

## CHAPTER 2

# Measure Your Carbon Footprint (How to Do It, and Why It Matters)

By Wing Sze Tang

Turns out you don't need to be a climatologist to calculate your carbon footprint. Here we demystify this concept, bringing it to life with illustrative examples.



# What is a carbon footprint, and how can we use it to fight climate change?

“Carbon footprint” is a term you’ve probably been hearing a lot of lately. But if you’re not 100 percent sure what it means, you’re in good company.

Recent polls suggest that while most Americans know that climate change is one of the most important issues of our time (some might say *the* most important), many of us are still a bit fuzzy on the specifics—especially when it comes to what we can do on an individual level.

We hear what scientists are saying. Rising levels of human-created greenhouse gases are trapping heat in the atmosphere and causing global warming and other aspects of climate change, like severe wildfires and flooding.

The whole thing is rather daunting, but there really are solutions. And it needs to be a collective effort. The first step? Measuring how big our impact is to start with—aka our carbon footprints.

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## 2.1

# Carbon footprints 101: What they are and how to measure them

Ever been in a performance review at work? Then you've probably heard the term SMART goals. (\*Insert audible sigh\*, but stay with us.)

The basic concept is that any objective is easier to reach when we make it SMART, aka specific, measurable, attainable, realistic and timely.

Cliché? Definitely. But the thing is, SMART goals work. That's why understanding how to calculate your carbon footprint is the first step in translating a massive global challenge into smaller, more achievable changes we can make right now.

It's true that climate change is a global crisis, and achieving a low-carbon future will take monumental changes from everyone everywhere. But finding ways to take personal action can feel empowering, and the changes you make might influence others around you, too. That "no good deed is too small" inspirational poster you might have seen in script font on Pinterest? It perfectly captures what it means to take individual climate action.

Don't underestimate the ripple effect our small actions can cause: According to political scientist [Erica Chenoweth](#), known for her research on peaceful protest, it takes only about 3.5 percent of a population engaging in action to spark real social change. This theory is known colloquially as the "3.5 percent rule," and we kind of want to embroider it on a sweatshirt.

If you think regulations are taking too long to enact, and you want to do your part for the cause, understanding how to calculate your carbon footprint—and then working to lower it—is a step in the right direction.



## What is a carbon footprint?

The term “carbon footprint” is a metaphor for the impact our actions have when it comes to global warming.

Basically, a carbon footprint is a way of calculating the GHGs created on behalf of a person, place or thing. You can calculate a carbon footprint for virtually anything: an individual, company, industry or country, for example, or a product, action or lifestyle. The final number reflects all the GHGs that something or someone is responsible for.

Just as an elephant walking down a sandy beach leaves a bigger footprint than the mouse strolling alongside it, someone whose daily activities depend on a lot of energy use will leave a bigger carbon footprint than someone who uses fewer resources. The bigger the footprint, the bigger the contribution to global warming and climate change.

Calculating your own carbon footprint is the first step on the journey from Dumbo to Mickey.

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## What about the term “ecological footprint”? How’s it different from a carbon footprint?

Well, as any good middle manager knows, you can’t get anywhere without a solid set of KPIs. To size up human impact on the planet, ecological footprint and carbon footprint are two common (and overlapping) measurements.

An [ecological footprint](#) adds up our impact in global hectares (gha), reflecting how much land you would need to support a certain way of living. (One hectare is 10,000 square meters, equivalent to 2.47 acres.)

Your ecological footprint includes not only your carbon footprint, but other factors too, like how quickly you consume natural resources like plant crops, animal foods and water. If a population’s

demands exceed supply (aka the region’s “biocapacity”), that means its ecological footprint is beyond its means. Spoiler alert: for the average American right now, it is.

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## Why, exactly, are we measuring carbon?

There are lots of greenhouse gases. But carbon dioxide (CO<sub>2</sub>) is the most common one, so people use it as a kind of shorthand to talk about all the different gases that can absorb heat energy and trap it in the atmosphere.

These are the heavy hitters:

- **Carbon dioxide (CO<sub>2</sub>)**, which makes up about 76 percent of global GHG emissions
- **Methane (CH<sub>4</sub>)**, which accounts for 16 percent
- **Nitrous oxide (N<sub>2</sub>O)**, which contributes 6 percent (but is still no slouch)

Simple, right? Not quite. Figuring out the total combined impact of these gases isn’t as easy as just adding them up, though, since they differ dramatically in how skilled they are at heating up the planet over a certain time frame (usually 100 years). This phenomenon is referred to as their [global warming potential](#), or GWP.

Since we can’t compare apples to oranges, a carbon footprint calculator does the hard work for us, transforming all other greenhouse gases into their carbon dioxide equivalent, or CO<sub>2</sub>e. That’s the amount of CO<sub>2</sub> that would create the same warming.

