

Overall Carbon footprint

To calculate your total carbon footprint, fill in the table below with the figures for tonnes of CO₂ from the previous six pages.

Item	Carbon footprint
	tonne CO ₂ / annum
Home energy	
Flights	
Car travel	
Public transport	
Food purchases	
Other expenditures	
Total	

The average carbon footprint of a UK resident is **11 tonne per annum**
The average footprint of a citizen of the world is **5 tonne per annum**
We need to become zero carbon by 2045.

Remember, the CO₂ emission factors used in this booklet will reduce as government and industry decarbonise. Your efforts to produce less CO₂ and theirs will hopefully keep global warming to below 2°C above pre-industrial levels.

References

1. Calorific values of fuels and CO₂ emissions from DECC DUKES website and <https://www.forestcarbon.co.uk> website
2. CO₂ emissions per £ expenditure for “Food and drink” and “Other emissions” sections taken from DECC carbon calculator. “Other emissions” average DECC emissions for the various items listed under this heading.
3. Photos (4) from <https://creativecommons.org/licenses/by.sa/3.0/>
4. <http://energyskeptic.com/2015/how-much-energy-does-it-take-to-make-a-car-by-david-fridley-lbl/>

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Carbon footprint calculator

The carbon dioxide in our atmosphere is increasing every year, primarily due to man burning fossil hydrocarbon fuels like oil, gas and coal. You can help to reduce these emissions by taking up the One Tonne Challenge.

A challenge to reduce your carbon dioxide emissions by one tonne



Use the calculator in the following pages to see what your present carbon footprint is and what it could be if you changed your lifestyle.

This calculator is based on the government's DECC Carbon footprint calculator but has been simplified.

Your name: -

Annual footprint, from to

For a greater understanding of Climate Change and ways to reduce your carbon footprint, go to the following websites: -

- <https://sustainability-in-practice.org.uk> (Bob Pringle)
- <https://sustainableaberdeen.com/>
- <https://www.aberdeenclimateaction.org/>

Home energy used per annum



To calculate the annual energy use in the home, fill in the cells in column A with fuel used. Multiply cells A, B, and C together and divide by 1,000, to get footprint of all fuels used.

Fuel	Unit	Cons. /annum	Energy / unit	CO ₂ /kWh	Carbon footprint
	kWh		kWh /unit	kg	tonne CO ₂
		A	B	C	$\frac{A \times B \times C}{1,000}$
Electricity	kWh		1.00	0.422	
Nat Gas ⁽¹⁾	kWh		1.00	0.194	
LPG	litre		7.00	0.234	
Heating oil	litre		10.63	0.265	
Coal	kg		7.94	0.291	
Ovoids ⁽²⁾	kg		7.86	0.392	
Logs ⁽³⁾	kg		3.69	0.025	
Wood pellets	kg		4.25	0.016	
Wood chips ⁽⁴⁾	kg		3.50	0.005	
Total home energy CO₂ footprint per annum					D
Number in home (Adult =1, Child 0-6=0.2, 7-12 =0.4, 13-18 = 0.7)					E
Home energy carbon footprint per adult					=D/E

⁽¹⁾ Multiply cubic metres (m³) by 11.25 to get kWh.

⁽²⁾ Smokeless coal. ⁽³⁾ 20% moisture content (m.c.), ⁽⁴⁾ 30% m.c.

Other expenditures

In calculating the carbon footprint in pages 1-4, the figures provided are based on the carbon dioxide given off by the various fuels used. In pages 5 and 6, in contrast, the footprints are calculated from household expenditures on all items except those on pages 1-4. All purchased items have a carbon footprint, from buying clothes to going out to a restaurant. Only donations to charities and gifts to others can be omitted.

Annual food and drink expenditure should be put into page 5. Annual expenditures on medicines, clothes, books, computers, TVs, furniture, home improvements, car repairs, hotels and restaurants, broadband bills, mortgages and loans, insurance, education, recreation and films and theatre should be put into the table on page 6. However, car purchases, car and house fuel and electricity payments, cost of flights, payments of travel on public transport should be omitted, as their carbon footprints have been accounted for on pages 1-4.

