000
Aluminium	-2,000	-2,900	-3,500	-3,000
Steel	-26,000	-29,000	-27,500	-8,000
Plastic bottles	-8,000	-16,000	-25,000	-33,000
Non-household packaging				
Plastic film from C&I sources	-15,000	-31,000	-53,000	-69,000
Total estimated shortfall	52,000	-169,900	-253,000	-298,000

* Tonnage shortfalls signified by negative signs

Cautionary note:

These estimations of the size of the gap are the result of many approximations and assumptions made throughout Packflow. Whilst they represent the best available estimate at the current time they are necessarily subject to margins of error of up to $\pm 5\%$ on demand tonnage and $\pm 10\%$ on supply. This means that the resulting gaps may vary significantly from the values shown above.

The potential shortfall is predicted to be about 165,000 tonnes in 2006, increasing to 300,000 tonnes by 2008. This is a measure of the task to be addressed through more directly targeted application of resources, particularly in expanding local authority packaging collections.

Recommendations to strengthen the existing market-based PRN system

PackFlow's full recommendations are set out later. However, in the short term the most urgent measures relate to strengthening the existing market-based PRN system. If the existing system is to remain in place at least until 2008, it can best be strengthened in the following ways:

- Non-compliance penalties** The packaging regulations should be amended at the earliest opportunity to introduce a mechanism for dealing with non-compliance by imposing non-criminal tonnage-related financial penalty charges on compliance schemes and producers that fail to meet their obligations. The revenue from these charges should be used to enhance UK packaging recycling and recovery.
- Targets** The methodologies proposed in this report for setting the Business Targets for the years 2006 to 2008 should be adopted. In addition the government should adopt a process, ideally not requiring continual amendment of regulations, to set 5-year rolling targets extending beyond 2008 and allowing targets to be managed through regular annual review.
- Packaging obligation and recovery data** The need for more accurate and timely data is a recurrent theme throughout this project, but it is essential if sound target setting and review is to be

accomplished. It is strongly recommended that the previous work of the ACP in this area is taken forward.

- iv) **Operational Plans & Business Plans** Operational Plans and Business Plans prepared by compliance schemes and accredited reprocessors should be subject to much closer scrutiny, and should demonstrate the extent to which they are directly linked to the expansion of packaging recovery from local authority collections and other sources.
- v) **Consistency in interpretation** There needs to be improved consistency in the ways in which agency guidance and protocols are applied and interpreted by reprocessors.
- vi) **Recycling Credits** Steps should be taken to improve local authority packaging recycling, expand municipal waste recycling and the recovery of 'away from home' packaging by encouraging third parties to provide high-performing enhanced recycling facilities through the wider payment of recycling credits.
- vii) **PRN/PERN fraud** The positive activities undertaken by the enforcement agencies to combat and eliminate PRN fraud should be continued and, where possible, strengthened to counter temptations to engage in fraudulent transactions as targets and prices rise and recycling markets tighten.

Recommendations relating to local authority recycling

Implementing the previous recommendations relating to the PRN system would create the conditions for the following practical steps to be taken forward in partnership with local authorities

- i) **Local authority recycling targets**

Any review of recycling/composting targets should take into consideration the disconnect that currently exists between UK implementation of the European landfill and packaging waste directives.

One way in which this might be done, restoring a better balance between BMW and dry recyclables, would be to introduce a specific target for the recycling of dry recyclables, expressed in kilograms per household.
- ii) **Financial incentives for consumers to recycle**

Despite the government's present opposition to the introduction of direct charging of households to stimulate recycling and reductions in residual waste, the arguments in support of the measure are overwhelming and should continue to be pressed. In its most appropriate form it would give local authorities the discretion to introduce charging arrangements, making it a locally-determined democratic choice.
- iii) **Performance efficiencies**

The packaging sector should support the measures being taken by government to stimulate performance and efficiency gains in local authority recycling. In particular it should encourage:

 - Complete kerbside coverage, with multi-material kerbside collections offered to all serviceable households in every local authority area;
 - Increases in the number and density of bring banks, and improvements in their design and siting;
 - Achieving effective integration between kerbside collections, high-density bring sites, and commercial collections;
 - An increase in the number of dry recyclable materials collected to increase yields and lower unit costs, to include - as a minimum - the five principal packaging materials: glass bottles and jars (colour separated wherever possible), steel cans, aluminium cans & foil, plastic bottles, and paper/card (all grades);
 - Maximising yields and tonnages, and minimise unit collection costs, through the provision of 'easy to recycle' co-mingled collections for all dry recyclables in those areas (especially metropolitan areas) where such collections are suitable;
 - The close monitoring of participation and material capture rates and effective communications and awareness programmes, such as the Recycle Now campaign.
- iv) **Local authority contracts**

Model 3-year contracts with standard contract terms should be developed for LA-collected packaging recycling, the main elements of which would be applicable to all materials and encourage multi-material collection wherever feasible.

v) **Funding support for local authorities**

PRN revenues should be used to support plans developed with groups of local authorities for specific multi-material collection, processing and sorting activities in return for contractually agreed incremental tonnages of packaging materials.

