

Cost-effective Collection of Plastic Bottles

Introduction



This factsheet sets out to demonstrate how the collection of plastic bottles for recycling can be achieved cost-effectively.

A common reason given by local authorities for not recycling plastic bottles is that it is too expensive to do so. This is not the case, plastic bottle recycling is only an expensive activity where best practice is not adopted.

All local authorities can operate cost-effective, efficient recycling collections, that include plastic bottles, by:

- Researching and considering all available options;
- Drawing on the experiences of others; and
- Employing best practice

Optimising cost-efficiency

The key to affordable and successful plastics recycling lies in the design of the collection scheme.

This message is strengthened by the fact that the Audit Commission in England has found almost no correlation between recycling rates and waste management expenditure. It is the design of the scheme that counts, not the amount of money expended on it. This explains why a number of councils in the UK are now able to collect large volumes of plastic bottles for recycling without incurring significant additional expenditure, while others will experience high costs.

Where schemes are simply an 'add on' and residual refuse collection and disposal cost savings are not realised, then overall waste management costs will be considerably higher. In broad terms, a plastic bottle bank collection scheme is likely to result in a net operating cost of £200-250/tonne. The addition of plastic bottles to a non-integrated kerbside collection where materials are sorted at the vehicle can add about 30% to overall kerbside scheme collection costs, due to the high volume of the plastic bottles.

Whilst these non-integrated approaches do result in growth of plastic bottle recycling, the relatively high costs can and should be avoided as they undermine the sustainability, performance and value of the scheme.

The most significant influence on affordability is the ability to integrate the waste management and recyclables management systems, and achieve costs savings on the residual waste handling.

When asking whether a council can afford to collect plastic bottles for recycling, it is worth noting that they already provide and pay for the infrastructure to collect all the plastic bottles as part of dustbin waste. Each year councils spend around £45 million to landfill plastic bottles collected as part of the domestic refuse service; currently these costs are hidden in the overall waste management budget.

Plastic bottles occupy around 10% of the capacity of household refuse collection vehicles (Figure 1). If collected and delivered to a MRF rather than a landfill, net revenue is generated and costs of residual refuse management can be reduced in certain circumstances.

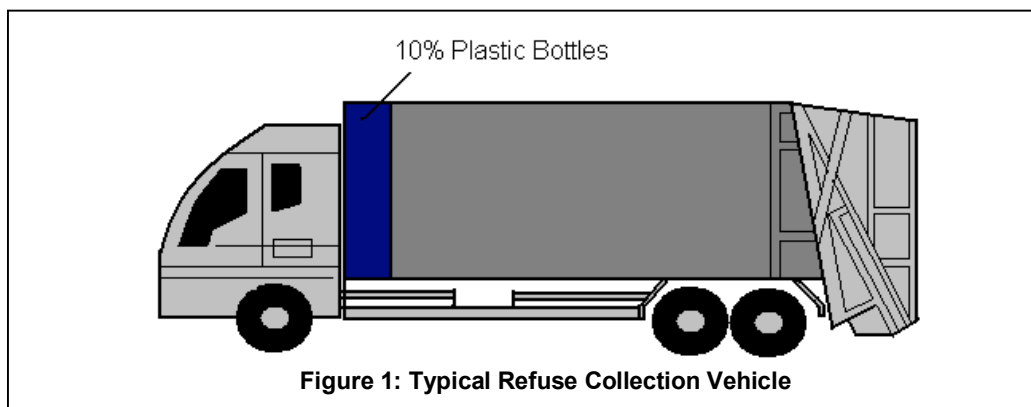


Figure 1: Typical Refuse Collection Vehicle

Well-integrated kerbside collection schemes enable plastic bottles to be collected weekly or fortnightly with a range of other recyclables for little more than the current refuse collection cost. Typically this can provide a comprehensive kerbside collection system delivering a recycling rate of over 20%. This type of system can recover glass, paper, plastic bottles and can material, for no more than a 20% increase on current refuse collection costs. It should also be noted that these extra costs are likely to decrease as a result of increased disposal avoidance benefits and continuing improvements in collection and handling technologies.

Case studies

Two case studies have been selected to demonstrate how plastic bottles can be collected cost-effectively as part of an integrated waste management programme.

Milton Keynes and Daventry both operate successful, established collection schemes; although different in design they both provide good examples of how waste and recyclables can be managed effectively as part of an integrated system.

Milton Keynes blue box/pink bag scheme

Milton Keynes Council operate a weekly collection of recyclables and residual refuse using split bodied collection vehicles. Residents are provided with a blue box for glass, pink sacks for plastic bottles, cans, paper and card and black sacks for residual refuse.

The boxes and sacks are collected, on the same day, weekly from the front of properties. The collection vehicle has two compartments at the back and a "pod" at the front. The glass goes into the "pod". The pink sacks go into one of the compartments at the back, and the black sacks into the other.

