

## Appendix 6 – Collection Modelling Results for Huntingdonshire District Council

This appendix provides the cost, operational and performance implications of each scenario for Huntingdonshire District Council. Table 1 illustrates the current collection service operated across the District.

Table 52: Current collection service (baseline)

|               | Collection                       | Frequency   | Container        | Vehicle              |
|---------------|----------------------------------|-------------|------------------|----------------------|
| Residual      | Residual                         | Fortnightly | 240l Wheeled Bin | RCV 20m <sup>3</sup> |
| Dry Recycling | Co-mingled                       | Fortnightly | 240l Wheeled Bin | RCV 20m <sup>3</sup> |
| Organics      | Co-mingled food and garden waste | Fortnightly | 240l Wheeled Bin | RCV 20m <sup>3</sup> |

The description of each scenario (1-5) is in section 3 'Collection Modelling' of the main report. Any sensitivity analysis, in the form of an additional scenario is also described in section 4 within the relevant scenario results.

## Annualised collection costs

Table 53: Annualised collection costs for current service and scenarios 1-5

|   | <i>Baseline</i>          | <i>Scenario 1</i>          | <i>Scenario 2</i>                                | <i>Scenario 3a</i>   | <i>Scenario 4</i>   | <i>Scenario 5</i>  |
|---|--------------------------|----------------------------|--|--|---|--|
|   | <i>Current service</i>   | <i>Separate food waste</i> | <i>Separate food waste + restricted residual</i> | <i>Twin-stream recycling, 3WC with residual, separate food, garden as is</i> | <i>Twin-stream recycling, fortnightly collection, separate food, garden as is</i> | <i>Kerbside Sort recycling with food, monthly residual, charged garden</i> |
| Annualised dry recycling collection cost  | £1,908,780               | £1,908,780                 | £1,908,780                                       | £3,420,704   | £3,518,386  | £6,638,083   |
| Annualised garden waste collection cost   | £1,760,012 <sup>51</sup> | £1,760,012                 | £1,760,012                                       | £1,760,012   | £1,760,012  | £1,607,672   |
| Annualised food waste collection cost     | -                        | £2,269,745                 | £2,375,182                                       | Co-collected with DMR and residual   | £2,375,182  | Co-collected with DMR  |
| Annualised residual waste collection cost | £2,125,389               | £1,833,100                 | £1,840,064                                       | £1,777,896   | £1,845,092  | £1,302,999   |
| <b>Total gross collection cost</b>        | <b>£5,794,182</b>        | <b>£7,771,638</b>          | <b>£7,884,038</b>                                | <b>£6,958,613</b>  | <b>£9,498,673</b>   | <b>£9,548,754</b>  |
| <b>Difference from Baseline</b>           | -                        | £1,977,456                 | £2,089,856                                       | £1,164,431   | £3,704,491  | £3,754,572   |

<sup>51</sup> Commingled organics

## Vehicle and container requirements

Table 54: Vehicle and container requirements for current service and scenarios 1-5

|            | Dry recycling                 |              |                | Garden waste         |              |                | Food waste         |              |                     | Residual             |              |                |
|------------|-------------------------------|--------------|----------------|----------------------|--------------|----------------|--------------------|--------------|---------------------|----------------------|--------------|----------------|
|            | Vehicle type                  | No. vehicles | Container type | Vehicle type         | No. vehicles | Container type | Vehicle type       | No. vehicles | Container type      | Vehicle type         | No. vehicles | Container type |
| Baseline   | RCV 20m <sup>3</sup>          | 8            | 240L           | RCV 20m <sup>3</sup> | 8            | 240L           | N/A                | 0            | N/A                 | RCV 20m <sup>3</sup> | 9            | 240L           |
| Scenario 1 | RCV 20m <sup>3</sup>          | 8            | 240L           | RCV 20m <sup>3</sup> | 8            | 240L           | Dedicated 7.5t     | 20           | Kitchen caddy + 23L | RCV 20m <sup>3</sup> | 8            | 240L           |
| Scenario 2 | RCV 20m <sup>3</sup>          | 8            | 240L           | RCV 20m <sup>3</sup> | 8            | 240L           | Dedicated 7.5t     | 21           | Kitchen caddy + 23L | RCV 20m <sup>3</sup> | 8            | 180L           |
| Scenario 3 | REL + front pod (75%/25%)     | 10           | 240L&180L      | RCV 20m <sup>3</sup> | 8            | 240L           | Collected with DMR | 0            | Kitchen caddy + 23L | RCV 20m <sup>3</sup> | 6            | 240L           |
| Scenario 4 | REL 65%/35%                   | 12           | 240L & 180L    | RCV 20m <sup>3</sup> | 8            | 240L           | Dedicated 7.5t     | 21           | Kitchen caddy + 23L | RCV 20m <sup>3</sup> | 8            | 180L           |
| Scenario 5 | Side loading 21m <sup>3</sup> | 34           | 50L box (x3)   | RCV 20m <sup>3</sup> | 7            | 240L           | Collected with DMR | 0            | Kitchen caddy + 23L | RCV 20m <sup>3</sup> | 5            | 240L           |