Key findings of the report

Overall results

Meeting the 2008 material-specific targets	2003 Actuals tonnes	2008 Requirement tonnes	Required increase tonnes
Household packaging recovery			
Total packaging collected by LAs	1,073,000	1,960,000	887,000
Direct collections by LAs from household waste	978,000	1,784,000	806,000
Including Glass	685,400	1,330,000	644,600
Metals recycled from EfW bottom ash & other MSW treatment (excluding IBA)	63,200	90,500	27,300
Non-household packaging recovery			
Recycling of <u>non-household</u> waste	3,630,000	4,364,000	730,000

Packaging consumption in the UK

- Chapter 2 of the PackFlow report describes packaging flows at the national level. It sets the 'top down' framework for packaging compliance in the UK, both historically and for the forward period to 2008, and shows that the total flow of packaging in the UK was 10.2 million tonnes in 2004.

'Precautionary principle'

- A major compliance scheme like Valpak needs to develop the best projections it can in the face of considerable uncertainty. The PackFlow project has therefore adopted a 'precautionary principle': where doubt exists it errs on the side of caution to avoid any risk of systematic under-estimation.
- There are two important areas where information is either not available or is highly uncertain:
 - future growth in the supply or consumption of packaging, essential to any assessment of future flows of packaging waste and its recovery;
 - the relative amounts of each packaging material consumed by households on the one hand, and commerce and industry on the other.

Further research and analysis in both these areas is necessary and would strengthen the UK's planning and monitoring of compliance with the packaging directive.

Assumed future growth in UK packaging

- An initial hypothesis in the PackFlow project was the likelihood of some relationship between UK packaging consumption and GDP growth. The evidence for this is variable, but the underlying proposition is that increase in economic activity will be accompanied by some growth in packaging. As the project has progressed the growth in each material has been assessed by materials representatives, although the data needed for such analysis is sparse.
- The growth assumptions finally made were agreed with representatives of the ACP Data Task Force and have been adopted by Defra:
 - Paper:** 1% pa adopted by ACP and Defra, although the paper industry remains of the view that paper packaging growth is unlikely to grow;
 - Glass:** rates reflect the results of detailed analysis by British Glass and glass reprocessors on anticipated growth in glass flows;
 - Plastics:** reduction in the trend growth of ~3% pa to a reduced growth rate of 2% pa. However there is a sharp upwards hike of 9.5% in 2006 to reflect an agreed adjustment in the estimated arisings, increasing the plastics packaging flow by 150,000 tonnes pa;
 - Steel:** -0.5% pa adopted to reflect the continuing slow decline in steel packaging consumption (however the downward trend has been a little steeper at -0.75% pa);
 - Aluminium:** 1% pa adopted;
 - Wood:** 0.5% pa growth assumed, but subject to the considerable uncertainty surrounding wood packaging in general. A sharp downward reduction of almost -16% is assumed in 2006 to reflect a reduction in Defra's

previous estimate of wood packaging, reducing it from 1.4 million tonnes pa to 1.18 million tonnes pa in 2006.

- 6 The net effect of these assumptions results in an assumed growth in UK packaging at rate about half that of UK GDP growth.

Growth %	2004	2005	2006	2007	2008	2009	2010
Paper	0.00%	0.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Glass	4.35%	4.17%	4.00%	1.92%	1.89%	1.85%	1.82%
Plastic	3.00%	3.00%	9.39%	2.47%	2.00%	2.00%	2.00%
Steel	0.93%	-0.75%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%
Aluminium	10.55%	0.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Wood	0.00%	0.00%	-15.94%	1.00%	0.50%	0.50%	0.00%
Other	-12.00%	0.00%	4.55%	0.00%	0.00%	0.00%	0.00%
Overall growth	1.70%	1.47%	0.88%	1.42%	1.27%	1.26%	1.20%

Flow projection for 2008

- 7 Under these assumptions the estimate of UK packaging flow by 2008 is 10.75 million tonnes.

Packaging recycling & recovery in the UK

- 8 Chapter 3 summarises progress made in the recycling and recovery of packaging waste over the 7-year period since the packaging waste regulations came into force in 1998.
- 9 It shows that packaging recycling rates have increased from 28% in 1998 to 50% in 2004. The total tonnage of packaging recycled has grown from 2.9m tonnes to 5.1m tonnes over the same period.
- 10 However there is considerable uncertainty and a lack of reliable data on the relative contributions towards packaging recovery made by local authority recycling of household waste on the one hand, and the recycling of commercial packaging on the other.

EfW & its contribution to the recycling of packaging

- 11 The tonnage of packaging waste recovered through energy-from-waste (EfW) plants has increased from about 450,000 tonnes in 1998 to 600,000 tonnes in 2003, and operational EfW capacity could increase from 3.1m tonnes pa today to more than 5m tonnes pa by 2008.
- 12 EfW has the potential by 2008 to provide the *recovery* of almost 1 million tonnes per annum of paper and plastic packaging. However this is of limited value in compliance terms, being well in excess of the required recovery tonnage.
- 13 EfW also contributes about 65,000 tonnes per annum to the *recycling* of steel and aluminium packaging; and, potentially, as much as 85,000 tonnes per annum of glass into aggregates.
- 14 The risks and uncertainties however are considerable. First and foremost the projected capacity may well be delayed or deferred as a result of planning delays and appeals, or the failure of waste companies to secure contracts for waste supply and/or project finance.
- 15 For glass in particular it will be necessary for additional processing capacity for bottom ash to be provided and market outlets secured through accredited reprocessors in the aggregates sector. The ability to achieve greater glass recovery through this route would be enhanced if intermediate processors (rather than small end users) were to be accredited.

