

FROM THE ACCLAIMED
ENVIRONMENTALIST, A CALL
TO HARNESS THE POWER OF
THE SUN AND REWRITE OUR
SCIENTIFIC, ECONOMIC, AND
POLITICAL FUTURE.

HERE COMES THE SUN

A Last Chance for the
Climate and a Fresh Chance
for Civilization

BILL MCKIBBEN

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Our climate, and our democracy, are melting down. But Bill McKibben, one of the first to sound the alarm about the climate crisis, insists the moment is also full of possibility. Energy from the sun and wind is suddenly the cheapest power on the planet and growing faster than any energy source in history—if we can keep accelerating the pace, we have a chance.

Here Comes the Sun tells the story of the sudden spike in power from the sun and wind—and the desperate fight of the fossil fuel industry and their politicians to hold this new power at bay. From the everyday citizens who installed solar panels equal to a third of Pakistan's electric grid in a year to the world's fifth-largest economy—California—nearly halving its use of natural gas in the last two years, Bill McKibben traces the arrival of plentiful, inexpensive solar energy. And he shows how solar power is more than just a path out of the climate crisis: it is a chance to reorder the world on saner and more humane grounds. You can't hoard solar energy or hold it in reserves—it's available to all.

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LET'S DO THIS!

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Introduction

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As I wrote the first words of this book, late in December 2024, a warm rain pelted the Green Mountains of Vermont. It should have been snow, of course, but scientists had just announced that 2024 was the hottest year ever recorded—indeed, the paleoclimatologists said it had been the hottest year in the last 125,000. While I was still immersed in typing these pages, America inaugurated Donald Trump as president after he ran on the premise that global warming was a hoax. Oh, and Los Angeles caught fire; among the least important results of that conflagration was that the home of my earliest memories, up against the Altadena hills, burned to the ground.

If I have a literary reputation, it's for a kind of dark realism. When I was still in my 20s—way back in the 1980s—I published what is sometimes called the first book on the climate crisis. It bore the cheerful title *The End of Nature*; in the decades since, with 20 books and countless essays and articles published, I have chronicled those early warnings as they came true. This moment would seem to be—indeed it is—the summation and the vindication of all that angst.

And yet, right now, really for the first time, I can see a path forward. A path lit by the sun.

And it's a path not just out of the climate crisis—it's a path that opens into a very new world. As I type, I've got this book's titular song, George Harrison's gentle and optimistic anthem, pouring through the headphones, blotting out the sound of the rain on the roof. I think that even as we teeter on the brink of renewed fascism, we're also potentially on the edge of one of those rare and enormous transformations in human history—something akin to the moment a few hundred years ago when we learned to burn coal and gas and oil, triggering the Industrial Revolution and hence modernity. But now, quite suddenly, we're learning *not* to burn those fossil fuels, and to rely instead on the large ball of flaming gas that hangs 93 million miles distant in the sky. We're on the verge of realizing that the sun, which already provides us light and warmth and photosynthesis, is also willing to provide us the power we need to run our lives. We are on the verge of turning to the heavens for energy instead of to hell.

It won't happen automatically, and I don't know if we *will* do it, at least in the short window physics is giving us to deal with climate change. In his first hours in office Trump did all he could think of to steer America and the world away from this bright future; the main headline in *The New York Times* on his second day was "Trump Wants to Unleash Energy, as Long as It's Not Wind or Solar." So no, it won't be easy. But I am convinced it *could* happen, and certain that it should. In a world where almost everything seems to be going wrong, this is the one big thing suddenly going right. I am willing to fight for it, and I hope you will be, too.

In one sense, this book is very time-bound. Sometime in the early part of the 2020s we crossed an invisible line where the cost