If you jotted it down, the equation would look like this: [amount of a greenhouse gas] x [the gas’s GWP] = CO<sub>2</sub>e. Amounts are generally calculated in metric tons, so you’ll see a *t* there out front: tCO<sub>2</sub>e. (One metric ton is about 2,204.6 pounds.) If you see a footprint measurement without a time frame or other limitation attached, assume it’s for a year.



Using this formula, we can calculate that one metric ton of methane = 25 tCO<sub>2</sub>e, and one metric ton of nitrous oxide = 298 tCO<sub>2</sub>e. Which is astonishing. And also, yeah, we're thankful for the ease of carbon footprint calculators, too.

### **Okay, but how does a person *actually* calculate their carbon footprint?**

Don't worry, there's a handy tool.

The quickest way is to use a carbon footprint calculator [like this one](#), literally designed just for this purpose. A quick Google search will find you countless other options too. They usually start with some easy questions about your lifestyle, like where you live, how much you travel, how much energy you use at home, what you eat and how you shop.

When choosing which carbon footprint calculator to use, make sure it covers your habits thoroughly. Otherwise, you might get an incomplete measure of your carbon emissions. (A "toe print," if you will.)

Think about this. A calculator that estimates transportation-related CO<sub>2</sub> based only on your car usage, without factoring in the flights you take to visit your mom every holiday, wouldn't be giving you the whole picture. And when it comes to the environment, we probably shouldn't be cutting corners.

### **I've heard about direct and indirect carbon emissions—what's the deal there?**

A complete carbon footprint includes both direct and indirect emissions, and the distinction can be confusing. Let's dig in, shall we?

If you're measuring the impact of a product, activity or lifestyle, the direct emissions are the ones immediately connected to it, while indirect emissions are one or more steps removed.

Try this example on. When you're calculating household energy use, like cooking your famous carbonara on the gas stove, that counts toward direct emissions—you're burning the gas right there in

your kitchen. But the electricity powering your shiny, retro-inspired fridge involves indirect emissions, as it was likely made by burning fossil fuel at a power plant.

Both of these *should* count toward your personal carbon footprint. But not all carbon calculators take this into account, so be vigilant.

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**Got it. Now, let’s cut to the chase. How much do we need to shrink our footprints?**

Let’s start at the end. The ultimate goal is a carbon-neutral planet. That means we balance out our GHG emissions by removing the same amount from the atmosphere, ending up with a net-zero carbon footprint. (Being carbon-negative takes this idea a step further: removing more emissions than we produce.)

Until we get there (cut to the global cheerleading team), the [Paris Agreement](#) set the target that nearly the entire world is now striving to reach: cutting emissions enough to ensure that the planet doesn’t get 2°C (3.6°F) hotter than pre-industrial levels.

In fact, the Paris Agreement uses hedging language on this. Climate scientists don’t actually want us to hit that two-degree mark. [They would prefer](#) the temperature increase to max out at “well below 2 degrees, maybe even 1.5.”

To reach this 2-degree hard limit, the [Deep Decarbonization Pathways Project](#) says **the target for all countries should be to cap energy-related CO<sub>2</sub> emissions at 1.7 tCO<sub>2</sub>e per person, as a global average, by 2050.** (This target zeroes in on emissions related to energy production and consumption, since those make up the bulk of all GHGs.)

The bad news is, that’s no easy feat. Even in Sweden, which is [considered the leader](#) in climate protection efforts, energy-related CO<sub>2</sub> emissions were about [3.8 metric tons](#) per person in 2016, more than double the target. And in the U.S.? The average American carbon footprint related to the energy sector is around [16 metric tons](#) a year. And if you look at total GHGs for *all* sectors? That number’s closer to 18 tCO<sub>2</sub>e per American.

Making the necessary changes requires everyone, from individuals to governments, to do the work. And one super-easy step we can take right now is to figure out our own carbon emissions so we can start making choices to cut back.

**Some of the most impactful things the average American can do to reduce their carbon footprint are cutting back on the bacon cheeseburgers, decreasing household energy use** (dryers are out, clotheslines are in!) and reducing—or, if you’ve got the chutzpah, eliminating—travel by car and plane.

So think hard: Do you really need to follow Lizzo to Vegas *and* NYC?

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## 2.2

### Global greenhouse gas rankings by country

Unsurprisingly, calculating a country's carbon footprint is complicated. And the results can be both controversial and morally questionable, so the whole thing is a tricky issue to discuss.

But the data definitively shows that we are creating way more greenhouse gases than we should be. (And here in the U.S., sad to say, we're ranking high when we should be aiming low.)

**The individual calculation makes sense, but how on Earth do you measure a country's carbon footprint?**

With a lot of very complex spreadsheets.

