Carbon Footprint

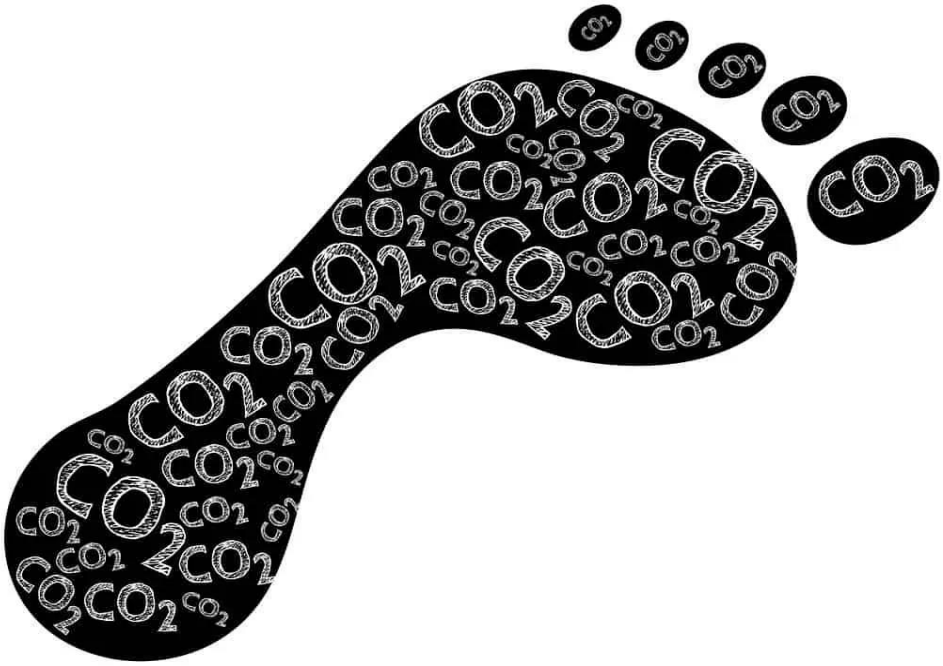
Index

1. INTRODUCTION

A carbon footprint is that the amount of greenhouse gases— primarily carbon dioxide—released into the atmosphere by a specific human action. A carbon footprint is often a broad measure or be applied to the actions of a personal, a family, an event, a company, or even an entire nation.

I. What is a carbon footprint?

Gases produced to directly and indirectly support human activities, usually expressed in equivalent heaps of greenhouse gas (CO2). In other words: after you drive a car, the engine burns fuel which creates a specific amount of CO2, looking on its fuel consumption and therefore the driving distance. (CO2 is that the chemical symbol for carbon dioxide). A carbon footprint is defined because the total amount of after you heat your house with oil, gas or coal, then you furthermore may generate CO2. whether or not you warmth your house with electricity, the generation of the power may additionally have emitted a specific amount of CO2. after you take out and goods, the assembly of the food and goods also emitted some quantities of CO2. Your carbon footprint is that the sum of all emissions of CO2 (carbon dioxide), which were induced by your activities in a very given time-frame. Usually a carbon footprint is calculated for the period of time of a year. The best way is to calculate the greenhouse gas emissions supported the fuel consumption. within the next step you'll add the CO2 emission to your carbon footprint. Below may be a table for the foremost common used greenhouse fuels: Examples of carbon emissions: For each (UK-) gallon of petrol fuel consumed, 10.4 kg greenhouse gas (CO2) is emitted. For each (US-) gallon of gasoline fuel consumed, 8.7 kg greenhouse gas (CO2) is emitted.



A carbon footprint is that the sum of all emissions of greenhouse gases (usually mainly CO2).

Examples for carbon footprint contributions:

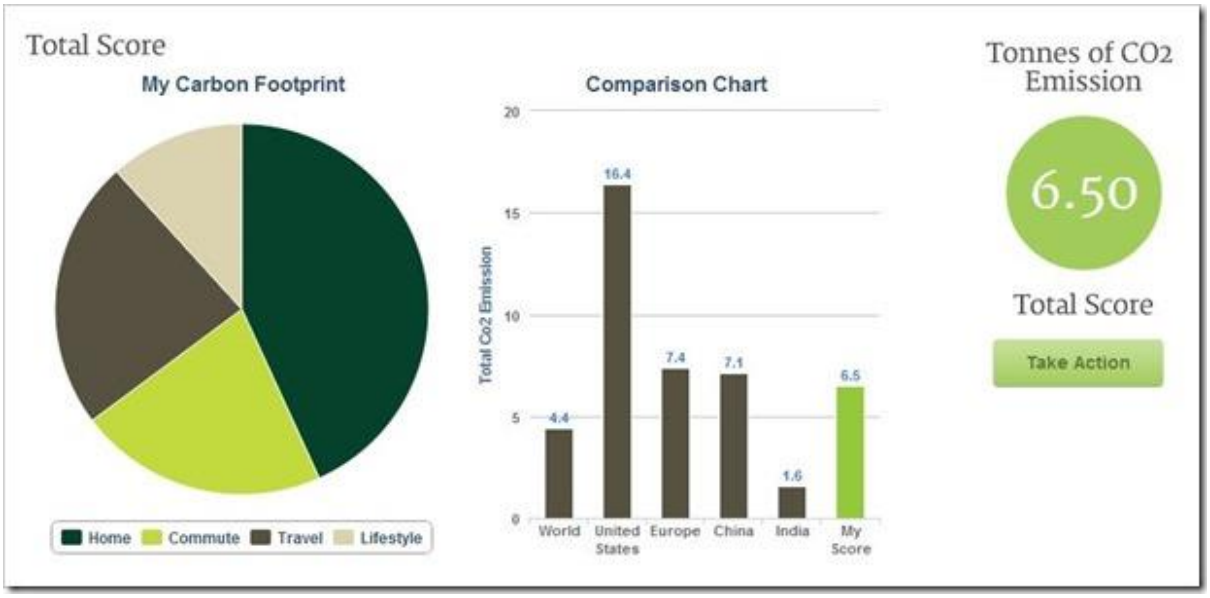
fuel type	unit	CO2 emitted per unit
Petrol	1 gallon (UK)	10.4 kg
Petrol	1 litre	2.3 kg
Gasoline	1 gallon (USA)	8.7 kg
Gasoline	1 litre	2.3 kg
Diesel	1 gallon (UK)	12.2 kg
Diesel	1 gallon (USA)	9.95 kg
Diesel	1 litre	2.7 kg
Oil (heating)	1 gallon (UK)	13.6 kg
Oil (heating)	1 gallon (USA)	11.26 kg