of producing energy from the sun dropped below the cost of fossil fuel. That's not yet common knowledge—we still think of photovoltaic panels and wind turbines as "alternative energy," as if they were the Whole Foods of power, nice but pricey. In fact—and more so with each passing month—they are the Costco of energy, inexpensive and available in bulk. We live on an earth where the cheapest way to produce power is to point a sheet of glass at the sun; the second-cheapest is to let the breeze created by the sun's heating turn the blade of a wind turbine. Beginning about the middle of 2023, we entered the really steep part of this growth curve that could redefine our future, crossing another invisible line, this one marking the installation of a gigawatt's worth of solar panels on this planet every day. (A gigawatt is about the output of a typical coal-fired power plant or nuclear reactor.) By the fall of 2024 that gigawatt was going up every 18 hours. We're still in the early days of this transformation—right now only about 15 percent of the planet's electricity comes from sun and wind, and only about a quarter of the energy we use comes from electricity. But exponential growth changes numbers like that very fast—in 2024, 92.5 percent of all new electricity bought online around the world came from renewables; in the US the figure was 96 percent. By April 2025, fossil fuel was producing less than half of American electricity, for the first time ever. There's no longer a technical or financial obstacle in the way; we already have the factory capacity, mostly in China, to produce as many solar panels as the climate scientists say we need. In May 2025 came the news that China had used 5 percent less coal in the first quarter of the year to produce electricity than it had in 2024—despite a surging economy, Chinese emissions were actually dropping.

The suddenness of this moment is startling. The solar cell was invented in 1954, and it took from then until 2022 to install the

first terawatt worth of solar power on this planet. It took two

years to get the second; the third will be quicker still. *It's all brand new.*

But there are a few places that are running far ahead, showing what's possible. China is well on its way to being the earth's first "electro-state"; something like half of all clean energy has been installed within its borders. And 2024 was a breakout year in California: there were finally enough solar panels that for parts of most days the state could produce from renewable sources more than 100 percent of the electricity it used; at night great batteries that had spent the afternoon soaking up sunshine often became the biggest source of supply to the electric grid of the world's fifth-largest economy. As a result, in 2024 California used 25 percent less natural gas to produce its power than it had in 2023, which is a big number. Through mid-April of 2025, as more panels and batteries came online, the numbers got even better: California was using 44 percent less natural gas to make electricity than it had just two years earlier. On the other side of the world, in Pakistan, a flood of cheap solar panels from China let homeowners and storekeepers and factory managers build the equivalent of a third of the country's electric grid inside of a year. Peasant farmers, often just laying the panels on the ground, started pumping their irrigation water with electricity instead of generators powered with fossil fuels; diesel sales dropped 30 percent in the course of a year.

Those kind of shifts, replicated quickly in many more places, could take a real bite out of the grim predictions of climate scientists; the sun burns so we don't need to. We are in a desperate race; those scientists have told us that to stay on anything like a survivable path we must cut greenhouse gas emissions in half before the decade is out. That target is on the bleeding edge of the technically possible, and this book is an effort to shove us toward that deadline.

But I hope that this book is timeless as well—that it's anticipating a shift that will play out over many lifetimes, and in ways that diverge dramatically from our recent history. That's because energy from the sun is not just cheap. It's also *diffuse*, available everywhere instead of concentrated in a few places. And that prefigures a different world with a more localized and more humane geopolitics; indeed, the sun works more reliably toward the equator, which could allow the redress of some of earth's great inequities. In February 2025 the energy analysts at the Rocky Mountain Institute reported that renewable energy was growing twice as fast in the developing world of the Global South as in the developed world of the Global North. Relying on energy sources that are abundant instead of scarce—the sun and the wind each day produce thousands of times as much energy as we could ever use—could even reconfigure our ideas of competition and conquest. Unlike oil and gas, sun and wind can't be hoarded. If fascism scares you the way it does me, figuring out how to break the centralized power of the fossil fuel industry is a key form of resistance.

And for a species that has become almost fatally disconnected from the natural world, the sun offers a way back into a relationship with reality. We were all sun worshippers once; it's not perhaps too much to imagine that we might someday soon gaze up a little more often, maybe even breaking a little of the enchantment woven by the glowing lights in our palms. This is not, I think, a "technofix," but something far more fundamental. We have the chance to join in a great global project, providing affordable energy to every human community even as we stave off our greatest threat. It could prove a unifying mission for a divided world. The last remotely comparable project was the moon shot of the 1960s,

but that involved one nation putting two men on an orbiting rock. This quest involves bringing our star down to earth to make that earth work—what could be more quintessentially human?

All this hope risks sounding giddy; let my dark realism reassert itself for a moment and offer up some caveats and cautions. I'm not overly concerned about the things people usually point to. As I'll make clear, we're not going to run short of minerals to build batteries or land to put panels on. Instead, my worries stem from hard realities both physical and political.