The experts have come up with a number of ways to measure carbon emissions by country, so governments, NGOs, journalists and random data

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geeks can crunch the numbers and spot trends over time. Here are three commonly used metrics:

**Annual output:** Total greenhouse gases emitted per year.

**Cumulative output:** Total historical levels of emissions by country.

**Per capita output:** Total greenhouse gases emitted per year, divided by total population.

**You promised a rankings chart. How do the world's nations stack up against one another in carbon emissions? And what is the U.S. carbon footprint?**

Photo by NASA on Unsplash

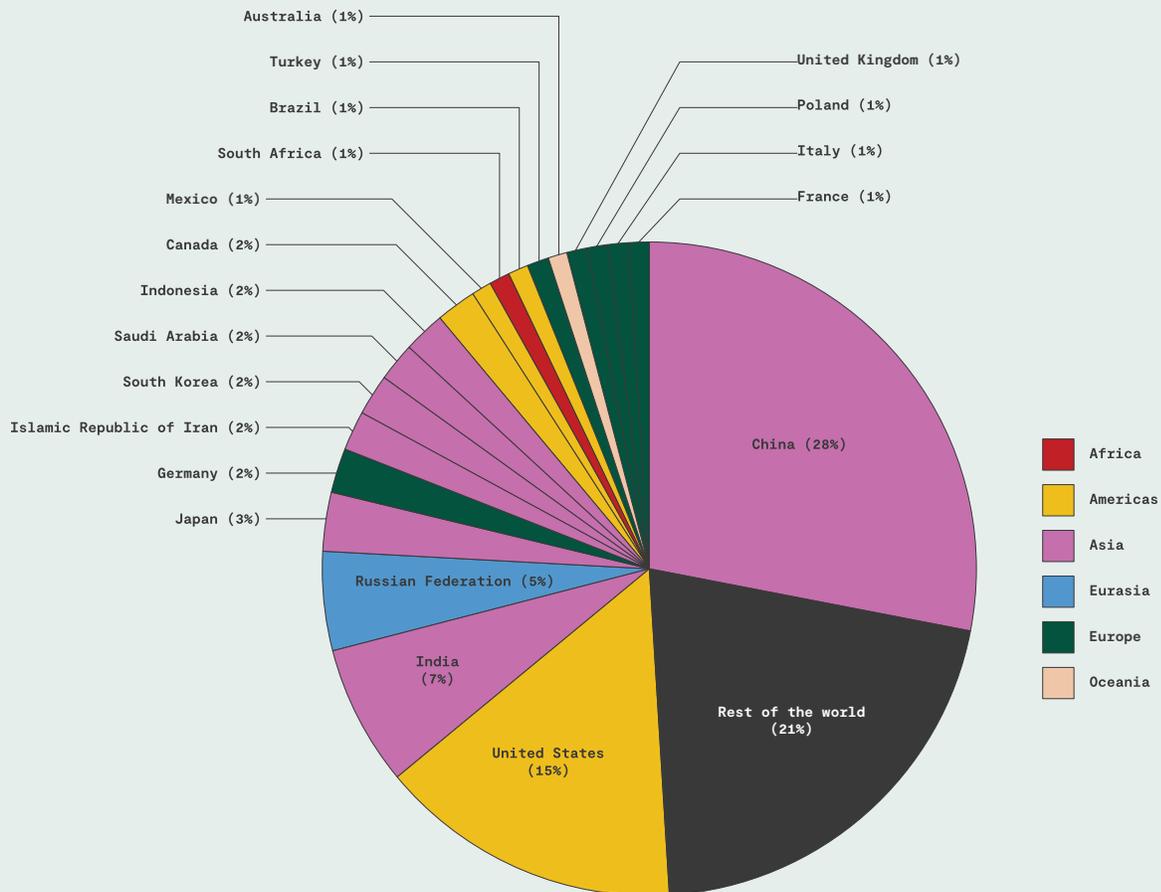


# Paris Accord Targets by Country

Critically Insufficient	Highly Insufficient	Insufficient	2°C Compatible	1.5°C Paris Agreement Compatible	Role Model
4°C+ World	< 4°C World	< 3°C World	< 2°C World	< 1.5°C World	<< 1.5°C World
Argentina	China	Australia	Bhutan	Morocco	
Russian Federation	Indonesia	Brazil	Costa Rica	The Gambia	
Saudi Arabia	Japan	Canada	Ethiopia		
Turkey	Singapore	Chile	India		
USA	South Africa	EU	Kenya		
Ukraine	South Korea	Kazakhstan	Philippines		
Vietnam	UAE	Mexico			
		New Zealand			
		Norway			
		Peru			
		Switzerland			

[Source](#)

# Emissions by Country (/Region) Pie Chart (2018)



[Source](#)