Oil (heating)	1 litre	3 kg

Each of the subsequent activities add 1 kg of CO2 to your personal carbon footprint: Travel by public transportation (train or bus) a distance of 10 to 12 km (6.5 to 7 miles) Drive together with your car a distance of 6 km or 3.75 miles (assuming 7.3 litres petrol per 100 km or 39 mpg) Fly with a plane a distance of two.2 km or 1.375 miles. Operate your computer for 32 hours (60-Watt consumption assumed) Production of 5 plastic bags Production of two plastic bottles Production of 1/3 of an American cheeseburger (yes, the assembly of every cheeseburger emits 3.1 kg of CO2!) To calculate the above contributions to the carbon footprint, the present UK mix for electricity and trains was taken into consideration. Carbon dioxide may be a so called greenhouse emission causing heating. Other greenhouse gases which could be emitted as a results of your activities are e.g. methane and inhalation general anaesthetic [N2O]. These greenhouse gases are normally also taken into consideration for the carbon footprint. they're converted into the quantity of CO2 that may cause the identical effects on heating within a specific timeframe, usually 100 years (this is termed equivalent CO2 amount). Few people express their carbon footprint in kg carbon instead of kg greenhouse emission. you'll be able to always convert kg greenhouse emission in kg carbon by multiplying with an element 0.27 (1’000 kg CO2 equals 270 kg carbon). See my comment to the article about personal responsibility for heating.

II. Why you should calculate your carbon footprint?

The carbon footprint may be a very powerful tool to grasp the impact of non-public behaviour on warming. the general public are shocked once they see the number of CO2 their activities create! If you personally want to contribute to prevent warming, the calculation and constant monitoring of your personal carbon footprint is crucial. For registered users, there's a carbon footprint calculator on this website, which allows to store individual activities like, e.g. travelling by car, train, bus or airplane, fuel consumptions, electricity bills then on (we call the individual contributions “carbon stamps”). you'll be able to then see the number of CO2 created for every individual activity. you'll be able to try this either earlier and use it as a help for decisions or afterwards to continually sum up your greenhouse gas emissions. Klick here to work out a sample carbon footprint with some activities. An off-line carbon footprint and first energy consumption calculator (Excel sheet) is already available within the download section. There are graphs available on this site for the CO2 emissions per capita by country (average carbon footprint by country). within the medium- and long run, the carbon footprint must be reduced to but 1’000 kg CO2 p.a. and per person. this is often the most allowance for a sustainable living .



III. A basic approach to carbon foot printing

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IV. Producing a full carbon footprint

Accurate calculation of your carbon footprint requires a more detailed approach and should require specialist advice. The five steps below show a scientific approach, suitable for producing an accurate carbon footprint:

1. Define the methodology
2. Specify the boundary and scope of coverage
3. Collect emissions data and calculate the footprint
4. Verify results (optional)
5. Disclose the footprint (optional).

1. Define the methodology

For a footprint to be accurate there must be a standardized approach, which is why it's important to define the organisation's methodology from the outset. This also ensures that when issues arise they'll be proscribed systematically. A standardized methodology is especially important in an exceedingly large organisation which depends on many individuals to assist collect and interpret data. Some organisations prefer to define their own approach for carbon footprint. However, it's usually quicker and better to use a strategy that's already widely accepted and understood. The results could also be seen to be more credible, and may be compared with other organisations using the identical methodology. One commonly used methodology is that the GHG Protocol produced by the globe Resources Institute (WRI) and also the World Business Council for Sustainable Development (WBCSD). This technique provides detailed guidance on corporate emissions reporting and is on the market freed from charge online. A newer standard from the International Organization for Standardization, ISO 14064, also provides guidance on corporate footprint calculation and emissions reporting. It builds on many of the concepts introduced by the GHG Protocol; both provide explanations of the steps covered here.

2. Specify the boundary and scope of coverage

Be clear about which set of emissions are quantified. This is commonly mentioned as defining your 'boundary'. Common issues include:

- Treatment of emissions from wholly or partially owned subsidiaries
- Treatment of emissions from leased assets, like from a van which is leased from a hire company.

It is usual to define the boundary to incorporate the total range of emissions that the organisation controls directly and this is often likely to incorporate subsidiaries and leased assets. Established methodologies like the GHG Protocol provide rules for allocation of the emissions to the organisation. Having defined the boundary, consider what varieties of emissions are included. Ask the subsequent questions:

- CO2 only or all greenhouse gases?

• Direct emissions from fuel use onsite and from transport?

• Direct emissions from manufacturing processes onsite?

• Emissions from the electricity the organisation purchased? • Emissions from the organisation's supply chain and other activities that the operation is indirectly responsible, such as outsourced activities or manufacture and transport of raw materials, by another company, which your organisation then uses?

The GHG Protocol and ISO 14064 discussed above provide helpful guidance and accepted standards on these questions. It is common to report all directly controlled emissions and emissions from electricity fully. Emissions from indirect sources, like the provision chain, are more complex to define and are usually treated as optional reporting items. However, where indirect sources contribute very large amounts of emissions it should be important to incorporate them – lots will rely on the aim of reporting the carbon footprint. Whatever the approach taken to the organisational boundary and inclusion of emissions sources, it's important to document the choice transparently.

3. Collect emissions data and calculate the footprint

The accuracy of the footprint relies on correct data and may include collecting information on:

• Onsite fuel consumption

• Owned transport utilisation

• Emissions from chemical reactions in manufacturing processes or from land use or agricultural activities

• Electricity consumption

• Employee move air, rail and in vehicles not owned by the organisation

• Suppliers' emissions.

For gas and electricity, collect consumption data in MWh or kWh. Data for other fuels may be collected in an exceedingly variety of units, for instance, kWh, MJ, Litres then on. For transport emissions it should be necessary to estimate the overall fuel consumption supported the mileage of the vehicles and fuel economy assumptions.

Data on energy consumption may be translated into equivalent CO2 emissions data using standard emissions factors, which are available from DEFRA and reproduced on the Carbon Trust website. For other emissions sources, more complex calculations could also be required. Emissions of other greenhouse gases must be translated into equivalent emissions data in tCO2e, using the worldwide warming potential factors published by DEFRA and available from the Carbon Trust.

