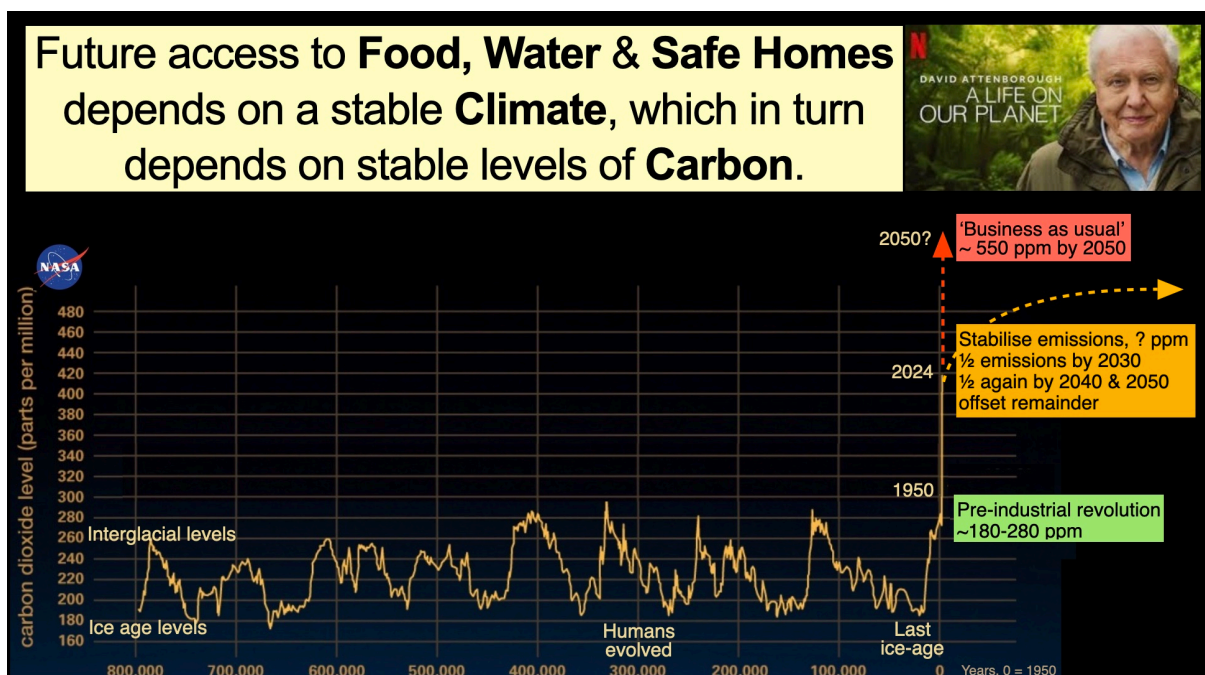


Why and How I Halved my Carbon Footprint

Dr Pat Watson, October 2024

I've always tried to live sustainably. My assumption being that without a healthy planet, it would be hard for me and my family to be healthy. I therefore recycled, and tried to be responsible with what I bought. As my children approached the age of leaving home, I became increasingly concerned about the state of the world they were going into, and also, that I may be unwittingly making it worse. I was a research scientist, and so I decided to use my research experience to find out more.

Our ability to produce affordable food, have clean drinking water, and have homes safe from flooding, storms or wildfires, all depend on a stable climate. This in turn depends on, amongst other things, a stable carbon cycle, because carbon dioxide (CO₂) in the atmosphere affects climate by trapping heat.










Since the industrial revolution, atmospheric CO₂ has increased dramatically and 99% of scientists agree that human activity is changing the climate. For more than 50 years, scientists have been studying how we can stabilise this (shown by the amber arrow in the graph). This is now called net zero, and involves halving emissions by 2030, halving them again by 2040 and 2050, and offsetting the remaining emissions by removing some carbon from the atmosphere. Almost all the world's countries have committed to this as part of the 2015 Paris Agreement, which aims to limit global warming to 1.5°C, or 2°C at the very most.

