

## Climate Toolkit for Business

### Carbon Calculator

- Users will enter their metrics in the appropriate input boxes in the calculator.
- Based on their data inputs, and using the conversion factors figures, the user's total carbon footprint will then be calculated.
- The figures for each emissions category will be calculated as follows:
  - o Metric x Conversion Factor = CO<sub>2</sub>.
  - o Energy Emissions + Travel Emissions + Materials Emissions + Water Emissions = Total Carbon Footprint.

#### Climate Toolkit for Business - Business Carbon Footprint Emissions Calculations

<u>Category</u>	<u>Scope</u>	<u>Metric</u>	<u>Conversion Factors</u>	<u>Calculation</u>
Energy	Natural Gas	€ or kWh Per Annum	€0.041525 per kWh 204gCO <sub>2</sub> /kWh (NCV)	xxxx tCO <sub>2</sub>
	Heating Oil	€ or litres Per Annum	€1 = 0.003022 tCO <sub>2</sub> eq 2,816.42 gCO <sub>2</sub> / litre	xxxx tCO <sub>2</sub>
	LPG	€ or litres Per Annum	0.7295€/litre €1 = 0.00162 tCO <sub>2</sub> eq	xxxx tCO <sub>2</sub>
	Electricity	€ or kWh Per Annum	€0.15 per kWh 254.8 gCO <sub>2</sub> /kWh (NCV)	xxxx tCO <sub>2</sub>
	Heavy Fuel Oil	€ or Litres Per Annum	0.83€/litre 273.6 gCO <sub>2</sub> /kWh (NCV) 11.45 kWh/litre (NCV)	xxxx tCO <sub>2</sub>

	Coal	€ or Tonnes Per Annum	€0.0164 per kWh	xxxx tCO <sub>2</sub>	
			7,759 kWh/tonne (NCV) 340.6 gCO <sub>2</sub> /kWh (NCV)		
Travel	Petrol	€ or Business Kilometres	€0.1852 Price Per kWh 251.9 gCO <sub>2</sub> /kWh (NCV) 1km = 200 gCO <sub>2</sub> eq	xxxx tCO <sub>2</sub>	
	Diesel	€ or Business Kilometres	€0.1499 Price Per kWh 263.9gCO <sub>2</sub> /kWh (NCV) 1km = 200 gCO <sub>2</sub> eq	xxxx tCO <sub>2</sub>	
	Business Flights	EU/UK (short-haul) and/or Non-EU <u>return</u> Flights (Long-haul)	<u>Destination:</u>	<u>CO<sub>2</sub>eq (kg) per person per return flight:</u>	xxxx tCO <sub>2</sub>
			Short-haul	181.50	
Long-haul			1,392.80		
Materials	Material Intensity	% of Expenditure	Sliding Scale – % of Expenditure: “What % of your businesses expenditure is attributed to goods or raw materials? (not wages services or utilities).”	this metric is to inform recommended actions but does not contribute to carbon footprint estimate.	
	Bin weights	Black bin	0.00098 tCO <sub>2</sub> per kg	xxxx tCO <sub>2</sub>	
		Green bin	0		
		Brown bin	0.00014 tCO <sub>2</sub> per kg		
Water	Water Usage	Volume m <sup>3</sup> Per Annum	0.1811 kgCO <sub>2</sub> /m <sup>3</sup>	xxxx tCO <sub>2</sub>	

- Natural Gas + Heating Oil + LPG + Electricity + Heavy Fuel Oil + Coal = Total Energy Emissions.
- Petrol + Diesel + flights = Total Travel Emissions.  black bin + brown bin = Total Materials Emissions  Water Usage = Total Water Emissions.
- Energy + Travel + Resource Use + Water = Total tCO<sub>2</sub> Emissions.

## Notes:

### Energy – Heating Oil

- Utilising a cost (€ amount) for heating fuels such as Natural Gas, LPG and Kerosene, or Electricity, requires some assumptions to be made to calculate the emissions footprint. The assumption is that the cost paid is close to the average cost paid by all consumers and could introduce an error depending on the actual cost paid by the business.

### Delivered Energy Cost (Cent Per kWh)

- Natural Gas – averaged across the bands.
- Heating Oil – averaged across the densities, excluding “heavy”.
- Electricity – averaged across the bands excluding the night rate.
- Coal – Based on average price per unit of €127.88 and calorific value of 7759.2 per unit.

### Note on use of “green electricity”

- Green electricity purchasing means you are buying the green portion of overall electricity, but this does not change the overall average emissions from the use of grid electricity and therefore the emissions from your electricity use

### Petrol & Diesel

- Using the Avg Biofuel Blend Rates.
- Monthly prices for petrol and diesel taken from the CSO Databank – National Average Price as of the beginning of 2021.
- Due to the potential range of vehicle emissions per km as shown in the table below, we are using a simplified estimate of 1km = 0.0002 tCO<sub>2</sub> eq for diesel passenger or small commercial vehicle.
- We note that utilising a cost (€ amount) for transport fuels requires some assumptions to be made to calculate the emissions footprint. The assumption is that the vehicle efficiency is close to a small van on average and depending on the vehicles your business uses this could introduce a significant error.

	km	Efficiency (l/100km)	kgCO <sub>2</sub> e	tCO <sub>2</sub> e
Petrol New Car	1.0	4	0.0967	0.00010

Petrol Old Car	1.0	7	0.1693	0.00017
Diesel New Car	1.0	4.5	0.1294	0.00013
Diesel Old Car	1.0	6.5	0.1870	0.00019
Diesel Small Van	1.0	7.5	0.2157	0.00022
Diesel Large Van	1.0	9	0.2589	0.00026
Diesel Small Truck	1.0	15	0.4315	0.00043
Diesel Large Truck	1.0	20	0.5753	0.00058
Diesel Tractor	1.0	35	1.0068	0.00101
Diesel Construction Vehicle	1.0	35	1.0068	0.00101

#### Business Flights

Destination	CO <sub>2</sub> eq (kg) per passenger (mean) per flight (80% occupancy)	
	low	high
Domestic	76.8	63.1
UK	71.0	61.4
EU27	142.1	120.1
Other International	696.4	515.8

The "low" and the "high" represent the range of configurations that each aircraft type can handle.

"High" represents roughly the maximum number of seats (i.e. the plane is all economy class). The

"High" may more closely reflect the reality on shorter flights and on all economy carriers whereas the "low" is more likely to be representative of traditional long-haul flights with business class, first class.

We assume no domestic flights.

For EU / UK flights, we assume "high" and average 61.4 and 120.1 = 90.75 kg CO<sub>2</sub> eq per person per flight

For non-EU flights, we assume "low" = 696.4 kg CO<sub>2</sub> eq per person per flight

## Water Usage

- The operational carbon impact per litre is 0.1517 kgCO<sub>2</sub>/m<sup>3</sup>, as per Uisce Éireann.

## Resource Use

Waste Destination	Tonnes CO <sub>2</sub> eq per tonne of waste
Landfill	0.98
Composting & Anaerobic Digestion	0.14

- Figures provided here by the EPA have been divided by 1,000 in the calculator to give tCO<sub>2</sub> per kg waste
  - We assume
    - o landfill = black bin and
    - o composting & AD = brown bin and do not use green bin weights to contribute towards the carbon footprint estimate.

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