Before collecting the information, decide what level of accuracy is required, and the way much margin for error is suitable.

4. Verify results

Having a carbon footprint verified by a 3rd party, such as a consultancy or accountancy firm can lend credibility to an organisation's claims. Verification typically involves analysis of the methodology, data collection techniques and the calculation process that was used. Different levels of assurance or verification of your results are available. Greater levels of assurance or verification are more onerous and expensive to attain, but provide greater confidence within the results.

5. Disclose the footprint

Whether the footprint is disclosed in advertising material, a CSR report or other collateral, make sure that the information is presented transparently, providing full information about the process followed and what the data means. Make the subsequent information available: • The methodology • What boundary conditions were set and which types of emissions are included and excluded • the information collection techniques, including what level of accuracy was achieved and any assumptions or estimates that were required • the extent of verification of the results provided by independent third parties. This robust approach to calculating a carbon footprint should give enough information to be ready to report it with confidence.

V. **Using a footprint for carbon management**

Calculating a carbon footprint is only the start of carbon management. there's little point in establishing a carbon footprint unless the organisation then acts to scale back emissions and improve efficiency. Carbon footprinting may be a useful exercise as a part of an entire environmental management system.

Help from the Carbon Trust

Your organisation could also be eligible for help from the Carbon Trust to enable you to require these steps. Our site survey and carbon management services can quantify energy usage, likely to be the most component of your basic carbon footprint. additionally, the positioning survey will identify opportunities to scale back an organisation's consumption, which form the premise for a concept of action. Accredited consultants spend some days onsite and provide you with a report containing:

• Details of your energy consumption

• A concept of action listing opportunities to scale back your footprint and save energy and money

• Access to further information.

• EFFECTS OF CARBON FOOTPRINT

1.1 DEPLETION OF RESOURCES

Large carbon footprints deplete resources on large and little scales, from a country's deforestation activities to at least one home's increased use of air con. The more those with large carbon footprints use resources, the more greenhouse gases increase and spur further climate change. The Environmental Protection Agency suggests that consideration of various energy supplies and conservation of current ones are going to be needed to balance energy demand. Reducing carbonic acid gas emissions, the maximum amount as possible and off-setting the remaining emissions by planting trees, for instance, or supporting energy efforts, will help to reduce the negative effects of carbon footprints. Emissions by planting trees, for instance, or supporting energy efforts, will help to reduce the negative effects of carbon footprints.

1.2 CLIMATE CHANGE

Climate change is that the ultimate effect of enormous carbon footprints. Greenhouse gases, whether natural or human-produced, contribute to the warming of the world. From 1990 to 2005, carbon dioxide emissions increased by 31 percent. By 2008, the emissions had contributed to a 35 percent increase in radiative warming, or a shift in Earth's energy balance toward warming, over 1990 levels. the last decade from 2000 to 2009 was the warmest decade on record worldwide, according to the U.S. Environmental Protection Agency's temperature change Indicators Report.

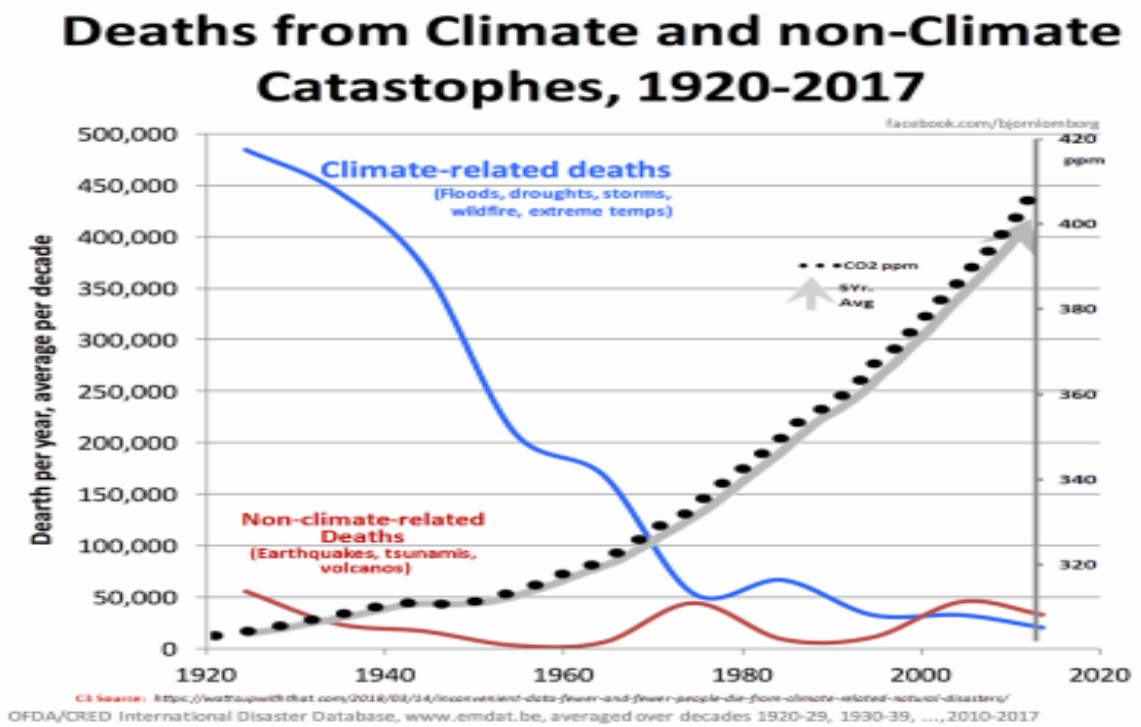
1.3 HEATING AND FOSSIL FUELS

About three-quarters of gas emissions that are attributed to humans come from burning fossil fuels. We burn fossil fuels — non-renewable energy sources — after we operate vehicles, heat our homes, and even use electricity, in line with the U.S. Energy Information Administration. The Administration has also concluded that gas emissions have been on the increase since industrialization, suggesting that humans are answerable for much of the greenhouse gas production. And science has also linked gas production to climate change, or the rise in earth's temperature. Because the Natural Resources Defence Council writes that heating can cause

catastrophic weather events, flooding, water shortages and disturbed ecosystems, it's important for every individual to know his or her impact on the longer term and work to create that impact more positive.

