

The Construction Commitments: Halving Waste to Landfill

Benchmarks for target setting

Benchmarks are valuable tools for setting targets, both for individual projects and for corporate performance.

This short guide provides information on:

- selecting suitable **metrics and KPIs**;
- **project** baseline and stretch targets for wastage, waste recovery and recycled content; and
- **corporate** targets for overall performance.

If your organisation only procures construction activity on an intermittent basis, you may not need to set corporate targets.

Whilst the generic benchmarks in this guide are useful, it is always preferable to draw on actual project data held by your organisation, provided they have been gathered through a robust measurement process.

Decide on metrics and KPIs

The first step is to define some simple metrics and KPIs that will help you track your progress in reducing waste. Information required is:

- tonnes of waste¹;
- tonnes of waste sent to landfill;
- construction value (the normalising factor); and
- (optionally) recycled content by value.

You might want to consider measuring other 'normalising' factors in addition to construction value. These may help you to understand the efficiency of your construction processes. Examples include Gross Internal Floor Area (GIFA), bed spaces, pupil numbers, km of road/pipeline, or completed homes.

Using these metrics, you can calculate the following project KPIs:

- tonnes of waste generated per £100k of construction value;
- tonnes of waste sent to landfill per £100k of construction value;
- waste recovery rate (%)²; and
- (optionally) average recycled content by value (%).

These KPIs can be used to underpin both project and corporate target setting.

Who is this guide for?	<ul style="list-style-type: none"> ■ Clients, developers and their advisors who want to set targets for reducing waste in construction projects ■also designers and contractors who are working to meet those targets.
When will it apply?	<ul style="list-style-type: none"> ■ Use the benchmarks to inform minimum and stretch targets for projects and to determine a corporate baseline for wastage (if no actual waste data are available) ■so that you can include appropriate targets in your project brief, tender invitation and contract/prelims for designers and contractors.
What are the benefits?	<ul style="list-style-type: none"> ■ Clear waste targets are an important component in delivering reduced wastage and the associated savings in construction cost.

¹ To provide greater resolution as to the causes of changes in performance, you might want to disaggregate this information into construction, demolition and excavation waste streams.

² This equals $[1 - (\text{waste sent to landfill} / \text{waste generated})] * 100$.

Project targets

Waste targets are a powerful tool for improving performance and delivering on corporate targets when procuring designers and contractors for your project.

Where possible, it is preferable to use real information from recently completed projects. However it is important to remember that the data must be of a **reasonable quality**³ and should be **broadly representative**⁴ of the project in question. For example, the data should include waste from demolition or excavation activity if this is relevant.

If robust project data are not available, the following tables can be used to set targets for different types of project. They should be used in conjunction with WRAP's model procurement wording (www.wrap.org.uk/constructionprocurement). The data are based on analysis and measured data from real projects, including work undertaken by WRAP (Waste & Resources Action Programme) and CRWP (Construction Resources and Waste Platform⁵).

It is important to remember that the benchmarks below are only guides as to the level of performance that can be expected. Project wastage in particular is highly variable depending on, for example, the need for demolition or excavation, site conditions, design, functionality, construction method etc. Where the circumstances of a particular project are unusual (e.g. land is contaminated, significant basement excavation is required, etc), these benchmarks will need to be adjusted by your technical team.

Table 1: Waste generation benchmarks (tonnes/£100k)

	Typical practice	Good practice	Best practice	Comments
Residential new build	16	11	6	Benchmarks based on CRWP research ⁶
Other new build	16	10	5	
Residential refurbishment	9	9	4	
Other refurbishment	8	5	3	

Table 2: Waste recovery benchmarks (%)

	Baseline practice ⁷	Good practice	Comments
Construction	50%	70-80%	Benchmarks based on WRAP and CRWP research
Refurbishment/strip-out	50%	70-80%	
Demolition	50%	80-90%	
Excavation (non-hazardous)	50%	100%	

³ i.e. the dataset is complete and the WRAP/UKCG/CECA waste measurement and reporting principles have been used (www.wrap.org.uk/construction/toolsandguidance/index.html).

