living witness
Quakers for Sustainability

QUAKERS

Climate impact calculator for individuals

This calculator helps you to estimate the climate impact of your own life. It is divided into seven categories: transport; energy; food; waste; house building; other goods and services; and public services.

You don't need access to precise information to fill it in. It may not quite fit your lifestyle so be creative and make guesses – but do be honest with yourself! Unless you are brilliant at mental maths, a calculator will be very helpful. An online version of this calculator is available at www.quaker.org.uk/climate-impact-calculators. Some sections start with calculations in kg per household, but all end up with kg per person (that means you!).

You don't need to do it all at once – perhaps tackle one section at a time.

Calculations are made in kg of CO_2-equivalent gases per year: this is the standard unit for greenhouse gas emissions. Some activities emit greenhouse gases (e.g. methane, nitrous oxide) that have a much higher climate impact per kg than CO_2, and this is taken into account in the calculations. As far as possible the calculations account for the total impact of activities in each category. For example, the calculations for food take into account emissions in transport and retail, as well as agriculture and processing. For more details see the 'Calculating Emissions' guide at www.livingwitness.org.uk

1. Transport

This accounts for emissions during vehicle construction and road building, as well as during use.

a) If you use a car

kg per car

If you use a diesel car:

Multiply number of miles you travel per year ☐ by 0.50 = ☐

What size is it?	4x4	people carrier	typical family car	super-efficient/ mini	
Multiply by	1.4	1.1	0.9	0.5	= ☐

If you use a petrol car:

Multiply number of miles you travel per year ☐ by 0.52 = ☐

(or by 0.65 if most of your trips are under 3 miles)

What size is it?	4x4	people carrier	typical family car	super-efficient/ mini	
Multiply by	1.4	1.1	0.95	0.65	= ☐

Divide by the average number of people travelling in the car to get your personal kg CO_2 per year from car use. (If you use more than one car, then calculate and add your share of all.)

Personal car kg CO_2 per year = ☐

Cars note:

If you have a record of the fuel used in a year, you can make a more accurate estimate of kg CO_2 per car:

For petrol, multiply the number of litres per year by 3.28

For diesel, multiply the number of litres per year by 3.81

b) If you use public transport

Write down the number of miles you travel per year by each type of transport and then calculate the kg CO_2 used.

Eurostar		miles	*Multiply by*	0.03	=	kg
coach		miles		0.07	=	kg
train/underground		miles		0.14	=	kg
bus		miles		0.31	=	kg

Add up to get your personal kg CO_2 per year from public transport use.

Personal public transport kg CO_2 per year =

c) If you travel by air

Write down the number of hours you fly and then calculate the kg CO_2 used.

Hours you fly per year *Multiply by* 230 = kg

Personal air transport kg CO_2 per year =

Now add up your totals for car, public transport and flying to get your personal kg CO_2 per year from travel.

Personal transport kg CO_2 per year =

2. Energy in your home

Emissions come from the fuels used directly in your home, and those that generate the electricity you use. Generating renewable electricity at your home replaces some grid electricity and cuts your emissions.

a) Heating

What size home do you have?

kg per household

	4/5 bed detached	3-bed semi	terrace	flat	single room	
Starting CO_2	4,800	3,200	2,200	1,600	800	=

How warm is your home?

	21°C	20°C	19°C	18°C	17°C	16°C	15°C	
Multiply by	1.4	1.3	1.2	1.1	1.0	0.9	0.8	=

How well is your house insulated?

	Not well	Loft, cavity walls, double glazing	Extremely well	
Multiply by	1.0	0.7	0.4	=

What do you mainly use for heating?

	Coal Open fire	Electricity	Coal boiler	Oil boiler	Gas, heat pump wood open fire	Wood stove	
Multiply by	10	2.5	1.8	1.4	1.0	0.13	=

How efficient is your heating?

	Over 20 years old	Brand new condensing boiler	
Multiply by	1.15	0.8	=

Divide by the average number of people living in your home to get your personal kg CO_2 per year from heating.

Personal heating kg CO_2 per year =

b) Hot water

How do you usually wash?

kg per person

	Daily bath/ long shower	Quick shower most days	Flannel wash	
Starting CO_2	300	150	20	=

If you have a solar water heater

Multiply by 0.67 =

What fuel do you mainly use for heating water?

	Electricity	Coal boiler	Oil boiler	Gas, heat pump	Wood boiler	
Multiply by	2.5	1.8	1.4	1.0	0.13	=

If you have a hot water cylinder (not a combi boiler)

Add 100kg divided by the total number of people in the house

Personal hot water kg CO_2 per year =

c) Appliances

kg per household

Starting point – average household emissions for electrical appliances and cooking = 1,600

How efficient are your appliances?

	Not very	All A or AA rated appliances and efficient lights	
Multiply by	1.0	0.75	=

How many appliances do you have and how carefully do you use them?

	Lots of appliances left on all the time	Careful, switch things off, no clothes dryer	Ultra frugal, no TV, freezer, oven etc.	
Multiply by	2.0	0.9	0.5	=

If you use a range cooker (like an oil-fired Aga)

Add 5,000 =

continued overleaf

Divide by the average number of people living in your home to get your personal kg CO_2 per year from appliances.

Personal appliances kg CO_2 per year =

d) Renewable electricity generation

If you generate renewable electricity from a photovoltaic array, to calculate the CO_2 saved by replacing grid electricity

Multiply the kWp of the array by 450 =

Divide by the average number of people living in your home to get your personal kg CO_2 saving from renewable generation.

Personal renewable generation kg CO_2 per year =

Now add up your totals for heating, hot water and appliances.