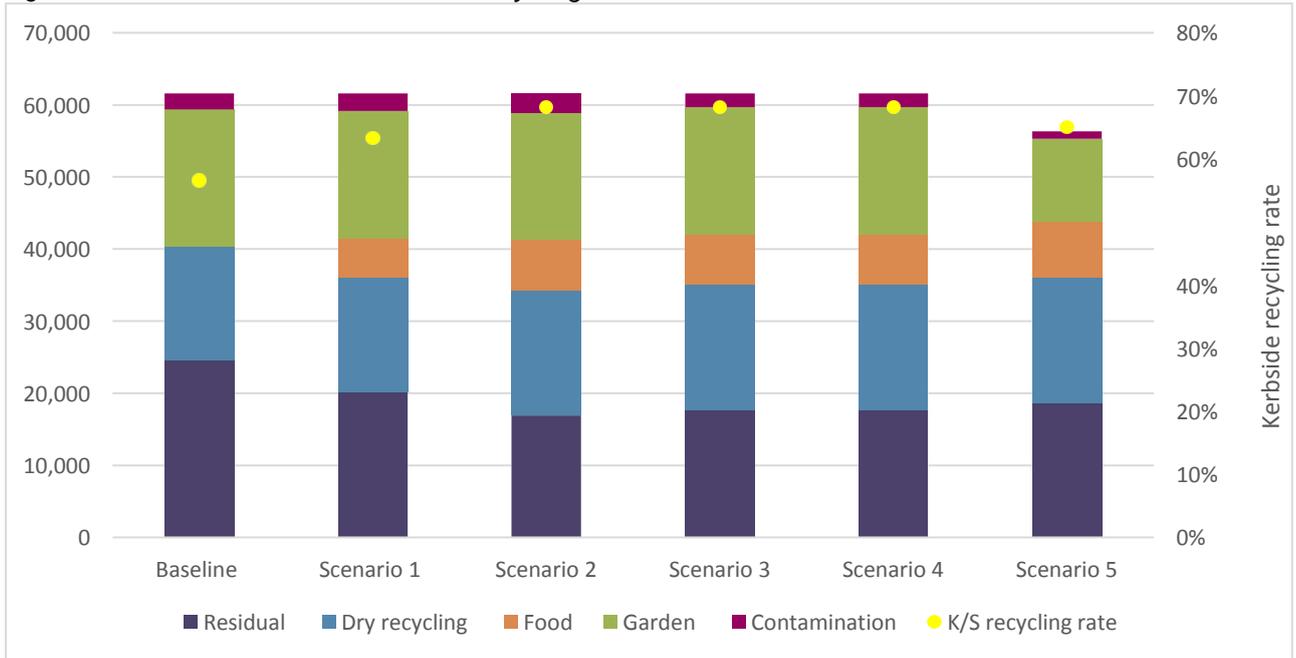
## Tonnes collected and kerbside recycling rate

Table 55: Tonnes collected and kerbside recycling rate<sup>52</sup> for current service and scenarios 1-5

|  | Baseline      | Scenario 1    | Scenario 2    | Scenario 3    | Scenario 4    | Scenario 5    |
|--|---------------|---------------|---------------|---------------|---------------|---------------|
| Residual   | 24,506        | 20,186        | 16,914        | 17,668        | 17,670        | 18,666        |
| Dry recycling  | 15,921        | 15,921        | 17,379        | 17,379        | 17,379        | 17,379        |
| Food   | 0             | 5,373         | 6,980         | 6,981         | 6,980         | 7,784         |
| Garden   | 18,929        | 17,663        | 17,663        | 17,663        | 17,663        | 11,481        |
| Contamination  | 2,218         | 2,431         | 2,638         | 1,882         | 1,882         | 1,008         |
| K/S recycling rate                                   | 57%           | 63%           | 68%           | 68%           | 68%           | 65%           |
| <b>Total</b>   | <b>61,574</b> | <b>61,574</b> | <b>61,574</b> | <b>61,574</b> | <b>61,574</b> | <b>56,318</b> |
| <b>Difference between kerbside recycling tonnage</b> | <i>0</i>      | <i>4,107</i>  | <i>7,172</i>  | <i>7,174</i>  | <i>7,172</i>  | <i>1,794</i>  |

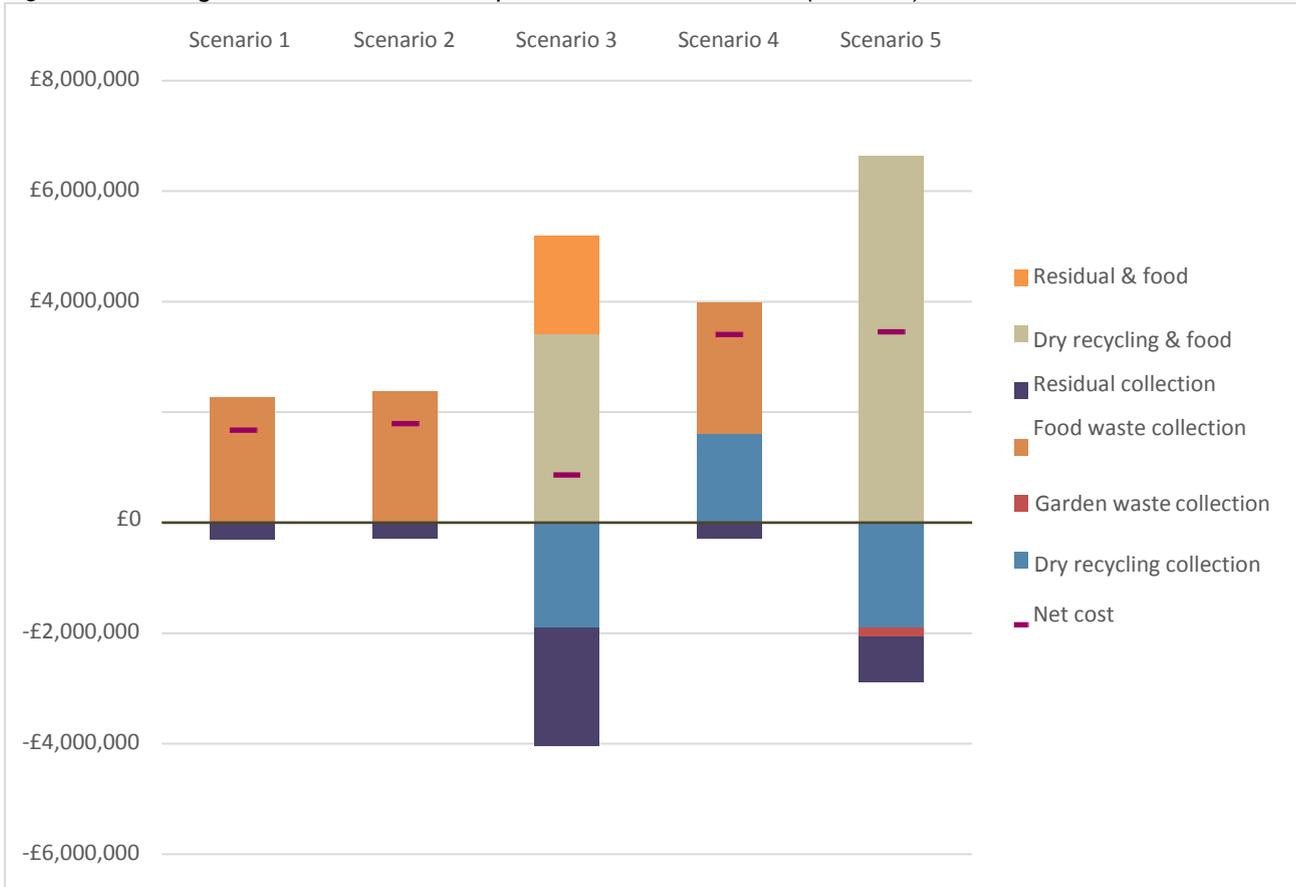
<sup>52</sup> Note that kerbside recycling rate will differ from local authority recycling rate, which will be influenced by other waste collected and recycled / disposed by the local authority