Packaging recycling by material

- 16 Chapter 4 summarises the tonnages of packaging waste collected by local authorities in 2002/03 and 2003/04, the 'base year' for the PackFlow project. It shows that in 2003/04:
- Local authority recycling programmes directly collected about 978,000 tonnes of packaging materials.
 - This represents about 16% of the total material recycled or composted by local authorities, much of the rest being newspapers, magazines and other non-packaging fibre, and bio-waste.
 - A further 63,000 tonnes was steel and aluminium packaging recovered from EfW plants and other municipal waste treatment facilities.

- The total tonnage of packaging collected for recycling from local authority wastes accounts for 23% of the overall tonnage of packaging recycled in the UK. (Non-household sources - C&I and away-from-home consumption - accounted for the remaining 3.6m tonnes, 77%. This exemplifies the UK's current heavy reliance on the recycling of C&I packaging to secure compliance.)
 - Glass was far and away the dominant packaging material in local authority collections, accounting for 685,000 tonnes, or 82% of the 830,000 tonnes of glass collected in total. The recycling rate for glass in household waste was about 40%, much higher than that for the other materials.
 - For packaging paper and card the recovery rate was 20%.
 - For the metals – steel and aluminium – the recycling rate for materials directly collected by local authorities was at the 13% level. Recovery of metal packaging from EfW plants makes an additional contribution.
 - Plastic bottles had a recycling rate of around 10%.
 - Expressed in kilograms per household (kg/hhd), local authority packaging recovery was about 38.5 kg/hhd.
- 17** The report then examines in more detail the packaging flows for each of the principal packaging materials, with particular reference to those that have a significant presence in the household waste stream. The focus remains at the national, 'top down', level, preparing the ground for the more detailed 'bottom up' analysis by local authority and Region that is presented later in the report.
- 18** The PackFlow projections also generate estimates of the likely growth in obligated tonnage and, on this basis, the UK business targets that would need to be met in the years 2006 to 2008 have been calculated.
- 19** For each material an assessment is made of the additional tonnages that will need to be collected through local authority recycling programmes if the UK is to meet the 2008 targets. In no case is the recycling rate needed particularly high compared with levels achieved elsewhere in Europe, internationally, or by the UK's highest performing authorities. Nevertheless in an overall UK context they are challenging when set against the relatively low average recycling rates that are currently being achieved.
- 20** Glass in particular will need to achieve significantly higher recovery rates from household waste. The average UK collection level will need to be much closer to 'best performance' levels than is required for the other materials.
- 21** By contrast, the required collection rates for paper, plastics and the metals are lower. Each material is able to meet a significant percentage of its compliance needs through the recovery of non-household wastes. Even so the increase in collection is still appreciable, with the possible exception of paper/card packaging.
- 22** Local authorities in the less densely populated areas outside the main population centres generally have higher recycling rates than the metropolitan areas, many of which have recycling rates that are still extremely low. Yet it is in precisely these areas that the largest tonnages of untapped material are to be found. If the 2008 targets are to be met these 'sleeping giants' will need to be awakened and specific targeted measures taken to expand their recycling programmes significantly.

Results by material

- 23** The particular position relating to each of the packaging materials can be summarised as follows:

Glass

- Taking glass as a whole, there is a requirement to recycle 1.63 million tonnes by 2008. The container glass industry can be expected to accept about half of this total. The remaining 800,000 tonnes will need to be used in alternative end markets (aggregates being in volume terms the most important), or exported. There is uncertainty over the ability to develop these markets sufficiently rapidly.
- 685,000 tonnes of glass were collected by local authorities in 2003/04.
- It is provisionally estimated that about 934,000 tonnes of glass will have been recovered by local authorities in 2004 (although this tonnage seems extremely high and will not be able to be confirmed until detailed data are available at the end of 2005 or early in 2006).
- The tonnage of glass collected by local authorities needs to increase to 1.33 million tonnes by 2008 if its material-specific packaging recovery targets are to be met.
- The best estimates of the PackFlow team in conjunction with British Glass suggest that this tonnage will not be achieved, resulting in a shortfall and a potential compliance gap.
- These estimates suggest that that the tonnage of glass collected by local authorities in 2008 is unlikely to exceed 1.145 million tonnes, resulting in a shortfall of about 170-200,000 tonnes, or about 14%.

- Collections in 2003/04 recovered almost 40% of the glass accessible to local authorities. This needs to increase to a national average of almost 66% if the 2008 target is to be met.
- It represents an increase from an average of 27 kg/hhd in 2003/04 to over 50 kg/hhd by 2008.
- 'Best performance' in glass recovery, defined to be an average recovery rate of 80%, was 54 kg/hhd in 2003/04, and was achieved by about 20 UK authorities. This will need to increase to 61 kg/hhd by 2008/09 to keep pace with increased consumption of glass.
- If the directive target is to be met in 2008 the 'required performance' ¹ from local authority recycling will need to average more than 50 kg/hhd across the UK, an extremely demanding requirement.
- Much of this will need to be derived through massive expansion of glass recycling in the major metropolitan areas which, with their high populations and numbers of households, are areas of great importance in delivering a large part of the additional tonnage required.