Subtract any saving from renewable electricity generation to get your personal kg CO_2 per year from home energy.

Personal home energy kg CO_2 per year =

Home energy note:

If you keep a record of the different types of fuel used in a year, you can make a more accurate estimate of kg CO_2 for your home.

See the Energy section of the Climate impact calculator for Quaker meetings.

3. Food

The major food-related emissions are methane and nitrous oxide, which come from animals, animal waste and agricultural soils. The other source is the energy used in agriculture, fertilizer manufacture, food transport, processing, storage, retail and catering. Organic agriculture increases the amount of carbon in soils, so an estimated CO_2 'credit' is used to account for this.

What sort of diet do you eat?

kg per person

	serious meat eater (50% animal)	typical UK (38% animal)	vegetarian (inc dairy)	vegan	
Starting CO_2	2,400	2,000	1,500	1,100	=

How much organic food do you eat?

	Nothing organic	nearly everything organic	
Multiply by	1.0	0.75	=

How much of your food is processed or imported?

	Nearly all	very little	
Add or subtract	+ 100kg	- 400kg	=

What % of your meals do you eat away from home?

	50%	25% (typical UK)	very few	
Add or subtract	+ 100kg	0kg	- 100kg	=

Personal food kg CO_2 per year =

4. Household waste

This section accounts for the greenhouse gas emissions associated with production of the materials that end up in your weekly household waste and building waste, and also the emissions associated with disposal of this waste.

How many bags of waste, including recycling, do you produce each week? (One bin is roughly two black rubbish bags.)

Number of bags =

kg per household

Multiply by 1,270 =

How much do you recycle or compost?

	compost all (kitchen and garden waste)	compost all *and* recycle paper, metal, glass	compost all *and* recycle paper, metal, glass *and* plastic, textiles, DIY waste	
Multiply by	0.95	0.7	0.6	=

How much building or DIY waste do you produce?

Add 1,000 kg for each skipload produced in a year =

Divide by the average number of people living in your home to get your personal kg CO_2 per year from waste.

Personal waste kg CO_2 per year =

5. Housebuilding

The energy and cement used to provide materials and construct or extend a building produce CO_2 emissions. There's no 'right' way to share these out over the lifetime of a building: we'll simply assume that the share decreases linearly over the first 50 years of the building's use, and is zero after that.

When was your home built?

kg for your home per year

(a) More than 50 years ago

If so, your building's CO_2 emissions = 0

But if you've had an extension/loft conversion in last 50 years, add the following for each:

10,000 x (51 minus age in years) and then divide by 1,275 =

(b) 50 or fewer years ago

If so, select the building CO_2 for your type of home.

	4/5 bed detached	3-bed semi	terrace	flat	single room	
Building CO_2	90,000	70,000	55,000	40,000	10,000	=

Multiply by (51 minus age in years) and then divide by 1,275 =

And if you've had an extension/loft conversion in last 50 years, add the following for each:

10,000 x (51 minus age in years) and then divide by 1,275 =

Divide (a) or (b) by the average number of people living in your home to get your personal kg CO_2 per year from building.

Personal building kg CO_2 per year =

6. Other goods and services

Greenhouse gases are emitted in the production and distribution of all the other goods (e.g. clothes, furniture, electrical appliances) and services (entertainment, sport, telephone) that you buy. It is very difficult to apportion these.

Estimate how much your household spends each year on goods and services such as those above.

UK average is about £5,000/year per person or £13,000/year per household. (Don't include travel, home energy, food, restaurants, DIY, mortgage, rent, tax, savings, pensions, investments or charitable giving.)

£ per household

Estimate of spending on goods and services =

kg per household

Multiply by 0.5 to get a very rough estimate of the emissions associated with this spending =

Divide by the average number of people in your household to get your personal kg CO_2 per year from other goods and services.

Personal other goods kg CO_2 per year =

7. Public services and non-profit organisations

Government and non-profit organisations – for example, schools, Quaker meetings, emergency services, prisons, the military etc. – provide public administration and services such as health and social care. All of these produce greenhouse gas emissions. We estimate that this amounts to 2,400kg CO_2 per person per year on average.

8. Adding it all up

Category	Your personal emissions for this category (kg CO_2 per year)
1. Travel	
2. Energy use in your home	
3. Food	
4. Materials and waste	
5. Building and extending your home	
6. Other goods and services	
7. Public services and non-profits	2,400
Your total kg CO_2 per year	
Divide by 1,000 to get	
Your total tonnes CO_2 per year	

Which area makes the biggest contribution to your climate impact? Do you know why? This may be where you want to start trying to reduce your impact.

9. Next steps

Take time to celebrate that you have worked through this booklet.

Keep a copy of your CO_2 values for future reference. You can then revisit the calculator at a later date and compare the findings so you can see what impact your changes have had on your carbon footprint.

Compare your findings with the UK average and averages from around the world (as of 2011).

	Tonnes CO_2 per person per year
UK 2050 target	3.0 tonnes
India average	1.3 tonnes
Global average	5.8 tonnes
Current UK average	13.7 tonnes
US average	23.0 tonnes

To avoid the worst effects of climate change, global emissions must fall to below 1.5 tonnes CO_2 per person.

Reduce your impact and campaign for change.

See www.quaker.org.uk/sustainability and www.livingwitness.org.uk for support and ideas or phone or write to QPSW or Living Witness using the details below.

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To order more copies of the Climate impact calculators (for individuals or meetings) contact QPSW or Living Witness using the details below.

Alternatively, online versions of both calculators are available at:
www.quaker.org.uk/climate-impact-calculators

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