⁴ i.e. the project does not contain any highly irregular factors that are unlikely to occur again (e.g. the reference project involved extensive remediation of contaminated land, when the proposed project is an office fitout).

⁵ Historical CRWP publications are available at <http://www.crwplatform.co.uk/conwaste/>. From 2010, WRAP has taken over as Defra's single point of contact for organisations seeking advice on resource efficiency.

⁶ Source: *Benchmarks and Baselines 2009*, published by CRWP, 2010. Data originally measured in m³ and then converted to tonnes using industry standard conversion factors.

⁷ In this case, baseline practice is the recovery rate that would be assumed if no attempt to secure a higher recovery rate can be demonstrated. In practice, many waste management companies can achieve higher recovery rates (particularly for demolition and excavation materials).

Table 3: Reused and recycled content benchmarks (% of materials value)

	Baseline practice	Good practice	Comments
Commercial retail	11 - 32%	21 - 44%	Benchmarks taken from projects modelled using WRAP's Net Waste tool ⁸ . The variability in benchmark performance is high, reflecting the impact of the specification type on recycled content level. For this reason it is recommended that you set a conservative target of 10% or 15% recycled content, but also require evidence of good practice (i.e. adopting the top 5-10 cost-competitive product options with higher recycled content which contribute the most to increasing the project's overall level of recycled content).
Commercial offices	10 - 22%	12 - 30%	
Educational	12 - 20%	15 - 27%	
Residential	6 - 26%	16 - 29%	
Infrastructure	8-36%	25-49%	

The above benchmarks can be used to set minimum requirements and 'stretch' targets for each KPI. These targets can be included in project briefs and consultant / contractor appointments. (Useful templates are provided in WRAP's model wording for procurement requirements, available at www.wrap.org.uk/constructionprocurement.)

⁸ WRAP's Net Waste Tool and Designing out Waste tools are useful resources for forecasting construction wastes and identifying opportunities to increase the recycled content of construction projects.

Corporate targets and performance management

Where you have an ongoing programme of construction activity, achieving improved average performance against the project KPIs will form the basis of your corporate waste targets, for example:

- to achieve an X% reduction in total waste⁹ per normalising factor (typically £100k construction value) by 20xx;
- to achieve an X% reduction in total construction, demolition and excavation waste sent to landfill per normalising factor (typically £100k construction value) by 20xx;
- to achieve an average waste recovery rate of X% by 20xx; and
- (optionally) to increase the average recycled content by value of all construction to X% by 20xx.

These targets require you to assess baseline values against which your future performance is compared, as explained below.

Assessing your current performance baseline

Assessing your current baseline is often a challenge. Where possible, it is preferable to use real information from a sample of recently completed projects. However, it is important to remember that the data must be of a **reasonable quality**¹⁰ and should be **broadly representative**¹¹ of the types of construction activity you plan to undertake in the future. Because your targets are based around normalised figures (e.g. per £100k construction value), it is not necessary to gather a full year's data to get a reasonable baseline.

A common approach is to assemble data from recent projects and then assess whether any patterns can be seen as far as 'typical performance' is concerned. It may be appropriate to remove outliers of particularly low or high waste arisings if these are unlikely to be representative of typical practice and would otherwise skew the findings. Once a representative sample has been determined, then simply totalling the construction value, total waste and waste to landfill will provide the relevant baseline information.

If you don't have representative or high quality data from recently completed projects, you can set a baseline using 'typical' benchmark wastage levels such as those presented in this guide (see Tables 1-3). These benchmarks will give you a reasonable starting point and help you assess your performance once actual project data are obtained.

Set improvement targets

Key steps are to:

1 Define your timeline	Define your target year. The time period should be short enough to engender immediate action, but should provide you with sufficient time for changes in performance to be seen in completed projects.
2 Assess your potential to improve performance	<ul style="list-style-type: none">■ Compare your wastage rates with relevant benchmarks (see Table 1).■ Compare your recovery rates with relevant benchmarks (see Table 2).■ <i>Optional:</i> compare your use of recovered material with typical projects (see Table 3).

⁹ You can add further KPIs using different normalising factors.