## CO<sub>2</sub> Emissions by Country (2018)

Country	Annual CO <sub>2</sub> emissions (tonnes)	% of world total (36.57 billion t)	Region (Africa, Americas, Asia, Eurasia, Europe, Oceania)
 China	10.06 billion t	28%	Asia
 USA	5.42 billion t	15%	Americas
 India	2.65 billion t	7%	Asia
 Russia	1.71 billion t	5%	Eurasia
 Japan	1.16 billion t	3%	Asia
 Germany	759.00 million t	2%	Europe
 Iran	720.41 million t	2%	Asia
 South Korea	658.79 million t	2%	Asia
 Saudi Arabia	621.30 million t	2%	Asia
 Indonesia	614.92 million t	2%	Asia
 Canada	568.41 million t	2%	Americas
 Mexico	477.32 million t	1%	Americas
 South Africa	467.56 million t	1%	Africa
 Brazil	457.19 million t	1%	Americas
 Turkey	428.18 million t	1%	Europe
 Australia	420.22 million t	1%	Oceania
 UK	379.04 million t	1%	Europe
 Poland	343.54 million t	1%	Europe
 Italy	338.03 million t	1%	Europe
 France	337.91 million t	1%	Europe
Rest of the world	–	21%	–

## Emissions per Capita (2018)

Country	Average Carbon Footprint (per capita)
 Qatar	37.97 t
 Curaçao	33.63 t
 Trinidad and Tobago	31.28 t
 Kuwait	23.70 t
 United Arab Emirates	21.35 t
 New Caledonia	20.56 t
 Bahrain	19.80 t
 Brunei	18.48 t
 Sint Maarten (Dutch part)	18.44 t
 Saudi Arabia	18.43 t
 Kazakhstan	17.56 t
 Australia	16.88 t

[Source](#)

So you want to know what country emits the most greenhouse gases? Like many global rankings, the U.S. is at or near the top in every category, except this one doesn't make us beam with pride.

By annual output, the [top emitters](#) are:

- **China:** 27 percent of total global CO<sub>2</sub>
- **The U.S.:** 15 percent
- **The E.U.\*:** 9.8 percent
- **India:** 6.8 percent
- **Russia:** 4.7 percent

\*The E.U.'s 28 countries are often grouped together since they set environmental targets as one body.

By cumulative output:

- The U.S. is the [biggest contributor](#) by far—it's responsible for 25 percent of total historical CO<sub>2</sub> emissions (from 1751–2017).
- China takes second place at 12.7 percent, thanks to its rapid industrialization, propelled by manufacturing—and, of course, the fact that more than a billion people live there. Between 1995 and 2015 alone, CO<sub>2</sub> emissions from its manufacturing industry went up [by 221 percent](#)



Photo by The New York Public Library on Unsplash

What countries have the highest carbon emissions per capita?

- In 2017, the [biggest CO<sub>2</sub> emitters](#) per capita were, in order: Qatar, Trinidad and Tobago, Kuwait, Brunei, Bahrain and the United Arab Emirates.
- Out of the top emitters by total output above, the highest on the per capita list is the good ol' U S of A. Our emissions in 2017 were more than 16 metric tons per person. Compare that with China at 6.86, the E.U. at 7.04, India at 1.84 and Russia at 11.31.



### THE AIR CONDITIONING CLIMATE SPIRAL

It's a vicious cycle. As the earth heats up from global warming, we use more AC to cool down. And all the power and refrigerants producing that cold air create greenhouse gases that are heating up the world.

There's now nearly one AC unit for every four people on the planet, and along with electric fans, they're responsible for 20 percent of global electricity use. 2050 predictions say they'll be in two-thirds of the world's households, making them as ubiquitous as cellphones are now.

One solution to help lower that projection? Building better, more efficient air conditioning. The technology hasn't really changed since it was invented in 1902. Until we get there (and even once we do), let's do our best to use less of it to slow down the cycle.

→ It's important to note that this metric ranks country emissions on the basis of *production* (which would include fuel and other products for export), because this is the standard accounting method. But [an alternative](#) is calculating based on a country's *consumption*, which would better reflect the population's lifestyle and policy choices. Total per capita CO<sub>2</sub> emissions in the U.S. in 2018, for example, were 16.58 tCO<sub>2</sub>e for production, and 17.63 tCO<sub>2</sub>e for consumption. For China, on the other hand, production is higher than consumption: 6.97 tCO<sub>2</sub>e vs. 6.28 tCO<sub>2</sub>e.

### Interesting. And what country has the smallest carbon footprint?

- Since it takes a certain amount of money to produce GHGs, it will come as no surprise that the individuals and countries with the lowest carbon footprint are those that have the least.
- In many [less affluent countries](#) such as Chad, Niger and the Central African Republic, the average footprint is less than 0.1 tCO<sub>2</sub>e per year. That's well under that 1.7 tCO<sub>2</sub>e target we're reaching for, though let's keep in mind that we shouldn't be relying on the world's poorest to keep the averages down.
  - Among more developed and industrialized countries, the lowest on the list are Sweden and Switzerland, with 4.27 and 4.52 tCO<sub>2</sub>e per capita.

