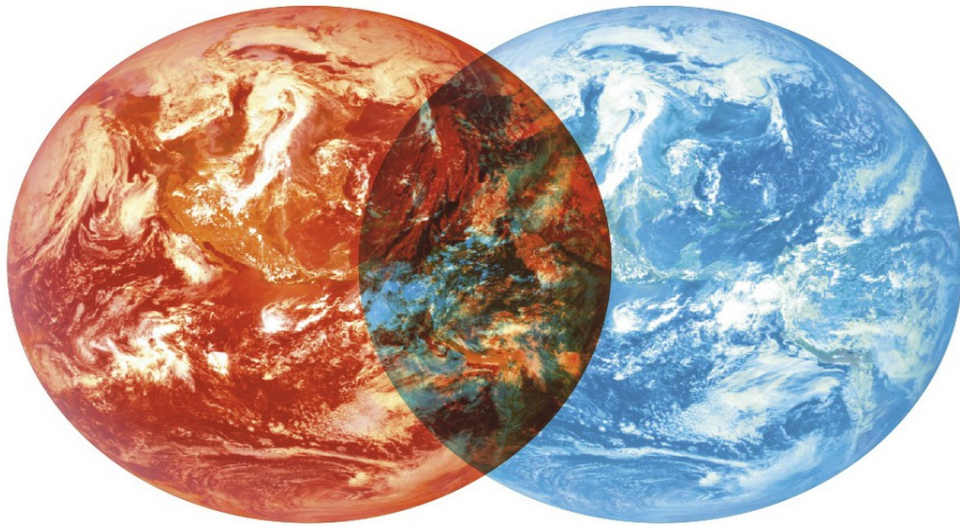


THE FUTURE WE CHOOSE



Surviving the Climate Crisis

Christiana Figueres and
Tom Rivett-Carnac

Architects of the 2015 Paris Agreement

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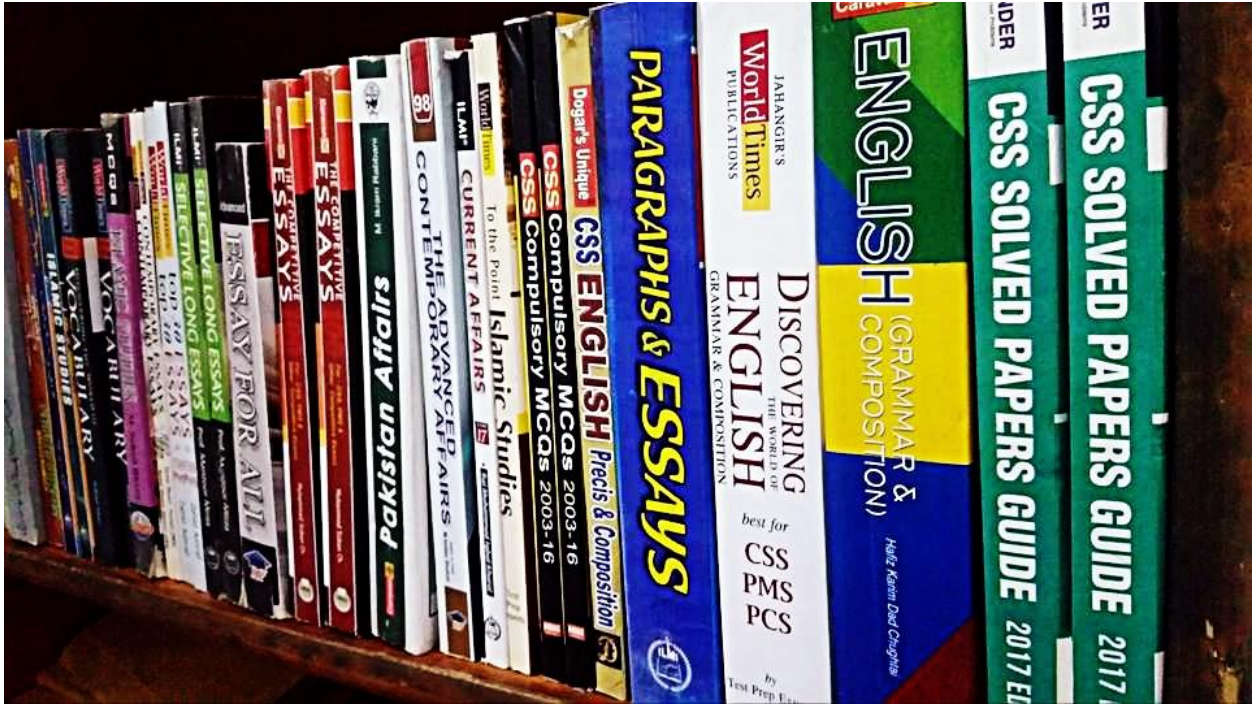


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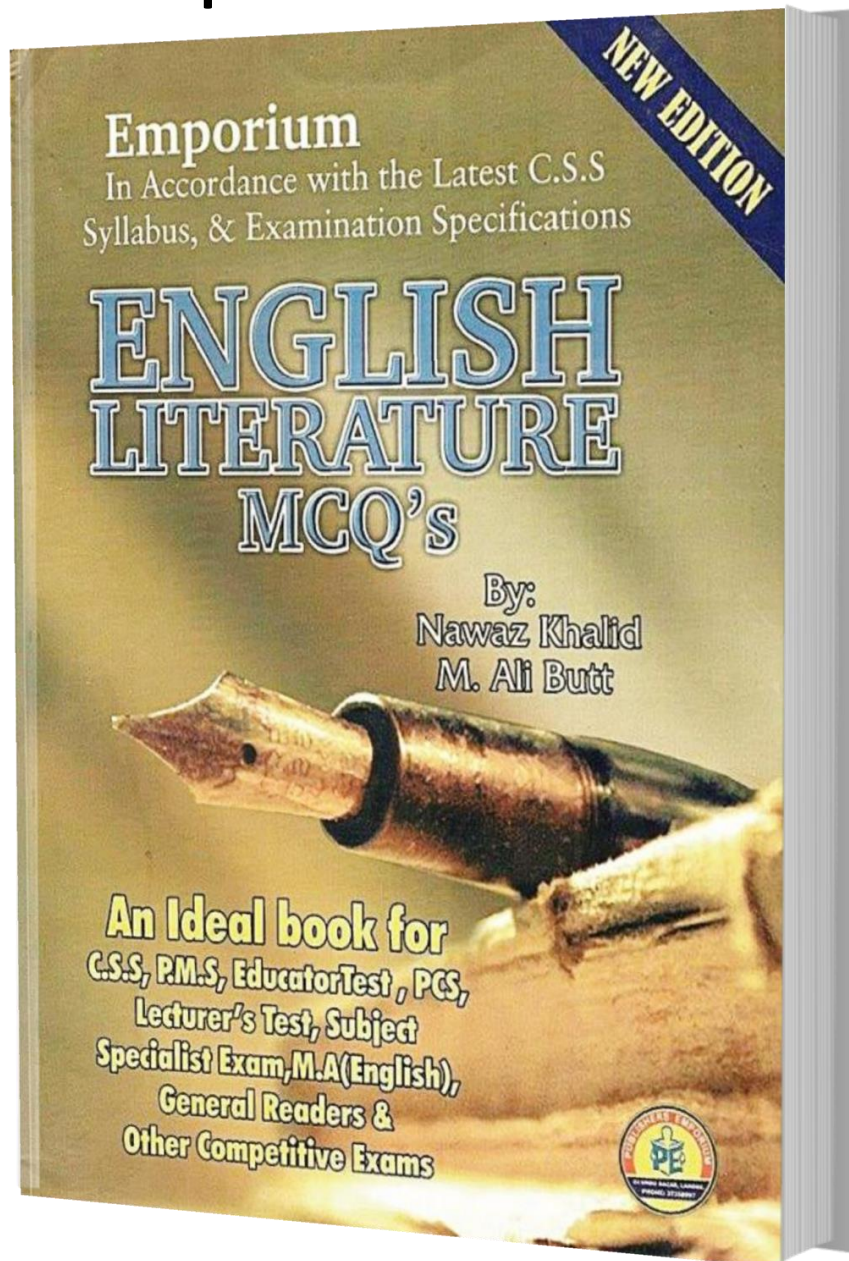
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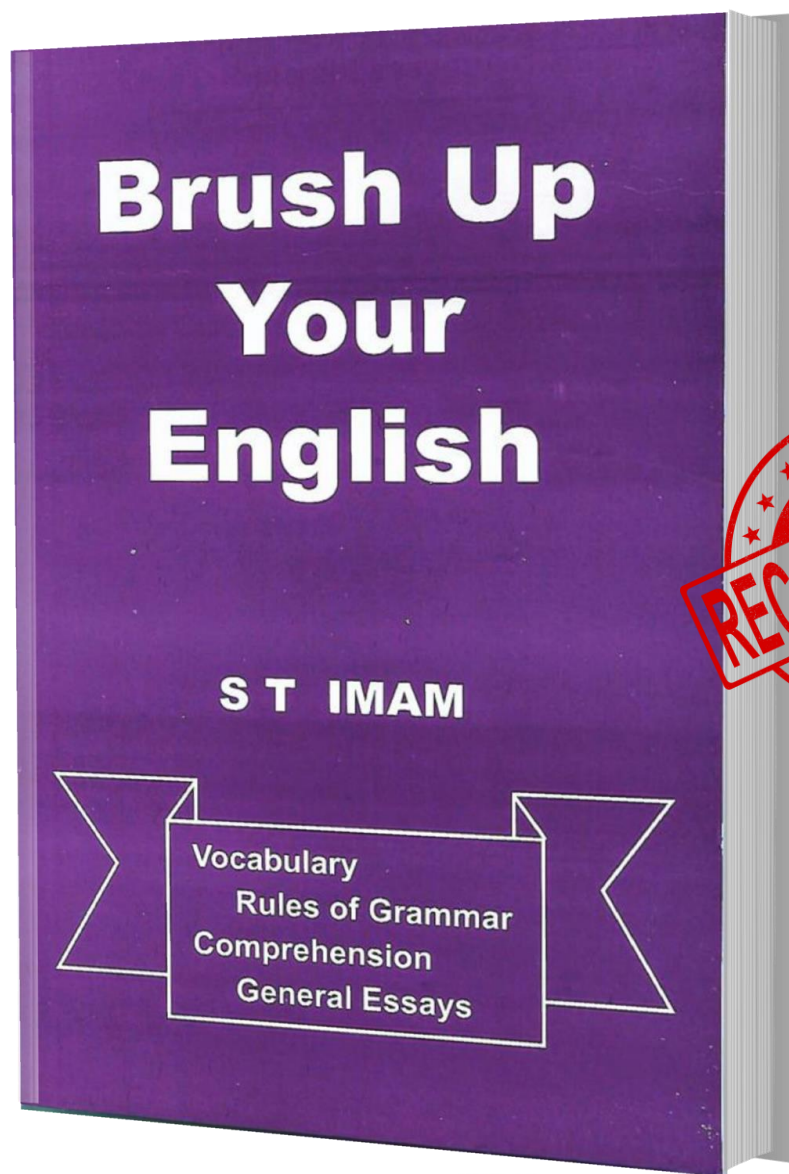


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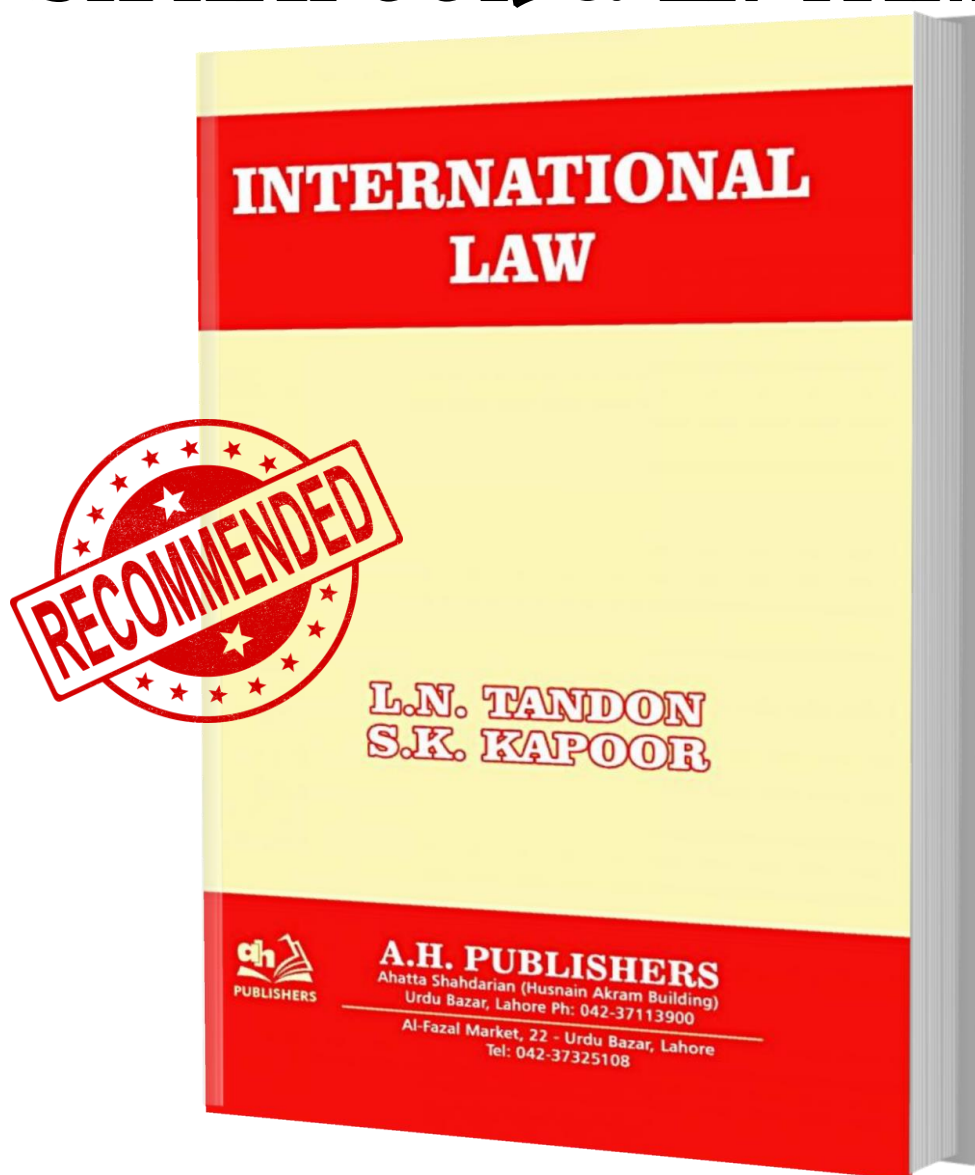


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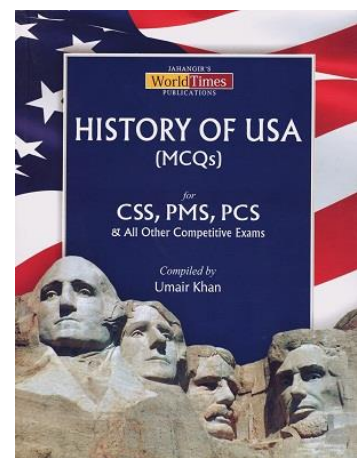
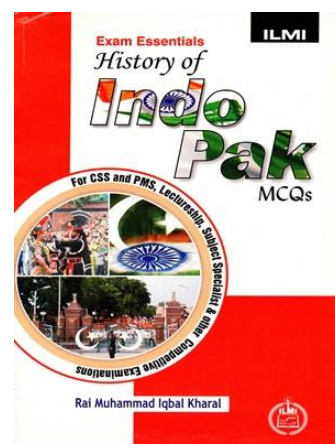
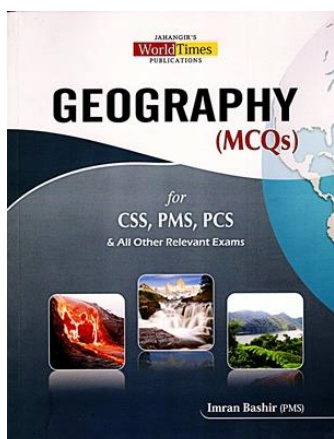
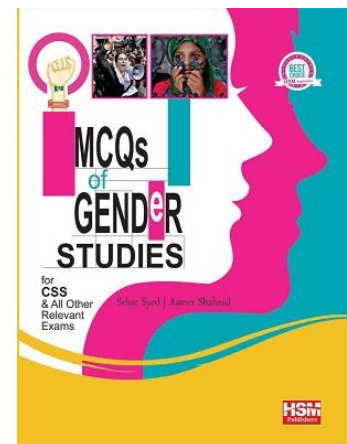
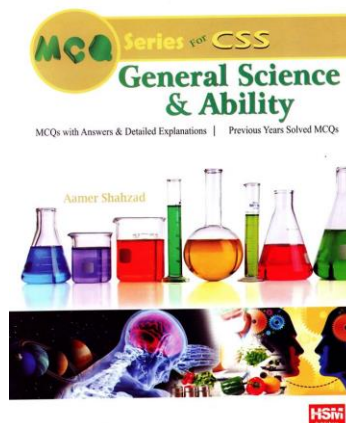
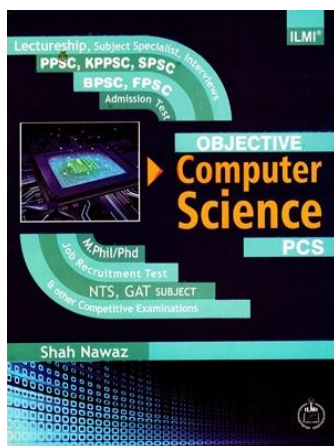
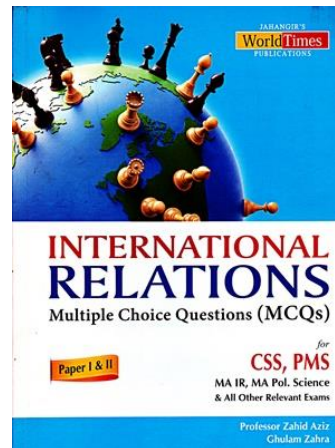
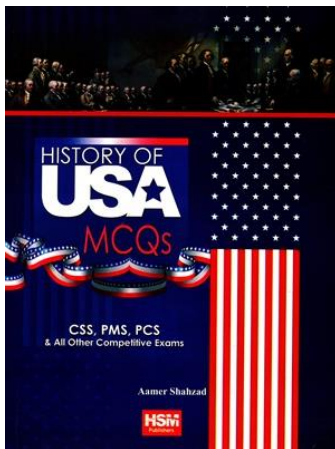
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Surviving the Climate Crisis

Christiana Figueres
and Tom Rivett-Carnac



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We dedicate this book to Christiana's daughters,
NAIMA AND YIHANA,
and Tom's daughter and son,
ZOË AND ARTHUR,
and to the generations who will inhabit the future we choose.

