

# Examples of Personal Actions to Reduce Your Carbon Footprint

	Already Doing	Might Do
<b>Home &amp; Garden</b>		
1. Turn down your water heater and use cold water when washing clothes		
2. Buy green cleaning products and reduce purchases of products in plastic packaging		
3. Electrify your home, swap-out old appliances, and buy Energy Star models		
4. Turn off and unplug appliances, lamps, TVs, computers, etc. when not in use		
5. Replace incandescent and CFL light bulbs with LED bulbs		
6. Insulate your home and install double-pane windows to prevent heat loss		
7. Conserve water by collecting water in shower and kitchen to water your garden		
8. Flush toilets less frequently, reduce water tank volume and take shorter showers		
9. Use rain barrels to collect excess water coming off your roof during storms		
10. Use less heat in the winter, less air conditioning in the summer, and line dry clothes		
11. Regularly replace old filters on heaters, dryers, and other appliances		
12. Use bamboo wood when renovating your home and for paper products (e.g. toilet paper)		
13. Landscape gardens with drought-resistant native plants and native trees		
14. Reduce food waste and create a compost bin to recycle and generate new soil		
15. Clear weeds and foliage around your house to reduce fire hazard		
16. Plant your garden without using pesticides or herbicides		
<b>Energy</b>		
17. Use a programmable thermostat to save energy when you are not at home		
18. Purchase or lease rooftop solar panels to generate renewable electricity		
19. Choose 100% renewable electricity option with your CCE clean energy utility		
20. Join a community solar grid if you live in an apartment or can't install solar		
21. Install a solar water heating system or heat pump in your home		
22. Install tank-less water heaters at faucets and showers throughout your home		
23. Install a home battery to save excess solar power generated in the daytime		
24. Schedule a free energy audit on your home with your local utility		
25. Convert to 100% renewable electricity at home and have gas line dismantled		
26. Erect residential wind turbine on your property where permitted by zoning law		
<b>Travel &amp; Lifestyle</b>		
27. Drive less. Carpool. Walk or bike more. Use more public mass transit.		
28. Drive a hybrid, electric, or hydrogen car to reduce or eliminate CO2 emissions		
29. Use shared economy services such as ZipCar, Freecycle, Uber, Lyft, etc.		
30. Fly less, take a "staycation" instead of a vacation in another location		
31. Simplify your life. Simply buy less stuff		
32. Ditch the plastic. Say NO to single use water bottles and disposable packaging		
33. Eat less meat. Eat a more local, organic, plant-based diet. Try Meatless Mondays.		
34. Bring reusable bags to the grocery store and use a reusable water bottle		
<b>Business &amp; Finance</b>		
35. Divest fossil fuel-based stocks from your portfolio		
36. Invest in renewable energy public companies such as SunRun, SunPower, Tesla...		
37. Buy carbon offsets when traveling by plane or ship from Terrapass, etc.		
38. Support local green businesses and ask them to stock additional green products		
39. Join or start a green team at your workplace		
40. Prioritize innovation of low carbon solutions		

**BILL GATES**

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**HOW TO  
AVOID A  
CLIMATE  
DISASTER**

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**THE SOLUTIONS WE HAVE AND THE  
*BREAKTHROUGHS WE NEED***

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## CHAPTER 12

# WHAT EACH OF US CAN DO

**I**t's easy to feel powerless in the face of a problem as big as climate change. But you're not powerless. And you don't have to be a politician or a philanthropist to make a difference. You have influence as a citizen, a consumer, and an employee or employer.

### As a Citizen

When you ask yourself what you can do to limit climate change, it's natural to think of things like driving an electric car or eating less meat. This sort of personal action is important for the signals it sends to the marketplace—see the next section for more on that point—but the bulk of our emissions comes from the larger systems in which we live our daily lives.

When somebody wants toast for breakfast, we need to make sure there's a system in place that can deliver the bread, the toaster, and the electricity to run the toaster without adding greenhouse gases to the atmosphere. We aren't going to solve the climate problem by telling people not to eat toast.

But putting this new energy system in place requires concerted political action. That's why engaging in the political process is the

most important single step that people from every walk of life can take to help avoid a climate disaster.

In my own meetings with politicians, I've found that it helps to remember that climate change isn't the only thing on their plate. Government leaders are also thinking about education, jobs, health care, foreign policy, and more recently, COVID-19. And they should: All those things demand attention.

But policy makers can take on only so many problems at once. And they decide what to do, what to prioritize, based on what they're hearing from their constituents.

In other words, elected officials will adopt specific plans for climate change if their voters demand it. Thanks to activists around the world, we don't need to generate demand: Millions of people are already calling for action. What we do need to do, though, is to translate these calls for action into pressure that encourages politicians to make the tough choices and trade-offs necessary to deliver on their promises to reduce emissions.

Whatever other resources you may have, you can always use your voice and your vote to effect change.

**Make calls, write letters, attend town halls.** What you can help your leaders understand is that it's just as important for them to think about the long-term problem of climate change as it is for them to think about jobs or education or health care.