I decided to see if I could halve the emissions I was responsible for, and so be an active (if very small) part of stabilising our planet's climate.

How I halved my carbon footprint.

I started by estimating my carbon footprint using the [WWF Footprint Calculator](#).

In 2019, I was responsible for about 14 tonnes of CO_{2e} emissions. For context, the table below shows the carbon footprints of high and low carbon lifestyles in the rural part of West Berkshire I live in. By January 2024, I had halved my carbon footprint to about 7 tonnes.

 FOOTPRINT CALCULATOR	High 	Low 	Change needed	Co-benefits
 FOOD	5 tonnes	2 tonnes	Eat less, but better, meat & dairy, etc Only buy food that will be eaten	Better health Save money
 TRAVEL	16 tonnes	2 tonnes	Use alternatives to petrol/diesel cars Reduce flying	Less asthma, heart disease, diabetes, dementia, strokes, lung cancers, low birth weights, etc
 HOME	7 tonnes	1 tonne	Draught-proof, insulate, ventilate Change boiler to heat pump	Lower bills Constant warmth
 STUFF	3 tonnes	<1 tonne	Reduce Reuse Recycle	Less clutter
TOTAL*	33 tonnes	7 tonnes		Less guilt

* Data are for 1 person living in West Berkshire for 1 year & includes 2 tonnes CO_{2e} for UK public services. West Berkshire average for rural areas is 14 tonnes. UK average is 9 tonnes. World average is 6 tonnes. (WWF Footprint Calculator, 2024)

1. Food

My family regularly ate intensively-produced meat, chicken, fish and dairy, and didn't initially see how eating less would reduce our carbon footprint. It's well established that producing crops takes a lot of energy - fertiliser production alone accounts for more than 1% of global carbon emissions - but it's less obvious what happens when crops are fed to farm animals. In fact, farm animals 'waste' a lot of energy by moving about and maintaining body temperature, eg, feeding 100 calories to a chicken may only produce 13 calories for us to eat: for a cow, only 3 calories. In contrast, a well-balanced, plant-rich diet provides plenty of protein and other nutrients, but without the ~90% inefficiency associated with the feed-to-meat conversion step of animal products.

I therefore stopped basing our family meals on supermarket meat, chicken and salmon, and instead, based them around a weekly vegetable box, supplemented with beans, lentils, cashew nuts, etc. My family helped by finding new recipes online, and after a bit of trial and error, we now eat casseroles, stir-fries, enchiladas, burgers, tacos, curries, salads, soups, etc made with a wide variety of veggies and pulses. This is similar to a Mediterranean diet, which is healthier than a standard 'Western' diet. Eating less animal products also has welfare benefits for intensively-farmed animals.

Most people underestimate their food waste, but wasting food costs the average family up to £1000 a year. Changing how I thought about food waste helped me to reduce it:

1. By not being embarrassed at running out of individual items - I was saving the planet, not being a bad parent, if we had porridge or toast instead of cereal for breakfast because we ran out of milk.
2. Realising my eyes didn't tell the full story - I only saw an uneaten chicken sandwich going into the bin, but what I didn't see was all the fertiliser, pesticides, antibiotics, land to grow wheat for bread and soya for chicken feed, river pollution, and the labour, processing and transport that it had taken for me to be able to throw away a sandwich.

I am also learning about the importance of choosing food that has been grown in as nature-friendly, or regenerative, way as possible. 90% of UK groceries, are bought from supermarkets, but buying direct from the farmer gives more transparency. I had thought buying local, seasonal or organic would increase our food bill, but combined with less animal products, and better use of left-overs, our overall spending on food has gone down.

