

Waste audit case study

Collecting and calculating waste data for our emissions inventory and audit

Purpose of this document

This document provides an example of how the Ministry for the Environment (MfE) collects and calculates its corporate waste data for emissions reporting under the Carbon Neutral Government Programme (CNGP). CPNG participants are welcome to borrow from it if useful, but there may be other methods or resources you prefer (we recommend checking with your auditor or external provider). Please note we are continually modifying and improving upon this methodology over time.

This guidance covers corporate office waste only.

To reduce waste, we first need to understand how much we are producing. Simply using the waste collection invoices your agency receives is unlikely to be accurate, as these are often based on the size of the collection bin, rather than the weight or composition of waste it contains.

Collecting waste audit data will be an important part of the work your organisation will need to do to reduce greenhouse gas emissions under the CNGP.

This guidance is split into two sections: how to calculate waste data for carbon emissions audits annually and how to conduct a detailed waste audit in your organisation.

How to calculate landfill waste volume

The methodology outlined below is a recent example of MfE's process for calculating the volume of office waste that goes to landfill.¹ This methodology was approved by our external

¹ You could do an audit of only your landfill bins, but it is advantageous to audit your recycling and compost bins at the same time to build a broader picture of your organisation's waste profile. It also means you will capture any landfill or recyclables wastes that are in the wrong bin.

auditors. There are two methods that can be used based on the data available to you: a monthly breakdown or a yearly average.² For both methods, the process begins the same way:

- 1 **Weigh all landfill bins.** We recommend doing this on two separate days and at the end of the day, to get a clear overview of an average amount of waste in your agency. (For MfE's context, this was for all landfill bins in one office, carried out within the same week).
- 2 **Sum the total of all landfill bins and calculate the average weight of the bins.** The weight of all bins on one day must then be summed together. All daily amounts then must be averaged between each other to supply you with your average weight of waste per day.
- 3 **Divide this figure by the number of full-time equivalent (FTE) staff who were in the office on those days.** At MfE, this figure was obtained by our IT department who were able to provide accurate user connection data, so that only office-based staff were included in the dataset. If you are unable to source accurate user connection data, you will need to use a figure that is robust and justifiable to auditors for example, the carrying capacity of the office. This will give you the average waste per FTE.
- 4 If you are using the yearly method, proceed to step 5 and finish at step 6. If you are using the monthly method, skip to step 7 and finish at step 8.

Yearly method:

- 5 **Multiply this total by the number of average office FTE that year.**³ This will give you the daily waste amount in the office.
- 6 **Multiply this total by the number of working days in the year.** This differs between workplaces. MfE used a figure that considered the average number of annual leave and sick days taken to increase the accuracy of the calculation. For example, average landfill bin weight x average office FTE for whole year x number of working days for whole year = total yearly waste in kgs.

Monthly method:

- 7 **Multiply this total by the number of average office FTE per month.** This will give you the daily waste amount in the office that month.
- 8 **Multiply this by the number of working days per each individual month.** This can be done by using online tools to get an accurate number of working days per month and considering workplace differences.

For example: Average landfill bin weight x average office FTE for that month x number of working days for specific month = total monthly waste in kgs

MfE uses the monthly method with specific working days for the latest audit. Below is an example of the table used for these calculations.

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³ If your agency has issues calculating an average FTE per day, talk to your auditor about alternative calculations for estimating this.

Table 1: Monthly method table example

Month	Working Days	Quantity (kg)	Average per FTE (kg)	FTE number	Total kg Waste
Jul-22					
Aug-22					
Sep-22					
Oct-22					
Nov-22					
Dec-22					
Jan-23					
Feb-23					
Mar-23					
Apr-23					
May-22					
Jun-22					
Year total (kg)		kg		TOTAL:	KG

How to conduct a detailed waste audit in your organisation

In conjunction with waste auditing for a carbon emissions audit, it is useful to perform a detailed waste audit to be able to analyse the content and contamination of your organisation's waste and improve your response to the challenges you are facing. The results of a comprehensive waste audit will help inform the areas your agency needs to focus on to achieve reductions.