Figure 1: Tonnes collected and kerbside recycling rate



### Annual gross collection cost comparison to current service

Figure 2: Annual gross collection cost comparison to current service (baseline)



Please note, that in Scenario 3 food waste is collected on an RCV with a pod, and in scenario 5, food waste is collected in a dedicated compartment of a sideloading kerbsider vehicle. Therefore, the cost of food waste collection cannot directly be extracted from the costings as the tonnage is split proportionality.

## Cost of change (additional CAPEX)

Operating cost savings are shown in the annualised KAT model results however no account has been taken of the residual value of any redundant vehicles. We have only accounted for the cost of new containers and vehicles not previously used in the Council. Any movement of bins or vehicles between different collection types has also not been accounted for.

Table 56: Additional CAPEX required to operate the service for scenarios 1-5<sup>53</sup>

| Scenario 1   | No. additional vehicles | Vehicle type   | Cost per vehicle | Total cost (vehicles) | No. additional containers | Container type | Cost per container | Total cost (containers) | Total additional CAPEX cost |
|--------------|-------------------------|----------------|------------------|-----------------------|---------------------------|----------------|--------------------|-------------------------|-----------------------------|
| Dry          | 0                       | n/a            | n/a              | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            | <b>£1,522,336.83</b>        |
| Garden waste | 0                       | n/a            | n/a              | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |
| Food waste   | 20                      | Dedicated food | £60,000          | <b>£1,200,000</b>     | 77299                     | Kitchen caddy  | £4.17              | <b>£322,336.83</b>      |                             |
| Residual     | 0                       | n/a            | £0.00            | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |

| Scenario 2   | No. additional vehicles | Vehicle type   | Cost per vehicle | Total cost (vehicles) | No. additional containers | Container type | Cost per container | Total cost (containers) | Total additional CAPEX cost |
|--------------|-------------------------|----------------|------------------|-----------------------|---------------------------|----------------|--------------------|-------------------------|-----------------------------|
| Dry          | 0                       | n/a            | n/a              | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            | <b>£2,977,583.78</b>        |
| Garden waste | 0                       | n/a            | n/a              | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |
| Food waste   | 21                      | Dedicated food | £60,000          | <b>£1,260,000</b>     | 77299                     | Kitchen caddy  | £4.17              | <b>£322,336.83</b>      |                             |
| Residual     | 0                       | n/a            | £0.00            | <b>£0.00</b>          | 77299                     | 180l bin       | £18.05             | <b>£1,395,246.95</b>    |                             |

<sup>53</sup> Note that this includes the Capex for new vehicles and containers only. It does not include any other costs associated with a change of service, for example take back of redundant containers, procurement, communications, enforcement or other infrastructure requirements such as additional depot space. However if the overall costs of the service have increased, the annualised costs will have more overheads included within them (as this is a percentage applied on top of the total annual service costs), which may account for some of these elements.