The pink sacks and the glass are unloaded at the MRF for sorting and the black sacks go to landfill. Milton Keynes have achieved a 20% recycling rate.

Website: http://www.mkweb.co.uk/waste_recycling/home.asp

Daventry's twin bin and box scheme

Daventry District Council operate an alternating weekly collection of refuse and green waste and have a separate red and blue box scheme for collecting a range of dry recyclables.

The red box is used for newspapers, magazines and textiles and the blue box for cans, plastics and glass.


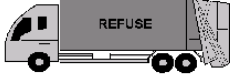
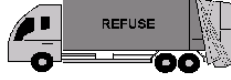

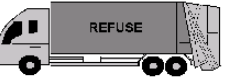


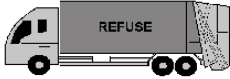



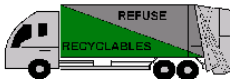
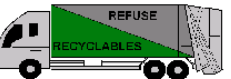


Introduced in 1998 this collection system has enabled Daventry to increase their recycling rate from 12% to an average of nearly 50%.

Website: <http://www.daventrydc.gov.uk/atoz/refuse/recycling/index.html>



The cost-effectiveness of different waste collection programmes

The examples below are based on an area with approximately 30,000 households, however the basic principles can be applied to areas of various size and population density.

<p>Typically</p> <p>HIGH COSTS Low participation Low recycling rates</p>  <p>LOW COSTS High participation High recycling rates</p>	Example 1: Basic waste collection 'refuse only'		
	Week 1	Week 2	No recyclables collected; recycling targets will not be met.
	Refuse collection vehicles x 6	Refuse collection vehicles x 6	
			
	1 set of collection rounds per week		
Example 2: 'Add on' recyclables collection (kerbside or bring bank) 'add on recyclables'			
Week 1	Week 2	Recyclables are collected, generating revenue from the material value and recycling credits, but no cost savings are made on the residual refuse collection. If participation rates rise the cost of collecting the recyclables will increase, as more vehicles and crews will be required, thus the overall cost of waste management will increase.	
Refuse collection vehicles x 6	Refuse collection vehicles x 6		
			
Recyclables collection vehicles x 2	Recyclables collection vehicles x 2		
			
2 sets of collection rounds per week			
Example 3: Recyclables collection, reducing the costs of residual waste management 'integrated'			
Week 1	Week 2	Recyclables are collected, generating revenue from the material value and recycling credits. In certain circumstances it may be possible to reduce the costs of residual refuse management through: rearranging collection routes; undertaking fewer trips to the landfill site; or decreasing the number of vehicles used for the collection of residual refuse (spare vehicles can be used to collect recyclables).	
Refuse collection vehicles x 5	Refuse collection vehicles x 5		
			
Recyclables collection vehicles x 2	Recyclables collection vehicles x 2		
			
2 sets of collection rounds per week			
Example 4: Same day collection of recyclables and residual refuse in a split vehicle 'fully integrated'			
Week 1	Week 2	The replacement of typical single body refuse vehicles with split body collection vehicles allows refuse and recyclables to be collected at the same time, with recyclables going in one compartment and residual refuse in the other. Recyclables are collected at little extra cost, and revenue is generated from the material value and recycling credits. It is important that plastic bottles, which account for about 10% of an average bin by volume, are moved to recyclables to create similar fill rates of the bins. One or more extra vehicles may be required due to logistics.	
Refuse and recyclables collection vehicles x 7	Refuse and recyclables collection vehicles x 7		
			
1 set of collection rounds per week			
Example 5: Alternate weekly collections of recyclables and residual refuse 'fully integrated'			
Week 1	Week 2	Operating alternate weekly collections of recyclables and residual refuse allows the same collection crews and vehicles to be used for both collections. This type of scheme can be introduced and operated at practically no extra cost, as the only initial expenditure is that of the extra collection containers. It also encourages greater participation, as households need to recycle to ensure sufficient space is left to store residual refuse over a two week period. It is important that plastic bottles, which account for about 10% of an average bin by volume, are moved to recyclables to create similar fill rates of the bins.	
Refuse collected Refuse/recyclables collection vehicles x 6	Recyclables collected Refuse/recyclables collection vehicles x 6		
			
1 set of collection rounds per week			

Summary

All local authorities can operate affordable and successful recycling collections that include plastic bottles; the key lies in the design of the collection scheme. The most significant influence on affordability is the ability to integrate the waste management and recyclables management systems, and achieve costs savings on the residual waste handling.

Further Reading

Recoup (2003) *Performance Improvement of Recycling Schemes*, Recoup <http://www.recoup.org>

Recoup Survey (2002) *Survey 2002 Plastic Recycling Report*, Recoup <http://www.recoup.org>

Waste Watch (1999) *Diverting Messages: Results of the Waste Watch Public Communication Programme as an element of the Daventry District Council Green Waste Trial*, Waste Watch http://www.wasteonline.org.uk/resources/WasteWatch/DivertingMessages_files/page1.html