Benefits of auditing your waste

There are many benefits to auditing your organisation's waste, both internally and externally.

Table 2: Benefits of auditing your organisation's waste

Benefit	Description
Carbon emissions	Help complete your carbon emissions profile and assist with tracking your progress
Cost savings	Potential for considerable financial savings with reduced quantities of waste being collected
Education	Staff will learn ways they can reduce their waste and make more informed consumer decisions
Walking the talk	Completing regular audits shows a commitment to reducing your environmental impact, and gives you a baseline for improvements
Wellbeing	Committing to waste audits and other sustainability-oriented actions can boost employee morale, satisfaction, and assist team-building
Accountability	By having your waste data on hand, you can be transparent about your progress and report on it annually

Waste audit preparation

A successful waste audit requires some organisation to make the audit itself run smoothly. Use this checklist to help you plan for your audit:

- ☐ Confirm who your waste collection contractors are and what their collection rules are. This is particularly important for recycling and compost collections, as what is accepted differs between contractors and regions. (See appendix 1 for general guidance).
- ☐ Decide what waste streams you will be auditing. Note that waste to landfill is a mandatory Scope 3 emissions source under the CNGP (see [Carbon Neutral Government Programme: A guide to managing your greenhouse gas emissions](#)). You could do an audit of only your landfill bins, but it is advantageous to audit your recycling and compost bins at the same time to build a broader picture of your organisation's waste profile. It also means you will capture any landfill waste that is in the wrong bin.
- ☐ Decide how you are going to organise your waste streams. At MfE, we sort our waste audits by floor. This allows us to create a more detailed analysis of our waste.

- ☐ Think about how much waste you want to sort, e.g., one day's worth, or one week's worth. At MfE, we typically sort Monday's waste on Tuesday and Wednesday's waste on Thursday. We then combine the data from those two days and average it.
- ☐ Organise with your cleaning staff to leave all waste being audited in a secure location in labelled bags.
- ☐ Let your building operations team know about the audit in advance.
- ☐ Work out health and safety pointers to provide to your team (below).
- ☐ Gather the equipment required (below).
- ☐ Gather your waste audit team. At MfE, we have found having five to six people sorting the waste and recording the weights is optimal for the size of our Wellington office which accommodates 400 FTE.
- ☐ Allow enough time to complete the audit. At MfE's Wellington office, it takes 1–1.5 hours to complete a waste audit for all the bins in the building to be sorted and weighed.
- ☐ Choose a ventilated, well-lit area to conduct your audit. Ideally, it will be close to your main contracted rubbish collection site.
- ☐ Think about what clean up after the audit will be required.

Health and safety

- Wear appropriate personal protective equipment.
- Be aware of hazards on-site and emergency responses and procedures.
- Be aware that many skips are left open and so anyone could put anything into it.
- Sorters should use aprons, gloves, and masks. Beware of broken glass and other sharp or gooey objects.
- Be careful not to lift boxes, bags or bins that are too heavy. You may need a wheelbarrow to move heavy loads.

Waste audit equipment

Use this checklist when gathering equipment required for a successful audit:

- ☐ **Change of clothes** – you may get dirty, so a change of clothes is recommended.
- ☐ **PPE** – aprons, gloves and masks are essential to protect yourself from any hazards, germs or mould. Wearing personal protection gear when sorting through waste is important to protect yourself from germs and any hazards.
- ☐ **Scales** – Make sure they are sensitive enough to handle your big and small groups of waste. They should be able to be zeroed too, to cancel out the weight of the bin you're weighing the waste in.
- ☐ **Power supply** – you may need power for your scales.
- ☐ **Camera** – it is a good idea to take photos of your audit (waste unsorted and sorted) as a record, and for use as internal communications with your staff.