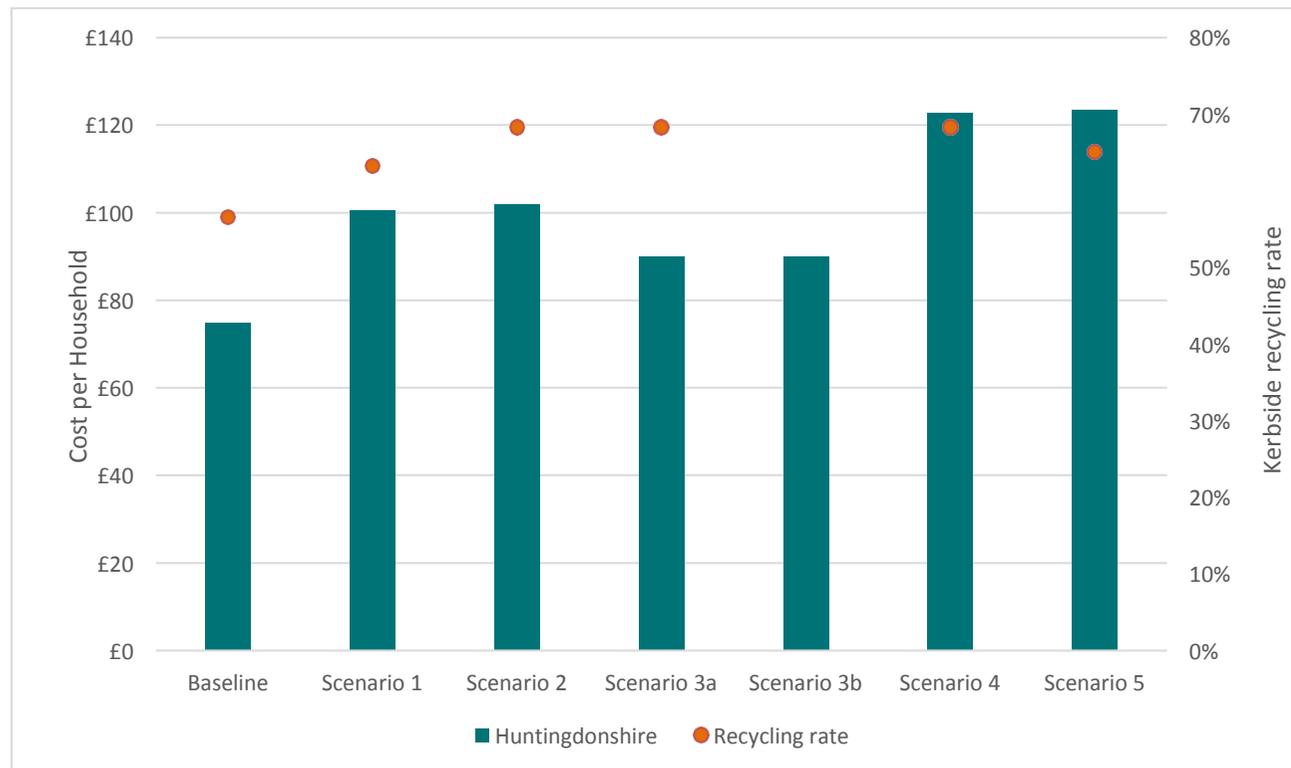
| Scenario 3   | No. additional vehicles | Vehicle type | Cost per vehicle | Total cost (vehicles) | No. additional containers | Container type | Cost per container | Total cost (containers) | Total additional CAPEX cost |
|--------------|-------------------------|--------------|------------------|-----------------------|---------------------------|----------------|--------------------|-------------------------|-----------------------------|
| Dry          | 10                      | REL + pod    | £215,000         | <b>£2,150,000</b>     | 77299                     | 180l bin       | £18.05             | <b>£1,395,246.95</b>    | <b>£3,867,583.78</b>        |
| Garden waste | 0                       | n/a          | n/a              | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |
| Food waste   | 0                       | n/a          | n/a              | <b>£0.00</b>          | 77299                     | Kitchen caddy  | £4.17              | <b>£322,336.83</b>      |                             |
| Residual     | 0                       | n/a          | £0.00            | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |

| Scenario 4   | No. additional vehicles | Vehicle type   | Cost per vehicle | Total cost (vehicles) | No. additional containers | Container type | Cost per container | Total cost (containers) | Total additional CAPEX cost |
|--------------|-------------------------|----------------|------------------|-----------------------|---------------------------|----------------|--------------------|-------------------------|-----------------------------|
| Dry          | 12                      | REL 65/35%     | £250,000.00      | <b>£3,000,000</b>     | 77299                     | 180l bin       | £18.05             | <b>£1,395,246.95</b>    | <b>£7,372,830.73</b>        |
| Garden waste | 0                       | n/a            | n/a              | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |
| Food waste   | 21                      | Dedicated food | £60,000          | <b>£1,260,000</b>     | 77299                     | Kitchen caddy  | £4.17              | <b>£322,336.83</b>      |                             |
| Residual     | 0                       | n/a            | £0.00            | <b>£0.00</b>          | 77299                     | 180l bin       | £18.05             | <b>£1,395,246.95</b>    |                             |

| Scenario 5   | No. additional vehicles | Vehicle type | Cost per vehicle | Total cost (vehicles) | No. additional containers | Container type | Cost per container | Total cost (containers) | Total additional CAPEX cost |
|--------------|-------------------------|--------------|------------------|-----------------------|---------------------------|----------------|--------------------|-------------------------|-----------------------------|
| Dry          | 34                      | Sideloadng   | £150,000.00      | <b>£5,100,000</b>     | 231897                    | 50l (x3)       | £2.98              | <b>£691,053.06</b>      | <b>£6,113,389.89</b>        |
| Garden waste | 0                       | n/a          | £0.00            | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |
| Food waste   | 0                       | n/a          | n/a              | <b>£0.00</b>          | 77299                     | Kitchen caddy  | £4.17              | <b>£322,336.83</b>      |                             |
| Residual     | 0                       | n/a          | £0.00            | <b>£0.00</b>          | 0                         | n/a            | n/a                | <b>£0.00</b>            |                             |

