



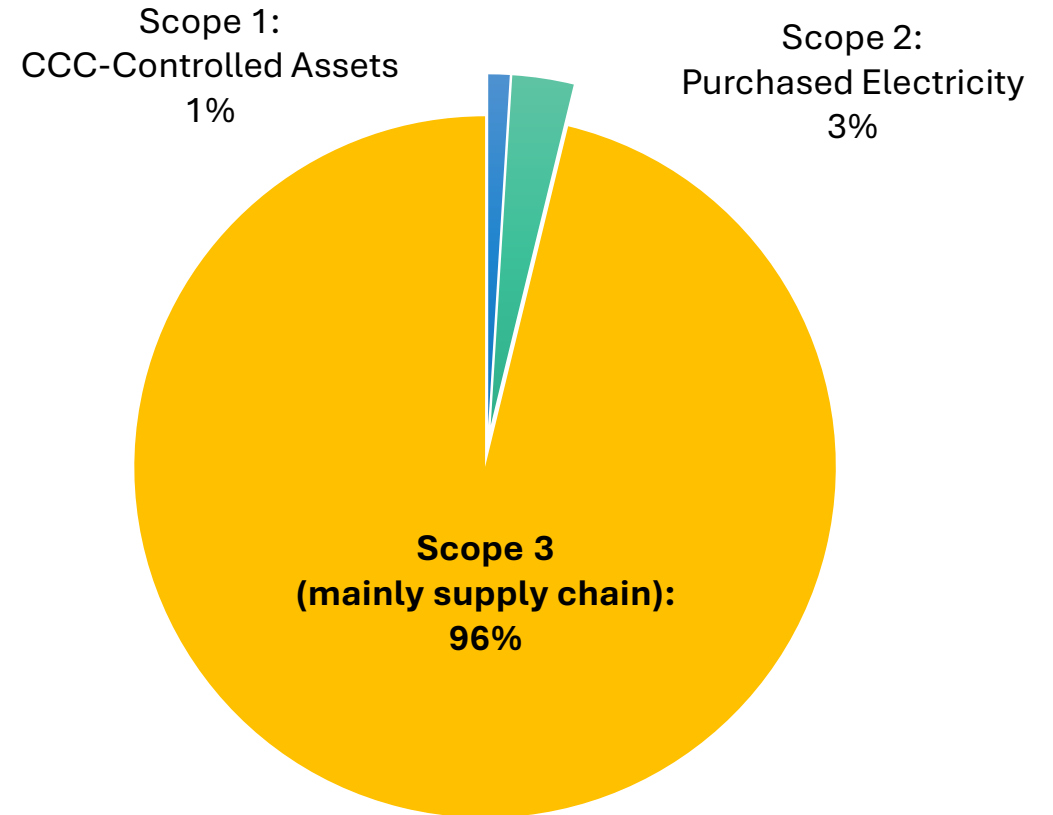
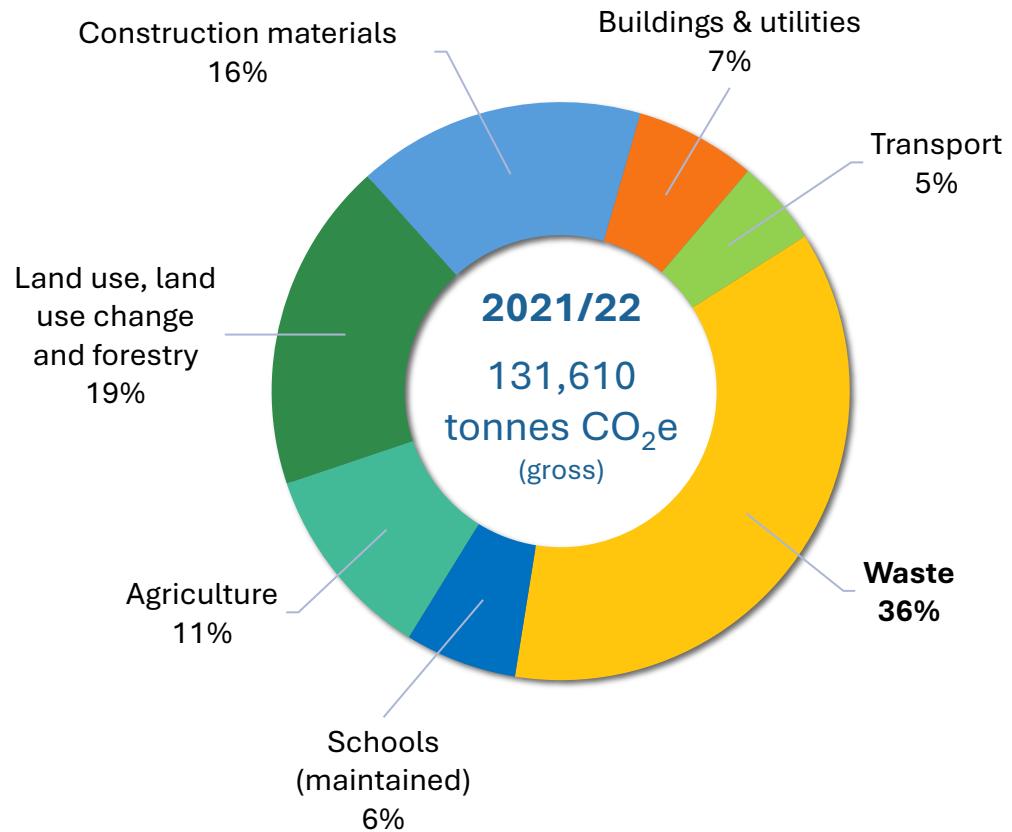
Net Zero Innovation
Programme