Let us not pray to be sheltered from dangers,
but to be fearless when facing them.

—RABINDRANATH TAGORE

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AUTHORS' NOTE

We are good friends and fellow travelers on this planet, but we differ in many ways. We were born in two different geological periods. Christiana was born in 1956, at the end of the twelve-thousand-year Holocene epoch, when a stable climate allowed humanity to flourish, and Tom in 1977, when the Anthropocene epoch—characterized by humanity's destruction of the very conditions that allowed us to thrive—began.

We come from opposite sides of the geopolitical map; Christiana from Costa Rica, a small developing country that has long been a model of economic growth in harmony with nature, and Tom from the UK, the world's fifth-largest economy and the birthplace of the Industrial Revolution and its reliance on coal.

Christiana comes from a deeply political family, immigrants to Costa Rica on both sides. Her father was three times president of the country and is considered the father of modern Costa Rica. Not only did he initiate some of the most far-reaching environmental policies in the world, he remains the only head of state ever to have abolished a national army. Tom stems from a family steeped in British history and rooted in the private sector. He is a direct descendant of the founding chairman of the East India Company when it was the only company in history to have a private army. Tom's earliest memories are of looking for oil with his petroleum geologist father.

Christiana is the mother of two adult daughters, and Tom is the father of a daughter and a son, both under age ten.

We could have had nothing in common, but we deeply share that which is most important: concern for the future of our children and *yours*. In 2013, we decided to work together to forge a better world for all children.

From 2010 to 2016, Christiana was Executive Secretary of the United Nations Framework Convention on Climate Change, the organization tasked with guiding the response of all governments to climate change. Assuming the highest responsibility for negotiations right after the dramatic debacle of the 2009 Copenhagen climate change conference, Christiana refused to accept that a global agreement was impossible.

In 2013, she heard about Tom, who was then president and CEO of the Carbon Disclosure Project U.S.A. and a former Buddhist monk. Intrigued by his unusual combination of experiences, Christiana asked him to join her in New York City to discuss his becoming her Senior Political Adviser.

At the end of a walk around Manhattan that took the better part of the day, Christiana turned to Tom and said, “It’s clear to me that you have none of the experience necessary for this job. But you have something far more important: the humility to foster collective wisdom, and the courage to work within a complexity that is beyond any mapping.”

With that, she invited him to join the UN effort to advance the negotiations for the Paris Agreement as her chief political strategist. He designed and led the largely covert Groundswell Initiative, which mobilized support for the ambition of the agreement from a wide range of stakeholders outside of national governments. A few years later the most far-reaching international agreement on climate change ever attempted was finally achieved.

When the green gavel came down at 7:25 p.m. on December 12, 2015, adopting the Paris Agreement, five thousand delegates who had been holding their breath for hours jumped out of their seats in ecstatic delight, in celebration of the historical breakthrough. One hundred and ninety-five nations had just unanimously adopted an

agreement to guide their economies for the next four decades. A new global pathway had been charted.

But pathways are valuable only if they are used. Humanity has procrastinated for far too long on climate change—now we have to walk the path, or rather we have to run it. This book maps the route of that run, and we hope you will run alongside us.

Join us at www.GlobalOptimism.com

INTRODUCTION

The Critical Decade

The world is on fire, from the Amazon to California, from Australia to the Siberian Arctic. The hour is late, and the moment of consequence, so long delayed, is now upon us. Do we watch the world burn, or do we choose to do what is necessary to achieve a different future?

Who we understand ourselves to be determines the choice we will make. That choice determines what will become of us. The choice is both simple and complex, but above all it is urgent.

In Washington, D.C., at ten a.m. on a Friday, a twelve-year-old girl marches with her friends, holding up a hand-painted sign of the Earth enveloped by red flames. In London, grown-up demonstrators dressed in black, wearing riot police headgear, form a human chain blocking traffic at Piccadilly Circus, as others glue themselves to the pavement in front of the headquarters of BP. In Seoul, South Korea, the streets teem with elementary schoolchildren sporting multicolored backpacks and carrying banners that say CLIMATE STRIKE—in English, for the benefit of the media. In Bangkok, hundreds of teenage students take to the streets. With firm resolve and heavy hearts, they walk behind their defiant leader, an eleven-year-old girl carrying a sign: THE OCEANS ARE RISING AND SO ARE WE.

All over the world, millions of young people—inspired by Greta Thunberg, the teenage girl who began a lone protest in front of the Swedish parliament—are engaging in civil disobedience to draw attention to climate change. Students understand the scientific projections and are terrified about the diminished quality of life on their horizon. They demand decisive action now. They are helping to

raise the level of outrage about the insufficiency of our efforts to address the crisis, and they have been joined by scientists, parents, and teachers. From the quest for independence in India to the civil rights movement in the United States, civil disobedience has erupted when a reigning injustice became intolerable, as we are now seeing with climate change. Unacceptable generational injustice and a deplorable lack of solidarity with the vulnerable have opened the floodgates of protest. Those who will be most affected have taken to the streets. Their anger is energy that we desperately need. It can propel a wave of defiance against the status quo and catalyze the ingenuity needed to realize new possibilities.

These protests should come as no surprise. We have known about the possibility of climate change since at least the 1930s and have been certain since 1960, when geochemist Charles Keeling measured CO₂ in the Earth's atmosphere and detected an annual rise.¹

Since then we have done little to counter climate change, the result being that greenhouse gas emissions, the cause of climate change, are increasing. We continue to pursue economic growth through the unbridled extraction and burning of fossil fuels, with a fatal impact on our forests, oceans and rivers, soil, and air. We have failed to manage wisely the very ecosystems that sustain us. We have wreaked havoc on them, unintentionally perhaps, but relentlessly and decisively.

Our negligence has catapulted climate change from an existential challenge to the dire crisis it is now, as we rapidly approach limits beyond which Earth as we know it will cease to be. And yet for many, these depredations are invisible. Despite the increasing frequency and intensity of natural disasters, we have still not connected the dots between the ongoing destruction of our natural habitat and our future ability to ensure our children's safety, feed ourselves, inhabit coastlines, and uphold the integrity of our homes.

Governments have taken incremental steps to address the issue. The farthest-reaching effort is the Paris Agreement, which delineates a unified strategy for combating climate change. All

governments of the world unanimously adopted it in December 2015, and most ratified it into law in record time. Since then many corporations, large and small, have set laudable emissions-reduction goals for themselves; many local governments have enacted effective policies; and numerous financial institutions have shifted significant capital from fossil fuels to alternative clean technologies. However, some governments have started to declare a climate emergency because as essential as the current corrective actions are, taken together they still fall far short of what is necessary to stop the rise—and start the reduction—of emissions worldwide. Every day that passes is one day less that we have to stabilize our increasingly fragile planet, by now on its way to becoming uninhabitable for humans. We are running out of time. Once we hit critical thresholds, the damage to the environment, and consequently to our future on this planet, will be irreparable.

Over the years, public reactions to climate change have run the gamut. At one extreme are the climate deniers who say they don't "believe" in climate change. President Donald Trump is the most prominent example. Denying climate change is tantamount to saying you don't believe in gravity. The science of climate change is not a belief, a religion, or a political ideology. It presents facts that are measurable and verifiable. Just as gravity exerts its force on all of us whether we believe in it or not, climate change is already affecting us all no matter where we were born or where we live. The irresponsibility of not "believing in climate change" is becoming more apparent with every new catastrophic event. Climate deniers are shamelessly protecting the short-term financial interests of the fossil fuel industry to the detriment of the long-term interests of their own descendants.

At the other extreme are those who acknowledge the validity of the science but are beginning to lose confidence that we can do anything to address climate change. People feel real grief over the unspeakable loss of ecosystems and biodiversity, over how much more we are about to lose, including the future of human life as we know it. Those who are enveloped by this grief may have lost all

faith in our collective capacity to challenge the course of human history. Every new documentary, every new scientific study, every report of disaster deepens the pain. Grief can be a powerful, transformative experience for some, and arguably a major reason climate change has continued largely unchecked for so long is that we have failed to truly feel what it will mean. It is important that we all allow ourselves adequate time and space to deeply feel our grief and to openly express it. As we tune in to the raw emotion, many of us will undergo a dark, unsettling period of despair, but we cannot allow it to erode our capacity to courageously mobilize for transformation.

Anger that sinks into despair is powerless to make a change. Anger that evolves into conviction is unstoppable.

A larger group of people, between these two extremes, understand the science and acknowledge the evidence but take no action because they don't know what to do, or because it is far easier not to think about climate change. It's scary and overwhelming. To a large extent, many of us stick our heads in the sand. Every time we see a report on extreme weather—hurricanes that used to occur once every five hundred years in a region now occur twice in a month, droughts that shrivel entire villages off the face of the Earth, heat waves that break record upon record, disasters that illustrate what is really going on—we feel a knot in our stomach. But then we turn off the news and distract ourselves with something likely to make us feel less hypocritical. Better to act as if nothing were happening, or as if there were no way to stop it. That way we can delude ourselves that life will continue unimpeded. While this reaction is understandable, it is also a colossal mistake. Complacency now will lock us into a future of guaranteed scarcity, instability, and strife.

We are already too far down the road of destruction to be able to “solve” climate change. The atmosphere is by now too loaded with greenhouse gases and the biosphere too altered for us to be able to turn the clock back on global warming and its effects. We, and all our descendants, will live in a world with environmental conditions

that are permanently altered. We cannot bring back the extinct species, the melted glaciers, the dead coral reefs, or the destroyed primary forests. The best we can do is keep the changes within a manageable range, staving off total calamity, preventing the disaster that will result from the unchecked rise of emissions. This, at least, might usher us out of the crisis mode. It is the bare minimum that we must do.

But we can also do much more.

By addressing the causes of climate change now, we can at once minimize risks and emerge stronger. Today we have the unique chance to create a future where things not only stabilize but actually get better. We can have more efficient and cheaper transportation resulting in less traffic; we can have cleaner air, supporting better health and enhancing the enjoyment of city life; and we can practice smarter use of natural resources, resulting in less pollution of land and water. Achieving the mindset needed to attain this improved environment would signal a maturation of humanity.

Without diminishing the enormity of what we are facing with climate change, we are capable of changing course, and no objective evidence says otherwise. Our societies have faced daunting challenges before—institutionalized slavery and racism, the oppression and exclusion of women, the rise of fascism. To be sure, none of these challenges have been definitively solved, but addressed collectively, we know they are surmountable. Climate change is even more complex because of the finality it portends for the human species, but we are well prepared to deal with it. We have already achieved a host of social and political successes; we have most, if not all, of the technologies we will need; we have the necessary capital, and we know which policies are most effective. We can do this.

But we are far from doing what is needed.

Whether you are complacent about climate change, or in pain, or angry, this book is an invitation for you to take part in creating the future of humanity, confident that despite the seemingly daunting

nature of the challenge, collectively we have what it takes to address climate change now.

This invitation requires your immediate response.

Two dates should now be seared in everyone's mind: 2030 and 2050.

By 2050 at the latest, and ideally by 2040, we must have stopped emitting more greenhouse gases into the atmosphere than Earth can naturally absorb through its ecosystems (a balance known as net-zero emissions or carbon neutrality). In order to get to this scientifically established goal, our global greenhouse gas emissions must be clearly on the decline by the early 2020s and reduced by at least 50 percent by 2030.

The goal of halving global emissions by 2030 represents the absolute minimum we must achieve if we are to have at least a 50 percent chance of safeguarding humanity from the worst impacts. We are in the critical decade. It is no exaggeration to say that what we do regarding emissions reductions between now and 2030 will determine the quality of human life on this planet for hundreds of years to come, if not more. If we do not halve our emissions by 2030, we are highly unlikely to be able to halve emissions every decade until we reach net zero by 2050.

That is our final limit. We cannot exceed it.

Why?

The effects of climate change do not proceed along a straight line. A bit more doesn't equate to a bit worse. Several parts of our planet are critically sensitive, such as the Arctic summer sea ice, the ice cover of Greenland, the boreal forests of Canada and Russia, and the tropical forest cover of the Amazon. They have been maintaining a stable temperature on Earth for millennia.² If those ecosystems were to go up in flames or be otherwise compromised, global temperature would rise precipitously, leading to irreparable worldwide damage. Think of this as an uncontrollable domino effect of devastation.³

Today's decisions on energy, transportation, and land use will all have direct and long-term effects on climate change because they lock in their respective emissions levels for decades, and cumulative emissions could push us over tipping points permanently and catastrophically.⁴ (See the graph in the appendix, [this page](#).) There will be no putting the genie back into the bottle. The milestones of 2030 and 2050 are rooted in the latest science that tells us just how long we can go on doing little or nothing before disaster sets in.

Here's the good news.

We are still just barely inside a zone where we can stave off the worst and manage the remaining long-term effects. But *only* if we do what is required of us in the short term. This is the last time in history when we will be able to do this.

Soon it will be too late.

We know what to do, and we have everything we need. Concern about climate change varies by country, but an increasing majority of people want their governments to address the issue.⁵ So as not to put our children's future in jeopardy, we must connect the urgency of now to the reality of that future.

—

We tend to think of “saving the planet” as salvaging certain iconic ecological features: polar bears, humpback whales, or mountain glaciers. The prevailing logic is that nature is suffering, and humans are complicit, therefore we should act. While that sentiment is worthy in many ways, it can also leave us feeling that the problem is “out there” unrelated to our daily life.

Climate change has long been misunderstood as an environmental issue affecting the survival of the planet. The truth is, the planet will continue to evolve. It has done so for 4.5 billion years, going through dramatic transformations that for the most part did not support the existence of humankind. We currently enjoy unique environmental conditions that do support human life,

but we forget that modern civilization as we know it is only about six thousand years old.⁶

The planet will survive, in changed form no doubt, but it will survive.

The question is whether we will be here to witness it.

That's why climate change is the mother of all issues.

This crisis both dwarfs and encompasses any other issue we may care about. Climate change should be of concern to all who care about social justice. It affects the poor in every country disproportionately—not only because they are often more exposed and invariably more vulnerable to climate-related shocks, but also because they have fewer resources with which to respond to disaster.

Climate change should be of concern to all who care about health. The burning of fossil fuels releases the greenhouse gas emissions that are responsible for climate change. But the burning of the very same fossil fuels (coal for industrial heat or electricity generation and diesel or gasoline for transportation) also pollutes the local ambient air with particulate matter. Microscopic pollutants in the air slip past our body's defenses, penetrating deep into our respiratory and circulatory systems, damaging our lungs, hearts, and brains. They are so pernicious to human health that more than 7 million people die from air pollution each year.

Climate change should be of concern to all who care about economic stability and investment value.⁷ It is no secret that coal has lost its financial viability in most parts of the world because it can no longer compete with cheaper and cleaner renewable energy options such as solar.⁸ Coal mines and coal plants are closing, and there is increasing momentum in the coal divestment movement, likely to be followed by divestment from other fossil fuels.⁹ Central banks around the world are assessing the macroeconomic risk of trillions of dollars invested in those high-carbon assets. The consensus is growing that we need to shift smoothly but decisively

into clean energy assets that will more safely keep their value over the long term.¹⁰

Finally, and fundamentally, climate change should be of concern to all who care about intergenerational justice—which should be every one of us. If we fail to act as we should, future generations will be powerless to undo the inexorable consequences of our failure. Hence our profound moral responsibility to them. Failure to make hard choices now will rob our children and grandchildren of their rightful future.

Some believe we are hardwired to react to threats only if they are immediate. The threats from climate change are now immediate. Superstorms, cyclones, wildfires, droughts, and floods everywhere give us ample evidence of climate change, and those disasters will increase in frequency, scale, and location. We cannot deny or ignore climate change any longer. We now need to let go of half-hearted attempts and instead act in proportion to the magnitude of the challenge.