## Collection cost per household vs recycling performance

Figure 3: Collection cost per household vs recycling performance



## Quantitative assessment

Table 57: Quantitative scored assessment of scenarios 1-5 based on a 50:50 weighting of cost (annual) and tonnes recycled

| <u>Huntingdonshire</u>        |           |                           |  | Separate food (weekly) | Separate food plus restricted residual (180l fortnightly) | Two stream (fibres separate), 3W rolling basis with residual, separate food & free garden | Two stream (fibres separate), separate food, garden 'as is', restricted residual (180l fortnightly) | Kerbside sort (including food) plus monthly residual and charged garden |            |
|-------------------------------|-----------|---------------------------|--|------------------------|---|---|---|---|------------|
| Category                      | Weighting | Considerations            | Guide  | Baseline               | Scenario 1  | Scenario 2  | Scenario 3  | Scenario 4  | Scenario 5 |
| <i>Financial</i>              | 50%       | <i>Annual cost</i>        | Annual cost in addition to Baseline. Score as deviation from the baseline.                       | £0                     | £1,977,456  | £2,089,856  | £1,164,431  | £3,704,491  | £3,754,572 |
|                               |           |                           |  | <b>10.0</b>            | <b>4.7</b>  | <b>4.4</b>  | <b>6.9</b>  | <b>0.1</b>  | <b>0.0</b> |
| <i>Recycling performance</i>  | 50%       | Tonnes recycled per annum | Tonnes recycled (dry recycling, food and garden excluding contamination) in addition to baseline | 0                      | 4107  | 7172  | 7174  | 7172  | 1794       |
|                               |           |                           |  | <b>0.0</b>             | <b>5.7</b>  | <b>10.0</b>   | <b>10.0</b>   | <b>10.0</b>   | <b>2.5</b> |
| <b>Total score unweighted</b> |           |                           |  | <b>10.0</b>            | <b>10.5</b>   | <b>14.4</b>   | <b>16.9</b>   | <b>10.1</b>   | <b>2.5</b> |
| <b>Weighted score</b>         |           |                           |  | <b>5.0</b>             | <b>5.2</b>  | <b>7.2</b>  | <b>8.4</b>  | <b>5.1</b>  | <b>1.3</b> |
| <b>Rank</b>                   |           |                           |  | 5                      | 3   | 2   | 1   | 4   | 6          |

## RAG (Red, Amber, Green) assessment

|  |   |
|--|---|
|  | Meets 1 or less of the requirements set out within the National Resources and Waste Strategy      |
|  | Meets less than half of the requirements set out within the National Resources and Waste Strategy |
|  | Meets at least half of the requirements set out within the National Resources and Waste Strategy  |
|  | Meets the majority of the requirements set out within the National Resources and Waste Strategy   |

Table 58: RAG assessment of the scenarios compared to the requirements within the national Resources and Waste Strategy

| <i>Resources and Waste Strategy proposal</i>                    | <b>Baseline</b>  | <b>Scenario 1</b>  | <b>Scenario 2</b>  | <b>Scenario 3</b>  | <b>Scenario 4</b>  | <b>Scenario 5</b>                  |
|---|--|--|--|--|--|------------------------------------|
| <b>Collection of a core set of materials</b>                    | PTT and cartons are collected at the kerbside  |  |  |  |  |                                    |
| <b>Effective collection system to preserve material quality</b> | All materials collected co-mingled. Risk associated with collecting glass with fibres (paper and card) | All materials collected co-mingled. Risk associated with collecting glass with fibres (paper and card) | All materials collected co-mingled. Risk associated with collecting glass with fibres (paper and card) | Fibres (paper and card) collected separately to glass and other containers (metals and plastics) | Fibres (paper and card) collected separately to glass and other containers (metals and plastics) | All materials collected separately |
| <b>Weekly separate food waste collection</b>                    | No but could be added to the service profile as a separate collection at additional cost               | Yes  |  |  |  |                                    |

|  |                                     |                              |
|--|-------------------------------------|------------------------------|
| Free garden waste collection to all households with a garden | Yes to all households with a garden | Charged garden waste service |
|--|-------------------------------------|------------------------------|



## Key assumptions

### Garden waste

The following assumption was applied in order to calculate the potential tonnage that could be collected through a charged garden collection scheme. The number of subscribers is based on benchmarking/rurality and that approximately 65% of the 'free tonnage' would be collected through the free garden waste service. Of the remaining 35% tonnage (not collected) we assume 15% is diverted into the residual collection and of the remaining 85%, 50% lost within the system to home composting, 35% to HWRC green waste composting.

| Assume 50% take up of service, tonnage as follow:                           |     | Huntingdonshire |
|---|-----|-----------------|
| Free tonnage collected as garden  | 65% | <b>11481</b>    |
| <i>15% of the difference in tonnage (35%) moves to residual</i>             | 15% | 927             |
| <i>85% of the difference in tonnage is lost (i.e. homecomposting, HWRC)</i> | 85% | 5255            |

## WRAP ready reckoner

The model uses the percentage of households in Social Groups D and E in a local authority area (derived from the 2011 Census) as a measure of deprivation and applies it to the following formulas:

- For areas with fortnightly residual waste collection (i.e. alternate weekly collection): = 2.1614 – (% Social Groups D and E  $\square$  2.2009)  $\pm$  0.40 kg/hh/week

|                            |                   |
|----------------------------|-------------------|
| <i>WRAP ready reckoner</i> | <b>kg/hh/week</b> |
|----------------------------|-------------------|

| <b>LA</b>       | <b>Social Grade D &amp; E 2011 (%)</b> |        |               | <b>Medium</b> | <b>High</b> | <b>Low</b>  |
|-----------------|--|--------|---------------|---------------|-------------|-------------|
| Huntingdonshire | 19.3%                                  | 2.1614 | 0.424773<br>7 | 1.73663       | 2.1366263   | 1.3366<br>3 |

|                 | <b>Number of households</b> | <b>Tonnage/year</b> |             |            | <b>Medium - High</b> |
|-----------------|-----------------------------|---------------------|-------------|------------|----------------------|
|                 |                             | <b>Medium</b>       | <b>High</b> | <b>Low</b> |                      |
| Huntingdonshire | 77,299                      | 6980                | 8588        | 5373       | 7784                 |