It may sound old-fashioned, but letters and phone calls to your elected officials can have a real impact. Senators and representatives get frequent reports on what their offices are hearing from constituents. But don't simply say, "Do something about climate change." Know where they stand, ask them questions, and make clear that this is an issue that will help determine how you vote. Demand more funding for clean energy R&D, a clean energy standard, a price on carbon, or any of the other policies from chapter 11.

**Look locally as well as nationally.** A lot of the relevant decisions are made at the state and local levels by governors, mayors, state



legislatures, and city councils—places where individual citizens can have an even bigger impact than at the federal level. In the United States, for example, electricity is primarily regulated by statewide public utility commissions, made up of either elected or appointed commissioners. Know who your representatives are and keep in touch with them.

**Run for office.** Running for the U.S. Congress is a tall order. But you don't have to start there. You can run for state or local office, where you'll probably have more impact anyway. We need all the policy smarts, courage, and creativity in public office that we can get.

## As a Consumer

The market is ruled by supply and demand, and as a consumer you can have a huge impact on the demand side of the equation. If all of us make individual changes in what we buy and use, it can add up to a lot—as long as we focus on changes that are meaningful. For example, if you can afford to install a smart thermostat to reduce your energy consumption when you're not at home, by all means do it. You'll cut your utility bill and your greenhouse gas emissions.

But reducing your own carbon emissions isn't the most powerful thing you can do. You can also send a signal to the market that people want zero-carbon alternatives and are willing to pay for them. When you pay more for an electric car, a heat pump, or a plant-based burger, you're saying, "There's a market for this stuff. We'll buy it." If enough people send the same signal, companies will respond—quite quickly, in my experience. They'll put more money and time into making low-emissions products, which will drive down the prices of those products, which will help them get adopted in big numbers. It will make investors more confident about funding new companies that are making the breakthroughs that will help us get to zero.

Without that demand signal, the innovations that governments

and businesses invest in will stay on the shelf. Or they won't get developed in the first place, because there's no economic incentive to make them.

Here are some specific steps you can take:

**Sign up for a green pricing program with your electric utility.**

Some utility companies allow homes and businesses to pay extra for power from clean sources. In 13 states, utilities are required to offer this option. (You can see whether your state does by checking the Green Pricing Programs map at C2ES—the Center for Climate and Energy Solutions—[www.c2es.org/document/green-pricing-programs](http://www.c2es.org/document/green-pricing-programs).) Customers in these programs pay a premium on their electric bill to cover the extra cost of renewable energy, an average of one to two cents per kilowatt-hour, or \$9 to \$18 a month for the typical American home. When you participate in these programs, you're telling your utility company that you're willing to pay more to address climate change. That's an important market signal.

But what these programs don't do is cancel out emissions or lead to meaningful increases in the amount of renewable power on the grid. Only government policies and increased investments can do that.

**Reduce your home's emissions.** Depending on how much money and time you can spare, you can replace your incandescent lightbulbs with LEDs, install a smart thermostat, insulate your windows, buy efficient appliances, or replace your heating and cooling system with a heat pump (as long as you live in a climate where they can operate). If you rent your home, you can make the changes within your control—such as replacing lightbulbs—and encourage your landlord to do the rest. If you're building a new home or renovating an old one, you can opt for recycled steel and make the home more efficient by using structural insulated panels, insulating concrete forms, attic or roof radiant barriers, reflective insulation, and foundation insulation.

**Buy an electric vehicle.** EVs have come a long way in terms

of cost and performance. Although they might not be right for everyone (they're not great for lots of long-distance road trips, and charging at home isn't convenient for everyone), they're becoming more affordable for many consumers. This is one of the places where consumer behavior can have a huge impact: If people buy lots of them, companies will make lots of them.

**Try a plant-based burger.** I'll admit that veggie burgers haven't always tasted great, but the new generation of plant-based protein alternatives is better and closer to the taste and texture of meat than their predecessors. You can find them in many restaurants, grocery stores, and even fast-food joints. Buying these products sends a clear message that making them is a wise investment. In addition, eating a meat substitute (or simply not eating meat) just once or twice a week will cut down on the emissions you're responsible for. The same goes for dairy products.

## As an Employee or Employer

As an employee or a shareholder, you can push your company to do its part. Of course, big companies will have the largest impact in many of these areas, but small companies can also do a lot, especially if they work together through organizations like local chambers of commerce.

Some steps are easier than others. The easy things do matter—planting trees to offset emissions, for instance, is a good thing to do for environmental and political reasons. It demonstrates that you care about climate change.

But doing only the easy things won't solve the problem. The private sector will also need to embrace the harder steps.

For one thing, that means accepting more risk—for example, financing projects that might fail, but might turn into a clean-energy



breakthrough. Shareholders and board members will have to be willing to share in this risk, making it clear to executives that they'll back smart investments even if they don't ultimately pan out. Companies and their leaders need to be rewarded for making bets that could move us forward on climate change.

Companies can also work with each other to identify and try to solve the toughest climate challenges. That means looking for the biggest Green Premiums and trying to reduce them. If the world's biggest private-sector consumers of materials like steel and cement got together and demanded cleaner substitutes—and committed to investing in the infrastructure needed to make them—it would accelerate research and shift the market in the right direction.

