

## Resource Futures

A cost-benefit analysis of local authority home  
composting support programmes

Report for Straight Plc



resourcefutures



# Resource Futures

## A cost-benefit analysis of local authority home composting support programmes

Prepared for Straight Plc

RF project No: 1385

July 2010



Resource Futures

1<sup>st</sup> Floor, Royal House, 28 Sovereign Street, Leeds, LS1 4BJ

0113 243 8777

[www.resourcefutures.co.uk](http://www.resourcefutures.co.uk)

## Document details

---

### Report prepared for:

Jonathan Straight  
Chief Executive  
Straight Plc  
No 1 Whitehall Riverside  
Leeds  
LS1 4BN

---

### Report prepared by:

Julian Parfitt and Kerrie Warburton  
Resource Futures  
Royal House  
28 Sovereign Street  
Leeds  
LS1 4BJ  
E-mail: [julian.parfitt@resourcefutures.co.uk](mailto:julian.parfitt@resourcefutures.co.uk)

---

## Contents

---

1.	Introduction .....	1
2.	Calculation of cost savings .....	1
2.1	Home composting diversion.....	1
2.2	Avoided local authority treatment and disposal costs.....	1
2.3	Local authority home composting scheme costs .....	1
2.4	Calculation of cost savings per bin .....	2
2.5	Scheme level cost savings.....	4
3.	Conclusions.....	6

## 1. Introduction

---

This study explores the costs of home composting campaigns in relation to the cost savings to local authorities associated with less municipal waste needing to be collected, treated or disposed of. The analysis involves considering the 'up-front' costs associated with home composting bin provision to householders set against projected estimates of future cost savings in terms of the quantities of waste diverted from municipal systems through home composting participation.

Estimates of the net savings associated with home composting need to take account of the 'time value' of money spent by local authorities today, set against the future savings resulting from waste diverted into home composting. For this, Net Present Values (NPVs) can be calculated to compare the value of a local authority pound invested in home composting today against the value of the same pound in the future (taking into account inflation and likely returns if the money had been invested).

## 2. Calculation of cost savings

---

### 2.1 Home composting diversion

The home composting diversion estimates take into account the findings of WRAP's latest set of estimates for home composting diversion, WRAP 2009<sup>1</sup>, which differentiates quantities diverted away from disposal (mostly food waste and some garden waste) and from garden waste collections (both at kerbside and at HWRCs).

### 2.2 Avoided local authority treatment and disposal costs

The following avoided costs were compiled and projected forward to 2020:

- Marginal cost of disposal (£/tonne, incl. gate fee and landfill tax)
- Marginal cost of windrow/ IVC composting (£/tonne, gate fee)
- Marginal avoided cost of collection (£/tonne)

Although these costs will be influenced by significant uncertainties over the coming years, the continued commitment to the Landfill Tax escalator will ensure that landfill costs continue to rise by £8/tonne until 2014 (£80/tonne) and with a floor beyond that date that would not allow costs to drop below that level.

### 2.3 Local authority home composting scheme costs

The main cost elements that have been considered on the local authority side include:

- Cost of home composting bins
- Cost of bin delivery
- Cost of campaign promotion and support

---

<sup>1</sup> Home Composting Diversion: District Level Modelling

[http://www.wrap.org.uk/downloads/Home\\_Composting\\_Diversion\\_District\\_Level\\_Analysis.cd5bb7e1.7747.pdf](http://www.wrap.org.uk/downloads/Home_Composting_Diversion_District_Level_Analysis.cd5bb7e1.7747.pdf)