- ☐ **Containers to sort into** – these can be plastic bins or rubbish bags.
- ☐ Somewhere to put your waste once it is sorted – such as your organisation’s large recycling and skip bins.
- ☐ **Pen and paper** – to record the results of the audit. An audit spreadsheet is a good idea to make recording the results simple.
- ☐ **Cleaning supplies** – disinfectant, cleaning spray, wipes, hand sanitizer, paper towels etc.
- ☐ **A sorting table** – depending on the scale of your waste audit, you will need a flat surface to sort your waste. This could be on a table, or on the floor, covered by a tarpaulin.
- ☐ **Wheelbarrow** – in case of needing to move heavy loads.

Defining ‘contamination’

At MfE, we have defined contamination for our waste audits as ‘anything in the wrong bin’ as outlined in table 3.

Table 3: Defined contamination for waste audits

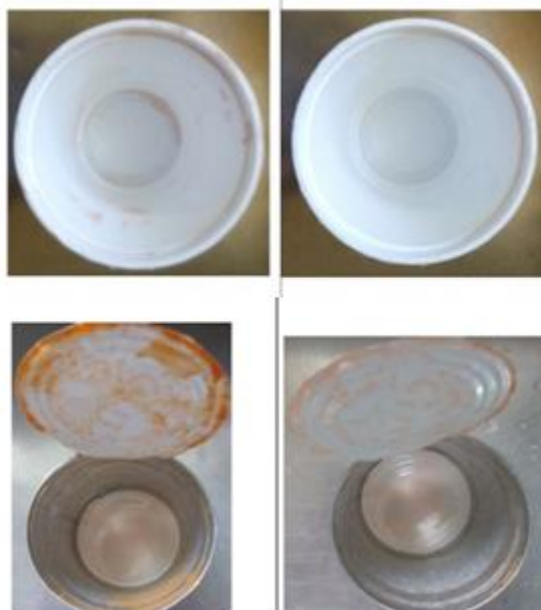
Contamination	Definition
Landfill bin contamination	<ul style="list-style-type: none"> Anything that should have been composted or recycled
Recycling bin contamination	<ul style="list-style-type: none"> Anything that should have been composted or landfilled Dirty recycling - all recyclables must be clean otherwise they cannot be recycled
Compost bin contamination	<ul style="list-style-type: none"> Anything that should have been recycled or landfilled Anything that isn't accepted by your compost contractor e.g. raw meat or dairy Any compostable packaging that isn't accepted by compost contractor

To assist you throughout your audit, it may be helpful to have available your bin signage, or guides from your waste contractors, to work out what goes in what bin. (See appendix 1 for general guidance on what is accepted or not).

How clean is clean?

Items need to be rinsed roughly. They do not need to be “squeaky” clean. All the items shown below (yoghurt pot and tin can) are at an acceptable level of cleanliness.

Figure 1: Example of dirty vs clean yoghurt pot and tin can



Identifying opportunities for reducing waste

In addition to identifying items that contaminate recycling and compost, it is also useful to note other items in the bins to consider ways in which both waste and recycling can be reduced. For example, if there are a lot of single use coffee cups or takeaway containers, you could factor this into future initiatives to reduce waste: some organisations have coffee cup or lunchbox libraries where staff can borrow a reusable coffee cup or reusable lunchbox or provide reusable plastic chopsticks if staff frequently order sushi.

For more ideas on how to reduce your waste check out:

- To reduce the amount of plastic: <https://www.plasticfreejuly.org/get-involved/what-you-can-do/your-workplace-kitchen/>.
- To reduce food waste: <https://lovefoodhatewaste.co.nz/>.
- To reduce workplace waste <https://methodrecycling.com/nz/journal/reducing-waste-in-the-workplace>.

It is important to note any waste placed in incorrect bins during your audit, such as paper towels in the recycling bin. Taking photos of these can be useful when sharing your waste audit findings to staff and providing advice on what they can do differently.