### Wow. Why do greenhouse gas emissions by country vary so much?

There are a lot of reasons, but it boils down to a combination of having money to burn—and deciding whether to burn it. There's also a bit of luck involved, like the climate you live in and the natural resources you're surrounded by.

Economic inequality is a big factor. The richer the country and the higher its standard of living, the more energy it tends to burn through and the more stuff people tend to buy (and discard).

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Think about the way we live in the U.S.: we drive more, fly more, shop more and air-condition our buildings more than people [in most other places](#). (Plus, those homes and cars tend to be a lot bigger than elsewhere.) Similarly, the more populous the country, the greater the potential for CO<sub>2</sub> emissions.

On the flip side, some countries are able to keep carbon emissions lower—or reduce them—by enacting climate-friendly policies.

Example? Sweden [instituted a carbon tax](#) way back in 1991, or when Will Smith was still sitting on his throne as the Prince of Bel-Air. **As a result, carbon emissions decreased and the tax contributed revenue for Sweden's general budgets, which they were able to use to fund other climate-related initiatives.**

Some countries are lucky enough to reap the benefits of endemic natural energy sources that limit their reliance on fossil fuels. Take Iceland, the world's largest green energy producer per capita. As you may have seen on Zac Efron's Netflix series “Down to Earth with Zac Efron,” nearly all of the island's electricity comes from hydropower and [geothermal power](#).

And then there's the realities of winter. It would be a challenge worthy of reality TV to live out the cold months in Alaska (or, for that matter, Sweden) without using some kind of energy to stay warm.



## How do we know what is an acceptable carbon footprint per person in each country?

As we previously touched on, 189 countries have [signed the Paris Agreement](#). That means they've committed to take action—i.e., not just talk—to keep temperatures from hitting that 2-degree average increase.

Most countries are taking the agreement seriously, at least from the public image POV. China, for example, [has pledged](#) that it will reach carbon neutrality by 2060, and that its overall emissions will start going down before 2030.

Unfortunately, some experts, like the ones behind the [Climate Action Tracker](#), believe the environmental commitments set by most countries aren't yet enough to block the literal floodgates of global warming.

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**“ The absolutely unfair fact is that while the world's poorest countries have contributed the least to the climate crisis, they are especially vulnerable to the fallout.**

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### Is it fair to say that everyone has to reduce their carbon footprint? What are the ethical conundrums here?

These are thorny issues. As is the question of which countries should shoulder the biggest burden of cleaning up the environment, cutting consumption and investing in new and upgraded infrastructure. Should this be the nation responsible for the most emissions historically (the U.S.), the current top emitter (China) or the ones cranking out the most CO<sub>2</sub> per capita (oil-producing countries)?

You can't answer this question without bringing up climate justice, a concept that positions climate change as an ethical and political issue as much as an environmental one.

The absolutely unfair fact is that while the world's poorest countries have contributed the least to



Photo by Nicolas J Leclercq on Unsplash

the climate crisis, [they are especially vulnerable to the fallout](#), which includes everything from land degradation and devastating food shortages to escalating infectious diseases.

This also goes for the [poorest members](#) of relatively affluent countries, who tend to live in areas that are already plagued with pollution and that are at greatest risk of being negatively affected by climate change. **In the U.S., this group disproportionately includes people of color, hence the term [environmental racism](#).**

The less money you have, the less you're able to escape disasters like flooding and fires or to be able to pay for air-conditioning and other things that make life in a hot climate more bearable. Climate change solutions need to take this growing inequality into account.



## So... is there any good news? What is being done by countries to lower their greenhouse gas emissions?

Well, let's just say there's room for improvement. But because it's important to celebrate the small victories, here are a [few noteworthy measures](#) being rolled out.

- **Morocco** is one of few countries on track to reach Paris Agreement goals. It's achieving this by generating more of its electricity from renewable sources. One example? It's home to the world's largest concentrated solar farm, the [Noor-Ouarzazate complex](#), which creates enough electricity to [cover the needs of one million Moroccans](#).
- **India** wants to generate 40 percent of its power through renewables like solar by 2030, and [it's well on its way](#) to earlier-than-planned success. In the past decade, the government has also doubled its coal tax (a de facto carbon tax) three times, putting that money toward clean energy projects.
- **Costa Rica** already gets 98 percent of its electricity from renewables, chiefly hydropower. It wants to hit 100 percent by 2021. The country is also [turning its attention](#) to reducing emissions from fossil fuels used for transportation. For example, government policy encourages people to choose electric vehicles: not just with financial incentives like tax breaks, but also other attractive perks like better parking.



## 2.3 Break it down: the U.S. carbon footprint

[Close to 80 percent](#) of all U.S. emissions are thought to be directly or indirectly related to household consumption. That includes things like your electricity usage and the gas in your car, plus things you buy like appliances, furniture, gadgets and food.