Steel cans

- The current contribution to steel recycling through local authority bring and kerbside collections is modest, and will need to increase significantly if the 2008 material-specific target of 54%, is to be met.
- 64,000 tonnes of steel cans were directly collected by local authorities in 2003/04.
- If the 54% target for steel packaging recovery is to be achieved by 2008 it will require local authority collections to increase to 91,000 tonnes pa.
- Collections in 2003/04 recovered about 13% of the steel cans accessible to local authorities. This needs to increase to an average of 19% if the 2008 target is to be met.
- It represents an increase from an average of about 2.5 kg/hhd in 2003/04 to 3.45 kg/hhd by 2008 - a 37% increase.
- However the PackFlow project estimates that the tonnage of steel cans collected by local authorities is unlikely to exceed 83,000 tonnes, resulting in a shortfall of about 7,600 – 9,200 tonnes against the required 91,000 tonnes.
- 'Best performance' in steel can recovery, taken to be an average recovery rate of 65%, was 12.3 kg/hhd in 2003/04 and will drop to 11.6 kg/hhd by 2008/09, as a result of the assumed slow reduction in steel can consumption.
- Overall the UK needs to achieve an average recovery rate of 3.45 kg/hhd, or 30% of the 'best performance' level, by 2008.
- Much of this will need to be derived through expansion of steel can recycling in the major metropolitan areas which, with their high populations and numbers of households, are areas of great importance in delivering a large part of the additional tonnage required.
- Steel recovery is however greatly enhanced through magnetic extraction of ferrous metals at EfW plants and other waste treatment facilities. This contributes about 60,000 tonnes pa today and is expected to increase to at least 86,000 tonnes by 2008, more if projected new infrastructure projects come on stream on time.

Aluminium cans & foil

- The current contribution to aluminium recycling through local authority bring and kerbside collections is modest, and will need to increase significantly if the 2008 material-specific target of 32%, is to be met.
- 13,000 tonnes of aluminium cans and foil were directly collected by local authorities in 2003/04, and about 15,400 tonnes of aluminium packaging is estimated to have been recovered by local authorities in 2004.
- This needs to increase to 22,700 tonnes by 2008.
- However the PackFlow project estimates that the tonnage of aluminium cans collected by local authorities is unlikely to exceed 19,450 tonnes, resulting in a shortfall of 2,700 - 3,300 tonnes against the required 22,400 tonnes.
- Current collections account for about 20% of the aluminium accessible to local authorities. This needs to increase to 30% if the 2008 target is to be met.
- It represents an increase from an average of 0.5-0.6 kg/hhd today to 0.86 kg/hhd by 2008.
- 'Best performance' in aluminium can recovery, taken to be an average recycling rate of 70%, is about 2.00 kg/hhd.
- Much of the additional tonnage required will need to be derived through massive expansion of can recycling in the major metropolitan areas which, with their high populations and numbers of households, are the only areas that can deliver the majority of the additional tonnage required.

¹ 'Required', that is, for the UK to meet the materials-specific packaging recovery target for glass in 2008. It is fully recognised that local authorities themselves have no obligations under the packaging waste regulations and have no formal requirement to collect or recover glass or any other packaging material.

Plastic bottles

- The current contribution to plastic packaging recycling through local authority collections is growing but it needs to be increased dramatically if the 2008 target of 22.5% is to be met.
- About 41,000 tonnes of plastic bottles were collected by local authorities in 2004. This represents an average capture rate of 1.6 kg/hhd, or about 11% of the plastic bottles accessible to local authorities.
- This needs to increase and both Packflow's review of local authority's plans suggest that an increased tonnage of 67,000 tonnes can be achieved.
- However, there is considerable uncertainty over the increased tonnages of C&I plastic film that will be recycled by 2008. As a precautionary measure to ensure compliance, PackFlow recommends that an objective should be set to increase local authority plastic bottle collections to 100,000 tonnes by 2008.
- If such a target were to be set for 2008, it would be equivalent to a 22.5% recycling rate for local authority plastic bottles and would require an average national recycling rate for all authorities of 3.8 kg/hhd.
- Much of this will need to be achieved through a major expansion of plastic bottle recycling in the major metropolitan areas which, with their high populations and numbers of households.
- PackFlow estimates that without further direct intervention there could be a shortfall of 100-110,000 tonnes against the required 500,000 tonnes of plastics recycling in 2008, represented by 70,000 tonnes in C&I film recovery and 35,000 tonnes in plastic bottle recovery.