PART I

TWO WORLDS

CHAPTER 1

Choosing Our Future

Geological time is long and slow. Or at least it used to be. Ice ages, during which vast glaciers covered much of the northern continents, have sluggishly come and gone throughout the history of our planet. The last ice age lasted about 2.6 million years. With very gradual warming resulting from natural influences on Earth's climate, we slowly left that ice age and entered the Holocene epoch, which stretched out over twelve thousand years—until the twentieth century—under relatively stable temperatures, fluctuating only 1 degree Celsius above or below the average.¹

Throughout that geological period, temperatures, precipitation patterns, and terrestrial and ocean ecosystems settled into a “sweet spot” of natural conditions conducive to human propagation and well-being. That environmental stability allowed the human species of approximately ten thousand people living in small tribes to start a sedentary life, evolve into agricultural farmers and settlers, and eventually develop cities, supported by industry and machine manufacturing. It allowed humans to thrive and the population to grow to the current 7.7 billion.²

During the Holocene, “life created the conditions conducive to life.”³ And we could have continued in that geological era. But we didn't.⁴

Over the past fifty years, we have severely undermined the environmental integrity of our Blue Marble and threatened our continued life here. Our post–Industrial Revolution lifestyles have caused massive damage to all our natural systems. Mainly because of the unbridled use of fossil fuels and vast deforestation, the concentration of greenhouse gases in the atmosphere today exceeds anything we have had since well before the last ice age,⁵ resulting in extreme weather events of increasing frequency and intensity all over the world: floods, heat waves, droughts, wildfires, and hurricanes. Half the world’s tropical forests have been cleared, and every year about 12 million more hectares are lost. In about forty years, at the current rate, 1 billion hectares could be gone—a land mass equivalent to Europe.⁶ In the last fifty years, the populations of mammals, birds, fish, reptiles, and amphibians have, on average, declined by 60 percent. Some suggest we are already living through the sixth mass extinction.⁷ According to the latest research, 12 percent of all surviving species are currently threatened, and climate breakdown will significantly amplify that threat.⁸ Oceans have absorbed more than 90 percent of the extra heat we have produced over the last fifty years.⁹ As a result, half the world’s coral reefs are already dead,¹⁰ and the Arctic summer sea ice, whose reflective capacity helps to regulate temperatures all over the world, is shrinking rapidly.¹¹ The melt from land glaciers has already caused sea levels to rise more than twenty centimeters, leading to major salt intrusion in many aquifers, worsening storm surges and existential threats to low-lying islands.¹² In short, in just the last fifty years we have catapulted humanity and the planet out of the previous benevolent Holocene epoch and into the Anthropocene, a new geological period where biogeochemical conditions are dominated not by natural processes but by the palpable impact of human activity. Humans are for the first time ever the prime driver of large-scale climate change on the planet.¹³

All studies you may read about the Anthropocene epoch point to the unprecedented levels of destruction that we have caused in just

five decades.¹⁴ The underlying assumption in those analyses is that we have irretrievably cast our die and that increasing destruction will be the leitmotif of the entire geological era.

We take a radically different view.

We argue that devastation is admittedly a growing possibility but not yet our inevitable fate. While the beginning of this period of human history has been indelibly and painfully marked, the full story has not been written. We still hold the pen. In fact, we hold it more firmly now than ever before. And we can choose to write a story of regeneration of both nature and the human spirit. But we have to choose.

In deciding what kind of world we and future generations will live in, we don't have many options; we have in fact only two, both of which are set out in the Paris Agreement, and both of which we present here for your consideration. Keep in mind that we have already warmed the planet by 0.9 degrees Celsius more than the average temperature before the Industrial Revolution. Under the Paris Agreement, all nations committed to collectively limit warming to "well under 2 degrees Celsius," and ideally no more than 1.5 degrees Celsius (2.7 degrees Fahrenheit), through national emissions-reduction efforts that substantially increase every five years. To start the process, in 2015, 184 countries registered details of what they would do in the first five years and agreed to come back every five years to make stronger commitments, since the first round of commitments was only the first step toward achieving the long-term goal of net-zero emissions.

We present two scenarios. One or the other will become our reality.

—

The world we are now creating, leading to warming of more than 3 degrees.¹⁵ The first scenario we set out illustrates the very dangerous trajectory we are on right now. If governments, corporations, and individuals make no further efforts than those registered in 2015, we will go to

a warming of at least 3.7 degrees Celsius by 2100. Worse yet, if they do not fulfill even the registered commitments, we can expect warming of 4 or 5 degrees. (See the appendix, page 172.) Be forewarned, this picture is dark. Even though many of the worst-case scenarios might not be realized until the second half of the century, it is clear that by midcentury human misery would be high, biodiversity would be decimated, and that we and our children would live in a world that is constantly deteriorating with no possible recuperation.

The world we must create, limiting warming to no more than 1.5 degrees Celsius.¹⁶ We cannot turn back the clock on past emissions. However, even at this late stage, we can strive for and achieve a better world in which nature and the human family will not only survive but thrive together. Scientists have been extremely clear that the 1.5-degree-Celsius-warmer scenario is still attainable but that the window is rapidly closing. To have at least a 50 percent chance of success (which in itself is an unacceptably high level of risk), we must cut global emissions to half their current levels by 2030, half again by 2040, and finally to net zero by 2050 at the very latest.¹⁷ A change of this magnitude would require major transformations in almost every area of life and work, from massive reforestation to new agricultural practices; from the cessation of coal production by 2020 and of oil and gas extraction soon thereafter to the abandonment of fossil fuels and even the internal combustion engine.

Precisely what we need to do is detailed later in the book, but for now, we have to wake up to the fact that we can choose our future and collectively create it. Our collective responsibility is to ensure that a better future is not only possible but probable, and then not only probable but foreseeable.

The great baseball player Yogi Berra famously said that predictions are hard to make, especially about the future. In constructing these scenarios, we are aware that making predictions

about the world in thirty years' time is to some degree an imaginative enterprise. However, everything we set out in these scenarios is predicted or expected by the best science.¹⁸ Indeed, much of what science has foretold is already happening. Read each scenario not as a prediction of the future but as a warning of what may come and what we still have a chance to change.

CHAPTER 2

The World We Are Creating

It is 2050. Beyond the emissions reductions registered in 2015, no further efforts were made to control emissions. We are heading for a world that will be more than 3 degrees warmer by 2100.

The first thing that hits you is the air.

In many places around the world, the air is hot, heavy, and depending on the day, clogged with particulate pollution. Your eyes often water. Your cough never seems to disappear. You think about some countries in Asia, where out of consideration sick people used to wear white masks to protect others from airborne infection. Now you often wear a mask to protect yourself from air pollution. You can no longer simply walk out your front door and breathe fresh air: there might not be any. Instead, before opening doors or windows in the morning, you check your phone to see what the air quality will be. Everything might look fine—sunny and clear—but you know better. When storms and heat waves overlap and cluster, the air pollution and intensified surface ozone levels can make it dangerous to go outside without a specially designed face mask (which only some can afford).¹

Southeast Asia and Central Africa lose more lives to filthy air than do Europe or the United States.² There fewer people work

outdoors, and even indoors the air can taste slightly acidic, sometimes making you feel nauseated. The last coal furnaces closed ten years ago, but that hasn't made much difference in air quality around the world because you are still breathing dangerous exhaust fumes from millions of cars and buses everywhere. Some countries have experimented with seeding rain clouds—the process of artificially inducing rain—hoping to wash pollution out of the sky, but results are mixed. Seeding clouds to artificially create more rain is difficult and unreliable, and even the wealthiest countries cannot achieve consistent results.³ In Europe and Asia, the practice has triggered international incidents because even the most skilled experts can't control where the rain will fall, never mind that acid rain is deleterious to crops, wreaking havoc on food supply.⁴ As a result, crops are increasingly grown under cover, a trend that will only increase.⁵

Our world is getting hotter. Over the next two decades, projections tell us that temperatures in some areas of the globe will rise even higher, an irreversible development now utterly beyond our control. Oceans, forests, plants, trees, and soil had for many years absorbed half the carbon dioxide we spewed out. Now there are few forests left, most of them either logged or consumed by wildfire, and the permafrost is belching greenhouse gases into an already overburdened atmosphere.⁶

The increasing heat of the Earth is suffocating us, and in five to ten years, vast swaths of the planet will be increasingly inhospitable to humans. We don't know how habitable the regions of Australia, North Africa, and the western United States will be by 2100. No one knows what the future holds for their children and grandchildren: tipping point after tipping point is being reached, casting doubt on the form of future civilization. Some say that humans will be cast to the winds again, gathering in small tribes, hunkered down and living on whatever patch of land might sustain them.⁷

Passing tipping points has already been painful. First was the vanishing of coral reefs. Some of us still remember diving amid

majestic coral reefs, brimming with multicolored fish of all shapes and sizes. Corals are now almost gone. The Great Barrier Reef in Australia is the largest aquatic cemetery in the world. Efforts have been made to grow artificial corals farther north and south from the equator where the water is a bit cooler, but these efforts have largely failed, and marine life has not returned. Soon there will be no reefs anywhere—it is only a matter of a few years before the last 10 percent dies off.⁸

The second tipping point was the melting of the ice sheets in the Arctic. There is no summer Arctic sea ice anymore because warming is worse at the poles—between 6 and 8 degrees higher than other areas. The melting happened silently in that cold place far north of most of the inhabited world, but its effects were soon noticed. The Great Melting was an accelerant of further global warming. The white ice used to reflect the sun's heat, but now it's gone, so the dark sea water absorbs more heat, expanding the mass of water and pushing sea levels even higher.⁹

More moisture in the air and higher sea surface temperatures have caused a surge in extreme hurricanes and tropical storms. Recently, coastal cities in Bangladesh, Mexico, the United States, and elsewhere have suffered brutal infrastructure destruction and extreme flooding, killing many thousands and displacing millions. This happens with increasing frequency now.¹⁰ Every day, because of rising water levels, some part of the world must evacuate to higher ground. Every day the news shows images of mothers with babies strapped to their backs, wading through floodwaters, and homes ripped apart by vicious currents that resemble mountain rivers. News stories tell of people living in houses with water up to their ankles because they have nowhere else to go, their children coughing and wheezing because of the mold growing in their beds, insurance companies declaring bankruptcy leaving survivors without resources to rebuild their lives. Contaminated water supplies, sea salt intrusions, and agricultural runoff are the order of the day. Because multiple disasters are often happening simultaneously, it can take weeks or even months for basic food and

water relief to reach areas pummeled by extreme floods. Diseases such as malaria, dengue, cholera, respiratory illnesses, and malnutrition are rampant.¹¹

Now all eyes are on the western Antarctic ice sheet.¹² If it did ever disappear, it would release a deluge of fresh water into the oceans, potentially raising sea levels by over five meters. If that were to happen, cities like Miami, Shanghai, and Dhaka would be uninhabitable—ghostly Atlantises dotting the coasts of each continent, their skyscrapers jutting out of the water, their people evacuated or dead.

Those around the world who chose to remain on the coast because it had always been their home have more to deal with than rising water and floods—they must now witness the demise of a way of life based on fishing. As oceans have absorbed carbon dioxide, the water has become more acidic, and the pH levels are now so hostile to marine life that all but a few countries have banned fishing, even in international waters.¹³ Many people insist that the few fish that are left should be enjoyed while they last—an argument, hard to fault in many parts of the world, that applies to so much that is vanishing.

As devastating as rising oceans have been, droughts and heat waves inland have created a special hell. Vast regions have succumbed to severe aridification sometimes followed by desertification,¹⁴ and wildlife there has become a distant memory.¹⁵ These places can barely support human life; their aquifers have dried up. Cities such as Marrakech and Volgograd are on the verge of becoming deserts. Hong Kong, Barcelona, Abu Dhabi, and many others have been desalinating seawater for years, desperately trying to keep up with the constant wave of immigration from areas that have gone completely dry.

Extreme heat is on the march. If you live in Paris, you endure summer temperatures that regularly rise to 44 degrees Celsius (111 degrees Fahrenheit). This is no longer the headline-grabbing event it would have been thirty years ago. Everyone stays inside, drinks

water, and dreams of air-conditioning. You lie on your couch, a cold, wet towel over your face, and try to rest without dwelling on the poor farmers on the outskirts of town who, despite recurrent droughts and wildfires, are still trying to grow grapes, olives, or soy—luxuries for the rich, not for you.

You try not to think about the 2 billion people who live in the hottest parts of the world, where, for upward of forty-five days per year, temperatures skyrocket to 60 degrees Celsius (140 degrees Fahrenheit)—a point at which the human body cannot be outside for longer than about six hours because it loses the ability to cool itself down. Places such as central India are becoming increasingly challenging to inhabit. For a while people tried to carry on, but when you can't work outside, when you can fall asleep only at four a.m. for a couple of hours because that's the coolest part of the day, there's not much you can do but leave. Mass migrations to less hot rural areas are beset by a host of refugee problems, civil unrest, and bloodshed over diminished water availability.¹⁶

Inland glaciers around the world are quickly disappearing. The millions who depended on the Himalayan, Alpine, and Andean glaciers to regulate water availability throughout the year are in a state of constant emergency: there is little snow turning to ice atop mountains in the winter, so there is no more gradual melting for the spring and summer. Now there are either torrential rains leading to flooding or prolonged droughts. The most vulnerable communities with the least resources have already seen what can ensue when water is scarce: sectarian violence, mass migration, and death.

Even in some parts of the United States, there are fiery conflicts over water, battles between the rich who are willing to pay for as much water as they want and everyone else demanding equal access to the life-enabling resource. The taps in nearly all public facilities are locked, and those in restrooms are coin-operated. At the federal level, Congress is in an uproar over water redistribution: states with less water demand what they see as their fair share from states that have more. Government leaders have been stymied on the issue for years, and with every passing month the Colorado River and the Rio

Grande shrink further.¹⁷ Looming on the horizon are conflicts with Mexico, no longer able to guarantee deliveries of water from the depleted Rio Conchos and Rio Grande.¹⁸ Similar disputes have arisen in Peru, China, Russia, and many other countries.

Food production swings wildly from month to month, season to season, depending on where you live. More people are starving than ever before. Climate zones have shifted, so some new areas have become available for agriculture (Alaska, the Arctic),¹⁹ while others have dried up (Mexico, California). Still others are unstable because of the extreme heat, never mind flooding, wildfire, and tornadoes. This makes the food supply in general highly unpredictable. One thing hasn't changed, though—if you have money, you have access. Global trade has slowed as countries such as China stop exporting and seek to hold on to their own resources. Disasters and wars rage, choking off trade routes. The tyranny of supply and demand is now unforgiving; because of its increasing scarcity, food can now be wildly expensive. Income inequality has always existed, but it has never been this stark or this dangerous.

Entire regions suffer from epidemics of stunting and malnutrition. Reproduction has slowed overall, but most acutely in those countries where food scarcity is dire. Infant mortality has rocketed, and international aid has proven to be politically impossible to defend in light of mass poverty. Countries with enough food are resolute about holding on to it.

In some places, the inability to gain access to such basics as wheat, rice, or sorghum has led to economic collapse and civil unrest more quickly than even the most pessimistic experts had previously imagined. Scientists tried to develop varieties of staples that could stand up to drought, temperature fluctuations, and salt, but there was only so much we could do. Now there simply aren't enough resilient varieties to feed the population. As a result, food riots, coups, and civil wars are throwing the world's most vulnerable from the frying pan into the fire. As developed countries seek to seal their borders from mass migration, they too feel the consequences.

Stock markets are crashing, currencies are wildly fluctuating, and the European Union has disbanded.²⁰

As committed as nations are to keeping wealth and resources within their borders, they're determined to keep people out. Most countries' armies are now just highly militarized border patrols. Lockdown is the goal, but it hasn't been a total success. Desperate people will always find a way. Some countries have been better global Good Samaritans than others, but even they have now effectively shut their borders, their wallets, and their eyes.²¹

Ever since the equatorial belt started to become difficult to inhabit, an unending stream of migrants has been moving north from Central America toward Mexico and the United States. Others are moving south toward the tips of Chile and Argentina. The same scenes are playing out across Europe and Asia. Enormous political pressure is being placed on northern and southern countries to either welcome migrants or keep them out. Some countries are letting people in, but only under conditions approaching indentured servitude. It will be years before the stranded migrants are able to find asylum or settle into new refugee cities that have formed along the borders.

Even if you live in areas with more temperate climates such as Canada and Scandinavia, you are still extremely vulnerable. Severe tornadoes, flash floods, wildfires, mudslides, and blizzards are often in the back of your mind. Depending on where you live, you have a fully stocked storm cellar, an emergency go-bag in your car, or a six-foot fire moat around your house. People are glued to weather forecasts. Only the foolhardy shut their phones off at night. If an emergency hits, you may only have minutes to respond. The alert systems set up by the government are basic and subject to glitches and irregularities depending on access to technology. The rich, who subscribe to private, reliable satellite-based alert systems, sleep better.

The weather is unavoidable, but lately the news about what's going on at the borders has become too much for most people to endure. Because of the alarming spike in suicides, and under

increasing pressure from public health officials, news organizations have decreased the number of stories devoted to genocide, slave trading, and refugee virus outbreaks. You can no longer trust the news. Social media, long the grim source of live feeds and disaster reporting, is brimming with conspiracy theories and doctored videos. Overall, the news has taken a strange, seemingly controlled turn toward distorting reality and spinning a falsely positive narrative.

Those living within stable countries may be safe, yes, but the psychological toll is mounting. With each new tipping point passed, they feel hope slipping away. There is no chance of stopping the runaway warming of our planet, and no doubt we are slowly but surely heading toward some kind of collapse. And not just because it's too hot. Melting permafrost is also releasing ancient microbes that today's humans have never been exposed to—and as a result have no resistance to.²² Diseases spread by mosquitoes and ticks are rampant as these species flourish in the changed climate, spreading to previously safe parts of the planet, increasingly overwhelming us. Worse still, the public health crisis of antibiotic resistance has only intensified as the population has grown denser in inhabitable areas and temperatures continue to rise.²³

The demise of the human species is being discussed more and more. For many, the only uncertainty is how long we'll last, how many more generations will see the light of day. Suicides are the most obvious manifestation of the prevailing despair, but there are other indications: a sense of bottomless loss, unbearable guilt, and fierce resentment at previous generations who didn't do what was necessary to ward off this unstoppable calamity.

CHAPTER 3

The World We Must Create

It is 2050. We have been successful at halving emissions every decade since 2020. We are heading for a world that will be no more than 1.5 degrees Celsius warmer by 2100.

In most places in the world, the air is moist and fresh, even in cities. It feels a lot like walking through a forest, and very likely this is exactly what you are doing. The air is cleaner than it has been since before the Industrial Revolution.