2. REVIEW OF LITERATURE

On every day when India's capital city continued to be engulfed in toxic post-Diwali smog, a new study provided a peek into the country's bleak future if greenhouse emission emissions still grow at high rates: a spike in temperatures, and with it, an increase in mortality. Released at an occasion in Delhi (Oct. 31), the report by the Climate Impact Lab together with the Tata Centre for Development at Chicago estimates that by 2100, around 1.5 million more people could die in India annually because of global climate change. Six states, state (402,280), Bihar (136,372), Rajasthan (121,809), province (116,920), Madhya Pradesh (108,370), and Maharashtra (106,749) are estimated to contribute 64% of the entire excess deaths. The study looks at two different scenarios for estimating temperature rise and its impact on mortality. The first—RCP 4.5—is supported the idea that carbon-dioxide levels within the atmosphere will peak around 2040 and reach 540 parts per million (ppm) by 2100. The second—RCP 8.5—assumes that emissions will still rise through the 21st century and carbon-dioxide levels will reach 940 ppm by the tip of the century. The world is currently on course to breach the RCP 4.5 scenario but more or less on the RCP 8.5 trajectory. Despite that, it's important to research worst-case scenario to grasp risks and work on mitigating harms. within the high-emission scenario, for example, Delhi will likely see 23,000 climate-related deaths annually by 2100.



Changes to death rates under two scenarios. Lines represent the all-India average change in death rates thanks to temperature. At the tip of the century, 16 of the 36 states and union territories in India will have average temperatures hotter than Punjab, which currently has the very best average summer temperature. At the tip of the century, 16 of the 36 states and union territories in India will have average temperatures hotter than Punjab, which currently has the very best average summer temperature. Extremely hot days are expected to greatly increase in India. Delhi is predicted to face about 22 times more extremely hot days. Nationally, an eight-fold increase in hot days of above 35°C is estimated. In a first, the report looks at global climate change as an immediate reason for death. rather than an abstract scenario, it provides costs of global climate change using comprehensive data analysis. “There is not any escaping that India is quite at the perfect-storm centre of the climate challenge,” said Michael Greenstone, the co-founder of Climate Impact Lab, adding: “It’s perfectly positioned to face a number of the foremost severe climate damages within the world.” The report, he said during a discussion following the launch, “underscores the urgency of reducing the speed of global climate change.” If the high-emission scenario continues, Delhi will likely see 23,000 climate-related deaths annually by 2100. It is supported global data on temperature and mortality, covering 57% of the world population. Mortality-temperature relationship estimates were accustomed generate projections of the longer-term impacts of global climate change on mortality rates. “It’s important to induce data from different parts of the globe because we are able to find out about what’s going to happen in India by learning what happens in wealthier countries,” said Amir Jina, a member of the Climate Impact Lab. “This is why wondering extremes is vital. As we move towards hotter days, mortality will increase sharply. So, it’s important for us to consider those extreme changes,” Jina added. India’s projected energy use is predicted to over double by 2040, with lots of the expansion coming from coal. in step with Greenstone, the country must move off from coal and 7 towards gas available at low prices round the world. “It would supply benefits today in reducing pollution and would even have long-term impacts,” he said

3. METHODOLOGY

Let’s take a better examine what’s involved in these steps.

1. **Define Your Borders** : you initially must define what you're visiting be measuring. You can be as liberal with this as you wish, but realize that the more you opt to include in your measurement, the harder it'll be. Realize, also, that while tracking less data is certainly easier, you don’t get an accurate accounting. In your calculations, you may consider both upstream and downstream events.

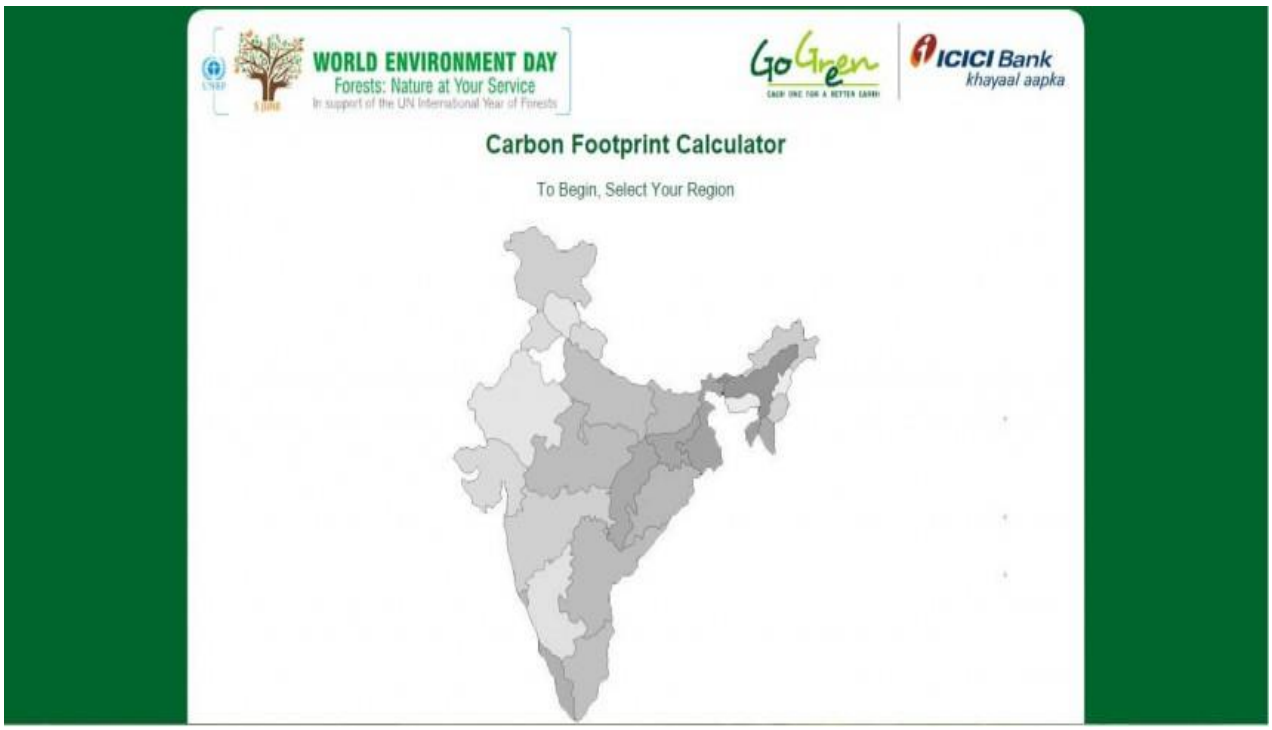
2. **Set a Baseline Take a glance at any available data**: you would like to determine a baseline year by which your future progress are measured. As you examine the present data, be aware whether anything unusual was happening that year. as an example, were there newly established governmental guidelines that drastically changed your work environment? If so, you may want to seem at a unique year.