Paper/card packaging

- The contribution to the recycling of paper/card packaging through local authority bring and kerbside collections is modest.
- Currently it is around 200,000 tonnes pa, or 7-8 kg/hhd.
- This represents a recycling rate of 20%.
- However, many local authorities already exceed this level of recovery, including a number of metropolitan and other high-population authorities.
- The increase in recovery to meet the overall 2008 target ought not to be demanding, particularly given the incentive local authorities have to divert higher tonnages of paper of all grades to meet the demands of the landfill directive and LATS.
- The tonnage required to be recovered from the household waste stream under PackFlow assumptions is about 240,000 tonnes, or 9.1 kg/hhd.
- The actual tonnage recovered in 2008 could well exceed this requirement as a result of significant increase in fibre recovery as a whole.
- The overall tonnage required to meet the material-specific target for paper of 60% in 2008 would be 2.33 million tonnes. However actual recovery rates are already in excess of this level, and for PackFlow purposes recovery has been assumed to continue to increase to reach 73% by 2008, resulting in the recovery of 2.78 million tonnes
- The contribution that paper makes to general recycling and the achievement of the directive target of an overall recycling rate of 55% in 2008 would then be 514,000 tonnes.

Wood

- The PackFlow approach to wood packaging differs from that for the other materials because it is almost exclusively found in the C&I waste stream, the amount of wood packaging in household waste being negligible.
- There is considerable uncertainty over the tonnage of wood packaging. The single largest contribution to the total is represented by new wooden pallets being put on the UK market, whether manufactured in the UK or imported beneath freight consignments from overseas. However it is practically impossible to identify 'first use' imported pallets with any certainty, making it difficult to assess the tonnage flows.
- Earlier Defra estimates put the flow at 1.4 million tonnes, but this has subsequently been reviewed and a reduced estimate of 1.18 million tonnes is being adopted from 2006 onwards.
- The tonnage required to meet the material-specific target for wood in 2008 would be 215,500 tonnes. However actual recovery rates are around 800,000 tonnes, well in excess of this level.
- The actual recovery rate for wood packaging reported by Defra has been in the range 54-57% in recent years and for PackFlow purposes it has been assumed to continue to increase, to reach 75% by 2008, resulting in the recovery of 898,300 tonnes in that year.
- The resulting 'over recovery' in wood would then make a contribution to general recycling of 683,000 tonnes, after meeting the material-specific requirement of 215,500 tonnes.

General recycling

- Material-specific recycling is expected to reach 5.13 million tonnes by 2008. This will deliver a packaging recycling rate of 48%.
- A further 1.02 million tonnes will need to be recovered through general recycling to meet (or slightly exceed) the 55% directive target.
- This additional tonnage that is expected to be achieved in 2008 through 'over-recovery' of both paper and wood is 514,000 tonnes of paper/card packaging, and 683,000 tonnes of wood packaging.
- This results in a net over-recovery of almost 180,000 tonnes in 2008, and the general recycling target is therefore met.

PackFlow: Regional projections and summary results

- 24** The 'top down' analysis given in Chapter 4 has provided estimates of the quantities of packaging that would require to be recovered from household waste if the UK is to meet the 2008 targets. The next step is to assess the extent to which such tonnages can reasonably be expected to be collected by local authorities.
- 25** A 'bottom up' approach has been adopted, collecting detailed tonnage data on packaging materials collected for recycling by all 433 local authorities with collection responsibilities throughout the UK ².
- 26** A modelling tool has been developed as part of the project:
- PackFlow is a software tool that manages a large number of calculations
 - It generates future projections of likely increases in LA collections to 2008 - and beyond
 - For all local authorities
 - For all packaging materials
 - Taking into account:
 - 2002/03 and 2003/04 actuals
 - growth in packaging consumption
 - growth in new household formation
 - deprivation
 - Reporting at any level
 - local authority, sub-Regional, Regional or National.
- 27** A two-stage process has been used to allow estimates of any potential shortfall in the tonnages of packaging collected from household waste:
- **Stage 1:** Calibrate the PackFlow tool to deliver the required tonnages in 2008. This draws a baseline and defines the contribution that each local authority would need to make if the overall tonnages are to be achieved.
 - **Stage 2:** Adjust the resulting projections to take into account the particular characteristics of individual local authorities and the likely progress they would make under existing circumstances between now and 2008. This results in a lower growth in tonnages compared with those calculated in Stage 1. The difference between these and the baseline provides an estimate of the possible compliance gap.
- 28** The projected shortfalls for each of the materials are brought together and summarised below. The results suggest that without further direct intervention there is a likely to be a shortfall in the tonnage of household packaging recycled compared with that needed to meet the 2008 targets:

² Data has also been collected for packaging recovered at CA sites by the 34 county councils in England and the 6 statutory waste disposal authorities (WDAs) in London (4), Greater Manchester and Merseyside.

LA direct collections tonnes	Estimated shortfall – tonnes *			
	2005	2006	2007	2008
Glass	102,604	-91,036	-144,482	-184,820
Aluminium	-1,994	-2,915	-3,470	-2,978
Steel	-26,355	-28,860	-27,504	-8,402
Plastic bottles ³	-7,760	-16,410	-24,962	-33,353

* Tonnage shortfalls signified by negative signs

Summary of estimated shortfalls in packaging recovery from household waste

Processing & reprocessing infrastructure and capacity

29 Chapter 6 provides summaries of:

- The UK infrastructure for the MRF sorting and processing of recyclables and its Regional distribution.
- An inventory of currently identified EfW treatment capacity and capacity for the treatment of residual wastes and recovery of packaging materials by other means.
- Reprocessor capacity by material.

30 It shows that MRF capacity in the UK is now about 3 million tonnes per annum, three times what it was in 2001. However there is a pronounced regional imbalance, with the three Regions of London, the South East and the East of England accounting for 60% of the total capacity, and many Regions poorly served.