We have trees to thank for that. They are everywhere.¹

It wasn't the single solution we required, but the proliferation of trees bought us the time we needed to vanquish carbon emissions. Corporate donations and public money funded the biggest tree-planting campaign in history. When we started, it was purely practical, a tactic to combat climate change by relocating the carbon: the trees took carbon dioxide out of the air, released oxygen, and put the carbon back where it belongs, in the soil. This of course helped to diminish climate change, but the benefits were even greater. On every sensory level, the ambient feeling of living on what has again become a green planet has been transformative, especially in cities. Cities have never been better places to live. With many more trees and far fewer cars, it has been possible to reclaim whole streets for

urban agriculture and for children's play. Every vacant lot, every grimy unused alley, has been repurposed and turned into a shady grove. Every rooftop has been converted to either a vegetable or a floral garden. Windowless buildings that were once scrawled with graffiti are instead carpeted with verdant vines.

The greening movement in Spain began as an effort to combat rising temperatures. Because of Madrid's latitude, it is one of the driest cities in Europe. And even though the city now has a grip on its emissions, it was previously at risk of desertification. Because of the "heat island" effect of cities—buildings trap warmth and dark, paved surfaces absorb heat from the sun—Madrid, home to more than 6 million people, was several degrees warmer than the countryside just a few miles away. In addition, air pollution was leading to a rising incidence of premature births,² and a spike in deaths was linked to cardiovascular and respiratory illnesses. With a health-care system already strained by the arrival of subtropical diseases like dengue fever and malaria, government officials and citizens rallied. Madrid made dramatic efforts to reduce the number of vehicles and create a "green envelope" around the city to help with cooling, oxygenating, and filtering pollution. Plazas were repaved with porous material to capture rainwater; all black roofs were painted white; and plants were omnipresent. The plants cut noise, released oxygen, insulated south-facing walls, shaded pavements, and released water vapor into the air. The massive effort was a huge success and was replicated all over the world. Madrid's economy boomed as its expertise put it on the cutting edge of a new industry.

Most cities found that lower temperatures raised the standard of living. There are still slums, but the trees, largely responsible for countering the temperature rise in most places, have made things far more bearable for all.

Reimagining and restructuring cities was crucial to solving the climate challenge puzzle. But further steps had to be taken, which meant that global rewilding efforts had to reach well beyond the cities. The forest cover worldwide is now 50 percent, and agriculture

has evolved to become more tree-based.³ The result is that many countries are unrecognizable, in a good way. No one seems to miss wide-open plains or monocultures. Now we have shady groves of nut and fruit orchards, timberland interspersed with grazing, parkland areas that spread for miles, new havens for our regenerated population of pollinators.⁴

Luckily for the 75 percent of the population who live in cities, new electric railways crisscross interior landscapes. In the United States, high-speed rail networks on the East and West Coasts have replaced the vast majority of domestic flights, with East Coast connectors to Atlanta and Chicago. Because flight speeds have slowed down to increase planes' fuel efficiency, passenger bullet trains make some journeys even faster and with no emissions whatsoever.⁵ The U.S. Train Initiative was a monumental public project that sparked the economy for a decade. Replacing miles and miles of interstate highways with a new transportation system created millions of jobs—for train technology experts, engineers, and construction workers who designed and built raised rail tracks to circumvent floodplains. This massive effort helped to reeducate and retrain many of those displaced by the dying fossil fuel economy. It also introduced a new generation of workers to the excitement and innovation of the new climate economy.

Running parallel to this mega public works effort was an increasingly confident race to harness the power of renewable sources of energy. A major part of the shift to net-zero emissions was a focus on electricity; achieving the goal required not only an overhaul of existing infrastructure but also a structural shift. In some ways, breaking up grids and decentralizing power proved easy. We no longer burn fossil fuels. There is some nuclear energy in those countries that can afford the expensive technology,⁶ but most of our energy now comes from renewable sources like wind, solar, geothermal, and hydro. All homes and buildings produce their own electricity—every available surface is covered with solar paint that contains millions of nanoparticles, which harvest energy from the sunlight,⁷ and every windy spot has a wind turbine. If you live on a

particularly sunny or windy hill, your house might harvest more energy than it can use, in which case the energy will simply flow back to the smart grid. Because there is no combustion cost, energy is basically free. It is also more abundant and more efficiently used than ever.

Smart tech prevents unnecessary energy consumption, as artificial intelligence units switch off appliances and machines when not in use. The efficiency of the system means that, with a few exceptions, our quality of life has not suffered. In many respects, it has improved.

For the developed world, the wide-ranging transition to renewable energy was at times uncomfortable, as it often involved retrofitting old infrastructure and doing things in new ways. But for the developing world, it was the dawn of a new era. Most of the infrastructure that it needed for economic growth and poverty alleviation was built according to the new standards: low carbon emissions and high resilience. In remote areas, the billion people who had no electricity at the start of the twenty-first century now have energy generated by their own rooftop solar modules or by wind-powered minigrids in their communities. This new access opened the door to so much more. Entire populations have leaped forward with improved sanitation, education, and health care. People who had struggled to get clean water can now provide it to their families. Children can study at night. Remote health clinics can operate effectively.

Homes and buildings all over the world are becoming self-sustaining far beyond their electrical needs. For example, all buildings now collect rainwater and manage their own water use. Renewable sources of electricity made possible localized desalination, which means clean drinking water can now be produced on demand anywhere in the world. We also use it to irrigate hydroponic gardens, flush toilets, and shower.⁸ Overall, we've successfully rebuilt, reorganized, and restructured our lives to live in a more localized way. Although energy prices have dropped dramatically, we are choosing local life over long commutes. Due to

greater connectivity, many people work from home, allowing for more flexibility and more time to call their own.

We are making communities stronger. As a child, you might have seen your neighbors only in passing. But now, to make things cheaper, cleaner, and more sustainable, your orientation in every part of your life is more local. Things that used to be done individually are now done communally—growing vegetables, capturing rainwater, and composting. Resources and responsibilities are shared now. At first you resisted this *togetherness*—you were used to doing things individually and in the privacy of your own home. But pretty quickly the camaraderie and unexpected new network of support started to feel good, something to be prized. For most people, the new way has turned out to be a better recipe for happiness.

Food production and procurement are a big part of the communal effort. When it became clear we needed to revolutionize industrialized farming, we transitioned quickly to regenerative farming practices, mixing perennial crops, sustainable grazing, and improved crop rotation on large-scale farms, with increased community reliance on small farms.⁹ Instead of going to a big grocery store for food flown in from hundreds, if not thousands, of miles away, you buy most of your food from small local farmers and producers. Buildings, neighborhoods, and even large extended families form a food purchase group, which is how most people buy their food now. As a unit they sign up for a weekly drop-off, then distribute the food among the group members. Distribution, coordination, and management are everyone's responsibility, which means you might be partnered with a downstairs neighbor for distribution one week and your upstairs neighbor the next.

While this community approach to food production makes things more sustainable, food is still expensive, consuming up to 30 percent of household budgets, which is why growing your own is such a necessity.¹⁰ In community gardens, on rooftops, at schools, and even hanging from vertical gardens on balconies, food sometimes seems to be growing everywhere.

We've come to realize, by growing our own, that food is expensive because it *should* be expensive—it takes valuable resources to grow it, after all. Water. Soil. Sweat. Time.¹¹ For that reason, the most resource-depleting foods of all—animal protein and dairy products—have practically disappeared from our diets.¹² But the plant-based replacements are so good that most of us don't notice the absence of meat and dairy. Most young children cannot believe we used to kill any animals for food. Fish is still available, but it is farmed and yields are better managed by improved technology.¹³

We make smarter choices about bad foods, which have become an ever-diminishing part of our diets. Government taxes on processed meats, sugars, and fatty foods helped us reduce the carbon emissions from farming. The biggest boon of all was to our collective health. Thanks to a reduced number of cancers, heart attacks, and strokes, people are living longer, and health services around the world cost less and less. In fact, a huge portion of the costs of combating climate change were recuperated by governments' savings on public health.¹⁴

Along with outrageous spending on health care, gasoline and diesel cars are also anachronisms. Most countries banned their manufacture in 2030,¹⁵ but it took another fifteen years to get internal combustion engines off the road completely. Now they are seen only in transport museums or at special rallies where classic car owners pay an offset fee to drive a few short miles around the track. And, of course, they are all hauled in on the backs of huge electric trucks.

When it came to making the switch, some countries were already ahead of the curve. Technology-driven countries such as Norway and bicycle-friendly nations like the Netherlands managed to impose a moratorium on cars much earlier. Unsurprisingly, the United States had the hardest time of all. First, it restricted their sale, and then it banned them from certain parts of cities—Ultra Low Emission Zones.¹⁶ Then came the breakthrough in the battery

storage capacity of electric vehicles,¹⁷ the cost reductions that came from finding alternative materials for manufacture, and finally the complete overhaul of the charging and parking infrastructure.¹⁸ This allowed people easier access to cheap power for their electric vehicles. Even better, car batteries are now bidirectionally connected with the electric grid, so they can either charge from the grid or provide power to the grid when they aren't being driven. This helps back up the smart grid that is running on renewable energy.

The ubiquity and ease of electric vehicles were alluring, but satisfaction of our appetite for speed finally did the trick.¹⁹ Supposedly, to stop a bad habit you have to replace it with one that is more salubrious or at least as enjoyable. At first China dominated the manufacture of electric vehicles, but soon U.S. companies started making vehicles that were more desirable than ever before. Even some classic cars got an upgrade, switching from combustion to electric engines that could go from zero to sixty mph in 3.5 seconds.²⁰ What's strange is that it took us so long to realize that the electric motor is simply a better way of powering vehicles. It gives you more torque, more speed when you need it, and the ability to recapture energy when you brake, and it requires dramatically less maintenance.

As people from rural areas moved to the cities, they had less need even for electric vehicles.²¹ In cities it's now easy to get around—transportation is frictionless. When you take the electric train, you don't have to fumble around for a metro card or wait in line to pay—the system tracks your location, so it knows where you got on and where you got off, and it deducts money from your account accordingly. We also share cars without thinking twice. In fact, regulating and ensuring the safety of driverless ride sharing was the biggest transportation hurdle for cities to overcome. The goal has been to eliminate private ownership of vehicles by 2050 in major metropolitan areas.²² We're not quite there yet, but we're making progress.

We have also reduced land transport needs. Three-dimensional (3D) printers are readily available, cutting down on what people need to purchase away from home.²³ Drones organized along aerial corridors are now delivering packages, further reducing the need for vehicles.²⁴ Thus we are currently narrowing roads, eliminating parking spaces, and investing in urban planning projects that make it easier to walk and bike in the city. Parking garages are used only for ride sharing, electric vehicle charging, and storage—those ugly concrete stacking systems and edifices of yore are now enveloped in green. Cities now seem designed for the coexistence of people and nature.

International air travel has been transformed. Biofuels have replaced jet fuel. Communications technology has advanced so much that we can participate virtually in meetings anywhere in the world without traveling. Air travel still exists, but it is used more sparingly and is extremely costly. Because work is now increasingly decentralized and can often be done from anywhere, people save and plan for “slow-cations”—international trips that last weeks or months instead of days. If you live in the United States and want to visit Europe, you might plan to stay there for several months or more, working your way across the continent using local, zero-emissions transportation.²⁵

While we may have successfully reduced carbon emissions, we’re still dealing with the aftereffects of record levels of carbon dioxide in the atmosphere. The long-living greenhouse gases have nowhere to go other than the already-loaded atmosphere, so they are still causing increasingly extreme weather—though it’s less extreme than it would have been had we continued to burn fossil fuels. Glaciers and Arctic ice are still melting, and the sea is still rising. Severe droughts and desertification are occurring in the western United States, the Mediterranean, and parts of China. Ongoing extreme weather and resource degradation continue to multiply existing disparities in income, public health, food security, and water availability. But now governments have recognized climate change factors for the threat multipliers that they are. That

awareness allows us to predict downstream problems and head them off before they become humanitarian crises.²⁶ So while many people remain at risk every day, the situation is not as drastic or chaotic as it might have been.²⁷ Economies in developing nations are strong, and unexpected global coalitions have formed with a renewed sense of trust. Now when a population is in need of aid, the political will and resources are available to meet that need.

The ongoing refugee situation has been escalating for decades, and it is still a major source of strife and discord. But around fifteen years ago, we stopped calling it a crisis. Countries agreed on guidelines for managing refugee influxes—how to smoothly assimilate populations, how to distribute aid and resources, and how to share the tasks within particular regions. These agreements work well most of the time, but things get thrown off balance occasionally when a country flirts with fascism for an election cycle or two.

Technology and business sectors stepped up, too, seizing the opportunity of government contracts to provide large-scale solutions for distributing food and providing shelter for the newly displaced. One company invented a giant robot that could autonomously build a four-person dwelling within days.²⁸ Automation and 3D printing have made it possible to quickly and affordably construct high-quality housing for refugees. The private sector has innovated with water transportation technology and sanitation solutions. Fewer tent cities and housing shortages have led to less cholera.

Everyone understands that we are all in this together. A disaster that occurs in one country is likely to occur in another in only a matter of years. It took us a while to realize that if we worked out how to save the Pacific Islands from rising sea levels this year, then we might find a way to save Rotterdam in another five years. It is in the interest of every country to bring all its resources to bear on problems across the world. For one thing, creating innovative solutions to climate challenges and beta testing them years ahead of using them is just plain smart. For another, we're nurturing

goodwill; when we need help, we know we will be able to count on others to step up.

The zeitgeist has shifted profoundly. How we feel about the world has changed, deeply. And unexpectedly, so has how we feel about one another.

When the alarm bells rang in 2020, thanks in large part to the youth movement, we realized that we suffered from too much consumption, competition, and greedy self-interest. Our commitment to these values and our drive for profit and status had led us to steamroll our environment. As a species we were out of control, and the result was the near-collapse of our world. We could no longer avoid seeing on a tangible, geophysical level that when you spurn regeneration, collaboration, and community, the consequence is impending devastation.

Extricating ourselves from self-destruction would have been impossible if we hadn't changed our mindset and our priorities, if we hadn't realized that doing what is good for humanity goes hand in hand with doing what is good for the Earth. The most fundamental change was that collectively—as citizens, corporations, and governments—we began adhering to a new bottom line: “Is it good for humanity whether profit is made or not?”

The climate change crisis of the beginning of the century jolted us out of our stupor. As we worked to rebuild and care for our environment, it was only natural that we also turned to each other with greater care and concern. We realized that the perpetuation of our species was about far more than saving ourselves from extreme weather. It was about being good stewards of the land *and* of one another. When we began the fight for the fate of humanity, we were thinking only about the species' survival, but at some point, we understood that it was as much about the fate of *our humanity*. We emerged from the climate crisis as more mature members of the community of life, capable not only of restoring ecosystems but also of unfolding our dormant potentials of human strength and discernment. Humanity was only ever as doomed as it believed itself to be. Vanquishing that belief was our true legacy.

PART II

THREE MINDSETS

CHAPTER 4

Who We Choose to Be

Our future is unwritten. It will be shaped by who we choose to be now.

As we learned during our stewardship of the Paris Agreement, if you do not control the complex landscape of a challenge (and you rarely do), the most powerful thing you can do is change how you behave in that landscape, yourself a catalyst for overall change. All too often in the face of a task, we move quickly to “doing” without first reflecting on “being”—what *we* personally bring to the task, as well as what others might. And the most important thing we can bring is our state of mind.

Mahatma Gandhi reminds us to be the change we want to see. The actions we pursue are largely defined by the mindset we cultivate in advance of the doing. When we’re faced with an urgent task, it may feel counterintuitive to first look inside ourselves, but it is essential.

Attempting change while we are informed by the same state of mind that has been predominant in the past will lead to insufficient incremental advances. In order to open the space for transformation, we have to change how we think and fundamentally who we perceive ourselves to be. After all, if what’s at stake is nothing less than the quality of human life for centuries to come, it is worth digging down to the roots of who we understand ourselves to be.

Paradoxically, systemic change is a deeply personal endeavor. Our social and economic structures are a product of our way of thinking.

For example, our economy is based on the belief that we can extract resources boundlessly, use them inefficiently, and discard them wantonly, drawing from the planet more than it can regenerate and polluting more than we can clean up. Over time we've developed a deeply exploitative ethos as the basis of our actions.

This no longer works.

Natural scientists have provided ample evidence that we have reached several planetary boundaries, beyond which Earth's biosystems cannot sustain life. Soon there will be little left to extract and exploit. Concerned social scientists are clear on what we need to do: we must move toward a regenerative economy, an economy that operates in harmony with nature, repurposing used resources, minimizing waste, and replenishing depleted resources. We must return to the innate wisdom of nature herself, the ultimate regenerator and recycler of all resources.

Less understood but just as important is the fact that we have reached the limits of our individualistic competitive approach. For a long time, Western societies have tended to prize self-interest over the well-being of the whole. We need to enlarge our understanding of ourselves and our relationships with others, and certainly with the natural systems that enable human life on Earth.

Our current crisis requires a total shift in our thinking. To survive and thrive, we must understand ourselves to be inextricably connected to all of nature. We need to cultivate a deep and abiding sense of stewardship. This transformation begins with the individual. Who we are and how we show up in the world defines how we work with others, how we interact with our surroundings, and ultimately the future we co-create.

We believe three mindsets are fundamental to us all in our pursuit to co-create a better world. With intentional provocation, we call them Stubborn Optimism, Endless Abundance, and Radical

Regeneration. These mindsets are not new. We can find shining examples in famous historical figures, but the future we want requires that they be prevalent among us all. These qualities of being are innate human capacities (individual and collective), values that can be called forth, nurtured, and developed in the crucible of daily practice.

A shift in consciousness may sound grandiose to some, insufficient to others. But we live at a time of growing awareness of the intimate connections between the outer and inner worlds. As author Joanna Macy has pointed out, “In the past changing the self and changing the world were regarded as separate endeavors and viewed in either-or terms. That is no longer the case.”¹ Scientific understanding and spiritual insights are converging on the reality of human-nature interconnectedness.