Waste audit process

Table 4: The seven-step waste audit process

Step	Description
1: Prepare	<ul style="list-style-type: none">• Organise the collection of the waste streams you'll be auditing, labelling the waste clearly• Prepare auditing area with all necessary equipment• Brief your other participants so everyone uses the same method
2: Total weight	<ul style="list-style-type: none">• Weigh the total weight of a bag/bin of waste first and record it

Step	Description
	<ul style="list-style-type: none"> It may be easiest to have a bucket on the scales, and then zero them, to make sure all of the waste is weighed accurately
3: Sorting waste	<ul style="list-style-type: none"> Once you've recorded the total weight of a bag/bin, empty its contents onto the sorting table Sort all the waste into groups e.g. compostables, recyclables and landfill
4: Weigh sorted groups	<ul style="list-style-type: none"> Weigh each of the sorted groups from one bag/bin separately and record their weight This will tell you how much contamination is in each bin
5: Data analysis	<ul style="list-style-type: none"> Enter your data into Excel, calculate your percentages and generate graphs to display your findings
6: Communicating results	<ul style="list-style-type: none"> Make sure you communicate the results of your waste audit back to your organisation. This way, when you conduct your next waste audit, your audience will have a point of reference and can see if their efforts have made a difference
7: Emissions inventory	<ul style="list-style-type: none"> The data collected from your waste audits can be used in calculating your organisation's overall emissions profile, and makes up an important component of your emissions inventory.

Analysing your data

Input your data into Excel soon after your audit, while the figures and experience are still fresh in your mind.

Below is an example of MfE's own audit template that you are welcome to copy (it is also available as an Excel file). It has built-in equations and graphs which automatically generate your results.

[Name of organisation]											
Waste audit data (in kg)											
Waste for what period of time:		1 day						Date of audit:		[e.g. 10/04/20]	
Floor:	Recycling bin			Rubbish bin					Compost bin		
	Total weight of bin	Non-recyclables	% of Contamination	Total weight of bin	Recyclable	Compostable	Total in wrong bin	% in wrong bin	Total weight of bin	Non-compostable	% of Contamination
Level 1			#DIV/0!					#DIV/0!			#DIV/0!
Level 2			#DIV/0!					#DIV/0!			#DIV/0!
Level 3			#DIV/0!					#DIV/0!			#DIV/0!
Level 4			#DIV/0!					#DIV/0!			#DIV/0!
Level 5			#DIV/0!					#DIV/0!			#DIV/0!
Level 6			#DIV/0!					#DIV/0!			#DIV/0!
Level 7			#DIV/0!					#DIV/0!			#DIV/0!
TOTAL	0	0	#DIV/0!	0	0	0	0	#DIV/0!	0	0	#DIV/0!

Note: agencies can choose to report a monthly or annual total with their auditor.

Useful resources to help you get started

Advice for DIY audits:

- A Guide to Implementing Recycling Systems in Multi-Tenanted Office Buildings (MfE) - [A guide to implementing recycling systems in multi-tenanted office buildings | Ministry for the Environment](#)
- Method Recycling DIY waste audit form – [DIY Waste Audit - Know Your Office Waste Habits | Method \(methodrecycling.com\)](#)
- Reducing Office Waste [Reducing Office Waste - Sustainable Business Network](#)

External consultants for waste audits

External waste auditors can be a good place to start, until you build up the capacity to conduct audits internally. Many include an educational aspect that can be helpful for generating behaviour change in your office.

What next?

After completing both a carbon emissions waste audit, and a detailed waste audit, this data can then be used to set reduction goals and create waste reduction initiatives.

This document should work as your rotating guide every year to be able to repeat this process and refine your method.

Appendix 1 – guidance on items generally accepted or not accepted in New Zealand recycling collections

All council managed household kerbside collections now accepting the same materials – see [Recycle right at kerbside | Ministry for the Environment](#).

Commercial services generally accept these same materials but may accept some different items. The availability of additional recycling options will depend on individual waste contractors and the facilities available in your area.

Alternative recycling options can also be found at - [How to recycle items not accepted at kerbside | Ministry for the Environment](#).