31 The analysis also shows that the theoretical UK capacity for reprocessing post-use packaging waste is sufficient to meet UK recycling targets in all materials, with the possible exception of rigid plastics and glass.

32 Export reprocessing capacity is not examined in detail, however, current levels of export and the predicted demand from rapidly growing economies (such as China) indicate that more than sufficient export capacity is available to fill any shortfalls that may arise in UK capacity.

³ The estimated shortfalls given here relate only to plastic bottles collected by local authorities from household waste. The PackFlow study also suggest that there could be a further shortfall of around 80,000 tonnes in the recovery of non-household (C&I) plastics packaging.

Recommendations

Recommendation 1: Risk hedging

Active consideration should be given to devising effective means to allow compliance schemes to off-set future PRN price risk in ways that a) remove the current inhibitions towards making future contractual commitments, and b) create no anti-competition difficulties.

Recommendation 2: Local authority contracts

Model 3-year contracts with standard contract terms should be developed for LA-collected packaging recycling, the main elements of which would be applicable to all materials and encourage multi-material collection wherever feasible.

Recommendation 3: Funding support for local authorities

PRN revenues should be used to support plans developed with groups of local authorities for specific multi-material collection, processing and sorting activities in return for contractually agreed incremental tonnages of packaging materials.

Recommendation 4: Application of PRN revenues

The environment agencies should develop much tighter guidance consistent with commercial confidentiality on the application of PRN revenues and the purposes to which they may be put, with a presumption that over the period to 2008 the greater proportion of these funds will be directly targeted at supporting local authority multi-material packaging recycling activities.

Recommendation 5: Operational Plans & Business Plans

The Operational Plans prepared by compliance schemes and the Business Plans prepared by accredited reprocessors should be subject to much closer scrutiny, and information should be made available for inspection to demonstrate the extent to which they are directly linked to the expansion of packaging recovery from local authority collections and other sources.

Recommendation 6: Consistency in interpretation

There needs to be improved consistency in the ways in which agency guidance and protocols are applied and interpreted by reprocessors.

Recommendation 7: Targeting larger authorities

The packaging sector's investment in supporting local authority recovery of packaging materials needs to be more sharply targeted. Those local authorities in Britain that historically have achieved most in recycling and reached the highest recycling/composting rates have tended, with a few exceptions, to be shire districts in England. Many are small authorities and the tonnages they deliver are small measured against the scale of the challenge facing the UK if it is to meet the 2008 directive targets.

The strategic challenge is that represented by the 100 or so local authorities with more than 75,000 households. Together they account for almost 50% of UK households. The next tranche of 100 authorities, those with greater than 50,000 households, bring the total coverage to more than two-thirds of all households.

In expanding packaging recycling, compliance schemes working with reprocessors should consider giving priority to these larger authorities. Many are low performers today but have direct access to large tonnages of untapped but potentially recoverable material.

Recommendation 8: Regional or sub-regional groupings

In like manner there are efficiencies and economies of scale to be gained from working with well chosen groups of local authorities. Where possible this should be the preferred approach, rather than working individually with large numbers of authorities. Local authorities themselves are being encouraged to form such groupings for procurement and other purposes, and the waste strategies in the devolved administrations have created groupings of authorities to achieve more integrated planning. Local political sensitivities can sometimes disrupt partnerships of this kind but there are examples where these have been successfully overcome.

Recommendation 9: Municipal v household waste

In England and in Northern Ireland local authority recycling/composting targets are set *household* waste, whereas in Scotland and Wales the targets relate to *municipal* waste. Household waste targets exclude recyclables that are potentially recoverable from the commercial wastes and other non-household wastes collected by local authorities; whereas municipal waste targets includes them. There are likely to be significant tonnages of packaging waste in the non-household waste stream that, at present, English authorities have no incentive to collect. This will include glass from pubs and clubs,

and cans and plastic bottles arising from 'away from home' consumption. Defra should be encouraged to reconsider this matter as part of its review of *Waste Strategy 2000* and extend its targets to cover municipal waste as a whole.

In any case, any contract entered into between compliance schemes and local authorities should be sufficiently broad in scope to include packaging from non-household sources as well as that in household waste, with incentives for these materials to be collected.

Recommendation 10: Revised packaging flow projections

The projections for each packaging material developed by the PackFlow project in association with the relevant materials organisations/industry sectors should be presented to Defra for adoption as part of its next round of consultations. PackFlow is aware of the work of the ACP Data Task Force in this area and the project will use the finalised numbers from that source once they are available.

Recommendation 11: Better forward projections

Forward packaging projections submitted to Defra by each industry/ materials sector should give explicit growth assumptions, supported by data on trends in consumption for the main product groups they represent. It has long been recognised that one of the main difficulties in developing sound flow projections is the lack of data on packaging weights associated with imports and exports of filled packaging.

Recommendation 12: Review and update

The results developed through the PackFlow project represent the best available assessment in June 2005. The tools that now exist need to be used to carry out periodic review of the projections and the estimated shortfall, updating them when necessary. This should be done on a regular basis. The next opportunity for a full review is likely to be at the end of 2005 or early in 2006 when detailed data on local authority recycling results in 2004/05 are substantially complete. Only then will it be possible, for example, to determine whether local authorities collected 945,000 tonnes of glass (as the 'top down' projections suggest) or some other tonnage.