The transformative power of the three mindsets lies not only in themselves but also in the direction each one provides. Attached as we are to many forms of status quo in our lives (relationships, job, home, etc.), we often delude ourselves that they are permanent. But the fact is, nothing is permanent; everything is always changing, no matter how much we insist on standing still, hanging on to fleeting moments. And making desired change always demands going in an intentional direction.

Our new intentional direction must move us beyond defeatism to optimism, beyond extraction toward regeneration, beyond linear toward circular economies, beyond individual benefit toward the common good, beyond short-term thinking toward long-term thinking and acting. By cultivating the three mindsets, we give clearer, stronger direction to our lives and to our world, setting the necessary foundation for us to collectively co-create the world we want.

CHAPTER 5

Stubborn Optimism

Twenty-five hundred years ago, Siddhartha Gautama, the man who became known as the Buddha, understood optimism. He said many times that a brightness of mind was both the final goal of the path of enlightenment and also the first step. A bright mind is how you proceed. Without it, you can't make progress.

The Buddha also understood that we are not subject to our attitudes in a passive way but are active participants in creating them. Neuroscience has now confirmed this. It does not matter if our natural tendency is to see things with optimism or with pessimism. At this point in history we have a responsibility to do what is necessary, and for most of us that will involve some deliberate reprogramming of our minds.

Psychological research has shown that attitudes can be transformed by first identifying our thought patterns, then deliberately cultivating a more constructive approach. The practice involves becoming aware of these patterns, drawing out the unconscious assumptions, and challenging them when they don't serve you.¹

It's not complicated, but neither is it easy. Essentially, we all have inbuilt reactions to adverse things that happen around us. From the latest alarming report on climate change to missing the bus, we have a learned response to all phenomena that we encounter in life, and those learned reactions dictate how we

respond to a particular situation. When it comes to climate change, the vast majority of us have a learned reaction of helplessness. We see the direction the world is headed, and we throw up our hands. Yes, we think, it's terrible, but it's so complex and so big and so overwhelming. We can't do anything to stop it.

This learned reaction is not only untrue, it's become fundamentally irresponsible. If you want to help address climate change, you have to teach yourself a different response.

You can do it. You can switch your focus, and you will be stunned by the impact such a shift can create. You don't need to have all the answers, and you certainly don't need to hide from the truth, nor should you. When you are faced with the hard realities, look at them with clarity, but also know that you are incredibly lucky to be alive at a time when you can make a transformative difference to the future of all life on earth.

You are not powerless. In fact, your every action is suffused with meaning, and you are part of the greatest chapter of human achievement in history. Make this your mental mantra. Take notice of how your mind tries to insist on your helplessness in the face of the challenge and refuses to accept it. Notice it, and refute it. It will not take long for your thought patterns to change.

When your mind tells you that it is too late to make a difference, remember that every fraction of a degree of extra warming makes a big difference, and therefore any reduction in emissions lessens the burden on the future.

When your mind tells you that this is all too depressing to deal with and that it is better to focus on the things you can directly affect, remind yourself that mobilizing for big generational challenges can be thrilling and can imbue your life with meaning and connection.

When your mind tells you that it will be impossible for the world to lighten its dependence on fossil fuels, remember that already more than 50 percent of the energy in the UK comes from clean power,² that Costa Rica is 100 percent clean,³ and that California

has a plan to get to 100 percent clean, including cars and trucks, by the time today's toddlers have finished college.⁴

When your mind tells you that the problem is the broken political system and we can't fix that so there is no point in doing anything, remind yourself that political systems are still responsive to the views of people, and that throughout history people have successfully overcome extraordinary odds to achieve political change.

And when your mind tells you that you are just one person, too small to make a difference, so why bother, you can remind yourself that tipping points are nonlinear. We don't know what is going to make the difference, but we know that in the end systems do shift and all the little actions add up to a new world. Every time you make an individual choice to be a responsible custodian of this beautiful Earth, you contribute toward major transformations.

You may not be religious or spiritually inclined, but consider the lot of the stonemason in medieval Europe building one of the great cathedrals. He could have chosen to throw down his tools because he was not going to personally finish the entire cathedral. Instead, he worked patiently and carefully on his one piece, knowing he was part of a great collective endeavor that would lift the hearts and minds of generations. That is optimism, and cultivating it will not only be a crucial step to advancing our human story, it will also improve your life today.

Václav Havel aptly described optimism as "a state of mind, not a state of the world."⁵ Three characteristics are generally agreed upon as essential to making this mindset transformative: the intention to see beyond the immediate horizon, the comfort with uncertainty about the final outcome, and the commitment that is fostered by that mindset.

To be optimistic, you must acknowledge the bad news that is all too readily available in scientific reports, your newsfeed, your Twitter account, and kitchen table conversations bemoaning our current state of affairs. More difficult, but necessary for any degree

of change to take place, is to recognize the adversities and still be able to see that a different future is not only possible but is already tiptoeing into our daily lives. Without denying the bad news, you must make a point of focusing on all the good news regarding climate change, such as the constantly dropping prices of renewables, an increasing number of countries taking on net-zero-emissions targets by 2050 or before, the multiple cities banning internal combustion vehicles, and the rising levels of capital shifting from the old to the new economy. None of this is happening yet at the necessary scale, but it is happening. Optimism is about being able to intentionally identify and prescribe the desired future so as to actively pull it closer.

It is always easier to cling to certainty than it is to work for something because it is right and good, regardless of whether it currently stands a decent chance of success. All the measures to address climate change still require further maturation; none guarantee ultimate success. We don't know which renewables, if any, will predominate, or which are more likely to scale quickly. Problems with the batteries of electric vehicles (weight, cost, recycling) must still be solved, and charging networks still require substantial expansion to succeed. Financial instruments must more effectively manage the risks of new technologies. Market models that shift us from single ownership of homes and cars to shared ownership must gather steam and make peace with regulation.

When you look at the future broadly instead of narrowly, you see that you must take these uncertainties in stride, or you will stay stuck in the knowns of the past. You have to be willing to risk mistakes, delays, and disappointments, or you will be at the mercy of only the tried and true, to your ultimate peril.

This mindset is all the more important once you realize that the habits, practices, and technologies of the past will lead us only to ecological demise and human suffering. Viewing our reality with optimism means recognizing that another future is possible, not promised. In the face of climate change, we all have to be optimistic,

not because success is guaranteed but because failure is unthinkable.

Optimism empowers you; it drives your desire to engage, to contribute, to make a difference. It makes you jump out of bed in the morning because you feel challenged and hopeful at the same time. It calls you to that which is emerging and makes you want to be an active part of change. Rebecca Solnit puts it well: “Hope is an ax you break down doors with in an emergency;...hope should shove you out the door, because it will take everything you have to steer the future away from endless war, from the annihilation of the earth’s treasures and the grinding down of the poor and marginal....To hope is to give yourself to the future, and that commitment to the future makes the present inhabitable.”⁶

In other words, optimism is the force that enables you to create a new reality.

Optimism is not the *result* of achieving a task we have set for ourselves. That is a celebration. Optimism is the necessary *input* to meeting a challenge.

Optimism is about having steadfast confidence in our ability to solve big challenges. It is about making the choice to tenaciously work to make the current reality better.

Optimism is about actively proving, through every decision and every action, that we are capable of designing a better future.

From the darkness of an Alabama jail, Martin Luther King, Jr., kept calling for the realization of a deeply held dream, no matter how bleak its prospects. Many others have done the same throughout history: John F. Kennedy refusing to accept that nuclear war was inevitable. Gandhi marching to the ocean to collect forbidden salt.

In all these cases, key people believed that a better world was possible, and they were willing to fight for it. They didn’t ignore difficult evidence or present things in a way that wasn’t true. Instead they faced reality with a fierce belief that change could happen, however impossible it might have seemed at the moment.

On the road to the Paris Agreement in 2015, we learned just how critical optimism is to transformation. When Christiana took over responsibility for the United Nations' annual rounds of climate negotiations in 2010, it was in the wake of a total collapse of the previous year's negotiations, which had been held in Copenhagen.

Copenhagen was nothing short of a disaster. After years of preparation and two weeks of excruciating around-the-clock negotiations, the only result was a weak, inadequate accord that was politically unacceptable and legally irrelevant. The United States had embarrassingly declared success prematurely. China and India had put up major roadblocks, supported by all developing countries. It had been a free-for-all of political frustration, outrage, and disagreement.

It was far from the "Hopenhagen" the hosts had advertised.

In fact, there had been blood.

Claudia Salerno, the Venezuelan representative, had been excluded from the small room where only a few leaders had negotiated behind closed doors. She was so angry and so adamant about getting the floor, she incessantly banged her country's metal nameplate on her desk until her hand was bleeding.

"Do I have to bleed to get your attention?" she screamed at the Danish chairman. "International agreements cannot be imposed by a small exclusive group. You are endorsing a coup d'état against the United Nations."

Each sentence was punctuated with the pounding of metal and blood.

If this is what saving the planet looked like, we were all doomed.

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Six months later, UN Secretary-General Ban Ki-moon asked Christiana to assume responsibility for the international climate negotiations. There was little hope in his request: pick up the pieces from the political garbage can and make something of them.

No one, from a high-level administrator at the UN to a government delegate to a climate activist working from home, believed that the world had a shot at ever achieving a workable agreement. Everyone thought it was too complicated, too costly, and too late anyway.

As a result, one of the toughest challenges Christiana faced was bringing everyone to believe that an agreement was even possible. Prior to considering the political, technical, and legal parameters of an eventual agreement, she knew she had to dedicate herself to changing the mood on climate. The impossible had to be made possible.

The very first step was to change her own attitude.

As the recently appointed Executive Secretary of the United Nations Convention on Climate Change, Christiana held her first and best-remembered press conference. The new voice of the entire international process, she sat before forty journalists, gathered in a windowless room in the Maritim Hotel in Bonn, Germany.

After a few anodyne interjections, the most important question was asked: “Ms. Figueres, do you think a global agreement will ever be possible?”

Without thinking, she blurted, “Not in my lifetime.”

Christiana had instinctively spoken for the thousands of people who had been in Copenhagen, and for millions more who followed the proceedings online. Hope was gone, and the pain was deep. Her words expressed the prevailing mood, but they also ripped straight into her own heart. The attitude she had just perpetuated was exactly the problem. If she succumbed to despair, and by extension let this whole political process succumb to it, it would define the quality of life for millions of vulnerable people today and determine the fate of future generations. She couldn’t let that happen.

Impossible is not a fact. It is an attitude.

When Christiana walked out of the press conference that day, she knew her primary task: to be a beacon of possibility that would allow everyone to find a way to a solution together. How it would

happen she did not know, but she knew with clarity that she had no other option.

Bringing about a complex, large-scale transformation is akin to weaving a tapestry of elaborate design with thousands of people who have never woven anything or even seen the pattern. Almost two hundred nations, five hundred supporting UN staff members, more than sixty topics under negotiation across five (sometimes intersecting) negotiating tracks, and thousands of participants from all walks of life were involved. Of course, everyone wanted a good future for humanity, but once you dove just one level below that very basic goal, everything else was under constant negotiation, from agreeing on the agenda for one working session, to topics as contentious as how science should be reflected in policy. Predictably, setbacks and obstructions quickly became the norm.

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Throughout the whole process, we paid attention to the underlying challenging dynamics, guiding them into a constructive space so that innovative solutions could emerge from the fertile ground of collective participation and wisdom. Careful and well-targeted interventions were repeatedly necessary to ensure forward momentum but could never become overbearing. The intention was to constantly unblock pent-up energy and catalyze the next level of work. Complex dynamic systems can be intimidating if approached from the expectation of control, but they are thrilling if seen as a carefully curated landscape of potential that blossoms as problematic issues find resolution and enrich the commonly agreed-upon grounds.

In December 2015, 195 nations adopted the Paris Agreement unanimously, and hundreds of millions of people widely recognized it as a historic achievement. Undoubtedly many factors contributed to this resounding success, as well as thousands of individuals, but the key was the contagious frame of mind that led to collective wisdom and effective decision making. Everyone who was there at

the adoption, and millions of people following online, felt optimistic about the future, but in fact optimism had been the starting point of the journey. It had had to be, or else we would never have reached any agreement.

We need to remember, however, that in the challenging years to come, optimism on its own won't be enough, as it wasn't enough in Paris. What sustained us through the long nights and years of building that initial agreement was a particular brand of optimism that is necessary for the most difficult tasks: stubborn optimism.

Optimism is not soft, it is gritty. Every day brings dark news, and no end of people tell us that the world is going to hell. To take the low road is to succumb. To take the high road is to remain constant in the face of uncertainty. That we may be confronted by barriers galore should not surprise anyone. That we may see worsening climate conditions in the short term should also not surprise us. We have to elect to boldly persevere. With determination and utmost courage, we must conquer the hurdles in order to push forward.

We need both systemic transformation and individual behavioral changes. One without the other will not get us to the necessary scale of change at the necessary pace. We all sit at various points of society: members of families, community leaders, CEOs, policy makers. No matter where you sit, we all can and must exercise that responsibility in favor of the common good. No one is irrelevant.

Particularly in the face of grand human challenges, the only responsible approach we can take is to protect humanity and other forms of life and steer the course of history toward the better. Changing direction at this late hour is entirely possible, but only with a collective intent and optimism that is so robust, we jolt ourselves out of the currently established default path.

The story of the five-year process toward Paris is in many ways like the process we must now unleash. Today most people believe it is impossible to transform our economy in one decade. But we cannot afford that fatalism; our only option is to turn our full attention to the immediate actions we can undertake to change direction. It starts with our own way of thinking about the

challenge, our determined attitude, and our capacity to infect others with the same conviction, no matter how challenging that is. That is stubborn optimism.

The evolution of humanity is a story of adaptive ingenuity to the challenges of the time. We face the greatest challenge of human history. We may be challenged beyond our currently visible capacities, but that only means that we are invited to rise to the next level of our abilities. And we can.

CHAPTER 6

Endless Abundance

The feeling that we have to compete with others to get what we want, or what we think we need, runs deep in each of us. Most of us have grown up under the stifling influence of the zero-sum paradigm, the notion that if one person wins, another one *has* to lose. (One person's gain has to be "balanced" by another's loss in order for the sum of all gains and losses to be zero.) The zero-sum paradigm has baked competition into our worldview. Without competition, we could not have achieved many of the great economic and social advances we have made over the centuries. And we will still need a healthy competitive edge to develop the new technologies that will help us address climate change. But when we allow competition to become the dominant feature of our decision making, we lose our grounding and start to see scarcity in places it may not even exist.

Few of us haven't felt that rush of urgency and determination to get ahead of the crowd for a seat on the train or bus. It's a feeling so ubiquitous that in some countries transportation companies have announcements reminding us to let passengers off the bus or train before attempting to board. But the drive to compete for a seat is sometimes so strong, the announcements cannot prevent people from pushing in first to claim their spot.

The frenzy that dominates in these scenarios doesn't begin with our competitive impulse. It starts with the deeply ingrained

perception of scarcity—the view that there is a limited amount of something regardless of what the reality may be. We are convinced that there is only one good seat, so we want to secure it before someone else does. Whether it is based on objective reality or not, our fear of scarcity elicits our competitive response, which in turn feeds our fear of scarcity in a self-reinforcing cycle.

The perception of scarcity puts us into a very small mental box. We can expand that box in either of two ways. First, we can realize that quite often the perception of scarcity is not objective but rather of our own making. We can climb out of the mental scarcity box by understanding that there are other seats on the train or bus, and that more buses are coming a few minutes later.

The second way is to decide to step away from the zero-sum paradigm, a rather odd construct when you think about it. Yes, the number of seats on the bus is limited. But another person's gain does not necessarily have to be my loss. Perhaps giving my seat on a bus or train to another allows me to start an unexpected, delightful conversation. Maybe that simple act improves the other person's day or adds joy to mine. Giving is well known to increase individual happiness, so my "loss" can actually become my "gain." In fact, "my loss ↔ your gain" can actually become "our gain."

It's all about the mindset.

Our mindset is so powerful that it can convince us that a scarcity exists, throwing us into unnecessary competition and thereby objectively creating the scarcity we initially feared. For instance, Tucson, Arizona, is a desert community, and over the years water has become more and more scarce. The Santa Cruz River, which used to flow freely through the community all year round, is now dry. Only twenty-eight centimeters of rain fall on Tucson each year. And perhaps because water has always been perceived as scarce in this region, the growing population, wanting more, has frantically pumped so much water from the ground that the water table has dropped by more than ninety-one meters. Trees and other vegetation, which used to line the Santa Cruz, died along with the river itself. The perception of water scarcity, which led to

overpumping, then contributed to even greater scarcity, because bare (or paved over) land cannot easily absorb the little rain that falls—most of which is washed away.

Here's the interesting part: the twenty-eight centimeters of rain that Tucson gets each year are actually more than the municipal water it consumes each year.¹ Water was never measurably scarce, it was only perceived as being scarce. Tucson has plenty of water if you consider the abundance of the entire water cycle instead of focusing only on the amount in your well at any given time. When a resource is *perceived* as scarce but is in reality abundant (plenty of seats on a bus or enough rain for everyone), we have the option of reacting either in a narrowly competitive way or in a more broadly collaborative manner. How we react may be influenced by something as profound as our degree of personal self-awareness, or by something as simple as how we happen to be feeling that day. Our attitude does not change any of the facts (how many seats there are on the bus or how much rain falls), but it does make a massive difference in the nature of our experience. And in many cases, when we collaborate, we have more rich experiences, not fewer.

However, when the resources are *actually* scarce and getting scarcer, we face a very different situation in making decisions. Contrary to what we might initially think, in circumstances of real (not only perceived) scarcity, our *only* viable option is collaboration. Fortunately, contrary to what most of us believe, it is the option we human beings tend to adopt, at least under certain circumstances.