3. **Track and Analyse Your Data**: Once you get the information tabulated, it’s not only good as a yardstick by which you'll be able to measure future performance, but given the proper data, you can use it to ferret problems now. examine the numbers critically and appearance for any anomalies. as an example, if you've got three locations that are more or less similar in size, and one has a bizarrely large reading, you recognize something’s wrong.

4. **Report**: within the end, you wish to present your carbon footprint information to big stakeholders in your organization. this could be the CEO, shareholders and employees. By showing them your study, these people can see the results of which efforts are being 9 made. Also, if you don’t see the development you expected, you can study the matter and explain why you didn’t reach a given milestone.

How do we calculate carbon footprint: Measuring Measurement isn't a five-minute project? it'll take time and expertise. You’ll likely want to call in someone who makes a speciality of this work, just because you’ll get well results, it’ll free you to try and do your own work, and you’ll be less likely to goof it up. Four major steps are wont to measure your carbon footprint:

- Define what's included in your carbon footprint.
- Set your baseline.
- Track, calculate, and analyse your footprint.
- Report your results to stakeholders.

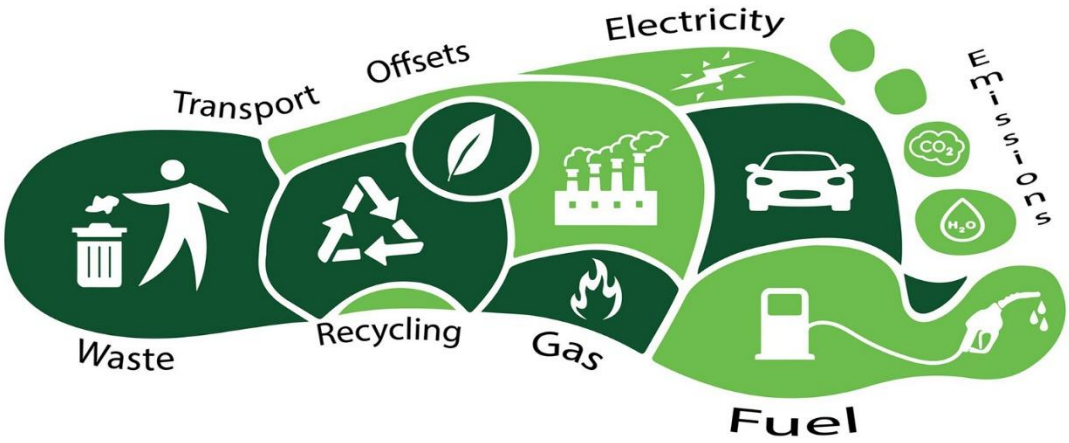


4. Findings

A. WAYS TO REDUCE CARBON FOOTPRINT

Going zero waste could be a great step towards combating global climate change. Practicing the 5 R's of zero waste can help. You've probably heard of the three R's: Reduce, Reuse and Recycle. But there are two more that are equally important. Lets break it down:

- Refuse – Avoid single use plastics and paper products by saying no many thanks, opting for reusables.
- Reduce – Downsize what you buy, opting to be more mindful of what you actually need.
- Reuse – Always find the way to stay an item out of the landfill by keeping it in great condition, repairing or upcycling it when it breaks.
- Rot – founded a compost system for your food scraps or find a food scrap drop off center (like a farmers market, or community garden) near your house.
- Recycle – Properly recycle any plastic, paper, glass or metal that comes into your life you cannot refuse, reduce, or reuse by researching your state's recycling laws.



B. BIKE MORE AND DRIVE LESS

1: You get ultra-cool tan lines! We'll start with a fun one, and you'll be able to laugh if you wish. We wear our cycling tans sort of a badge of honour, an indication of our healthy lifestyle choices, a tangible token of membership to an exclusive group. It says, "hey, I ride a motorcycle," or "I grow turnips." Either way, or both, people are absolute to be impressed at the beach. Enjoy the sights, sounds and smells! Just make sure to use sunblock so you do not overdo it!

2. You see your city like drivers can't! On two wheels and moving at a snug pace you'll be able to enjoy your environment and see, smell and listen to stuff you never notice in a very car. Which of your neighbours has the best-landscaped yard? What bakeries smell so good you simply must stop? what number different architectural styles are you able to spot? On a bicycle you'll be able to take the scenic route and explore and become a tourist in your own city. Every ride is an adventure.

3. All those we-miss-you cards from your doctor! Pedalling only 10mph, a 140-pound cyclist burns about 400 calories an hour. And studies prove that biking some times per week reduces pressure and stress while increasing your energy and elevating your overall mood. Your doctor may must wait a bit longer to shop for that yacht!

4. You never mire in traffic and always have an excellent parking spot! If you ride in a very city and bike during commuting hours you'll love having the ability to cruise past long lines of vehicles delayed at red lights (be absolute to watch carefully for right-turning traffic who won't see you). While drivers breathe exhaust (studies have shown that cyclists breathe less exhaust), and honk at one another, you're feeling the breeze and luxuriate in the sights off the roadside. to not mention that you just always get an excellent parking spot and sometimes even beat your co-workers who drive to figure.

5. you have got one less car payment and do not pay registration or insurance fees, either! According to our very unscientific study (read: quick Google search), the common car payment is $500 a month. On top of that, add the value of insurance, registration, gas, maintenance,

etc. By eliminating that vehicle and using your bicycle instead, just think about all the bike gear you'll be able to buy!

6. you discover cool free stuff on the side of the road! By observing the flotsam and jetsam along America's streets and highways, you never know what you'll find. Loose change, designer sunglasses, cool tools, $20 bills — heck, maybe a whole bag of money? after all, you will have to return back to grab that awesome Naugahyde sofa with the "free" sign you noticed on someone's lawn.Cycling is great for you, not such a lot for your doctor.