## 2.4 Calculation of cost savings per bin

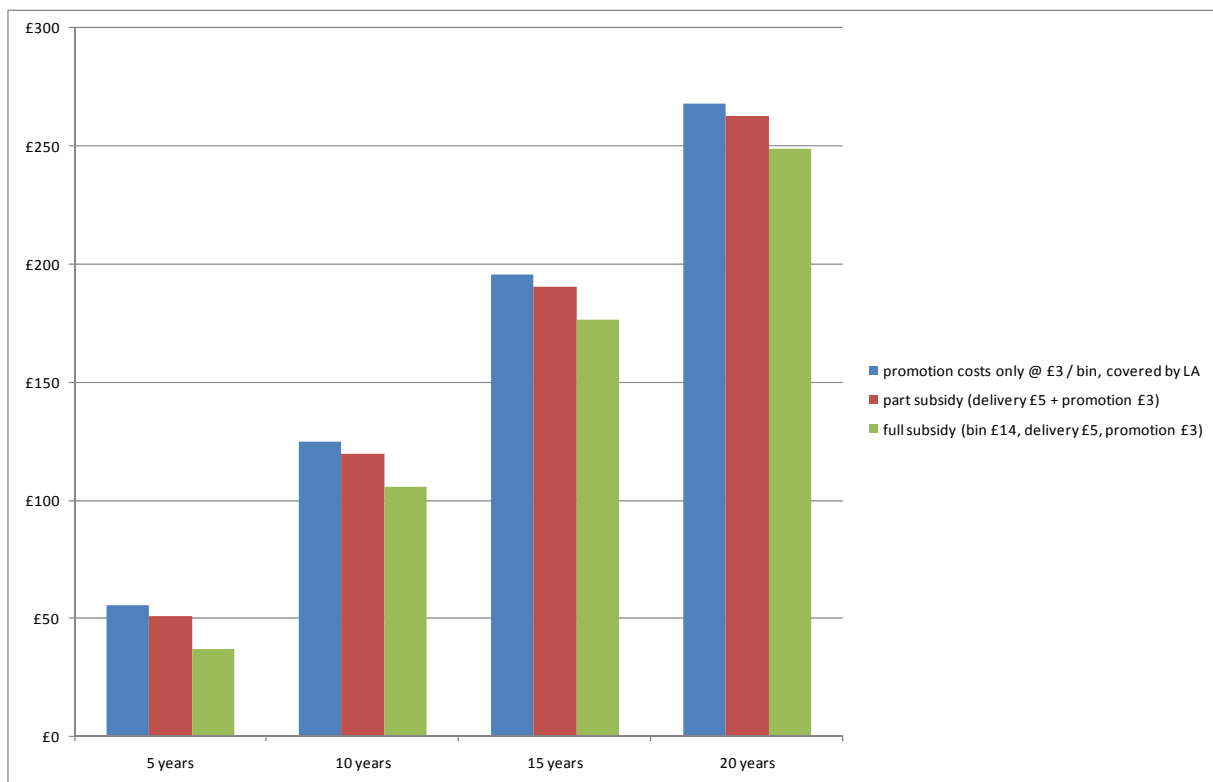
To illustrate the potential cost savings to a local authority, three scenarios have been developed, as shown in Table 1 below. The first scenario involves the local authority paying only for promotional costs (including a newsletter, instructions and general communications), the second is a partial subsidy where the local authority also pays for bin delivery, and the third is a full subsidy where the local authority pays for promotions, delivery and the cost of the bin itself. The costs associated with the scenarios in Table 1 do not, however, take into account any reductions in promotional and distributional costs associated with households ordering more than one bin.

**Table 1: Scheme subsidy scenarios: illustrative costs per bin**

Scenario	Local authority costs	Householder costs
1. No subsidy (promotion costs only)	£3/bin promotion	£14/bin £5/bin delivery
<b>Total</b>	<b>£3/bin</b>	<b>£19/bin</b>
2. Partial subsidy	£3/bin promotion £5/bin delivery	£14/bin
<b>Total</b>	<b>£8</b>	<b>£14</b>
3. Full subsidy	£3/bin promotion £5/bin delivery £14/bin	
<b>Total</b>	<b>£22</b>	<b>£0</b>

Assuming a 3.5% discount rate per annum, the Net Present Value (NPV) of the investment made by the local authority per bin for each scenario is shown in Figure 1. It can be seen that even within five years the financial benefits can exceed £50 per bin; over 20 years they can exceed £250 per bin. This assumes that each bin is in full use during each time period.