Waste Carbon Calculator

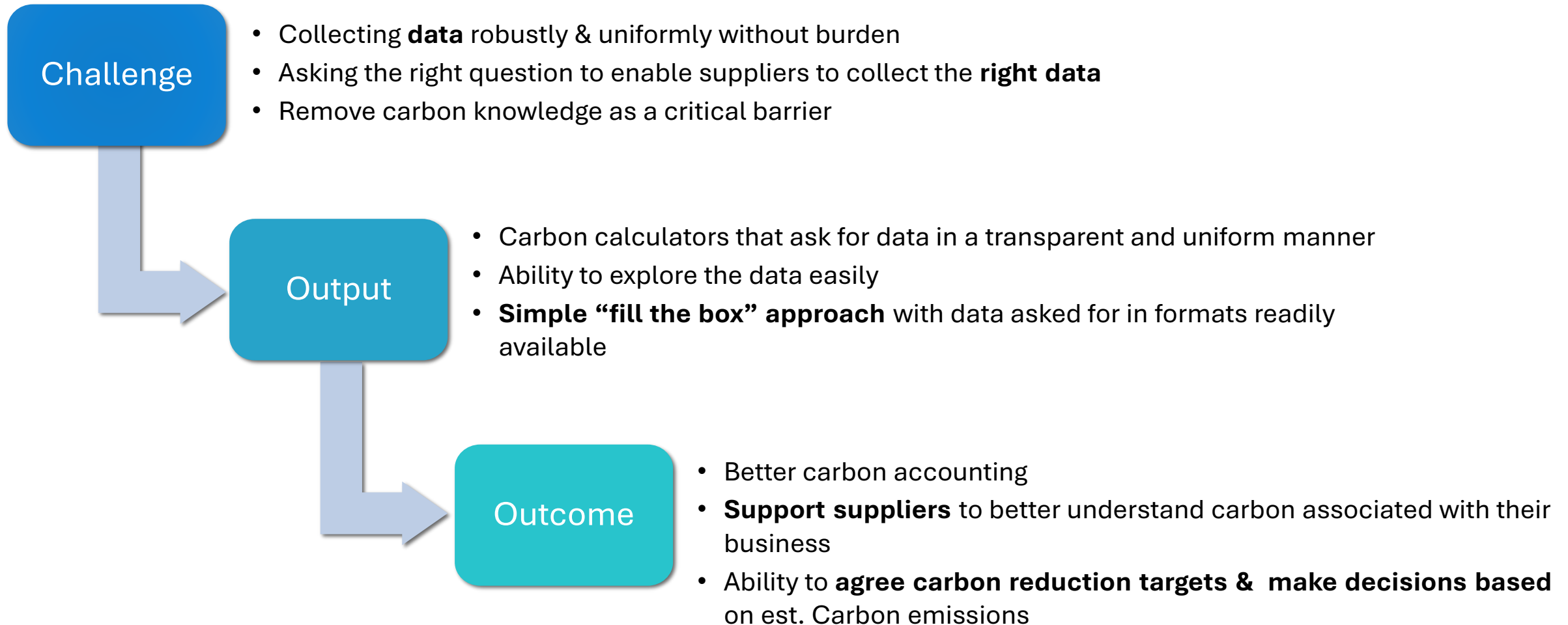
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How to reduce our carbon footprint?