7. you'll be able to cancel your gym membership! Riding outside sure beats the treadmill, elliptical machines and also the three pieces of cardio equipment you continue to haven't discovered. No waiting in line for those machines, either. Best, you'll not must spot for Rocko while he's bench-pressing weights similar to atiny low car.

8. You'll never be late for work again! Because you'll be able to avoid traffic and cruise faster than jammed vehicles, it's likely you'll commute faster on 2 wheels and never be late again. Plus, if you're late sometime, it'll probably be because you made the decision to require the scenic route in. We've done it, too. But tell your boss instead that you just got a flat. we all know you'll be able to fix a flat in a very matter of minutes, but he doesn't. And, he should be impressed that you are making the trouble to bike in, keeping yourself healthy within the process and saving a automobile parking space for somebody else.

9. Cyclists make better lovers! According to a study led by Dr. Romualdo Belardinelli, director of the Lancisi Heart Institute in Ancona, Italy, the results of aerobics are adore those of Viagra, because both widen blood vessels. Hmmm... that's a bit scary. Our point is that regular exercise like cycling, will cause you to feel better, increase your energy and even facilitate your look better, too. All of which cause you to more interesting to and fascinated by the alternative sex.

10. Bicycling may be a Fountain of Youth! It's a tremendous thing. you're feeling younger and truly get more years out of your muscles, joints and organs just by using your highly capable self to pedal around rather than sitting statue-like behind that wheel. In fact, cycling might just be the closest thing you'll be able to find to a real Fountain of Youth. Like few other sports it keeps you fit and young with little or no risk of injury. for instance, we all know lots of 55-year-old regular riders who look and

move like they’re closer to age 35, and also 80-year olds who still like to ride — and might because they're been riding for years.

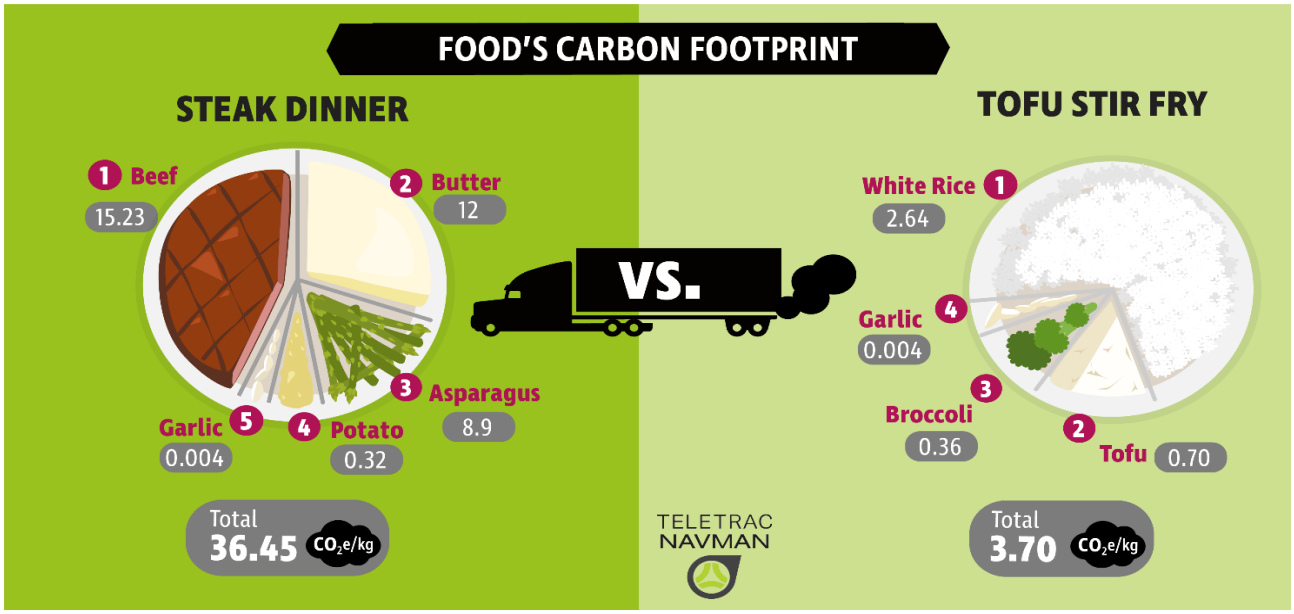
C. Conserve WATER AND PROTECT OUR WATERWAYS

Reducing your water usage is essential: There’s only most water on this earth, and we can’t make to any extent further of it. Did you recognize 96.5 percent of the water on earth is simply too salty for human consumption? Two thirds of the remaining H2O are locked away in polar ice, glaciers, and permanent snow. Melting it won’t help, seeing as most of it the air. In fact, vehicles produce one-third of all U.S. air pollution. The toxins emitted by vehicles are very dangerous for human health, considering the tailpipes are at street level where humans can breathe the air directly into their lungs. Challenge yourself to drive less and bike more. Riding your bike forces you to utilize your own muscle power. You’ll get a workout all while helping the environment. Plus, it requires much less energy to supply a motorcycle than it does to manufacture a car. will just find yourself as sea water. That’s why it’s so important to cherish the water we've got. Here are some ways to assist conserve water and protect our waterways: once you brush your teeth, make certain to shut off the water while you lather up. Don’t leave it running: Only turn it on when it’s time to rinse your mouth out. Take shorter showers. A fun thanks to do that is by being attentive to a 5 to 10 minute song, then shut the shower off when it’s over. Don’t flush things down the rest room to eliminate them. One flush can waste up to five or 7 gallons of water! Avoid dish/body soaps crammed with toxins. Conventional dish and body soap contain ingredients that go down the

drain and only further pollute our facility. Make the switch to all-natural, eco-friendly soap. ? Host or join a waterway cleanup in your area people. Keep those waters plastic free! ? choose reusables. plenty of disposable items take gallons of water to create. For example, one roll of bathroom paper takes 37 gallons of water; one disposable diaper takes 144 gallons of water. There are several other products, like paper plates, cups and towels, that gallons of water to create in addition. That's why switching to reusables will facilitate your save water within the long term.