## KAT outputs

### Type of Collection

|               | <b>Baseline</b>                      | <b>Scenario 1</b>                    | <b>Scenario 2</b>                    | <b>Scenario 3</b>                        | <b>Scenario 4</b>                     | <b>Scenario 5a</b>                    | <b>Scenario 5b</b>                    | <b>Scenario 5c</b>                     |
|---------------|--------------------------------------|--------------------------------------|--------------------------------------|--|---------------------------------------|---------------------------------------|---------------------------------------|--|
| Scenario Name | <b>Baseline</b>                      | <b>Separate food waste</b>           | <b>Restricted residual</b>           | <b>3 weekly</b>                          | <b>2 stream, restricted residual</b>  | <b>Kerbside sort</b>                  | <b>Vehicle capacity sensitivity</b>   | <b>Vehicle utilisation sensitivity</b> |
| Dry recycling | Kerbside co-mingled or single stream | Kerbside co-mingled or single stream | Kerbside co-mingled or single stream | Co-collected dry recyclables and compost | Co-collected 2 dry recyclable streams | Kerbside sorted (more than 2 streams) | Kerbside sorted (more than 2 streams) | Kerbside sorted (more than 2 streams)  |
| Garden waste  | Kerbside co-mingled or single stream     | Kerbside co-mingled or single stream  | Kerbside co-mingled or single stream  | Kerbside co-mingled or single stream  | Kerbside co-mingled or single stream   |
| Food waste    | select from list                     | Kerbside co-mingled or single stream | Kerbside co-mingled or single stream | Co-collected dry recyclables and compost | Kerbside co-mingled or single stream  | select from list                      | select from list                      | select from list                       |
| Dry recycling | select from list                     | select from list                     | select from list                     | Kerbside co-mingled or single stream     | select from list                      | select from list                      | select from list                      | select from list                       |
| Refuse        | Refuse collection                    | Refuse collection                    | Refuse collection                    | Refuse collection                        | Refuse collection                     | Refuse collection                     | Refuse collection                     | Refuse collection                      |

### Collection Frequency

|               | <b>Baseline</b>  | <b>Scenario 1</b> | <b>Scenario 2</b> | <b>Scenario 3</b> | <b>Scenario 4</b> | <b>Scenario 5a</b> | <b>Scenario 5b</b> | <b>Scenario 5c</b> |
|---------------|------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|
| Dry recycling | every fortnight  | every fortnight   | every fortnight   | every 3 weeks     | every fortnight   | once a week        | once a week        | once a week        |
| Garden waste  | every fortnight  | every fortnight   | every fortnight   | every fortnight   | every fortnight   | every fortnight    | every fortnight    | every fortnight    |
| Food waste    | select from list | once a week       | once a week       | every 3 weeks     | once a week       | select from list   | select from list   | select from list   |

|               | Baseline         | Scenario 1       | Scenario 2       | Scenario 3    | Scenario 4       | Scenario 5a      | Scenario 5b      | Scenario 5c      |
|---------------|------------------|------------------|------------------|---------------|------------------|------------------|------------------|------------------|
| Dry recycling | select from list | select from list | select from list | once a week   | select from list | select from list | select from list | select from list |
| Refuse        | every fortnight  | every fortnight  | every fortnight  | every 3 weeks | every fortnight  | monthly          | monthly          | monthly          |

### Collection Vehicle

|               | Baseline         | Scenario 1                 | Scenario 2                 | Scenario 3                               | Scenario 4                            | Scenario 5a                 | Scenario 5b                 | Scenario 5c                 |
|---------------|------------------|----------------------------|----------------------------|--|---------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Dry recycling | RCV, 20m3        | RCV, 20m3                  | RCV, 20m3                  | REL + front pod<br>75%/25%<br>22m3 total | REL<br>65%/35%<br>,<br>21 m3<br>total | side loading,<br>lift, 21m3 | side loading,<br>lift, 28m3 | side loading,<br>lift, 21m3 |
| Garden waste  | RCV, 20m3        | RCV, 20m3                  | RCV, 20m3                  | RCV, 20m3                                | RCV, 20m3                             | RCV, 20m3                   | RCV, 20m3                   | RCV, 20m3                   |
| Food waste    | select from list | Dedicated food 7.5T<br>GVW | Dedicated food 7.5T<br>GVW | REL + front pod<br>75%/25%<br>22m3 total | Dedicated food 7.5T<br>GVW            | select from list            | select from list            | select from list            |
| Dry recycling | select from list | select from list           | select from list           | Dedicated food 7.5T<br>GVW               | select from list                      | select from list            | select from list            | select from list            |
| Refuse        | RCV, 20m3        | RCV, 20m3                  | RCV, 20m3                  | RCV, 18m3                                | RCV, 20m3                             | RCV, 20m3                   | RCV, 20m3                   | RCV, 20m3                   |

### Collection crew size including driver

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 3        | 3          | 3          | 4          | 3          | 3           | 3           | 3           |
| Garden waste  | 3        | 3          | 3          | 3          | 3          | 3           | 3           | 3           |
| Food waste    | #DIV/0!  | 2          | 2          | 4          | 2          | #DIV/0!     | #DIV/0!     | #DIV/0!     |
| Dry recycling | #DIV/0!  | #DIV/0!    | #DIV/0!    | 2          | #DIV/0!    | #DIV/0!     | #DIV/0!     | #DIV/0!     |
| Refuse        | 3        | 3          | 3          | 4          | 3          | 3           | 3           | 3           |

### Number of households served

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 77,299   | 77,299     | 77,299     | 77,299     | 77,299     | 77,299      | 77,299      | 77,299      |
| Garden waste  | 68,368   | 68,368     | 68,368     | 68,368     | 68,368     | 77,299      | 77,299      | 77,299      |
| Food waste    | 0        | 77,299     | 77,299     | 77,299     | 77,299     | 0           | 0           | 0           |