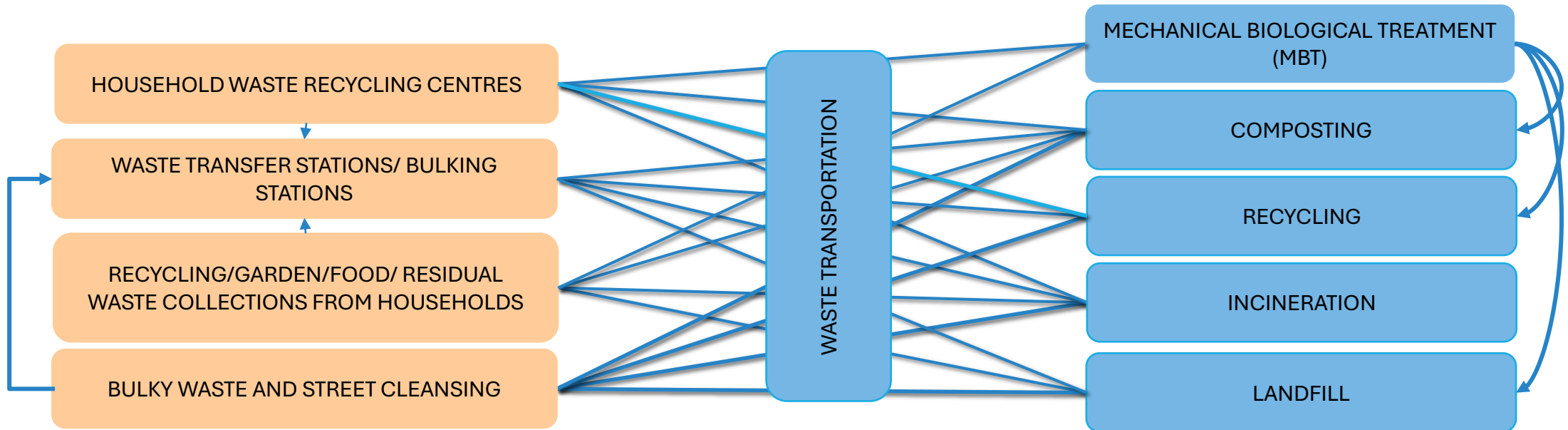


The Challenge: “50% reduction in scope 3 by 2030”



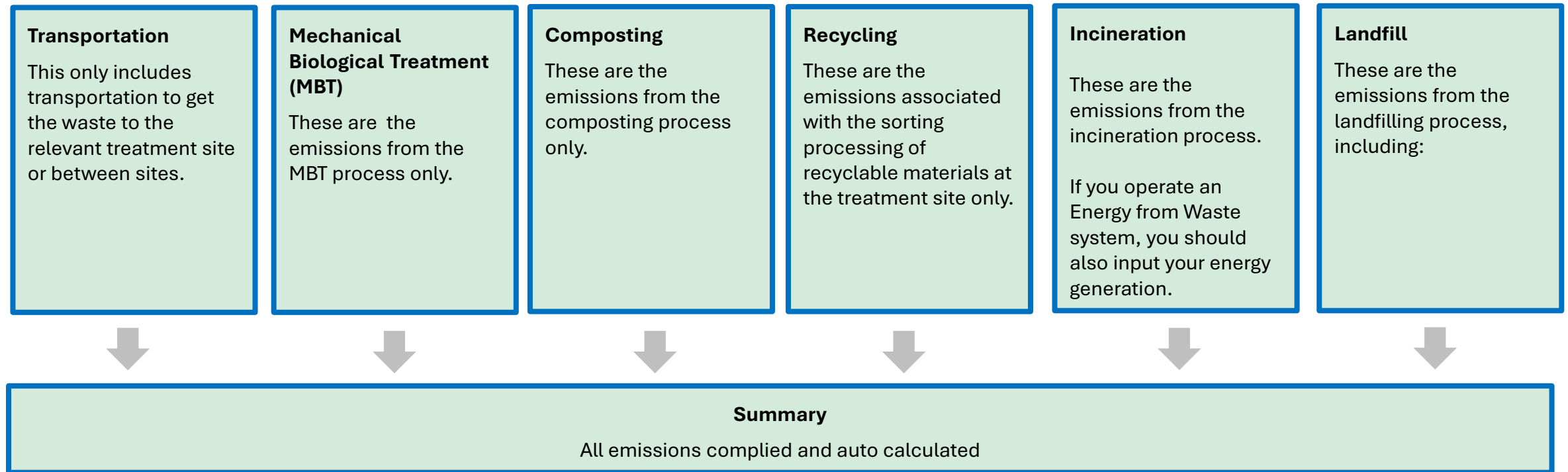
The Waste GHG calculator

- Co-designed with the council and its suppliers
- Modular structure
 - Includes a selection of waste treatment processes
 - Each module corresponds to a specific waste treatment
 - Easy to add new modules