FOOD

- A vegetarian diet greatly reduces an individual's carbon footprint, but switching to less carbon intensive meats can have a significant impact further. as an example, replacing all beef consumption with chicken for one year results in an annual carbon footprint reduction of 882 pounds CO2e.
- Food accounts for 10 - 30% of a household's carbon footprint, typically the following portion in lower-income households.2 the assembly of food accounts for 68% of emissions, while its transportation accounts for five.
- • Food production emissions consist mainly of dioxide (CO2), inhalation general anesthetic (NO2), and methane (CH4), which result primarily from agricultural practices.
- Eliminating the transport of food for one year could save the GHG equivalent of driving 1,000 miles, while shifting to a vegetarian meal someday per week could save the equivalent of driving 1,160 miles.
- Ruminants nitrous oxide cattle, sheep, and goats produced 175 million metric tons (mmt) in CO2 equivalents of enteric methane within the U.S. in 2017.



D. SWITCH TO SUSTAINABLE, CLEAN ENERGY

Sustainability and also the environment are currently within the public consciousness during a way they haven't been before. we've got all seen the heart-breaking images of plastic in our oceans, affecting wildlife and polluting the earth. the great news is that we all have the facility to form better individual choices, to form less waste and make positive changes which will have a bearing for future generations too. It are often hard to understand where to begin once you first start making changes, so here are ten easy sustainable switches to assist you on your eco-friendly journey:

1. Invest during a reusable bottle – annually billions of single-use plastic water bottles are used round the world and also the majority of those are sadly not recycled. With more locations offering water fountains and refills, there has never been a far better time to speculate during a reusable bottle to assist keep you hydrated on the go and reduce waste as you are doing so. Glass may be a great option, because it doesn't change the taste of the water and simple to scrub.

2. value more highly to reuse with an eco-coffee cup – Disposable cups for decent drinks are made up of a spread of various materials that are very difficult to recycle, meaning that the majority are destined for landfill. Choosing a reusable eco cup made up of materials like bamboo won't only save waste but can also prevent money as more coffee shops reward customers for bringing their own cup.

3. Shop plastic free where you'll – Shopping plastic free isn't yet a straightforward task, but the great news is that supermarkets are being attentive to consumer demand and more plastic-free items are available than before. By choosing plastic free fruits, vegetables and other staples where possible, you're creating more demand for sustainable, plastic-free products. Simple cotton bags are an excellent alternative to the plastic bags on offer for produce and may be reused again and again.

4. Ditch the oil – Did you recognize many of the cosmetics on sale contain oil, a reasonable and non-renewable ingredient? With more choice than ever before choosing natural beauty products that use plant oils instead of unsustainable mineral oils is a straightforward switch to form.

5. Use a bamboo toothbrush – Plastic toothbrushes are used for a matter of months but will lallygag around for years afterward during a landfill. Sourcing a toothbrush with a bamboo handle means once you have got removed the bristles it are often composted reception and can save on yet one more piece of plastic visiting the bin.

6. Embrace an old fashion shave – Plastic razors, disposable heads with even more plastic, the straightforward act of hair removal has become a wasteful habit. There is, however, in our own way, old-fashioned safety razors are making a comeback. With minimal waste and a long-lasting shave, they're an amazing sustainable choice for the toilet.

7. Simplify your cleaning routine – observing the supermarket cleaning isles you'd think you would like a special bottle for every task around you

to hold out round the home. Luckily you merely actually need some basic products to induce the task done. Invest during a good eco-friendly multi-purpose cleaner and use ingredients like vinegar for cleaning glass. Simple are often very effective.

8. Bars not bottles – With many consumers switching to more eco-friendly packaging, items like soap and shampoo bars are in high demand. rummage around for products with minimal, natural ingredients and compostable cardboard packaging.

9. Sustainable storage – Make your kitchen more sustainable by choosing food storage wisely. Keep pulses, nuts and other cupboard staples in reusable mason jars. Store leftovers in glass containers and use beeswax wraps rather than unsustainable plastic wraps.

10. Switch up your laundry – Washing clothes may be a daily essential, but the plastic waste generated from most washing products doesn't should be. Eco alternatives like Soapnuts, an eco-egg or perhaps simply sourcing soap that's plastic free are all better alternatives for the earth and weigh down lots of waste within the process. At Flower and Spice, we use glass jars and our products are made during a certified 100% sustainable laboratory in Switzerland. Make a minimum of one switch today and contribute towards a cleaner planet.

- SHOPPING

- Buy less stuff! And buy used or recycled items whenever possible.
- Bring your own reusable bag once you shop.
- attempt to avoid items with excess packaging.
- If buying appliances, lighting, office equipment or electronics, explore for Energy Star products.
- Support and buy from companies that are environmentally responsible and sustainable.

- IN YOUR HOME

There are simple changes you'll make reception that may prevent energy and money. Heat, Lights and Appliances: In the average American home, 25 percent of energy is employed to heat spaces, 13 percent is employed to heat water, 11 percent is employed for cooling and therefore the remainder is spent on appliances, according to estimates from the Natural Resources Défense Council. Making even small changes to those can make an enormous difference, said Noah Horowitz, a senior scientist and director of the N.R.D.C.'s Center for Energy Efficiency. "There's plenty you'll do without having to choose up a hammer or write a check," he said. (This calculator can facilitate your see your energy usage before and after you create these changes.)

- Turn down the heat: Use a programmable or smart thermostat, if you have got one. Keep blinds closed to assist keep temperature stable inside.

- Turn down your water heater: 120 degrees Fahrenheit is sufficient.

- shut down lights and appliances: when you're not using them. shut down appliances at the power outlet to scale back even more energy. Putting them to sleep is competitor.

- Stream movies through your smart TV, not your game console: Smart TVs and their plugins use just some watts to stream movies, Mr. Horowitz said, but if you utilize 26 your game console, energy use is about 10 times higher, because they aren't optimized to play films.

- Buy a laptop, not a desktop computer: Laptops take less energy to charge and run.

- Replace lights: LED lights burn up to 85 percent less energy, last up to 25 times longer and are cheaper to run than in candescent lights. About two billion sockets in the u. s. still have an energy-wasting bulb in them, said Mr. Horowitz. "This is a massive opportunity that we could change almost overnight," he said.

- Don't set your fridge and freezer temperatures below necessary: The United States Department of Energy recommends around 35 to 38 degrees Fahrenheit for the fresh food compartment and 0 degrees

for freezers. (And unplug that old fridge within the garage once you don't need it to sit back anything.)