In the face of disasters like hurricanes, earthquakes, and even terrorist attacks, members of a community tend to come together in solidarity with one another. Studies conducted after Hurricane Katrina in New Orleans and Typhoon Haiyan in the Philippines, as well as many other disasters around the world, have shown that communities respond overwhelmingly with an altruistic spirit of solidarity under the initial common pain and then collaborate to reconstruct and recover afterward.² At these moments, our tendency to give, be it time, skills, money, love, or simply a home-cooked meal, overrides our tendency to be competitive. Key to this shift

away from competition is that giving makes us happy, so while we act primarily in service to others during times of great hardship, we are also, in fact, acting in service to ourselves.³

On November 13, 2015, two weeks before the start of the final session of negotiations for the Paris Agreement, the city suffered its worst terrorist onslaught ever. The attackers targeted six popular locations across the city, killing 130 people and wounding almost five hundred.⁴ No one who was there in the days following will ever forget the sight of thousands of pairs of shoes placed in neat rows in the Place de la République, including a pair of plain black shoes sent by Pope Francis. And far from staying away, 155 heads of state and government traveled to Paris two short weeks afterward for the largest ever gathering of heads of state and government under one roof on a single day, partly because of the importance of the need to reach a global climate agreement, and partly as a mass demonstration of solidarity with France.

In times of profound suffering and great need, we rise to the occasion, we stand shoulder to shoulder in mutual support. That impulse to gather in a circle of care for one another must be extended to our efforts to address the climate crisis.

Particular recent disasters that you may recall, and the subsequent collaboration and solidarity they precipitated, likely had only a local impact, but the situation we face with global scarcity is vastly more challenging. Globally, we have dramatically fewer insects, birds, and mammals than we did just fifty years ago, and far less forest cover. Our soils are less productive, and our oceans are less bountiful. Harder to see but even more threatening in its consequence is the fact that we are running out of atmospheric space for our greenhouse gas emissions. Think of the world's atmosphere as a bathtub in which, for fifty years, not water but greenhouse gases have been rising. They are now approaching the rim, the limit that the bathtub can hold, or the scientifically established maximum amount of greenhouse gases that the atmosphere can contain—its carbon budget. If we exceed the carbon budget, the bathtub will start to overflow uncontrollably. We are on

the verge of atmospheric tipping points that are frighteningly unpredictable and irreversible. Every bit of carbon dioxide (CO₂) emitted—no matter where in the world—contributes to the possibility of disaster. We are rapidly exhausting the space in the bathtub. This is the ultimate scarcity.

Adopted in 1992, the UN Climate Change Convention is based on the recognition that developed countries bear overwhelming historical responsibility for climate change because of the emissions caused by their fossil-fuel-based industrialization. In contrast, developing countries have insignificant historical responsibility but bear disproportionately high destructive impacts in relation to the size of their economies. That is not ideology, it is an indisputable fact. At the same time, three decades later it is evident that, as they develop and their growing populations emerge from poverty, some developing countries are rapidly increasing their emissions because their economic growth is still largely linked to fossil fuels. As a result, industrialized nations have been advocating that developing countries assume more responsibility for emission reductions. For years, developing countries have flatly rejected these demands as hindering their economic growth, even as they must shoulder increasing negative impacts from climate change.

Suggestions for a fair allocation of what remains of the carbon budget have been varied. Some have proposed imposing a limit on emissions from industrialized nations so that space remains for those of developing countries; the developed nations deemed this unacceptable. Others have proposed a gradual reduction of emissions in industrialized countries and a managed growth of emissions in developing countries. Unsurprisingly, no happy point of convergence has been agreed on. Another proposal would impose a worldwide limit of two tons of CO₂ emitted per person per year. As the range of national per capita yearly emissions spans from 0.04 to more than 37 tons of CO₂, it was inevitable that those countries substantially above the suggested two tons did not seriously consider the proposal.

Fair allocation of the remaining atmospheric space has proven to be a futile exercise no matter the formula. A fair outcome is not viable as long as we pursue it from a mindset of scarcity and competition.

The state of the planet no longer allows for this mindset because we have reached existential scarcity: limits to the survival of many of the ecosystems that sustain us and that help to maintain safe greenhouse gas levels in the atmosphere. If the Amazon is destroyed, carbon emissions will rise so high that the entire planet, not only Brazil, will suffer the consequences. Likewise, if the Arctic permafrost thaws, not only will the countries surrounding the North Pole suffer, but so will the whole Earth. We are all in the same boat. A hole at one end of the boat does not mean that only the occupants sitting there will drown. We all win or lose together.

The new zero-sum model presupposes collaboration, not competition, as the necessary engine for regenerating the biosphere and creating abundance.

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It was close to midnight, and we were at our breaking point.

The 2014 negotiations in Lima, Peru, had been moving forward swiftly over the past days, but now we were at the anticipated impasse: responsibility for emissions reductions. We had known that the issue would raise its head, and that this time the consequences were grave—they would make or break next year's Paris negotiations.

Without fail, at every major international negotiation session, whenever we were on the cusp of an intractable deadlock, there would be a soft knock on the office door, often after midnight, and Minister Xie Zhenhua, for years the head of the Chinese delegation, would walk in. As anticipated, here he was again with a clear message. The draft negotiating text did not properly account for the great differences in responsibility for, and future ability to respond to, climate change. Developing countries would prefer no agreement

in Lima or Paris next year, if it meant accepting one that was unfair. He pointed to a recent agreement between the United States and China that steered away from an approach grounded in competition and scarcity, toward collaboration and abundance. The agreement did not focus on the historical responsibility of industrialized nations nor on the obligations of developing countries to reduce their emissions. It was based on a different paradigm, one that encouraged the shared pursuit of the benefits of emissions reductions for individual nations as well as for the collective: a new model beyond zero sum.

Now it was our job to adapt that conceptual model to the context of a global agreement between 195 nations in a way that was coherent with all the rest of the issues for which we were finding common ground. First we had to repeatedly negotiate every word and every comma of the adapted text between the U.S. delegation, led by Todd Stern and Sue Biniaz, and the Chinese delegation led by Minister Xie. We had to move quickly but discreetly between delegation offices so as to not give any visible signs of frenzy to the thousands of other delegates who were exhausted and anxious about the deadlock, wondering if the whole session would go up in flames. But after several iterations of goodwill on both parts, an agreed version emerged, and each side undertook to bring their respective group of countries on board.

The new understanding established that reducing emissions is indeed a responsibility of every nation, for its own enlightened self-interest *as well as* for the benefit of the planet as a whole. The mindset shift and associated new language in the text—away from competition and toward shared winning, where everyone can gain from a new abundance without impinging on each other—unlocked the door to the global agreement that would be signed in Paris the following year.

An increasing number of countries today fully understand that their development in the twenty-first century can and should be clean; that by decarbonizing their economies, they can reap the benefits of more jobs, cleaner air, more efficient transportation,

more habitable cities, and more fertile lands. This shift toward a mindset of creating abundance does not negate the limitations of a carbon economy; instead, it gives every country a wealth of positive individual and collective reasons to stay within that limit. As one country moves forward demonstrating the national benefits of clean technologies and policies, others will follow, momentum will be built, and the global rate of decarbonization will increase, protecting the planet.

When we are motivated by a desire for collaboration, we liberate ourselves from the restrictive framing of attaining “what I want, or think I need,” and open ourselves up to a broader framing of what is available and possible in many other forms—available to me, but not only to me, to others as well. The realization of abundance is not an illusory increase in physical resources, but rather an awareness of a broad array of ways to satisfy needs and wants so that everyone is content. In this way resources will be protected and replenished, and the relationships among us are enriched.

Endless abundance.

At the individual level, we are called to enhance collaboration and nurture abundance as a mindset. Making that mindset shift is not as hard as it sounds. Consider, for example the endless abundance of energy coming from the sun, wind, water, sea waves, and heat within the Earth, all of which we are now harnessing to produce electricity, and none of which will ever get used up. Regenerated soils, forests, and oceans can all be wisely managed for endless abundance rather than squandered for imminent depletion. In fact, ecosystems operate from the very principle of abundance—they depend on components within them that are naturally plentiful, such as waste, to provide the food and nutrients for further growth.

We can also add creativity, solidarity, innovation, and many other abundant human attributes available to us, endlessly.

The rise of collectively generated and freely shared knowledge on the internet has data challenges that remain to be addressed, but it has made the notion of collaborative systems and endless

abundance easier to understand. Think of Wikipedia, LinkedIn, or Waze. Each user of the system is unique, but all users are interrelated through the network of the endlessly growing system. Every user contributes to the whole, but the total body of knowledge is larger than the sum of all users. And the system is in constant change, amplifying in some areas, correcting course in others, and growing into previously unknown spaces. Competition plays a role, but it is limited because everyone contributes, everyone benefits, and everyone partakes of a constantly increasing total. Collaboration is the name of the game. Shared benefit from endless abundance is the result of the game.

As a next step, one could imagine a world of “open source everything,” an open approach in every field of human endeavor, where competition is no longer the operating principle, but rather collaboration. Following the principles we observe in any natural ecosystem, this approach explicitly promotes learning and growth throughout the whole system. It allows us to constantly teach one another, thereby exponentially increasing our capacity to co-create knowledge and share goods and services with open access, used by everyone for the benefit of all.

The practice of abundance starts by shifting our minds away from perceived scarcity to what we can collectively *make* abundant. In so doing, we will become more aware of others, what we can learn from them and share with them. We will be more conscious of our own impulse to compete and, as a corrective, develop a keener interest in how we can all win. We will be more likely to show appreciation to those who have contributed to a joint task, encouraging ever-higher levels of teamwork and collaboration everywhere. We will share the results of our labor with anyone who can use it as input to their further work, without mentally claiming any intellectual property rights. Another person’s success is not our loss; it is our constantly growing collective success.

We are entering the next phase of human evolution. The human species (and many other animal and plant species) must now adapt to the scarcity of natural resources we have caused, and the rapidly

diminishing space left in our global atmosphere for carbon emissions. To do this, we need to prioritize collaboration. Faced with the ultimate scarcity, we must internalize the new zero sum (either we all win or we all lose) and apply a mindset of abundance to that which we have left and that which we can co-create and share.

CHAPTER 7

Radical Regeneration

Exhausted after a long day's work at the UN, we were having a quiet meal at a little restaurant close to our office, chatting and commenting on what had been done and what was left to do. Two young men sitting next to us had finished eating and were talking over their third beer about what to do next. We tried to focus on our own to-do list, but their conversation pulled us away.

“But why do you want to leave?”

“Because there's nothing more for me here.”

“So where do you want to go?”

“I don't know. Wherever I can get something better.”

We looked at each other with raised eyebrows. The man had expressed a sentiment we'd heard so many times before—that when there's nothing left, it's time to find more elsewhere.

The man's focus on “getting something better” was no individual quirk. It has been with human societies for centuries. Conquerors of distant lands pillaged colonies for metals, minerals, and exotic foods, in many cases leaving little more than chaos, infectious diseases, and Bibles in exchange. As managers of fertile soils, we humans have proved remarkably effective at extracting trees and nutrients, leaving only depleted topsoil in our wake.

There's nothing inherently wrong with these instincts. They help us grow to meet rising challenges. But our growth, both personal

and professional, is a two-way street: what we get *and* what we give. As a species, however, we have become used to a one-way transaction, that of *getting*, often losing sight of the void that our taking has created.

Our planet can no longer support one-directional growth. We have come to the end of humanity's extraction road. The time for "getting" is over. Staring us in the face is a huge red sign that reads STOP: PRECIPICE AHEAD.

Extraction is a propensity deeply ingrained in human behavior. To move away from extracting and depleting, we need to concentrate on another equally strong and intrinsic trait: our capacity for supporting regeneration. Caring for ourselves and others. Connecting with nature. Working together to replenish what we use and to make sure plenty remains for tomorrow. These tendencies are just as much second nature, but they are less well developed in modern society. It's time to bring them to the surface.

Being regenerative is not strange to us.

If you have children, think about how supportive you are with them when they go through periods of deep doubt. Remember how patiently you listen to their worries and help them stay hopeful. Or think of how encouraging you are to friends who may have fallen into a professional hole, how much time and energy you invest in helping them replenish their self-confidence so that they can rise to the top of their game once again.

Sometimes it's easier to act in more regenerative ways with our friends and families—or even with strangers halfway across the world—than with ourselves. While this may be noble, to be most effective, we need to begin with ourselves.

Amid the climate crisis, we each have an urgent responsibility to replenish ourselves and protect ourselves from breaking down. In the face of imminent burnout, some of our colleagues who have worked for years to address climate change under extremely stressful circumstances have at some point prudently taken time off to restore their energies by turning to the healing arms of nature or the loving embrace of a spiritual community. The wisest among

them have incorporated meditation and mindfulness practices into their daily lives.

We know from our own experience that continual personal grounding is key to being able to withstand the daily bombardment of bad news from all sides. Without such grounding, you will be a leaf in the wind—vulnerable to the elements from all directions. Better to stand as a tree, firmly rooted in your own values, principles, and convictions. The two of us easily notice the difference between a day in which we meditate and a day in which we don't. The benefits of meditation undoubtedly blossom with years of practice, but they are also palpable on a day-to-day basis. Maybe you don't care for meditation, and a spiritual practice holds no interest for you. Fair enough. But this does not mean you should not be mindful of yourself. Whether it is gardening, crafting, drawing, playing or listening to music, exercising, meandering in the park, or paddling down a river, identify what replenishes you and your soul, and do it regularly and intentionally.

Our first responsibility is to notice how and when we are depleted and to support ourselves. Our second responsibility is to reaffirm and strengthen the regenerative capacity we already display with family and friends. But we cannot stop there. Our third responsibility is to engage those beyond our innermost circle and, indeed, nature itself.

In the natural world, the strictest interpretation of the term *regeneration* is the self-generated healing process that restores an organism's injured bodily part from the remaining healthy tissue. For instance, newts, lizards, octopuses, and starfish have the capacity to regenerate lost limbs or tails. In humans, adults can regenerate a damaged liver to its original size after either partial removal or injury. And all of us have witnessed the miracle of skin repairing itself after a scrape or wound, sometimes leaving no trace of the injury at all.

A broader interpretation of regeneration is the capacity of a species or a biosystem to recover on its own, once humans remove the pressure they had been exerting. Whale populations and

degraded lands are good examples. Gray whales and humpbacks, once decimated by nineteenth-century commercial whaling practices, have now almost recuperated their numbers. The prohibition of whaling shows that if we remove the extractive pressure, animal populations have the ability to rebound (assuming of course we have not driven them to extinction). The same is true for ecosystems, as we can see in photos of ancient ruins abandoned by humans that have been taken over by the surrounding green growth. The recuperation of a flourishing ecosystem around Chernobyl is a great example. With humans gone, the plants started to grow back, supporting worms and fungi that nourished the soil. Birdsong is now abundant and even large mammals like boars and bears have returned. If we remove the pressures we have wielded, nature tends to return to health.

The converging crises of climate change, deforestation, biodiversity loss, desertification, and acidification of the oceans have taken us to the point where we can no longer naïvely depend on the Earth's natural resilience or capacity to recuperate. While nature is innately restorative, regeneration does not always occur completely on its own. Right now, we have almost extinguished nature's capacity for self-renewal. In many cases, ecosystem restoration requires intentional human intervention, such as *rewilding*, by which we not only remove the destructive pressure of grazing or unsustainable harvesting but also reintroduce native animals and help nature bounce back, slowly recuperating its rich biodiversity. Planting trees and shrubs in degraded or deforested landscapes is an intentional regenerative process that restores soil health, increases productivity, and stabilizes underground aquifers. In one well-known effort currently under way to reforest the Scottish Highlands, researchers noticed that when the trees were lost from the landscape, so were the fungi normally found in the soil around them. It turns out that mycorrhizal fungi are hugely beneficial for reforesting degraded landscapes, and now a sprinkling of native mushroom spores is added to the roots of new saplings as

they are planted to speed up and strengthen the revival of the Great Caledonian Forest.

Coral farming, another fine example of intentional regeneration, is the process whereby fragments of corals are collected from local reefs, further broken up, raised in nurseries where they mature much faster than in the open sea, and then planted at the restoration site to regrow the damaged reef. With the advent of innovative coral-farming techniques, scientists will soon be able to launch large-scale restoration efforts to revive the valuable coral reefs that are at risk or already dead. Nature can restore itself, but with intentional human help it has a better chance and can speed up. With our support, regeneration can become the predominant direction of the future evolution of this planet.

We have brought our natural world to several perilous brinks from which it may not be able to recover on its own. It is like an elastic band that stretches and contracts normally but if stretched too far will snap. Undoubtedly regeneration of nature now needs to be intentional, planned, and well executed at scale.

We will not recover everything. Many species are already extinct and will not return, and some ecosystems may already be damaged beyond their resilience threshold. But fortunately we still have a relatively hardy natural environment that responds positively to our care and caring. Well-intentioned and well-planned regenerative practices will restore our ecosystems, perhaps not to their former state but to a new state of regained health with enhanced resilience.

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Let's begin our regenerative mindset shift by acknowledging and internalizing the simple fact that our lives, our very physical survival, depend directly on nature. Human beings cannot survive longer than a few minutes without oxygen. The oxygen we breathe comes from the photosynthetic processes of trees, grasses, and other plants on land and of phytoplankton in the oceans. Every sip of water we drink comes from rain, glaciers, lakes, and rivers.

Without land we would have no food to eat, no fruits, vegetables, or grains, no cows, chickens, or sheep; and without rivers and oceans, we would have no fish or seafood to consume. Humans cannot survive for more than a week without water or for three weeks without food. Every breath we take, every drop of liquid we drink, and every morsel of food we eat comes from nature and connects us profoundly to it. It is a simple basic truth, yet one we often tend to ignore or take for granted.

It is not only our immediate survival that depends on functioning ecosystems. In large part our health, physical and emotional, relies on having contact with the natural world around us. This contact is under threat from rising rates of urbanization and from time spent with our electronic devices. Sedentary indoor life—often characterized by limited natural light, poor air quality, walled surroundings, and increasing screen time—leads not only to obesity and loss of physical strength but also to feelings of isolation and depression. This family of symptoms has been broadly diagnosed as “nature-deficit disorder.”¹ Conversely, studies show a significant decrease in mortality, stress, and illness for those who exercise and spend time in the natural world. Nature-based play, gardening, and access to natural landscapes heighten our sense of well-being while sensitizing us to the ever-changing light, weather, and seasons.