2. Travel

Living in a rural area and driving a petrol car meant my travel emissions were higher than average. I decided to switch to an electric car after talking to friends who were happy with theirs. Most of my journeys are under 100 miles, easily within the range of the car. I can charge on a cheap overnight tariff, which works out at about £2.50 per 100 miles. Many of the myths I'd heard about electric cars turned out to be just that - myths. Although I still chose a car with 6 years left on the warranty, just in case.

Several of my family and friends have/had illnesses made worse by air pollution (asthma, cancer, stroke and dementia), and it is good to know that electric cars produce only about a third of the pollution of petrol or diesel cars. To further reduce pollution from travel, our government could provide more walking and cycling routes, better public transport, and the charging infrastructure and workforce to support electric cars.

I don't like airports, and don't have family abroad, so I rarely fly. Worldwide, 90% of people don't fly, yet aviation is responsible for up to 4% of global temperature rise. Campaign groups are hoping to cut demand from frequent flyers and private jet users and make low-carbon alternatives more accessible.

3. Home

My 1970's, three-bedroom bungalow was heated with a 50-year-old oil boiler, and quickly lost heat through draughts and poor insulation. After looking into some of the myths about heat pumps, we changed the boiler to an air-source heat pump (£4000). We also insulated the attic (£2000, including flooring), sealed up draughts (£30) and put solar panels on our south-facing roof (£7000). We are still to install heat-recovery ventilation (eg single room MVHR units) to reduce condensation, which can lead to mould.

Our energy bills were £2500 in 2019, and went down to £1800 in 2022 after the home improvements, and despite the increase in UK energy prices. In addition, we now have a home that is warm all day, whereas before we only put the heating on for a few hours in the morning and evening and suffered the cold during the day.

4. Stuff

Recycling is good for keeping raw materials in a circular economy, but because the collection and processing of unwanted stuff needs energy, it doesn't reduce carbon emissions as much as reducing and reusing. About 80% of plastic waste comes from food and drink packaging, so I now take reusable bottles and containers when possible. I also try to follow the guidance of Take the Jump of buying less than 3 new items of clothing a year, and keeping electronics for at least 7 years.

An added incentive to keep our home decluttered is how much effort it took to sort through all the stuff we had in our loft before we could insulate it. This has taken much of the enjoyment out of buying yet more stuff, which has the advantage of saving money.

What else can we do for climate and nature?

Stay calm & carry on?	Make sustainable changes?
<p>\$6-10 trillion/year in damages & rising. By 2100: millions of early deaths 1 in 5 people displaced 1 in 10 animals extinct</p>	<p>Healthier Better value for money Fairer</p>
 <p>Lambourn.org</p>	 <p>Vitolda Klein, Unsplash</p>

Many people are not able to switch to lower-carbon food, travel, homes and stuff, and are therefore missing out on a healthier diet, lower bills and warmer homes. Governments and companies need to do more to help, but we can play a part in bringing this about. Studies suggest that as few as 1 in 4 people can trigger a positive tipping point.

In addition to reducing our carbon footprint, we can have a positive effect by:

- sharing information with friends and neighbours, our MP, our local council and councillors, and the companies we do business with
- switching to banks and pensions that don't invest in fossil fuels
- supporting organisations and campaigns, eg Friends of the Earth, ClientEarth, Climate Income, the Fossil Fuel Non-proliferation Treaty, and the UK's Climate and Nature Bill
- taking more care of nature in our gardens and local green spaces

Unfortunately, many governments around the world support highly polluting industries by as much as 8% of global GDP. This is through direct subsidies including tax relief, and by not charging for the effects of their pollution (World Bank). As a result, we are losing basic freedoms such as breathing clean air (98% of Europeans breathe toxic air), and for our children and grandchildren to live as we do now (United Nations).

In conclusion

Returning the world to a stable carbon cycle is obviously not in my direct control. However, up to 90% of people worldwide support climate change solutions, and if enough people make sustainable changes, this could be in our collective control.

No matter what happens, at least I now believe that I'm doing what I can to give my children a better future.