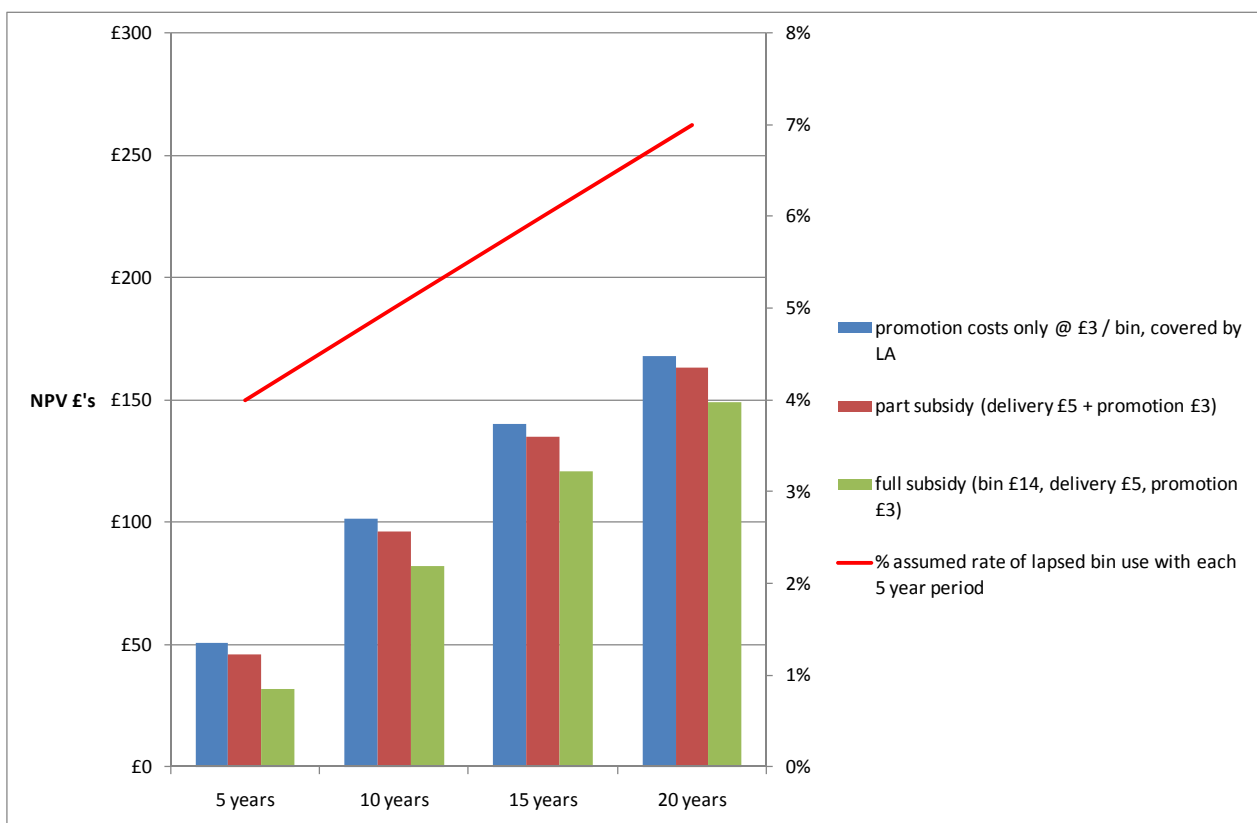
**Figure 1: NPV's per bin distributed under three different subsidy scenarios**



Although there are significant uncertainties in projecting avoided costs forward over long time periods (fuel costs, gate fees, the status of separate food waste collections), generally the NPVs are high, indicating considerable return on the initial investment made. Over 20 years the savings per bin is estimated to be in the region of £250 – £269; over 5 years the saving is in the region of £38-£57 per bin; over the 15 year ‘bin life time’, savings to the local authority would be approximately £178-£197 per bin.

As it is unlikely that every bin will remain in full use for the duration of its lifetime, Figure 2 below demonstrates the impact of an increasing drop-out rate as householders cease to compost, resulting in a reduction in the NPV calculated. Taking into account a drop-out rate estimated at increasing from 4% up to 7% per annum over the 20 year period, the NPVs are significantly reduced, but still high.