What you do, use and buy can also generate emissions outside your country. Clothing as a category, for example, accounts for more than 12 percent of U.S. household emissions *overseas*, even though it has no significant domestic footprint. (In other words, if your shirt was manufactured, say, in Bangladesh, its carbon footprint is mostly attributed to that country. Which seems kind of unfair, since demand is coming from elsewhere.)

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### Which sectors contribute most to carbon emissions in the U.S.?

The United States Environmental Protection Agency (or, to their friends, the EPA) has been crunching the numbers on national GHGs from all human-made sources since 1990. The findings are published every year in the [Inventory of U.S. Greenhouse Gas Emissions and Sinks](#), which we’re sure would be a great pick for your bedside table if you’re prone to insomnia.

To browse numbers by sector, and see trends over time, you can use the EPA’s interactive tool,

the [Greenhouse Gas Inventory Data Explorer](#). For the CliffsNotes, have a look below for a breakdown of greenhouse gas emissions by sector in the U.S., according to [EPA data from 2018](#).

### Transportation (28 percent)

More than 90 percent of the fuel we use to get around—by car, truck, plane or diesel-powered train—is still petroleum-based. The largest sources of these emissions are passenger cars and light-duty trucks, including SUVs and minivans.

### Electricity (27 percent)

Around 63 percent of [U.S. electricity](#) comes from fossil fuels, mostly coal and natural gas; these release GHGs as they burn. In American homes, the [biggest electricity hog](#) is making things cooler and heating them up: that means the hot water tank, the furnace and AC, and the fridge, freezer and stove.

And then there's all our power-sucking gadgets and the systems they're connected to. The information and communications technology industry could account for [up to 21 percent of global electricity demand](#) by 2030.

### Industry (22 percent)

When it comes to the industrial production of goods, burning fossil fuels for power or heat is one of the biggest sources of GHG emissions. And sometimes the production process itself involves emissions, like when petroleum is used to manufacture plastic. (As for the impact of plastic, that's a story for another day.)

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### Commercial and residential (12 percent)

In this sector, many of the emissions in the U.S. are related to heating and cooking. Burning natural gas is responsible for the majority of GHGs directly emitted, since most of us don't burn any other fuels right in our homes anymore.

Other sources of GHG emissions include organic waste, wastewater and leaky air conditioning and refrigeration systems.

### Agriculture (10 percent)

Livestock, especially cattle, produce and release methane—enough to make up more than 25 percent of agriculture-related emissions in the U.S. Certain farming practices, like using fertilizers, can lead to emissions of nitrous oxide.

### Land use and forestry

Since trees and plant matter absorb and store carbon, that category is a “net sink” in the U.S. In fact, this sector offset around 12 percent of GHG emissions in 2018. Score one for the trees!