The Waste GHG Calculator

- Structure of the tool
 - Guidance
 - Summary page
 - Calculation sheets
 - Background data sheets (blue labels)



Taking a closer look

e.g. Transportation

Description of the module

- Text
- Highlighted module on the system boundary diagram

Data input section

- User to fill in orange shaded cells
- Flexible depending on availability of data

Calculation method

- Specified within the tool for maximum transparency
- Follows IPCC Waste treatment and GHG Protocol guidelines

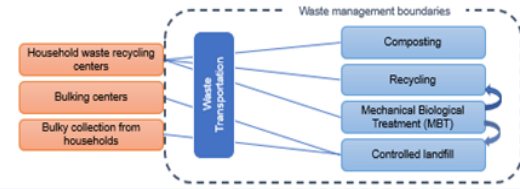
Data sources

- Primarily supplier data
- Emission factors from BEIS/other trustable and regularly updated datasets
- Proxies/averages based on national averages

Estimation of GHG emissions from Transportation

This section calculates the GHG emissions from transporting waste from the household recycling centres and bulking centers to the waste management site. It also includes the bulky waste collection from households undertaken by the County Council, and other transport activities required for waste disposal. GHG emissions in this phase include GHG emissions from the use of transport fuels. Biogenic emissions are out of scope 3 reporting, but for completeness they are quantified here and reported separately as 'outside of scopes'.

The collection of residential waste and its transport from homes to the waste treatment facilities is outside the boundaries of this assessment, because this is the responsibility of the city and district councils.



INPUT DATA Please fill in the shaded cells below

There are two types of ways of estimating transport emissions, please fill in only the one which fits the best your data

1. If you have fuel consumption data, please fill in cells below with the fuel consumption attributable to council share of the waste transport activities

Fuel consumption for waste transportation and handling, e.g. in machinery for loading/unloading the waste trucks (mobile plants/cranes), AND between the waste treatment processes	Electric (kWh/yr)	Hydrogen (m3/yr)	Petrol* (l/yr)	Diesel** (l/yr)	Red diesel*** (l/yr)	LPG (l/yr)	Biodiesel or HVO (l/yr)

* this is standard petrol bought from any local filling station (typically contains biofuel content)
** this is standard diesel bought from any local filling station (typically contains biofuel content)
*** medium oil used in diesel engines and heating systems

Total GHG emissions from waste transport (method 1), not including biogenic fuel emissions - tonnes CO₂e/year
'outside of scopes' GHG emissions from waste transport (method 1) - tonnes CO₂e/year

OR

2. If you don't have fuel consumption data for transportation of waste, the calculation below will estimate emissions from type of vehicle and distance the waste is transported in

Type of waste transport vehicle	Electric	Hydrogen	Van, petrol*	Van, diesel**	Articulated, diesel	Rigid, diesel	Biodiesel or HVO
Distance unit - please choose from drop down							
Distance the waste is transported over one year (please add up round trips; leave 0 if not used)							

Passenger vehicles used for waste operations	Diesel	Petrol	Hybrid	CNG	LPG	Plug-in Hybrid Electric Vehicle	Battery Electric Vehicle
Distance unit - please choose from drop down							
Distance over one year (please add up round trips; leave 0 if not used)							

Fuel consumption for waste handling, e.g. in machinery for loading/unloading the waste trucks (mobile plants/cranes), AND between the waste treatments	Electric (kWh/yr)	Hydrogen (m3/yr)	Petrol (l/yr)	Diesel* (l/yr)	Red diesel** (l/yr)	LPG (l/yr)	Biodiesel or HVO (l/yr)

* this is standard petrol bought from any local filling station (typically contains biofuel content)
** this is standard diesel bought from any local filling station (typically contains biofuel content)
*** medium oil used in diesel engines and heating systems

Total GHG emissions from waste transport (method 2), not including biogenic fuel emissions - tonnes CO₂e/year
'outside of scopes' GHG emissions from waste transport (method 2) - tonnes CO₂e/year

RESULTS

Total GHG emissions from waste transport, in scope	- tonnes CO ₂ e/year
'Outside of scopes' GHG emissions from waste transport	- tonnes CO ₂ e/year

METHODS

$$GHG_{TBA} = m_f \times EF_f$$

Where
 m_f is the amount of fuel utilised over one year for waste transport
 EF_f is the emission factor of the fuel utilised

OR

$$GHG_{TBA} = \sum (dist_i \times CF_{TBA,i})$$

Where
 $dist_i$ is the distance to final treatment (composting, recycling or landfill)
 $CF_{TBA,i}$ is the conversion factor for the truck, based on the size and type of truck. We use average CFs reported by the BEIS, as for annual estimations we do not know, on average, how full each HGV travels between the sorting unit and the final disposal or treatment of waste.