Recommendation 13: On-going research

Consideration should be given to widening the remit of the ACP and its Data Task Force to consider these and other data-related issues in greater detail, commissioning specific research studies if necessary, and providing it with a budget for this purpose.

Specific areas where further research is necessary are i) the split of packaging between household and non-household consumption, and ii) improved understanding of the growth in the consumption of the different packaging materials.

Recommendation 14: Business targets 2006 to 2008

The PackFlow projections have generated a set of proposed business targets for the years 2006 to 2008, in which provision for lease packaging has been included. It is recommended that the business targets with these adjustments should be presented to Defra for its consideration, in conjunction with the revised packaging flows agreed with the relevant materials organisations/industry sectors.

Recommendation 15: Setting business targets

It is further recommended that Defra should develop a process for a regular, managed, annual review of the business targets which does not involve lengthy consultation.

Recommendation 16: Landfill tax

The packaging sector, its industry bodies and the compliance schemes share the view held by many other bodies that progress towards the achievement of recycling and composting targets would be greatly accelerated if the landfill tax escalator were increased more rapidly. The present increase in the tax is limited to the minimum of £3 per tonne per annum. We believe this to be too low (even when combined with the Landfill Allowances Trading Scheme – LATS) to have a marked effect on packaging waste diversion in the critical period from 2005 to 2008. We recommend that the tax be increased by £6 per tonne each year for three years from 2006/07, to reach £36 per tonne in 2008/09.

Recommendation 17: Local authority recycling targets

Any review of recycling/composting targets should take into consideration the disconnect that currently exists between UK implementation of the European landfill and packaging waste directives. One way in which this might be done, restoring a better balance between BMW and dry recyclables, would be to introduce a specific target for the recycling of dry recyclables, expressed in kilograms per household.

Alternatively such a linkage might be achieved through the introduction of a year-on-year reduction in residual municipal waste (not only BMW), resulting in an incentive to divert packaging materials as well

as BMW.

A longer term approach might be through the setting of material-based targets along the lines suggested in the EC *Thematic strategy on waste prevention and recycling*, although this would require further research.

Recommendation 18: Financial incentives for consumers to recycle

Despite the government's present opposition to the introduction of direct charging of households to stimulate recycling and reductions in residual waste, the arguments in support of the measure are overwhelming and should continue to be pressed. In its most appropriate form it would give local authorities the discretion to introduce charging arrangements, making it a locally-determined democratic choice.

Recommendation 19: Recycling credits

Active steps should be taken to improve local authority packaging recycling performance, expand municipal waste recycling and the recovery of 'away from home' packaging by encouraging third parties to provide high-performing enhanced recycling facilities through the wider payment of recycling credits. Guidance on the payment of recycling credits to third parties should be developed which encourage their use where performance targets agreed between local authorities and third parties are met, and other considerations are satisfied consistent with local authorities' land use plans and waste management strategies.

The packaging sector should encourage its member companies and the members of compliance schemes to review their existing waste management arrangements to see to what extent access to recycling credits might help in the recovery of additional tonnages of packaging waste.

Recommendation 20: Household Waste Recycling Act

The Act as it stands is unchallenging. It should be strengthened to widen the number of materials to be collected and bring forward the date for their achievement: five materials by 2008 would be more challenging.

Glass

Recommendation 21: Glass collection from metropolitan and urban areas

Glass reprocessors in partnership with compliance schemes and local authorities should develop a glass recycling programme targeted specifically at high-population authorities, underpinned by medium-term contracts providing guaranteed off-take and a guaranteed floor price, with funding support for the expansion of recycling matched by tonnage supply guarantees provided by the local authorities. These contracts in turn would need to be supported by agreements between compliance schemes and reprocessors with assured PRN prices over a number of years. Such a programme should seek the support and participation of the WRAP ROTATE programme and Defra's WIP programme to the extent that both are closely involved in securing improvements in local authority kerbside schemes and other recycling initiatives.

Recommendation 22: High density colour-separated glass banks

Bring banks will continue to form an important part of the recycling infrastructure, complementing the role provided by kerbside collections. The number of sites, and their density, should be increased and their design and siting improved to encourage more extensive use. In addition, best practice guidance should be prepared on achieving high-density bring banks in urban areas for glass - and other packaging materials. As one element in the glass contracts described above, local authorities in such areas should be given specific funding support to provide such facilities.

Recommendation 23: Commercial glass

Commercial glass collection from pubs, clubs and restaurants should be expanded to maximise recovery to achieve at least 150,000 tonnes by 2008.

Recommendation 24: Green glass into aggregates

Further measures are needed to stimulate increased off-take of glass in alternative end markets, especially the aggregates industry, with a minimum target tonnage of 700-800,000 tonnes of predominantly green glass in 2008. This will be a massive challenge. Given the size of this task the assistance of WRAP in extending its glass and aggregates programmes to expand ways of using glass in alternative end markets will be particularly important.