First, this definitely comes too late to “stop global warming.” We've already done fundamental damage to the planet's physical systems, to the point of altering the jet stream and weakening the Gulf Stream; we've already raced past the 1.5 degree Celsius rise in global temperature that we pledged in Paris to avoid. (In April 2025, the Trump administration fired most of the American scientists who monitor this increase, perhaps reasoning that what we don't know can't hurt us.)

Our best hope now is simply to stop the heating of the earth short of the point where it cuts civilization off at the knees, and even that will be a very close call. I will return to the question of pace over and over in these pages, because it's what matters most. I have little doubt we will run the world on sun and wind 40 years from now, but if it takes us anything like 40 years to get there then it will be a broken planet; our energy sources will hardly matter. The march of history won't get us where we need to go fast enough; we need to force that march.

Second, there's no guarantee that the momentum of the last few years will continue. The fossil fuel industry has read the numbers too, and so they've girded for the fight. As the chairman of one big oil company said in the fall of 2024, the industry

thinks we should keep burning gas and oil until “every last molecule” had been sucked from the earth. If you think that capitalism guarantees we'll pick the lowest-priced option, think again: In certain ways, solar and wind power are almost too cheap for our economy. Investors who have gotten rich controlling the hoarded “reserves” of fossil fuel are scared of the fact that the sun delivers energy for free each time it rises above the horizon, and in their fear they're massively gaming our political system. The worldwide elections of 2024 saw setback after setback, with oil-soaked populists winning control in too many places. Just as they played the game of climate denial with real success for three decades, they now engage in a kind of solutions denial, claiming we're not ready for clean energy, or offering up substitutes closer to the status quo. Some of these substitutes (geothermal power and nuclear energy, if the cost ever comes down) may offer useful side dishes to the main course of sun, wind, and batteries; others (carbon capture from power plants, biofuels) are just expensive efforts to extend the business model of this industry a little longer. All of the substitutes are effective at distracting us, especially in the distorted infosphere of greenwash and spin we inhabit.

Nowhere, of course, is that distortion more powerful than the United States, where Trump rode back into office vowing to “drill, baby, drill” and to crash the electric vehicle (EV) industry. He'd been in office four hours when he signed an order ending all federal support for wind power. (As for solar energy, the week before the election he said, “it's all steel and glass and wires. It looks like hell. And you see rabbits get caught in it.”) By April, just three months into his second term, Trump was announcing plans to revive the coal industry, and his bizarre tariffs were making life harder for renewable energy developers; he cut off funding to Princeton's climate modelers on the grounds that their findings were causing “climate anxiety.” All of which is to offer a third

caution: Just because the world goes in one direction, that doesn't mean every nation will follow. Yes, there's enormous momentum behind this transformation; on the last day of February 2025 the federal Energy Information Administration predicted that 93 percent of American electric generation built in Trump's first year would be carbon-free, mostly from solar. In the first month of 2025, as Trump was taking office, sun and wind combined made up 98 percent of new generating capacity in the States. But clearly the Trump/Musk team will try to break that momentum; already-high tariffs on Chinese solar panels are being increased again even as I finish this manuscript, and the administration is embarked on a sprawling effort to achieve "energy dominance" based on oil and gas. It's an effort to stuff the solar genie back in the barrel, and we don't know yet to what degree it will succeed. The Biden administration, with the Inflation Reduction Act, set in motion transformative spending on clean energy technology, and spread the money carefully around the red states; Texas, home base of the hydrocarbon industry, is now outpacing even California in clean energy (though the state legislature, as of spring 2025, was engaged in an all-out effort to sabotage that growth). Power from the sun can appeal to conservatives ("my home is my well-wired castle") as powerfully as it does to liberals. But the addiction to fossil fuels and all its accomplices (the giant SUV, say) runs deeper here than anyplace else; it will be a fight to turn the American page.

I'm ready for that fight. Even as I write these pages, I'm helping organize what we're calling Sun Day, set for the autumnal equinox in September 2025. Indeed, some of the proceeds from this book are supporting that organizing process, because its goal is the same: to help people understand the possibility of our moment. As we shall see, much of the progress that engineers have made has come on the back of inspired activism, something

we need more of. In this fight, the solar panel and the wind turbine are both the crucial machines and also the symbols of potential liberation.

And in true Hollywood fashion, our liberation and our destruction are arriving at precisely the same time, offering us a remarkable choice. Everything is going wrong, except this one big thing. Our species, at what feels like a very dark moment, can take a giant leap into the light. Of the sun.