To get these costs, calculate annual outgoings from your bank account. These costs should be divided by the number in your family, as for home energy. The footprint is calculated by multiplying A x B /1000 below.

Expenditure Per annum	Carbon footprint	Total footprint
£	Kg CO ₂ / £	Tonne CO ₂
A	B	= A x B/1000
	0.442	
No of people in the family		
Other expenditures carbon footprint per adult		

Food and drink

In calculating the carbon footprint for food and drink, the proportion of meat and animal products you eat has a major impact. For every pound Sterling you spend, the carbon footprint goes from 1.35 kg / £ spent for a heavy meat eater to 0.54 for a vegan. Select which category you are in and calculate your food and drink carbon footprint by multiplying A x B.



Type of meat eater	Food spend	Carbon footprint	Food carbon footprint	People	Personal footprint
	£	kg CO ₂ /£1	tonne/an	No	tonne/an per person
	A	B	= AxB/1000		
Heavy		1.35			
Medium		1.06			
Low		0.88			
Pescatarian ⁽¹⁾		0.73			
Vegetarian		0.72			
Vegan		0.54			

⁽¹⁾ Fish eater

Flights per annum

To calculate the carbon footprint for flights, use a search engine (e.g. Google) to find <https://www.carbonfootprint.com/calculator.aspx>

Register on the computer programme (app) giving your email address and a password.

Click on “personal calculator” and select tab entitled “flights”.

Click on the start and destination airports (Use IATA airport codes or name of city).



Choose single, return, economy or business. Record the carbon footprint in the table below.

Flight	Start	End	Return	Carbon footprint	
			Y/N	tonne CO ₂ eq.	
No 1					C
No 2					D
No 3					E
Total flights carbon footprint					=C+D+E

NB. Carbon dioxide emissions at flying height have a warming impact that are greater than that of emissions at ground level due to the ice formed by contrails, so the carbon footprint is stated as CO₂ equivalent.

Car travel

The carbon footprint of car travel comprises both the CO₂ emitted in the manufacture of the car (embedded) and the CO₂ emitted in running the vehicle.



Car details

Go to the DVLA website <https://vehicleenquiry.service.gov.uk/> and put in your registration number. It gives you the vehicle weight and, for petrol/diesel cars, the CO₂ output per km.

If you use a shared car and/or do not know the registration number, go to <https://www.honestjohn.co.uk/carbycar/> to get its weight and CO₂/km.

Embedded CO₂ in manufacture of the vehicle

To calculate the CO₂ emitted (embedded) making the car, use the equation:

Embedded CO₂/an. = (Car weight (t) x 6.96) / Life in years (Usually 13.5).

Put this value in the table opposite (A) for up to three cars or motorbikes.

For shared (e.g. Co-wheels) cars, multiply the annual embedded CO₂ for the car you normally use by (number of days used per year)/365.

CO₂ per annum in running the vehicle

Fill in the DVLA emissions under B for each vehicle, km driven (C), and calculate D to find tonne CO₂ emitted in burning fuel. (Dividing by 10⁶, a million, converts grams to tonnes).

For electric cars, assume the CO₂ emissions are 84.4 g CO₂/km, if not stated.

Total CO₂ / annum in manufacture and running vehicle

Add the annual embedded CO₂ (A) to the fuel emissions (D) to get the total vehicle emissions.

Make	Embed. CO ₂ /an	DVLA emissions	Annual km	Fuel emissions	Vehicle Total
	tonne/an	gm CO ₂ /km	km/an	tonne	tonne
	A	B	C	D=BxC/10 ⁶	=A+D
Total footprint for all vehicles					
Average number of occupants					
Net vehicle carbon footprint per person					

Public transport

To calculate the carbon footprint of travel on public transport, estimate your travel distance (km) on the seven modes of transport listed below. Then multiply the cells A and B and divide them by 1,000 to get the footprint in tonne of CO₂.



Travel mode	Distance	Carbon footprint	Carbon footprint
	km/an	kg CO ₂ /km	Tonne CO ₂
	A	B	=AxB/1000
Bus		0.10	
Coach		0.03	
National rail		0.04	
International rail		0.01	
Tram		0.04	
Tube/subway		0.03	
Taxi		0.15	
Total public transport emissions			