• Choose renewables: If you reside in an exceedingly state where you'll choose your energy supplier, pick one that runs on renewables.

• Replace old fridges: they're “energy hogs” in step with Mr. Horowitz, and can cost you up to $100 extra per annum to run. “If it’s 15 to twenty years old,” he said, “it’s a no brainer to recycle it.”

• hunt for an Energy Star symbol when buying new products: This certification means a product has met energy efficiency standards for the u. s.

- WHAT you do

In addition to changing your day-to-day habits, exercising your rights as a citizen is one among the most significant belongings you can do to assist the world. Taking global climate change into consideration after you vote could be a good start. Here are another tips:

• Know your facts: Understanding the science of global climate change will facilitate your ask your family, friends and local representatives with about the problem confidently.

• Find local climate action groups or meetups in your area: Attending these meetings will help to stay you up on way you'll be able to help in your community.

• Speak to your local representative: Suggest things your city or town can do to cut back its carbon footprint, like developing a town action plan, improving recycling, and adopting green energy policies.

• Vote on policies that protect the environment: Use your vote to curb global climate change.

WAYS TO REDUCE PERSONAL CARBON FOOTPRINT

1. Learn the 5 R's: refuse, reduce, reuse, rot, recycle

2. Bike more and drive less

3. Conserve water and protect our waterways

4. Switch to sustainable, clean energy

5. Clothing

6. Shopping

7. There are simple changes you can make at home that will save you energy, and Money

PERSONAL TRANSPORTATION

U.S. fuel economy (mpg) declined by 12% from 1987-2004, then improved by 29%

Annual per capita miles Cars and light trucks emitted 1.1 billion metric tons CO2e or 17% of the 2017 total U.S.

from 2004-2017, reaching an average of 24.9 mpg in 2017. driven increased 9% since 1995 to 9862 miles in 2017.

Of the roughly 66,000 lbs CO2e emitted over the lifetime of an internal combustion greenhouse gas emissions.engine car (assuming 93,000 miles driven), 84% come from the use phase.

Gasoline releases 19.6 pounds of CO2 per gallon when burned, compared to 22.4 pounds per gallon for diesel. However, diesel has 11% more BTU per gallon

The average passenger car emits 0.79 pounds of CO2 per mile driven.

Automobile fuel economy can improve 7-14% by simply observing the speed limit. $0.19-$0.37 per gallon.

Commercial aircraft GHG emissions vary according to aircraft type, the length of trip,

Domestic air travel fuel efficiency (passenger miles/gallon) rose by 118% from 1990

2017, due to increased occupancy and fuel efficiency to 2018, largely due to increased occupancy.

In 2017, rail transportation emitted 45 million tons CO2e, accounting for 2% of transportation emissions in the U.S.

6. Conclusion

- **CALCULATE YOUR FOOTPRINT**

Many people act to reduce their carbon footprint without ever calculating it. Although such action can produce serious reductions it can just as easily produce trivial ones. Calculating your footprint provides a way of telling the difference between the two. The better your calculation the more easily you will be able to prioritise which parts of your footprint are the most important.

Whether you use an online calculator or do you own calculation, getting an accurate calculation of your footprint is a challenge. Housing and travel footprints should be relatively easy and accurate, if you get enough information. Food and service footprint calculations are both more difficult and less precise, while product footprint calculations can be quite challenging with high uncertainty.

The numerous examples shown throughout this guide are examples of how carbon calculations can improve understanding. By comparing the emissions of a kilowatt-hour used, mile travelled, kilo-calorie consumed or dollar spent we sharpen our understanding of carbon footprints. The better these calculations are, the more targeted our actions can be.

- **SHRINK YOUR FOOTPRINT**

The most important thing to remember when shrinking your footprint is scale. Although your personal footprint is made up of hundreds of items, it is generally dominated by just a few. Making a change to these few items is likely to result in the biggest reductions, so it pays to think big.

If after calculating your personal footprint you can list its items in terms of size you will create a type of ‘things to shrink’ list. Using our US example, the list looks like this: petrol (4.8 t), electricity (3.1 t), natural gas (1.0 t), red meat (0.9 t), health care (0.9 t), recreation (0.7 t) and air travel (0.7 t). In this list the obvious opportunities are in reducing the emissions from driving, electricity use, heating and meat consumption. Your own footprint may reveal other priorities.

In steps five to nine of this guide we have detailed different ways to shrink your housing, travel, food, product and service footprints. The information and advice shown in these steps is just a valid whether you are trying to reduce your personal footprint to 20t CO2e or to 2t CO2e.

Only by experimenting with your own footprint will you determine which actions are practical and effective for you.

7. Glossary

Carbon neutral

Commonly accepted terminology for something having net zero emissions (for example, an organisation or product). As the organisation or product will typically have caused some greenhouse gas emissions, it's usually necessary to use carbon offsets to realize neutrality. Carbon offsets are emissions reductions that are made elsewhere and which are then sold to the entity that seeks to scale back its impact. so as to become carbon neutral it's important to have a really accurate calculation of the quantity of emissions which require to be offset – requiring calculation of a carbon footprint.

Greenhouse gases

Greenhouse gases are those which contribute to the greenhouse effect when present within the atmosphere. Six greenhouse gases are regulated by the Kyoto Protocol, as they're emitted in significant quantities by human activities and contribute to temperature change. The six regulated gases are greenhouse emission (CO_2), Methane (CH_4), inhalation anaesthetic (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

Carbon dioxide equivalent (CO2e)

There are six main greenhouse gases which cause climate change and are limited by the Kyoto protocol. Each gas has a different global warming potential. For simplicity of reporting, the mass of every gas emitted is often translated into a carbonic acid gas equivalent (CO2e) amount so that the whole impact from all sources may be summed to one figure.

Carbon footprint

The total set of gas emissions caused by an individual or organisation, event or product. It should be expressed in greenhouse emission equivalent (CO2e).

ISO 14064

ISO 14064 is a global standard for corporate emissions reporting. It builds on the approach outlined in the greenhouse emission Protocol. See www.iso.org for more information.

8. Reference

https://www.icicibank.com/go-green/carbon-world-day/indexef62.html
https://www.unenvironment.org/news-and-stories/press-release/switch-green-initiatives-show-how-build-sustainable-societies
https://www.c3headlines.com/2018/03/empirical-evidence-correlation-between-co2-climate-related-deaths-connect-the-dots.html