Reconnection to nature is a powerful antidote to anxiety and stress, as well as a counter to physical illnesses. The Japanese health system has developed the practice of *shinrin-yoku*—literally, forest “bath” (not with water)—or spending mindful time in the woods. It is beneficial for soul and body as it boosts the immune system, lowers blood pressure, aids sleep, improves mood, and increases personal energy. It has become a cornerstone of preventive health care and healing in Japan.

A growing number of pediatricians are prescribing more unstructured time in nature for children to fight childhood obesity while engendering a sense of wonder and love of local wildlife, fauna, and special places. In fact, some doctors argue that watching

documentaries about endangered species and faraway ecosystems cannot substitute for personally caring for plants at home and directly exploring the flights of butterflies, birds, and dragonflies.

Public consciousness of our dependence on, and interconnectedness with, the planetary life-support system is growing, along with an increasing awareness of the need to restore ecosystems and planetary health. Countless efforts are under way around the world to plant trees, protect mangroves and peatlands, reestablish wetlands, and restore degraded lands via rain harvesting, perennial grains, grasses, and agroforestry. But more is needed so that these solutions can be taken to scale globally.

A regenerative mindset is most effective if pursued intentionally and consistently. It is both a tough mental discipline and a gentleness of spirit that needs to be cultivated. It is about understanding that beyond getting what we want and need from our fellow human beings, we have the responsibility to replenish ourselves and to help others to restore themselves to levels of greater energy and insight. It is about understanding that beyond extracting and harvesting what we need from nature, it is our responsibility and in our enlightened self-interest to protect life on this planet, indeed even enhance the planet's life-giving capacity. Personal and environmental goals are interlinked, mutually reinforcing, and they both need our attention.

A regenerative mindset bridges the gap between how nature works (regeneration) and how we humans have organized our lives (extraction).² It allows us to “redesign human presence on Earth”³ driven by human creativity, problem solving, and fierce love of this planet.

Sir David Attenborough, one of the most renowned naturalists of our time, has warned us that “the Garden of Eden is no more.” We agree. That is why we now have to create a Garden of Intention—a deliberately regenerative Anthropocene.

Instead of strip-mined mountains, destroyed forests, and depleted oceans, imagine millions of rewilding projects covering over a billion hectares of forests, regenerating wetlands and grasslands, and restoring coral farms in all tropical oceans.

We will not have a regenerative Anthropocene by default, but we can create it by design. With directional intent, we can shift our aspirations from our current extractive growth to a life-sustaining society of regenerative values, principles, and practices.

We can ignite regenerative human cultures that seek to ensure that humanity becomes a life-sustaining influence on all ecosystems and on the planet as a whole. We will need artists as well as policy experts, farmers as well as leaders of industry, grandmothers as well as inventors, and indigenous leaders as well as scientists.

We can choose regeneration as the overarching design principle of our lives and our activities. We can restore the resilience of the land and our communities while healing our souls. Our corporate strategy meetings and family reunions should be carbon neutral for sure, but beyond that, they can include regenerative projects in which we put our hands in the soil or in the water, together taking actions that restore rather than degrade life on our planet.

We have to shift our action compass from self-centric to nature-aligned. We have to filter every action through a consequential stress test, and we have to be pretty radical about it. When considering an action, we have to ask: Does it actively contribute to humans and nature thriving together as one integrated system on this planet? If yes, green light. If not, red light. Period.

This is not a distant dream. It is already happening. Together with renowned author Arundhati Roy, we can say, “Another world is not only possible, she is on her way. Maybe many of us won’t be here to greet her, but on a quiet day, if I listen very carefully, I can hear her breathing.”

PART III

TEN ACTIONS

CHAPTER 8

Doing What Is Necessary

Toward the end of the first week of the Paris negotiations in December 2015, we were working in Christiana's office when we heard a knock on the door.

Kevin O Hanlon, head of UN Security, came in. We had all worked together for years, so the concern on his face was easy to read.

"We found a bomb."

It was the nightmare scenario we had been dreading.

Because of the recent terrorist attacks in Paris, we had allowed the security forces of the host country to assume responsibility for the arrival and departure area of the UN meeting grounds. By law, the location of a UN negotiation meeting is considered extraterritorial for the duration of the meeting, therefore not under the sovereignty of the host country. But for COP21, we had transformed Le Bourget Airport into a large conference center, and with 195 countries and 25,000 people in attendance, it was an obvious potential target. We knew we needed help from French law enforcement, especially the specialized French antiterrorism police and their bomb-sniffing dogs.

Thirty thousand police officers had been deployed across the country, and 238 security checkpoints had been set up. Security was unprecedented. What we were attempting to accomplish inside the

UN grounds was unprecedented as well. Now we were five days into the largest climate change negotiations in UN history. The stakes were enormous.

Kevin explained that the bomb had been found in a trash bag in the transportation hub of the Le Bourget subway station, the main train stop for our conference—every single one of the 25,000 participants streamed through that station all day long. Christiana's two daughters used the station at least twice a day. Tom had two children at home, waiting for him to return. We looked at each other and saw in each other's eyes the scenes from three weeks earlier in Paris and Saint-Denis. Broken glass. Blood. Dead bodies. Family members weeping.

The bomb had been deactivated, but there was no way to determine if there were more explosive devices in the area.

Everything hung in the balance. After years of development, we finally had a draft text of a global climate agreement. We had the long-term target of a net-zero emissions economy, language to protect the vulnerable, and even a ratchet mechanism to periodically deepen emission reductions to try to keep the world to “well below 2 degrees Celsius” of temperature rise. These ambitious goals were in the draft text but were not guaranteed to survive many countries' political pressure to remove them. Plus, we wanted more. We wanted the agreement to put us on a path to a 1.5-degree-Celsius maximum temperature rise. A 2-degree world would result in up to three times as much infrastructure destruction, biological destruction, and life-threatening heat, hunger, and water scarcity. The difference would save millions of lives and perhaps even give low-lying islands and coastlines a chance of survival. If we called off the conference, we didn't know whether we could ever achieve an agreement again—formidable political obstacles remained, and the forces of resistance were beginning to gather to prevent the world from achieving what it needed to do.

This was our chance.

And now a decision was needed.

Should we close down the conference and with it the chance for a global climate agreement, or should we keep it open, with all the risk that this entailed? Christiana was no stranger to making hard choices, but this wasn't a choice a mother should ever have to make.

All the risks, the fears, and the loss washed over us both in that moment. It was a terrifying place to be, but we couldn't stay there long. We had to act—one way or another.

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You also have a choice ahead of you, and by now you understand the risks.

The time you have to make that choice and act on it is vanishingly small. We have discussed the mindset everyone needs to cultivate in order to meet the global challenge of the climate crisis, but on its own, this is not enough. For change to become transformational, our change in mindset must manifest in our actions.

There are ten necessary actions for the making of a regenerative future, the future we hope you will choose. Some may be familiar; others will be new. We have considered not only the world we are trying to create but also the risks inherent in the effort.

On one level, the big solution to the climate crisis is blindingly obvious; we need to stop filling our atmosphere with greenhouse gases. But in order to deliver on that goal, we need to find myriad small solutions.

Greenhouse gases are emitted as a direct result of the things humans do to survive, such as sourcing food and getting around. Our ways of doing and being have become so entangled with what is killing the planet that we cannot feasibly just flip a switch and stop emitting greenhouse gases.¹ Consider the implications: if in an imaginary world, we stopped using all fossil fuels in an instant, if we denied people what they are used to—we would have a global revolution in a matter of weeks if not days.

On the other hand, if governments do not do enough and keep endangering the lives of young people and their future children, a major uprising is also likely and perhaps even already underway.²

We need transformational change at the speed that science demands and in a manner consistent with democracy—that is, if we do not wish to descend into tyranny or anarchy. This point is critical. In the coming decades, climate change will show up in larger and more lethal ways, leading to more forced migrations, changes in agricultural output, and more extreme weather. Increasingly populist leaders will try to justify their actions by claiming to protect the short-term interests of those they govern. This could hinder attempts to deal with the root causes of climate change, thereby worsening the crisis. Even the most casual observers of today's politics see that this risk is not merely theoretical. A five-year drought in Syria—the worst ever recorded—destroyed agriculture and caused many rural families to migrate to cities. Large numbers of refugees were already pouring in from the war in Iraq, and the combined tensions gave rise to the civil war and the atrocities committed by Bashar al-Assad. Then a flow of refugees, largely from Syria, made their way to Europe, where Chancellor Angela Merkel eventually accepted many into Germany.³ This led to fundamental changes in the German political system as the AfD (Alternative for Germany), a far-right movement, jumped from averaging 3 percent in the polls to 16 percent and is now a major political force.⁴ This weakened Merkel, then the de facto leader of the European Union, and it continues to affect politics in Europe and beyond.

If we are to resist extremist politics as the effects of climate change grow ever more critical, we will have to be vastly better prepared than we are today. The ten action areas we set out here attempt to portray not only how we can reduce emissions but also how as a society we can make ourselves more resilient to extremist movements that could pull us back in the wrong direction.

The ten actions that we call for are not only about moving beyond fossil fuels and investing in technological solutions. They

also call for a fairer economic system that does not strain the social net even further. They call for strong political engagement by everyone, and for relinquishing nostalgia for a past that might be dangerous to re-create. The additional pieces may feel remote from the issue of climate change, but they are fundamental parts of our response. We must reject the cycle of blame and retribution and embrace the shared endeavor we so desperately need. We cannot strain the social safety net and continue to expand inequality, or else our democratic systems will refuse to allow further changes to the economy. We have to get our arms around the whole issue at the same time.

What we will ask of you is significant. It is not simply about making minor changes to your lifestyle, although those can be important too; it is about transforming our priorities in order to create a future in which all of us may thrive. It will involve developing and utilizing the qualities of mind we talked about in the previous section and using them to take greater steps toward creating a new world.

None of us has complete control over which path the world ultimately chooses to take and which future will be ours. But each of us individually can engage in these ten action areas, giving direction to the transformation toward a regenerative world.

We are all weavers of the grand tapestry of history. As we cast our minds back and consider those who lived at moments of great consequence, we naturally feel that if we had lived then, we would have been among those who made the noble choices rather than those who stumbled along, head down, changing nothing. Well, this is our chance. Every one of the needed actions is something you can personally achieve as a human being, even if that boils down to urging others to take climate change seriously. Our hope is that by the time you put this book down, you will understand that you can make a significant difference.

We can no longer afford the indulgence of feeling powerless.

We can no longer afford to assume that addressing climate change is the sole responsibility of national or local governments, or

corporations or individuals. This is an everyone-everywhere mission in which we all must individually and collectively assume responsibility. You play many roles in your life—parent, spouse, friend, professional, person of faith, agnostic. You may have great means or none at all. You may sit on the board of a corporation or lead a city, province, or country. Whoever you are, you are needed now in every one of your roles.

Changing our mindset is critical but does not suffice. We invite you to dive into *doing* as soon as possible. Focus on doing one or two of the ten actions at first. Choose the areas that make the most sense for you, and then challenge yourself to do more over time. Know that our discussion can only point the way, shining a light on what we think is critical at this unique moment, but all of us can do myriad other things to make a difference.⁵ If you leave this book with a commitment to be part of this journey, then you will need to go beyond what we set out here.

You already know the end of our bomb story.

We had to do what was necessary, no matter the cost.

We knew the only way to truly protect our own children was to courageously continue the work of protecting all humanity and our planetary home. The metro station stayed open. The conference proceeded. Taking this action was not without risk, but neither of us regrets it. We hope that, in ten years, we will be able to say the same about our collective action.

The time for doing what we can has passed.

Each of us must now do what is necessary.

ACTION 1: *Let Go of the Old World*

To meet the challenges of the climate crisis and preserve all that we hold dear; to retain democracy, social justice, human rights, and other hard-won freedoms in the future, we must part ways with that which threatens to destroy them. Now is the time to make profound shifts in how we live, work, and relate to each other. To be successful, we need to make a series of intentional moves.

The first of these is to honor the past, then let it go.

Fossil fuels have given a huge boost to humanity's development, but their continued use is no longer supportable because of the extraordinary damage they cause to our health, our ecosystems, and our climate. Viable alternatives are safer. Now is the time for us to thank fossil fuels, retire them, and move on.

It is the same story for so many of the profound shifts we need to make today. The building blocks of our current society—energy, transportation, and agricultural systems, which we now know to be harmful—must undergo radical transformations.

We all find change difficult. We tend to cling to what we know and resist what is new—even when the new brings tremendous benefits. Opposition to onshore wind turbines in the UK is a good example. Even though onshore wind is now the cheapest form of energy⁶ (cheaper than coal, oil, gas, and other renewable sources), rural landowners have significantly resisted it, keen to preserve the appearance of the countryside. When the Conservative Party (which derives much of its support from these rural communities) came to power in 2015, it slashed subsidies and changed planning laws for onshore wind—leading to an 80 percent reduction in new capacity.⁷ Only now, with climate change awareness rapidly rising among the UK public, is support for onshore wind starting to outweigh an attachment to yesterday's aesthetics.

Be mindful that some individuals and industries are actively fighting the changes we need to make to achieve a world that is only 1.5 degrees warmer. They are sowing fear and uncertainty, sponsoring divisiveness, and seducing us into an unconstructive blame game, all of which we would do well to resist.

Change makes us vulnerable to tribalism and to the illusion of certainty. In the transition to a regenerative world, one of the biggest risks is that the political center does not hold, and people succumb to the easy promises of populist leaders at either end of the political spectrum. History and early signs both suggest that this might be our new reality, with the real potential to turn democracy into tyranny. We cannot go back to the way of life that created the climate emergency in the first place, but treading new ground is politically challenging. The political shocks currently reverberating across the world are just the start.

Change can also trigger blame. Some people who claim to be on the right side of the climate change debate will have a narrative laced with exclusion or blame. Blame is already a powerful current in our relationship to climate change—it is directed toward the developed world, the oil industry, capitalism and corporations, particular countries, and the older generation. Outrage is understandable, particularly now that we know beyond a doubt that some companies hid the truth about climate change for decades in order to continue making money.⁸ In those cases, justice and due process are called for and should certainly be delivered.

But blame does not serve us. It creates a sense of needed restitution but does not actually deliver it. Blame can consume us and cause us to lose years of constructive action. History shows very clearly that once humans start pointing the finger of blame at each other, it can be hard to stop. In the aftermath of the First World War, the Allied powers humiliated Germany, forced her to accept full blame for the war, and imposed crippling reparations payments. Historians agree that that paved the way for the rise of fascism and a second massive global conflict twenty years later.⁹

Here's what we can do to let go of the old world and keep the worst of our impulses in check:

Focus on where you're going, not on where you've been. Cultivate your constructive vision for the future and hold on to it, come what may. When you can see where you're going, you won't be so afraid of losing your grip on the past.

Build resilience to nostalgia. Recognize and understand the inherent impermanence of our world, and build a practice of nonattachment. We can all be susceptible to a desire to re-create the past. However, history teaches us that at moments of profound change, our nostalgia can be used against us. It can distract us from the urgent work ahead, and political leaders may appeal to the past to manipulate our emotions and secure our consent to act immorally.

Burst out of your bubble. We will not be able to make big changes in our society without fully understanding and accepting one another's deeply held values and legitimate concerns. Certain segments of our society may continue to resist change for good reasons, and our failure to understand them may set us all back. In 2018 French President Emmanuel Macron tried to approach reducing emissions and air pollution by increasing the fuel tax. But he failed to bring everyone on board—those struggling to make ends meet faced unacceptable increases in the cost of their commutes. The result was a fury of protest, catching the government completely off guard. And the French *gilets jaunes* (“yellow jackets”) activists spectacularly forced Macron to abandon his plan.¹⁰ Why do these disconnects happen? Partly because we are becoming increasingly divided by the type of media we consume. We tend to read opinion

pieces that reflect or support our own views, reinforcing what we want to hear and already believe. Cleverly programmed algorithms turbocharge that process on the internet and social media.¹¹

This means that often we have no idea what other people deeply value or think.

Get offline and get to know your neighbors, people in the grocery line, or fellow commuters. Challenge your own assumptions, and be mindful of misinformation and disinformation. Share your hopes and fears *in person*, listen to others, and be honest and respectful.

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In 1990, after spending twenty-seven years in prison, Nelson Mandela was informed by President F. W. De Klerk that he would be freed in less than twenty-four hours. The following day Mandela walked out of Victor Verster Prison and into history. He had to pass through a courtyard, beyond which he would be a free man. As he later recounted, he knew that if he did not forgive his captors before he reached the outer wall, he never would. So he forgave them. This did not mean that he forgot. The Truth and Reconciliation Commission (TRC) that he later established played a remarkable role in helping post-apartheid South Africa let go of its past. The TRC allowed anyone who had been a victim of violence to be heard in a formal setting. In addition, anyone who had perpetrated violence could also give testimony and request amnesty from prosecution. Mandela's achievement and the process he established greatly aided the transition from one state to another very different one.

The past was relinquished, and the future finally had room to emerge.

We too must let go of the fossil-fuel-dominated past without recrimination. The process of letting go is essential, and it must be intentional. The more work we do to let go of the old world and walk with confidence into the future, the stronger we'll be for what lies ahead.

ACTION 2: *Face Your Grief but Hold a Vision of the Future*

The winters, springs, summers, and autumns, the rainy and dry seasons that we remember will not be those that our children and their children will enjoy. It's rare today to find someone over fifty who isn't conscious that the weather patterns that defined their childhoods are being quickly and drastically altered. Glaciers and lakes are rapidly retreating, and our oceans are choking in plastic.¹² Ancient bones and diseases are surfacing in the permafrost.¹³ As our weather and landscapes change before our eyes, as millennial signposts of natural rhythms disappear, our understanding of the ways of the world is unraveling. Things don't make sense the way they used to.