**Figure 2: NPV for different time period, taking into account home composting drop-out rates**



This calculation serves to illustrate the need for continued promotion of home composting to protect the initial investment made by the local authority, in order to minimise the rate of lapsed home composting and maximise the long term cost savings. Within the 5 year time frame, savings will range from £33-£52 per bin distributed; over 20 years from £151-£170 per bin distributed. Over a 15 year ‘bin life time’, savings to the local authority per bin distributed would be of the order of £122-£141.

Overall, these ‘NPV per bin’ calculations illustrate that the cost of different levels of bin subsidy and any promotional or distributional costs are small in relation to the longer term benefits, using the NPV calculation to take account of the time value of money (with an assumed discount rate of 3.5% per annum).

These scenarios have illustrated the cost-benefits at the level of individual bins, however each scenario will induce a different level of public demand for bins, depending on the area type and level of subsidy. These issues are considered next.

## 2.5 Scheme level cost savings

Local authorities across England were designated as 'green', 'amber' and 'red' areas based on statistical modelling of the potential for extra bin demand, with 'high', 'middling' and 'lower' home composting bin distribution potential respectively (Resource Futures 2009 report 'Analysis of Future Potential for Home Composting Participation in England'). As it will be easier to promote home composting bins in 'green' areas (where less promotional work has already been carried out and fewer bins have been sold historically), it can be assumed that there will be a:

- greater incidence of multiple bin ordering in 'green' areas (assumed rates: 30% green, 15% amber, 5% red), which reduces mean delivery and promotional costs/bin sold (see Table 2);
- there is a trade-off between achievement of greater bin up-take and the extent to which the public or the local authority pay for the scheme costs (Table 3).
- greater overall number of bins sold within green areas, compared with amber and red (Table 4);

The scenarios used to illustrate different levels of subsidy and bin uptake (Table 3) have been modified slightly, as Scenario 3 (free bins) is not likely to result in higher diversion, as many 'bargain hunting' households with little interest and commitment to home composting are likely to place bin orders. Instead, the highest subsidy scenario (3b) is a £5 reduction on the £14 bin, bringing the price to £9 per bin. With free composting bins, it would not be credible to assume that the home composting diversion factor derived from the WRAP model would be fully applicable.

**Table 2: Characteristics of 'green', 'amber' and 'red' areas**

	Comments	% bins as multiple orders	Number of households in scenario authority	Current % households with LA home composting bins	Extra demand predicted relative to existing national norms	Promotional cost per bin	Distributional cost per bin
GREEN	easier to promote and sell bins as area not sold so many bins in	30%	50,000	14%	5%	£2.55	£4.33
AMBER	higher incidence of free garden waste collection: more difficult to promote	15%	50,000	16%	0%	£2.78	£4.66
RED	more difficult to promote further, yet local waste policies are supportive of HC	5%	50,000	22%	-5%	£2.93	£4.89