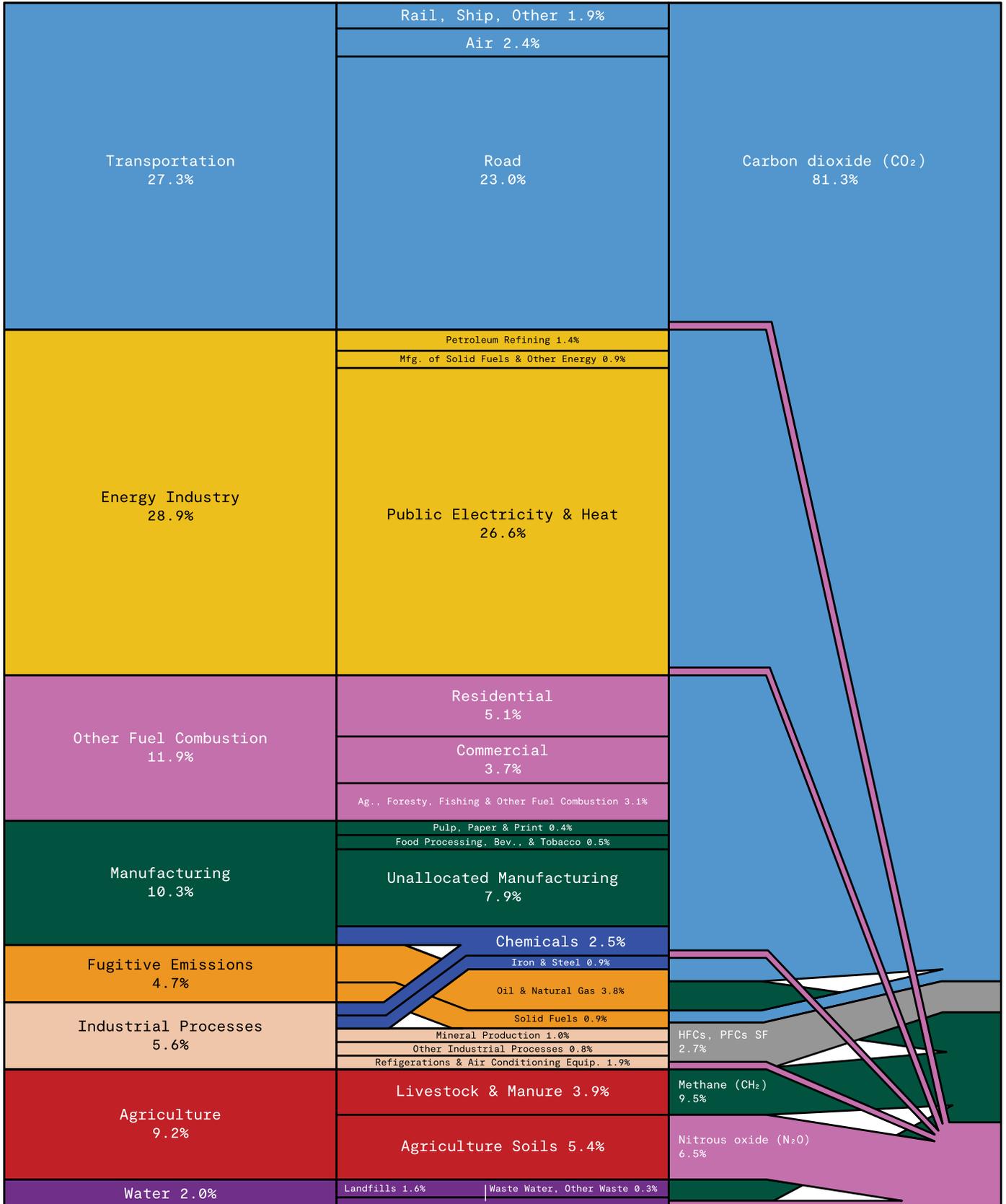


## LEO'S CLIMATE CRUSADE

He's famous for his big-screen roles and standing at the bow of the Titanic, but Leo has a leading part as an environmentalist, too. Since the '90s, he's been using his heartthrob status for good, shedding light on climate-related issues and becoming one of the most famous climate action champions in the world.

But it isn't just UN speeches, low-emissions cars and climate-change docs. Among other endeavors, the actor is a big-time investor in plant-based food companies. Since 1998, the Leonardo DiCaprio Foundation has funded more than 200 organizations with climate action and eco-system protection on their agendas. That's a romance we can get behind.

# U.S. Greenhouse Gas Emissions, 2018



[Source](#)



## 2.4 Carbon emissions, and what companies are doing about them

A country's carbon footprint is the sum of the actions of a lot of individuals—and that includes individual companies. The good news? For a number of reasons, more and more businesses are motivated to care about their carbon footprint.

To start with, consumers increasingly value and expect sustainable business practices.

Next, extreme weather caused by climate change is putting companies and their [supply chains](#) at risk. And no smart CEO likes that kind of risk.

Plus, businesses are realizing that a carbon-

conscious future isn't just about making sacrifices. In fact, it holds huge opportunities for growth and leadership.

### **Why are companies tracking their corporate carbon footprint? What's in it for them?**

Sometimes they just have to: The biggest GHG emitters in the U.S. must [report their data](#) annually to the EPA. Other times, companies track their corporate carbon footprint so they can give the details to non-profit organizations such as [CDP](#) (formerly the Carbon Disclosure Project), or because they have their own reasons for trying to do better.

CDP shares data on carbon emissions with potential investors. Since sustainability is increasingly crucial, a firm's carbon footprint—assuming it's relatively good—can be seen as a competitive edge.

## What are corporations doing with their carbon footprint score?

Just like age, a carbon footprint is, well, just a number. But if companies want their upcoming annual reports to include truly impressive graphs, they have to have a plan. And great news: There are plenty of companies making huge efforts to reduce their carbon footprints.

Luckily, there are lots of options available. They can work toward reducing emissions, or buy offsets to counteract their carbon footprint. They can set internal carbon pricing (more on this concept later). And they can also push their business partners, such as suppliers, to do their own carbon accounting and set emissions targets.

## What's being done to lower carbon emissions by industry?

Reducing greenhouse gas emissions begins with spotting the opportunities. And there is plenty of inspiration, if you know where to look. Like these potential measures:

- **Cut overall energy consumption:** One simple first step is to upgrade to energy-efficient lighting and HVAC equipment. Companies can also consider extensive building overhauls, known as “deep retrofits,” which are estimated to [save up to 60 percent in energy costs](#).
- **Reduce unnecessary business travel:** Transitioning to a [remote workforce](#), for instance, would cut down on car commuting, a significant source of emissions. If one good thing has emerged from the COVID-19 pandemic—at least when it comes to climate change—it's that we've been abruptly thrust into a world where video conferencing is normal.

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- **Use renewable energy:** Corporations can commit to getting more electricity from renewable sources like wind or solar power. Apple, for instance, [uses 100 percent renewable energy](#) for its operations. It's now working on transitioning its products—including its full supply chain—away from fossil fuels.
- **Buy carbon offsets:** Both companies and individuals can put money toward GHG-reducing measures (think tree planting, energy-efficiency projects and methane recovery) in order to balance out their emissions.