DATA AND METHODS ASSUMPTIONS

Calculation of fuel emission factors

Fuel	unit	Electricity (kWh)	Hydrogen (m3)	Petrol (l)	Diesel (l)	diesel (l)	LPG (l)	(l) outside of scope

Distance units

kilometres
miles

Vehicle emission factors

find emission factors per mile/km for electric and H2

	Electric	Hydrogen	Van, petrol	Van, diesel
	kg CO ₂ e	kg CO ₂ e	kg CO ₂ e	kg CO ₂ e

Calculator results

2 types of results

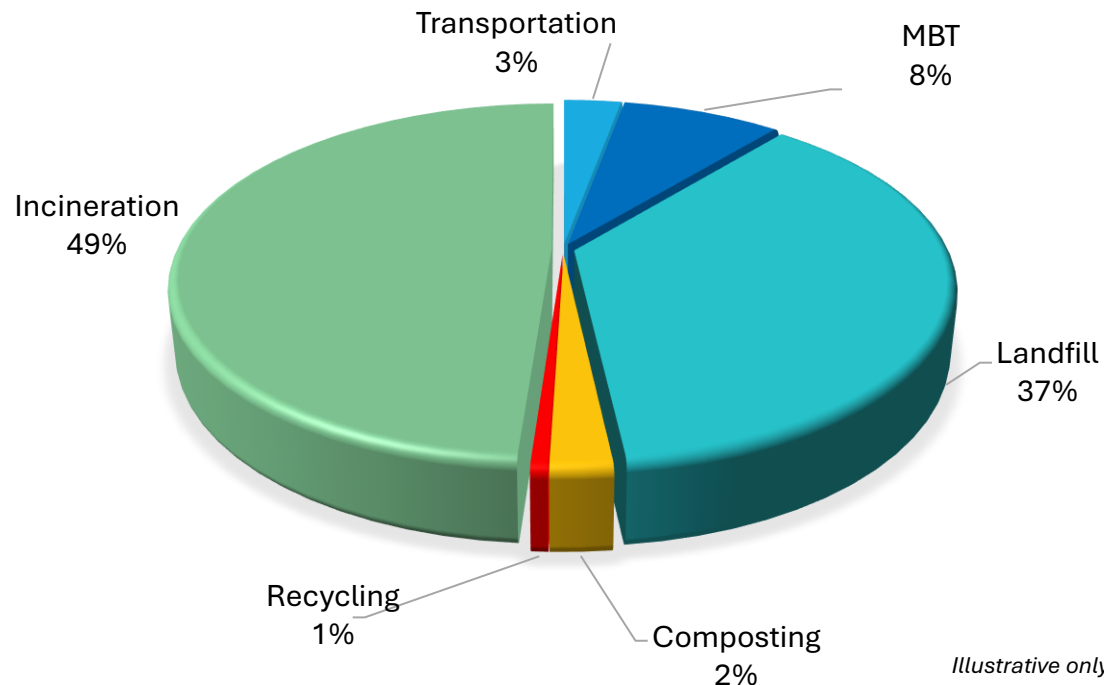
- GHG emission from each waste treatment

RESULTS	
Total GHG emissions from recycling per year	- kg of CO ₂ e/year
'Outside of scopes' GHG emissions	- kg of CO ₂ e/year

- “Outside of scopes” GHG emissions are carbon dioxide (CO₂) emissions from burning biomass and biofuels. As per current accounting rules their impact is considered net zero, but they need to be documented.

Overall results

- Total per year – scope 3 emission reporting
- Contribution analysis – guide measures for emission reduction



Illustrative only

What can you use it for?

Target Audience

Waste Disposal Authorities

Waste Collection Authorities

Officers responsible for carbon calculations

Officers making key decisions on waste management

Contract managers

How to apply it?

To baseline emissions from your service

To calculate annual emissions

To highlight emissions hotspots

Contract management: Set carbon reduction KPIs

Guide interventions to reduce carbon

Model future emissions / explore different disposal or collection options