**Table 3: Local authority and public bin costs by scenario and area type**

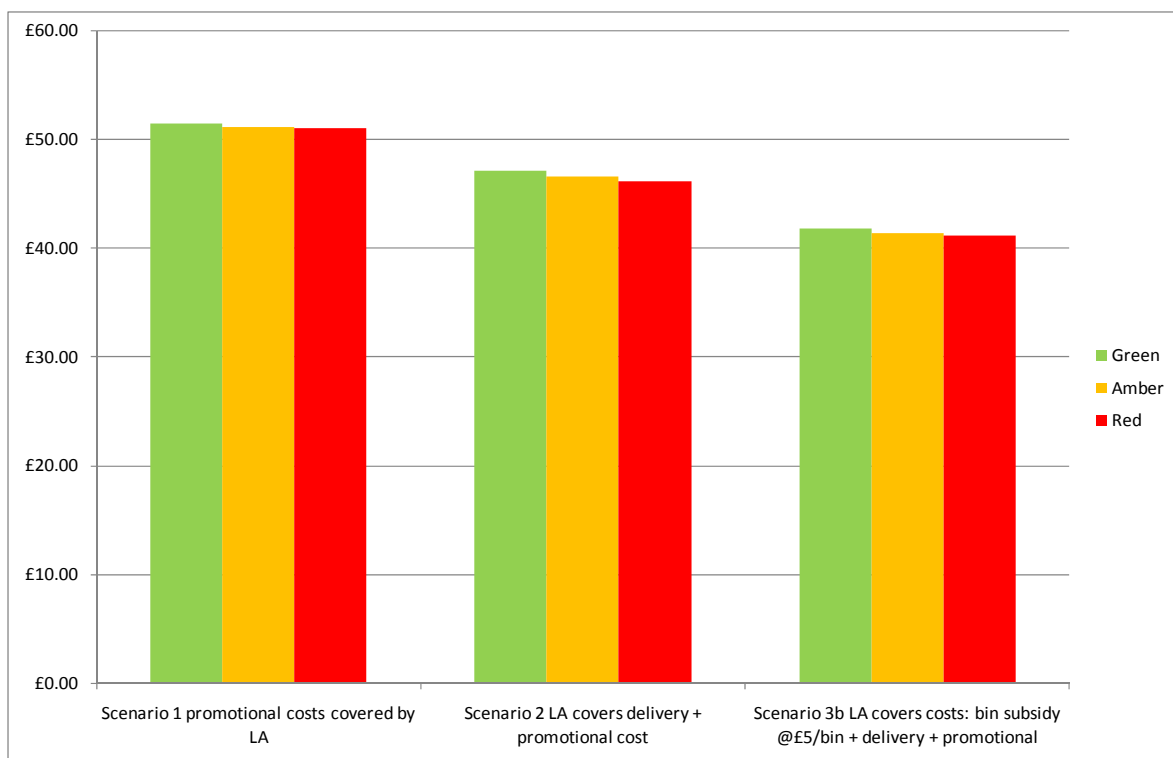
Cost to Local Authority per bin			Cost to householder per bin		
Scenario 1	Scenario 2	Scenario 3b	Scenario 1	Scenario 2	Scenario 3b
£2.55	£6.88	£11.88	£18.33	£14.00	£9.00
£2.78	£7.44	£12.44	£18.66	£14.00	£9.00
£2.93	£7.81	£12.81	£18.89	£14.00	£9.00

**Table 4: Bin up-take by scenario and area type**

Total bin up-take scenario1 (% h'holds)	Total bin up-take scenario2 (% h'holds)	Total bin up-take scenario 3b (% h'holds)
1,900	2,750	3,900
3.80%	5.50%	7.80%
900	1,400	2,200
1.80%	2.80%	4.40%
300	550	960
0.60%	1.10%	1.92%

Taking each of the three area types, and applying adjustments to scheme costs taking into account multiple bin orders (based on historical data), it can be seen that the differentials in promotion and distribution costs are not significant within the context of the Net Present Value calculations (Figure 3), as the 'up-front' costs are relatively small in relation to the net savings accrued to local authorities throughout a compost bin's lifetime, and even within a five year period. The estimated NPV over 5 years from bin delivery, for the three scenarios ranges from £40 to £50 per bin. These values also take into account lapsed home composting rates across the time period. Even with maximum subsidy (scenario 3b), a NPV over 5 years of around £40 per bin in use is predicted.