## Who's turning words into action when it comes to reducing corporate carbon emissions?

While no company has a perfect track record, there are lots of examples of positive corporate change when it comes to climate issues. Here are a few highlights.

- [Microsoft](#) intends to be carbon-negative by 2030. Even more ambitiously, by 2050 it aims to remove all the carbon it has emitted since the company was founded. To get this done, the company plans to slash its carbon emissions by more than half by 2030, and will launch a \$1-billion fund for climate innovation, aiming to accelerate technology for carbon reduction, capture and removal. Woohoo!
- Consumer goods giant [Unilever](#) plans to achieve net-zero emissions for all products by 2039. It will set up a system to improve supply-chain transparency, with each supplier invoice declaring the carbon footprint of goods and services provided. The company will also invest €1 billion in a climate fund, expected to support projects like reforestation, carbon sequestration and water preservation.





- [Amazon](#) wants to be carbon-neutral by 2040, and it co-founded [The Climate Pledge](#) to get other companies to hit that same deadline. It's reducing emissions related to customer shipments by developing more environmentally friendly packaging and delivering packages via zero-emission transportation such as electric trucks. And it intends to power its operations entirely with renewable energy by 2030.
- [Ford Motor Company](#) aims to be carbon-neutral globally by 2050. The car maker plans to run all its manufacturing plants worldwide on 100 percent locally sourced renewable energy by 2035. It will also be launching electric/no-emission versions of some of its most popular vehicles.
- Never one to be outdone, [Apple](#) has pledged to become carbon neutral for both its supply chain and its products by 2030. (The company's global corporate operations are already carbon neutral.) The plan includes low-carbon product design, increased energy efficiency, renewable energy, carbon removal (aka offsetting) and other innovations, like the development of a new, lower-carbon process for smelting aluminum. And also, because we're talking about the future, there's a smart recycling robot called Dave. No joke.

## What's all this talk about internal carbon pricing, and why are organizations using it?

It's widely expected that one day, emitting GHGs will come with a cost to corporations, like a government-imposed carbon tax. (This kind of system already exists in some countries.)

To prepare for this future, some companies are setting their own internal carbon pricing. This can be a real fee that's collected, or a "shadow" amount that's strictly theoretical, like Monopoly money.

Here are two examples, along with the business benefits.

- [Microsoft](#) has an internal carbon fee of \$5–\$10 per metric ton. They funnel the funds into sustainability projects, like the purchase of renewable energy.
- [BHP](#) set a shadow price on its carbon of \$24–\$80 per metric ton. They've factored this cost into their budgets to help them manage risks and make decisions, including ways to mitigate current emissions.

## If I want to shop and invest according to my values, how can I tell the difference between greenwashing and legitimately sustainable companies?

It's not always easy to tell if claims are just greenwashing—a marketing tactic designed to create the illusion that a company is more environmentally friendly than it truly is—but there are some questions to ask while you're digging. How does the company define "sustainable," "carbon-neutral" or "climate-positive," and what's the specific plan to get there? Will it reduce corporate carbon emissions by switching to renewable energy, buying carbon offsets, or both? How will progress be measured and documented? Those companies that are making real change are easily able to explain how they're doing it.

Luckily, you don't (always) need to casually comb through 70-page annual reports to figure this out. There are tools available to help you research just how sustainable a company really is. [Good On You](#) is a guide to the clothing industry, for example, and [HowGood](#) gives insight into food brands.



Photo by Karolina Grabowska from Pexels

## 2.5 Now that I know my carbon footprint, what can I do to reduce it?

Real talk: it's not always easy, and our society is built for consumption, not reduction. But no matter the size of your personal carbon footprint, you really can make mindful changes to lower it. Here are just a few ideas to start.

- Considering going vegan or vegetarian, at least part-time. [One study](#) estimates that eliminating meat and dairy would reduce our footprints from food by two-thirds. We know, steak is tasty, and cheese is delicious. So don't think it's a question of all or nothing. **Even eating less red meat (especially beef and lamb) and more plants will still make a difference.** Meatless Monday is a really delicious challenge to take on. Honest.

- When you can, trade car rides for bikes, buses, trains or your own two feet. The next time you're in the market for a vehicle, consider if an electric or hybrid might be your next ride.
- Reduce your overall home energy use. Make sure the heat or AC isn't cranked too high, improve insulation and switch to energy-efficient appliances when the time comes for replacements. (And listen to your thrifty grandfather: turn the lights off when you're not in the room!)
- When it comes to clothing and other consumer goods, we could all stand to be more considerate about purchases. Buying less, shopping vintage or secondhand and choosing quality things we'll want to keep for years are all steps in the right direction.

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Up for more? You got it. Head on over to Chapter 3 for our guide to reducing your carbon footprint with 26 ways to get started today.