Finally, the private sector can advocate for making these hard choices—for instance, by agreeing to use its resources to develop these markets, and by demanding that governments set up regulatory structures in which new technologies can succeed. Are political leaders focusing on the biggest sources of emissions and the toughest technical challenges? Are they talking about grid-scale energy storage, electrofuels, nuclear fusion, carbon capture, and zero-carbon cement and steel? If not, they're not helping us get on the path to zero emissions by 2050.

Here are some specific steps the private sector can take along these lines:

**Set up an internal carbon tax.** Some big companies now impose a carbon tax on each of their divisions. These companies aren't paying lip service to reducing emissions. They're helping products get out of the lab and into the market, because the revenue from internal taxes can go directly to activities that reduce the Green Premiums and help create a market for the clean-energy products those firms will need. Employees, investors, and customers can advocate for this approach, giving cover to the executives responsible for implementing it.



**Prioritize innovation in low-carbon solutions.** Investing in new ideas used to be a point of pride for most industries, but the glory years of corporate R&D are gone. Today, companies in the aerospace, materials, and energy industries spend on average less than 5 percent of their revenue on R&D. (Software companies spend upwards of 15 percent.) Companies should reprioritize their R&D work, particularly on low-carbon innovations, many of which will require long-term commitments. Larger companies can partner with government researchers to bring practical commercial experience to research efforts.

**Be an early adopter.** Like governments, companies can use the fact that they buy a lot of products to speed up the adoption of new technologies. Among other things, this can involve using electric vehicles for corporate fleets, buying lower-carbon materials to build or renovate company buildings, and committing to use a certain amount of clean electricity. Many companies around the world have already committed to using renewable power for a large part of their operations, including Microsoft, Google, Amazon, and Disney. The shipping company Maersk has said it will cut its net emissions to zero by 2050.

Even if these commitments will be hard to meet, they send important market signals about the value of developing zero-carbon approaches. Innovators see the demand and know they'll have a market ready to buy their products.

**Engage in the policy-making process.** Companies can't be afraid of working with the government, any more than governments should be afraid of working with companies. Businesses should champion getting to zero and support funding for basic science and applied R&D programs that will get us there. This will be especially important given the decline in corporate R&D over the past several decades.

**Connect with government-funded research.** Businesses should

be advising government R&D programs so that basic and applied research is focused on the ideas that have the best shot of turning into products. (No one knows what is or isn't likely to succeed better than the companies that develop and market products every day.) Joining industry advisory boards and taking part in planning exercises are low-cost ways to inform government R&D programs.

Companies can also help fund R&D through cost-sharing agreements and joint research projects—the kind of public-private collaboration that gave us gas turbines and advanced diesel engines.

**Help early-stage innovators get across the valley of death.** Many researchers never turn their promising ideas into products because the process would be too risky or too expensive. Established businesses can help by providing access to their testing facilities and providing data like cost metrics. If they want to do more, they can offer fellowships and incubation programs for entrepreneurs, invest in new technology, create business divisions that are specifically focused on low-carbon innovation, and finance new low-emissions projects.

## One Last Thought

Unfortunately, the conversation about climate change has become unnecessarily polarized, not to mention clouded by conflicting information and confusing stories. We need to make the debate more thoughtful and constructive, and most of all we need to center it on realistic, specific plans for getting to zero.

I wish there were some magic invention that could steer the conversation in a more productive direction. Of course, no such device exists. Instead, it's up to each of us.

My hope is that we can shift the conversation by sharing the facts with the people in our lives—our family members, friends,

and leaders. And not just the facts that tell us why we need to act, but also those that show us the actions that will do the most good. One of my goals in writing this book is to spark more of these conversations.

I also hope we can unite behind plans that bridge political divides. As I've tried to demonstrate, this isn't as naive as it may sound. No one has cornered the market on effective solutions to climate change. Whether you're a believer in the private sector, or government intervention, or activism, or some combination, there's a practical idea you can get behind. As for the ideas you can't support, you may feel compelled to speak out, and that's understandable. But I hope you'll spend more time and energy supporting whatever you're in favor of than opposing whatever you're against.

With the threat of climate change upon us, it can be hard to be hopeful about the future. But as my friend Hans Rosling, the late global health advocate and educator, wrote in his amazing book *Factfulness*: "When we have a fact-based worldview, we can see that the world is not as bad as it seems—and we can see what we have to do to keep making it better."

When we have a fact-based view of climate change, we can see that we have some of the things we need to avoid a climate disaster, but not all of them. We can see what stands in the way of deploying the solutions we have and developing the breakthroughs we need. And we can see all the work we must do to overcome those hurdles.

I'm an optimist because I know what technology can accomplish and because I know what *people* can accomplish. I'm profoundly inspired by all the passion I see, especially among young people, for solving this problem. If we keep our eye on the big goal—getting to zero—and we make serious plans to achieve that goal, we can avoid a disaster. We can keep the climate bearable for everyone, help hundreds of millions of poor people make the most of their lives, and preserve the planet for generations to come.