¹⁰ i.e. the dataset is complete and the WRAP/UKCG/CECA waste measurement and reporting principles have been used (www.wrap.org.uk/construction/toolsandguidance/index.html).

¹¹ i.e. the projects contributing data to the baseline did not contain any highly irregular factors that are unlikely to occur again (e.g. they involved extensive remediation of contaminated land, when most projects will be office fitout).

3 Assess your market position and ambition	<ul style="list-style-type: none"> ■ Identify targets being adopted by your peers. ■ Identify targets being adopted by your contractors. ■ Consider what fits with your policy on corporate responsibility (e.g. do you aim to be seen as a sector leader, or sector average?)
4 Quantify your target	<p>Set your target for a percentage reduction in CD&E waste generation and/or waste to landfill. For example:</p> <ul style="list-style-type: none"> ■ "X% reduction in tonnes of waste to landfill per £100k of construction value by FY 2012/13 compared to FY2008/09 baseline" <p><i>Signatories to the Halving Waste to Landfill Commitment may set a target which is more or less than half of current performance.</i></p>
5 Report your target	<p>Enter your target at WRAP's web-based 'Waste to Landfill Reporting Portal'.</p>

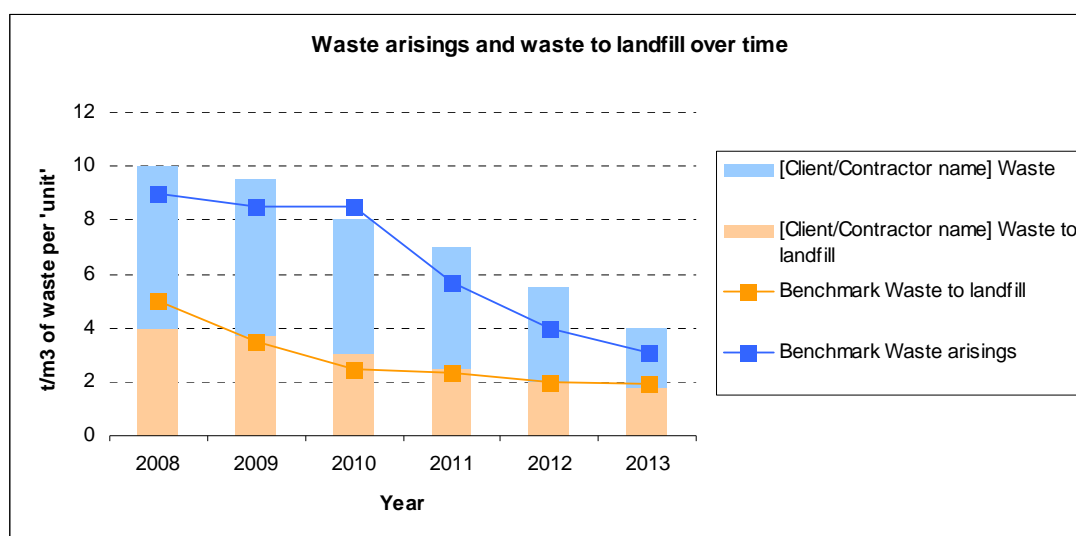
For waste reduction, one approach might be to aim to achieve good practice levels of wastage by your target year on average across your projects. The benchmarks will help in determining the % reduction in waste arisings that is needed to achieve this target. Similarly if you are targeting good practice recovery rates together with good practice waste arisings, you will be able to estimate the scale of reduction in waste sent to landfill from your baseline.

Track and review your progress

WRAP's Waste to Landfill Reporting Portal (<http://reportingportal.wrap.org.uk>) provides a simple tool for recording waste data to enable you to measure progress against the corporate targets.

The Portal uses standardised conversion factors so that users can enter data in tonnes, m³ or a combination. After setting up your own organisation's account, you will be able to:

- enter data on your waste performance (either project by project or for a given time period);
- submit data to another user's account (e.g. your client);
- receive data from another user's account (e.g. your contractor)¹²; and
- track progress towards your targets and benchmark your performance against other organisations (see below).



¹² This means that construction clients will be able request that contractors submit waste data directly into the Portal from their own account, thereby minimising data handling whilst retaining the confidentiality of client data.