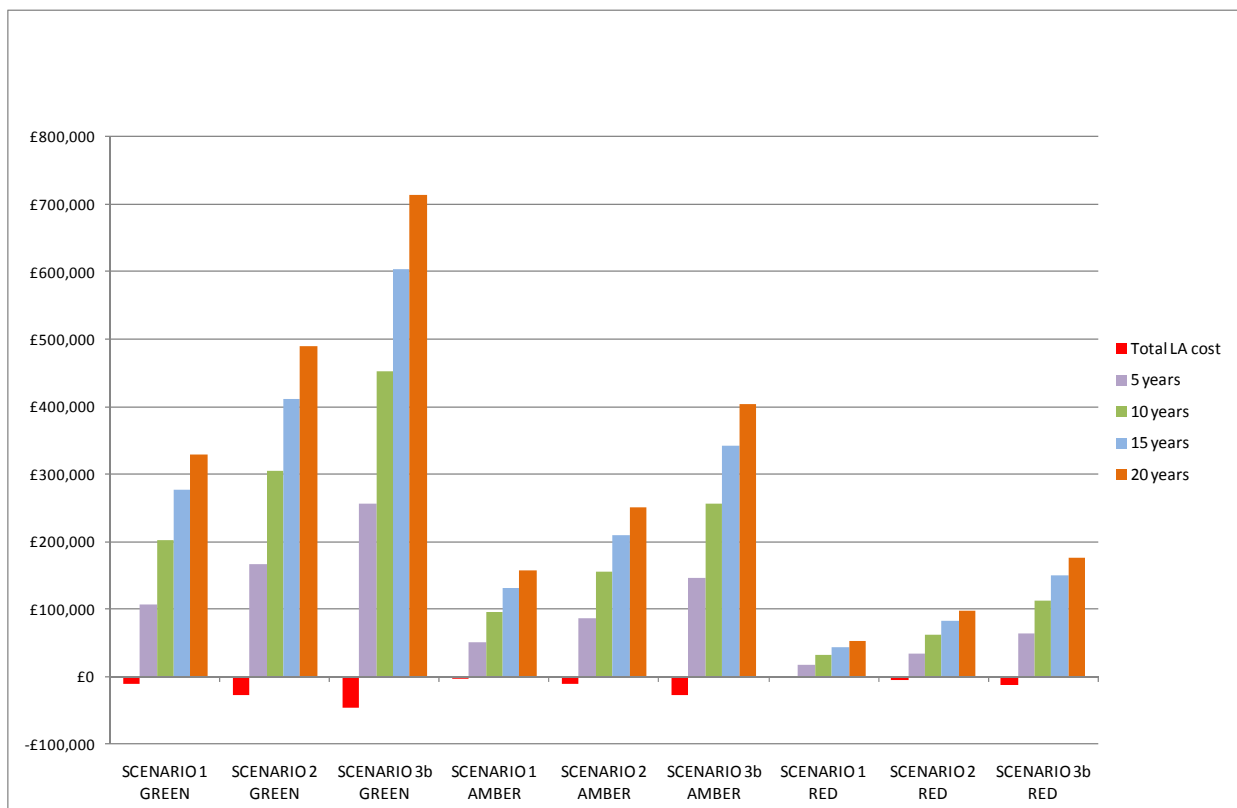
**Figure 3: NPVs/ bin projected over 5 years for different levels of scheme subsidy and area type, taking into account lapsed home composting rate**



Using the assumptions set out in Table 4, Figure 4 below combines the three subsidy scenarios with the 'green', 'amber' and 'red' local authority districts and illustrates the total potential cost savings for an indicative authority with 50,000 households, taking into account lapsed participation and increased up-take in different area types with higher levels of subsidy.

It can be seen that in the most favourable scenario ('green' area, 3b: householder charged only £9 per bin), savings could exceed £700,000 over 20 years, and reach approximately £250,000 in just five years. Even in the less favourable scenarios with lower assumed up-take of bins ('red' areas, lower level of subsidy), savings are still considerable.

**Figure 4: NPVs for home composting bin scenarios for 'green', 'amber' and 'red' districts with 50,000 households with lapsed participation and increased up-take with higher levels of subsidy**



### 3. Conclusions

The analysis presented indicates that investment in home composting is highly cost-effective, with relatively modest local authority investment resulting in significant cost savings at landfill, treatment facilities and waste haulage.

NPV's have been calculated to illustrate the scale of these saving relative to costs under different scenarios and for different area types.

Previous research for Straight plc has established that the market for home composting bins is far from saturated. For local authorities to realise the cost savings that have been identified they need to weigh-up the benefits of extra participation in home composting brought about through an adequate level of subsidy, against the budgetary pressures in the short term. To make the best decision for their area, they need to be fully aware of the longer term benefits of home composting in reducing the costs of municipal waste services in their area.