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 0        | 0          | 0          | 77,299     | 0          | 0           | 0           | 0           |
| Refuse        | 77,299   | 77,299     | 77,299     | 77,299     | 77,299     | 77,299      | 77,299      | 77,299      |

### Percentage set out

|               | Baseline         | Scenario 1       | Scenario 2       | Scenario 3 | Scenario 4       | Scenario 5a      | Scenario 5b      | Scenario 5c      |
|---------------|------------------|------------------|------------------|------------|------------------|------------------|------------------|------------------|
| Dry recycling | 75%              | 75%              | 75%              | 75%        | 75%              | 75%              | 75%              | 75%              |
| Garden waste  | 75%              | 75%              | 75%              | 75%        | 75%              | 40%              | 40%              | 40%              |
| Food waste    | select from list | 45%              | 55%              | 75%        | 55%              | 55%              | 55%              | 55%              |
| Dry recycling | select from list | select from list | select from list | 55%        | select from list | select from list | select from list | select from list |
| Refuse        | 80%              | 80%              | 85%              | 90%        | 85%              | 90%              | 90%              | 90%              |

### Percentage set out (2nd stream)

|               | Baseline         | Scenario 1       | Scenario 2       | Scenario 3       | Scenario 4       | Scenario 5a      | Scenario 5b      | Scenario 5c      |
|---------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Dry recycling | select from list | select from list | select from list | 55%              | 75%              | 75%              | 75%              | 75%              |
| Garden waste  | select from list |
| Food waste    | select from list | select from list | select from list | 55%              | select from list | select from list | select from list | select from list |
| Dry recycling | select from list |

### Average Participation

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 85%      | 85%        | 87%        | 87%        | 87%        | 87%         | 87%         | 87%         |
| Garden waste  | 82%      | 82%        | 82%        | 82%        | 82%        | 44%         | 44%         | 44%         |
| Food waste    | 100%     | 55%        | 65%        | 87%        | 65%        | 65%         | 65%         | 65%         |
| Dry recycling | 100%     | 100%       | 100%       | 65%        | 100%       | 100%        | 100%        | 100%        |

### Average Capture

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 75%      | 75%        | 80%        | 50%        | 80%        | 76%         | 76%         | 76%         |
| Garden waste  | 114%     | 256%       | 256%       | 256%       | 256%       | 273%        | 273%        | 273%        |
| Food waste    | 100%     | 73%        | 80%        | 48%        | 80%        | 0%          | 0%          | 0%          |
| Dry recycling | 100%     | 100%       | 100%       | 27%        | 100%       | 100%        | 100%        | 100%        |

### Tonnes collected excluding contamination

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 15,921   | 15,921     | 17,379     | 11,855     | 17,379     | 25,163      | 25,163      | 25,163      |
| Garden waste  | 18,929   | 17,663     | 17,663     | 17,663     | 17,663     | 11,481      | 11,481      | 11,481      |
| Food waste    | 0        | 5,373      | 6,980      | 10,179     | 6,980      | 0           | 0           | 0           |
| Dry recycling | 0        | 0          | 0          | 2,327      | 0          | 0           | 0           | 0           |
| Refuse        | 24,506   | 20,186     | 16,914     | 17,668     | 17,670     | 18,666      | 18,666      | 18,666      |
| Dry recycling | 0        | 0          | 0          | 0          | 0          | 0           | 0           | 0           |
| Garden waste  | 0        | 0          | 0          | 0          | 0          | 0           | 0           | 0           |
| Food waste    | 0        | 0          | 0          | 0          | 0          | 0           | 0           | 0           |
| Dry recycling | 0        | 0          | 0          | 0          | 0          | 0           | 0           | 0           |

### Tonnes of contamination collected

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 1,385    | 1,385      | 1,512      | 531        | 756        | 503         | 503         | 503         |
| Garden waste  | 833      | 777        | 777        | 777        | 777        | 505         | 505         | 505         |
| Food waste    | 0        | 269        | 349        | 458        | 349        | 0           | 0           | 0           |
| Dry recycling | 0        | 0          | 0          | 116        | 0          | 0           | 0           | 0           |

### Utilisation of each

|                       | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|-----------------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling (small) | N/A      | N/A        | N/A        | 74%        | 95%        | N/A         | N/A         | N/A         |

### Compartment in 2 stream

|                       | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|-----------------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling (large) | N/A      | N/A        | N/A        | 100%       | 100%       | N/A         | N/A         | N/A         |
| Garden waste (small)  | N/A      | N/A        | N/A        | N/A        | N/A        | N/A         | N/A         | N/A         |
| Garden waste (large)  | N/A      | N/A        | N/A        | N/A        | N/A        | N/A         | N/A         | N/A         |
| Food waste (small)    | N/A      | N/A        | N/A        | 39%        | N/A        | N/A         | N/A         | N/A         |
| Food waste (large)    | N/A      | N/A        | N/A        | 100%       | N/A        | N/A         | N/A         | N/A         |
| Dry recycling (small) | N/A      | N/A        | N/A        | N/A        | N/A        | N/A         | N/A         | N/A         |
| Dry recycling (large) | N/A      | N/A        | N/A        | N/A        | N/A        | N/A         | N/A         | N/A         |

### Tonnes of biodegradable material collected

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 8,727    | 8,727      | 9,528      | 11,855     | 9,528      | 17,311      | 17,311      | 17,311      |
| Garden waste  | 18,929   | 17,663     | 17,663     | 17,663     | 17,663     | 11,481      | 11,481      | 11,481      |
| Food waste    | 0        | 5,373      | 6,980      | 2,327      | 6,980      | 0           | 0           | 0           |
| Dry recycling | 0        | 0          | 0          | 2,327      | 0          | 0           | 0           | 0           |