Recommendation 25: Preference for clear glass

The structural problems in the UK glass market are primarily created by colour imbalance, with large tonnages of imported filled packaging in green glass far in excess of the container industry's capacity to absorb it, and a shortage of clear glass. It is extremely difficult to influence established brand choices

and the marketing plans of distant producers, nevertheless the major UK importers and retailers do have considerable commercial leverage. Support should be given to the BRC working group currently examining ways in which the import of clear glass can where practicable be substituted for green glass.

Recommendation 26: Incinerator bottom ash (IBA)

The potential tonnage of glass recycled into aggregates from the bottom ash of EfW plants can be as high as 80,000 tonnes per annum, although at present only modest tonnages processed by accredited reprocessors. The position can be improved by ensuring the accreditation of the small number of intermediate processors handling this material (rather than the large number of small potential end users, few of whom would wish to seek accreditation), and including the increased tonnage recovered in any setting of intermediate business targets.

Local authority collections

Recommendation 27: 'Away from home' consumption.

It is evident that 'away from home' consumption represents a significant system loss. However the true scale of the problem is not known with any accuracy. Two actions are needed:

- i) further research should be done to understand and quantify these flows in more detail;
- ii) steps should then be taken by the relevant industry bodies, brand owners and compliance schemes working in partnership with local authorities, to plan, fund and implement suitable collection systems.

Recommendation 28: Plastic bottle recycling

UK compliance in plastics is extremely sensitive to variations in the assumed recycling rate for C&I film plastics. Local authorities have plans to collect 67,000 tonnes of plastic bottles by 2008. Meeting the 2008 targets would then require more than 430,000 tonnes of plastic film to be recovered from C&I sources, a recycling rate of 55%. There is considerable doubt as to whether this tonnage can be achieved, and PackFlow assumes a lower tonnage of around 400,000 tonnes (50% recycling rate).

Given these extreme sensitivities, it is recommended that a prudent national compliance strategy would be to set a target to recover 100,000 tonnes of plastic bottles by 2008 from household waste. Even then it is likely that there would be a shortfall. If such a target were to be set for 2008, it would be equivalent to a 22.5% recycling rate for local authority plastic bottles and would require an average national recycling rate for all authorities of 3.8 kg/hhd.

Recommendation 29: Performance efficiencies

The packaging sector should support the measures being taken by government to stimulate performance and efficiency gains in local authority recycling. In particular it should encourage:

- Complete kerbside coverage, with multi-material kerbside collections offered to all serviceable households in every local authority area;
- Increases in the number and density of bring banks, and improvements in their design and siting;
- Achieving effective integration between kerbside collections, high-density bring sites, and commercial collections;
- An increase in the number of dry recyclable materials collected to increase yields and lower unit costs, to include - as a minimum - the five principal packaging materials: glass bottles and jars (colour separated wherever possible), steel cans, aluminium cans & foil, plastic bottles, and paper/card (all grades);
- Maximising yields and tonnages, and minimise unit collection costs, through the provision of 'easy to recycle' co-mingled collections for all dry recyclables in those areas (especially metropolitan areas) where such collections are suitable;
- The close monitoring of participation and material capture rates and effective communications and awareness programmes, such as the Recycle Now campaign.

Recommendation 30: Household v non-household packaging consumption

More detailed research should be carried out to assess and quantify for each packaging material the magnitude of the flows into each of their principal end markets, differentiating between household and non-household consumption.

Recommendation 31: Improved information sources, data and analysis

Throughout the PackFlow project it has been apparent that many areas remain where there are uncertainties or inaccuracies in the data needed to make any strategic or operational assessment of UK packaging flows and their recovery. The quality, accuracy, completeness and timely availability of data remains an area of major weakness.

The quality of data on local authority collections is improving but much remains to be done. The position with respect to non-household flows of packaging is much worse and the PackFlow team has seen little detailed information to support many of the flow assumptions made.

The ACP Data Task Force has been tackling these issues for some time, but more needs to be done. Some of the areas of difficulty or uncertainty have already been mentioned, but a more complete list would include:

- More detailed analysis of material flows for major product groups, analysis of trends in the consumption of packaging and growth rates, including analysis of imports;
- Better understanding of the breakdown of packaging flows between household and non-household consumption;
- Analysis of the material composition of dry recyclables when collected as a single co-mingled stream, with different numbers and combinations of materials;
- Timely release of data on the tonnages of materials collected in local authority recycling programmes;
- Development of a data standard for determining household numbers in a local authority for waste management purposes.

Recommendation 32: Kg/hhd as the standard performance measure

The use of kg/hhd as a performance measure is one that is gaining wide support, providing as it does more meaningful performance information than a recycling/composting percentage. It is recommended that a data standard be developed to provide guidance on the methodology to be used in determining the number of households in a local authority area for waste management purposes.

Recommendation 33: Expansion of MRF sorting capacity

The PackFlow analysis points to a strategic shortfall in several Regions of the UK. The most important by virtue of their size, metropolitan populations and population densities are the North West, West Midlands, Yorkshire & the Humber, and the East Midlands. It is likely that any contracts entered into with groups of local authorities in these areas will require funding support to provide the processing and sorting capacity needed to deliver packaging tonnage expectation, especially for light-fraction packaging. PRN-funded investment is likely to be limited to capital projects that can be amortised over a 3-year period owing to the uncertainties surrounding packaging targets and the PRN system post-2008.