### Number of collection vehicles required

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 7.9      | 7.9        | 7.9        | 4.7        | 11.7       | 33.2        | 33.2        | 34.9        |
| Garden waste  | 7.5      | 7.5        | 7.5        | 7.5        | 7.5        | 6.8         | 6.8         | 6.8         |
| Food waste    | 0.0      | 19.7       | 20.6       | 4.8        | 20.6       | 0.0         | 0.0         | 0.0         |
| Dry recycling | 0.0      | 0.0        | 0.0        | 20.6       | 0.0        | 0.0         | 0.0         | 0.0         |
| Refuse        | 8.3      | 7.4        | 7.1        | 5.8        | 7.1        | 4.1         | 4.1         | 4.1         |

### Collection limited by weight or volume

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | volume   | volume     | volume     | weight     | volume     | volume      | volume      | volume      |

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Garden waste  | volume   | volume     | volume     | volume     | volume     | volume      | volume      | volume      |
| Food waste    | volume   | weight     | weight     | volume     | weight     | volume      | volume      | volume      |
| Dry recycling | volume   | volume     | volume     | weight     | volume     | volume      | volume      | volume      |
| Refuse        | weight   | weight     | weight     | weight     | weight     | weight      | weight      | weight      |

#### Number of loads collected per vehicle per day

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 1.4      | 1.4        | 1.6        | 1.1        | 1.0        | 1.4         | 1.0         | 1.9         |
| Garden waste  | 1.5      | 1.4        | 1.4        | 1.4        | 1.4        | 1.0         | 1.0         | 1.0         |
| Food waste    | 1.0      | 0.4        | 0.5        | 2.0        | 0.5        | 0.5         | 0.5         | 0.5         |
| Dry recycling | 1.0      | 1.0        | 1.0        | 0.2        | 1.0        | 1.0         | 1.0         | 1.0         |
| Refuse        | 1.1      | 1.0        | 0.9        | 1.2        | 0.9        | 1.7         | 1.7         | 1.7         |

#### Number of households passed per vehicle per day

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 980      | 980        | 980        | 1,101      | 660        | 465         | 465         | 443         |
| Garden waste  | 916      | 916        | 916        | 916        | 916        | 1,129       | 1,129       | 1,129       |
| Food waste    | 0        | 785        | 751        | 1,063      | 751        | 0           | 0           | 0           |
| Dry recycling | 0        | 0          | 0          | 751        | 0          | 0           | 0           | 0           |
| Refuse        | 932      | 1,045      | 1,085      | 889        | 1,085      | 889         | 889         | 889         |

#### Number of households collected from per vehicle per day

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 735      | 735        | 735        | 825        | 495        | 349         | 349         | 332         |
| Garden waste  | 687      | 687        | 687        | 687        | 687        | 451         | 451         | 451         |
| Food waste    | 0        | 353        | 413        | 798        | 413        | 0           | 0           | 0           |
| Dry recycling | 0        | 0          | 0          | 413        | 0          | 0           | 0           | 0           |
| Refuse        | 746      | 836        | 922        | 800        | 922        | 800         | 800         | 800         |

#### Pass rate

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | 203      | 203        | 203        | 236        | 141        | 103         | 103         | 98          |
| Garden waste  | 183      | 183        | 183        | 183        | 183        | 226         | 226         | 226         |





### Total capital cost of vehicles

|               | Baseline   | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | £1,568,720 | £1,568,720 | £1,568,720 | £1,075,000 | £3,000,000 | £5,100,000  | £5,440,000  | £5,250,000  |
| Garden waste  | £1,568,720 | £1,568,720 | £1,568,720 | £1,568,720 | £1,568,720 | £1,372,630  | £1,372,630  | £1,372,630  |
| Food waste    | £0         | £1,200,000 | £1,260,000 | £1,075,000 | £1,260,000 | £0          | £0          | £0          |
| Dry recycling | £0         | £0         | £0         | £0         | £0         | £0          | £0          | £0          |
| Refuse        | £1,764,810 | £1,568,720 | £1,568,720 | £1,176,540 | £1,568,720 | £980,450    | £980,450    | £980,450    |

### Annual vehicle operating costs

|               | Baseline   | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | £1,081,597 | £1,081,597 | £1,081,597 | £965,890   | £1,955,243 | £4,173,125  | £4,173,125  | £4,289,764  |
| Garden waste  | £986,863   | £986,863   | £986,863   | £986,863   | £986,863   | £876,996    | £876,996    | £876,996    |
| Food waste    | £0         | £1,511,822 | £1,584,659 | £962,559   | £1,584,659 | £0          | £0          | £0          |
| Dry recycling | £0         | £0         | £0         | £0         | £0         | £0          | £0          | £0          |
| Refuse        | £1,188,377 | £990,559   | £999,784   | £1,002,135 | £999,784   | £663,850    | £663,850    | £663,850    |

### Annual overheads

|               | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|----------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | £324,479 | £324,479   | £324,479   | £289,767   | £586,573   | £1,251,938  | £1,251,938  | £1,286,929  |
| Garden waste  | £296,059 | £296,059   | £296,059   | £296,059   | £296,059   | £263,099    | £263,099    | £263,099    |
| Food waste    | £0       | £453,546   | £475,398   | £288,768   | £475,398   | £0          | £0          | £0          |
| Dry recycling | £0       | £0         | £0         | £0         | £0         | £0          | £0          | £0          |
| Refuse        | £356,513 | £297,168   | £299,935   | £300,641   | £299,935   | £199,155    | £199,155    | £199,155    |

### Annual gross collection cost

|               | Baseline   | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5a | Scenario 5b | Scenario 5c |
|---------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| Dry recycling | £1,908,780 | £1,908,780 | £1,908,780 | £1,759,333 | £3,518,386 | £6,638,083  | £6,698,989  | £7,319,410  |