We cannot hide from the grief that flows from the loss of biodiversity and the impoverished lives of future generations. We have to feel the full force of this new reality in our bones. There is a power to consciously bearing witness to all that is unfolding without turning away, and counterintuitively, you may actually feel better about the situation when you deeply accept the reality of it. And beyond this, we also then need to look to the future and set our sights on what we can still create. The changes to come will be more disorienting than those we have already experienced, and it will be easy to lose our footing unless we can clearly see where we want to go. We need to take responsibility for this reality by facing the uncertain future with as much courage as we can muster. Doing so requires us to understand why we must meet this moment with energy and commitment.

For years, the countries of the world tried to reach a global agreement on climate change. The effort became so all-encompassing that the challenge being attempted began to merge with the reason for doing it. The vision became securing a global agreement. As powerful and important as it was, the global

agreement was actually a goal in service of a vision. The vision was, and still is, a regenerative world where humans and nature can thrive.

Confusing vision with goals is easy. A goal is a specific target that we set on the way to achieving a vision. It includes the strategies and tactics we use in moving toward the vision. Goals are critical, but we also need a vision to inspire the kind of commitment and energy we will need to get through the difficult years ahead. If we don't have a vision, our goals alone may not afford us the flexibility necessary to achieve the vision.

And if we lose sight of the big picture and become fixated on how to achieve it, at best, progress can grind to a halt, or worse, divisiveness can take hold.

However, for those eager to take action, fixating on the vision can feel irresponsible and unconnected to reality. When we are caught up in the issues of today—communities decimated by increasingly violent weather patterns; the unbridgeable chasm between the rich and the poor; rapacious multinational companies focused on short-term profits rather than long-term value; and political leaders bent on driving divisions between nations (and within nations)—having a vision can seem naïve and wishful thinking. The distance between projecting a vision of a better world and realizing it through concerted action can sometimes seem unbridgeable.

Having a vision is essential, but we have to be open to doing things in new ways. So hold on to your vision, but remain flexible and adaptive about the route to get there. The route may change based on circumstances, while the vision remains a fixed North Star, a guide *and* a destination.

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Start with why. You do not have to believe your vision is likely to be achieved, or that the struggle to achieve it is going well, to keep pursuing it.

Pondering the different scenarios presented at the beginning of this book, you may conclude that we cannot turn this ship around in time, that we are going to crash, and that our vision is unattainable. That thought is not irrational. What would be irrational is to imagine that the reasons for building a better future are therefore diminished. Stubborn optimism needs to motivate you daily; you always need to bear in mind why you feel the future is worth fighting for. The essential “why” should be the driving force of all efforts to combat climate change no matter what.

Imagination is essential. Ideologies and ways of organizing this world can seem very ingrained, but they are subject to major disruption more easily than you think. It took Emmeline Pankhurst and the suffragette movement slightly more than a decade to force the British government to give women the right to vote.¹⁴ The Soviet Union seemed so solid as to be eternal, but once cracks started to appear, the edifice crumbled in just a few months.¹⁵

In 1939 General Motors presented visitors to the World’s Fair in New York City with an imaginative vision of what the future could look like. It was called Futurama and consisted of an enormous model of multiple high-rise buildings, vast suburbs, and large motorways for travel between them, necessitating the use of cars.¹⁶

Imagination is going to be critical as we work to transform today’s urban sprawl to make it fit for the future. Some futurists have predicted that in the course of a decade, the rise of the autonomous, shared, on-demand electric car means we will need 80 percent fewer cars on the roads than we do now.¹⁷ This will free up huge areas of urban space that are currently used as parking lots.

In London, for instance, it could mean that 70 percent of the space currently used for parking cars, or the equivalent of about five thousand sports fields, could become available for growing food, rewilding, or building sustainable housing.¹⁸

Much of what we imagine to be permanent is more ephemeral than we realize. Sometimes imagination can seem naïve, but don't belittle thinking big. Time and again societies have turned seeming fantasies into realities when circumstances require something new.

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Keep your eyes on what's to come. There will be times when we feel we are failing. However much we progress, we will see some deterioration in our environment and our society. Heartbreakingly, people will die as a result of climate change, land that people live on will become uninhabitable, and species will continue to become extinct—all causes for real grief, and grieving is needed. Give adequate time and space for that necessary mourning, and seek support from your communities—both are extremely important. We cannot and should not turn away from the pain, but that heartbreak should spur us on to greater action rather than sink us into a pit of blame, despair, or hopelessness.

As Maya Angelou said so eloquently: “You may encounter many defeats, but you must not be defeated. In fact, it may be necessary to encounter the defeats, so you can know who you are, what you can rise from, how you can still come out of it.”¹⁹

A compelling vision is like a hook in the future. It connects you to the pockets of possibility that are emerging and helps you pull them into the present. Hold on to that. Stay firmly fixed to a vision of a world you know is possible. This act is radical resistance to the belief that solving our problems is beyond us.

When Martin Luther King, Jr., stood on the steps of the Lincoln Memorial in August 1963, the outlook for race relations in the United States was grim. Just months earlier, Alabama governor George Wallace had stood outside the Alabama state capitol and declared, “Segregation now, segregation tomorrow, segregation forever.” To enforce segregation, police unleashed dogs and water cannons on protesters, even on children as young as six. Even those who supported civil rights felt that change was too far off and the

campaign was hopeless. Given that context, King's words about having a dream were like a light in darkness. He didn't know how it was going to happen, but he held tight to his vision of a society in which people were treated equally regardless of their race. The following year his persistence led to the passage of the Civil Rights Act, and his vision lived on after his death, inspiring equal rights movements across the world and embedding nonviolent protest as a cornerstone of political protest movements.²⁰

A world that has become richer in the active use of vision and imagination is a much more vibrant, inspiring, and joyful place. In these complex times, we often lament the lack of global leaders who can show us the way and help guide us. Those people are important, but we must all believe that the world is worth saving and a regenerative future is utterly possible. In the end, we are not going to solve this problem by hoping that our democratic systems produce enlightened leadership. They might, but the survival of our species can't depend on the partisan lines of a divided electorate. Instead, we must all embrace a strong vision of a better future.

ACTION 3: *Defend the Truth*

Three centuries ago Jonathan Swift wrote, “Falsehood flies, and truth comes limping after it.”²¹ How prophetic this turned out to be. A recent analysis by MIT shows that on Twitter lies spread on average six times faster than truth, and that truth never reaches the same level of penetration.²² Social media is an engine for the production and dissemination of lies.

This fact has serious consequences for our society and in particular for our ability to come together to deal with complicated long-term threats like the climate crisis. In this “post-truth era,” the undermining of science now has currency.

The fabric of the scientific method is fraying. Objectivity is under attack. Some political leaders have chosen to part company with objective reality. The rise of social media has afforded these leaders ample opportunity to obscure facts. This move toward subjectivity creates a breeding ground for oppression and tyranny. We all have an urgent responsibility to recognize and defend such an attack on truth because if it persists, our small window of opportunity to turn back the tide on the climate crisis will be lost forever.

In no period of history did leaders ever speak the truth at all times, but right now an altogether different level of lying is evident in the political arena.

Humans are vulnerable to the post-truth world for a reason. Our natural inclination seems to be to seek confirmation of things we already believe to be true, rather than evidence for an objective reality.²³

It feels good to have our beliefs confirmed, and we respond with positive emotion to anyone who makes us feel this way. Thus, if a leader affirms our belief that vaccines cause autism, or that climate change is a hoax, or that anything else that we feel to be true is true,

then we get a frisson of positive emotion. This well-documented and -researched phenomenon is called confirmation bias.²⁴

Climate change will result in disasters, lots of them: inundations of major cities, loss of islands, a rising tide of migration. At these moments of extreme vulnerability, leaders with authoritarian instincts will want to seize the chance to consolidate their power. Populist authoritarian rulers will not seek to address the complex climate crisis with long-term solutions; instead they will find someone to blame. We cannot allow them to use the coming disasters to exacerbate tragedy to the detriment of us all.

Here's what we can do to defend the truth:

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Free your mind. In the end, you are responsible for what you choose to believe in a post-truth world. Make no mistake, this problem is not ancillary to the climate crisis. If we can't agree on something as basic as a verified fact, our hands will be tied when it comes to the big stuff, and climate change is *huge*.

The reality of climate change is finally provoking genuine public anger, spurring people onto the streets. Our democratic systems cannot resist our voices for long, provided we can maintain the basis of objective truth within our societies. We must consciously enter into a state of self-reflection, questioning whether we are making a conscious choice to adhere only to information that does not challenge our position. For example, the fact that you are reading this book might be an instance of your own confirmation bias. Pay attention to your own eagerness to believe political leaders you agree with and to disbelieve those with whom you don't. Fight to force your mind down avenues and ways of thinking that you are unused to. Thinking outside established patterns is a radical act for preserving our collective freedom. Get good at it.

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Learn to distinguish between real science and pseudoscience. In 2017, the Heartland Institute, a conservative think tank funded in part by the Mercer Family Foundation, sent beautifully produced textbooks on climate science to three hundred thousand schoolteachers across the United States. The book, originally targeting policy makers and published in 2015 to coincide with the Paris negotiations, was titled *Why Scientists Disagree About Global Warming* and began with this statement: “Probably the most widely repeated claim in the debate over global warming is that ‘97% of scientists agree’ that climate change is man-made and dangerous. This claim is not only false, but its presence in the debate is an insult to science.” This textbook, authored by “distinguished climate scientists,” was sent to teachers, with a letter urging them to use the book and its accompanying DVD in their classrooms. The Heartland Institute, which promotes denial of established climate science, encouraged people to “seek out advice from independent, non governmental organizations and scientists who are free of financial and political conflicts of interest” rather than relying on the UN Intergovernmental Panel on Climate Change (IPCC) for scientific advice.

It would have been extremely difficult for some recipients of that book to determine whether this was real science or bunk, and whether the authors were indeed distinguished climate scientists. In fact, one author was formerly director of environmental science at Peabody Energy (a coal company that went bankrupt). That author has a master’s degree and a Ph.D. in geography, not climate science. One of his credits is that he is the lead author of the reports of the Nongovernmental International Panel on Climate Change (NIPCC). Note the striking and confusing similarity of that name to the UN-backed IPCC. The NIPCC is actually a project sponsored by the Heartland Institute. Many teachers immediately saw the textbook as the unscientific propaganda it was, but those who didn’t and used it in their classrooms had a lasting impact on their students.

This story teaches us a good lesson: even when a document looks “official,” is beautifully produced, and is authored by real scientists, we should approach its contents with caution. It is essential that you make the extra effort to determine whether you are basing your opinions on fact or fiction. Check where your information comes from. If necessary, follow the money. Determine the source of the funding for the research in question, be it a climate science statement, report, or article. See if the research is accredited by an established university or other well-known academic body. The simplest way to do this is to find out if the study was “peer reviewed,” meaning reviewed and evaluated by other experts in the field. For example, the IPCC report on 1.5 degrees Celsius, released in October 2018, was a collaboration of ninety-one authors and review editors from forty different countries. Most mainstream newspapers will have an editorial policy to ensure that sources are either peer reviewed or have similar criteria for reliability, but it is *always* worth checking.

Don't give up on climate deniers. As we enter the post-truth world more fully, the fault line between a desire for truth and an adherence to ideology runs closer to each of us. Some of us may have a natural inclination for one point of view but a deeper desire for truth, whereas others will exhibit a slavish adherence to one perspective, whatever the facts. In fact, those at the latter extreme have left the arena in which facts make a difference. Many people are now experiencing this even within their own families. Facts aren't enough to change the mind of a climate denier, so presenting statistics and sources won't help. If you reach them, it will be because you sincerely listened to them and strove to understand their concerns. By giving care, love, and attention to every individual, we can counter the forces pulling us apart.

For people who came of age between the fall of the Berlin Wall and the fall of the Twin Towers, today's world can indeed appear strange. Those days were marked by a general consensus about how humanity should advance. Some may now wish for that simpler time, making us vulnerable to the promises of leaders who would take us back instead of focusing on what lies ahead.

The future will be different, it will be complex, and the genie of social media can't be put back in the bottle. There is no getting away from the fact that humanity needs to come to grips with the truth if it wishes to contain a monster of its own creation. If we wish to come together to address the climate crisis, and halt the rapidly accelerating extinctions that are now taking place in greater and greater numbers, we need to accept our responsibility to always defend the incontrovertible truths of climate change and their consequences. We are all responsible for what we hold to be true and for defending that truth against attack. We will succeed by applying a thoroughly critical approach to the information that shapes our ideas, opinions, and actions. We will succeed by calling out falsehoods, particularly those that may determine how we act on climate change. Once this becomes a habit, once we become better practiced at determining what is real, the fog of misinformation that we are currently cloaked in and the daily distractions vying for our attention will be easier to navigate. When we work this way to defend and advance a fact-based reality, the view of the regenerative future we want, and the path we will travel to get there, will come more sharply into focus.

ACTION 4: *See Yourself as a Citizen—Not as a Consumer*

The South Indian monkey trap is an ingenious but cruel device. It consists of a coconut staked to the ground with a hole in it and a ball of sweet rice inside. A monkey approaches and fits his hand through the hole to grasp the rice he can smell inside. However, the hole is not large enough for his clenched fist to pass back through. His instinct is to keep his hand clasped over the ball of rice, so he is trapped by his instinct, not by anything physical: if he would let go of the rice, he would be free.

Such is our relationship with consumption (purchasing, using, and throwing away): we know it is trapping us, but it has become so embedded in our psyche—to the point of being almost instinctive—that we cannot let go.

Much of what we buy is intended to enhance our sense of identity. Particular brands of clothes, soap, cookies, televisions, and cars are designed with a *tribe* in mind, their attributes carefully cultivated by the consumer goods companies that sell the products. Identity and consumption keep moving closer together. In the UK, for example, the average person consumes more than sixty-five pounds of clothes every year, equivalent to about five loads of laundry.²⁵ These purchases are driven mainly by the fact that fashion trends change each season. These cycles, by their very nature, require us to clear out our closets regularly and hop back in line for more clothes.

But the fashion industry has an enormous carbon footprint. Textile production is second only to the oil industry for pollution. It adds more greenhouse gases to our atmosphere than all international flights and maritime shipping combined. Estimates suggest that the fashion industry is responsible for a whopping 10 percent of global CO₂ emissions,²⁶ and as we increase our

consumption of fast fashion, the related emissions are set to grow rapidly.

Our engines of economic growth depend on us continuing to spend money. In the 1920s, some Americans were concerned that a new generation was emerging that had satisfied its needs—and that would lead to a drag on growth. President Herbert Hoover’s Committee on Recent Economic Change in 1929 concluded that advertising was necessary to create “new wants that will make way for endlessly newer wants as fast as they are satisfied.”²⁷

Today consumer goods companies spend a great deal of money to make sure we remain stuck in the consumption cycle. Their marketing and advertising budgets are enormous. In the United States, the price of one thirty-second advertisement during the Super Bowl—one of the most-watched sporting events on television—was more than \$5 million in 2019.²⁸ Amazon, the online marketplace, raked in an extraordinary \$10 billion in revenue from advertising sales in 2018 alone.²⁹ Every year more than \$550 billion is spent on advertising in a world of consumption and fast consumerism.³⁰

What is more, billions of products are intentionally designed to become obsolete, fueling even more economic growth as we strive to replace them. Single-use plastics are the epitome of that, but obsolescence—the process of becoming outdated and discarded—is designed into almost all consumer goods. Warranties for certain products rarely go beyond three years because the product is likely to break after that period. And often a new item costs less than the replacement part. New software updates won’t install on old computers, meaning those too must be replaced. The list is endless and depressing. As a result, the practice of mending, repairing, and restoring is becoming a dying art.

In the global economy, supply chains often reach across the world and back again. Each link represents a different production stage, often performed by a different company, from the mining of precious metals in Bolivia for your smartphone to the packaging of

the final product in China. As a result, it is hard to know which parts of the supply chains of major corporations practice sustainability and which contribute to climate change.

Here's what you can do.

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Reclaim your idea of a good life. Consumerism is the prevailing definition of a good life: you are in perpetual pursuit of the almighty upgrade, whether it is to your phone, your clothes, or your car. But rather than meeting our needs, buying things in order to achieve a sense of satisfaction or belonging can become addictive and lead to self-doubt and confusion about our very identity and life direction.³¹ Identifying as a consumer—of any particular type of product or brand—implies passivity, and it also implies that consuming that product meets our needs.

Consumerism traps us into thinking we can purchase personality. Moreover, it eats up our mental space and creates a constricted view of the world, one in which our value and identity are built upon the proliferation of disposable waste. Psychological studies have shown that mass consumption creates a bigger and bigger hole in our lives that we keep trying to fill.³² As we consciously or unconsciously attempt to consolidate our sense of identity through curated buying habits, we drive the engine of mass consumption faster and faster, bringing ourselves ever closer to the edge of disaster.

Despite all the ways culture is pushing us in the direction of blind consumerism, we can start to intentionally push back. We can develop the mental discipline to resist the imperatives of consumerism. We can change our consumption habits and vote with our money for products that are sustainable.

Further, we can change the way we identify as consumers, to reboot our relationship with materialism. Freeing ourselves from the influence of advertising can be a liberating experience and a radical political act.

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Become a better consumer. In the short term, we can improve matters by changing our consumption patterns within the system. Not all purchases are equal. Buying high-quality clothes made from organic cotton that will last and be handed down is different from buying cheap, disposable items that end up in a landfill after a few weeks of wear. If you have the option of voting with your money, make more educated decisions about the products you do need to buy. Buy from companies that are public about their values, have made commitments to sustainability, and are part of organizations that certify they are following through on their pledges. The impact will be significant.

Vote with your money. Most important, eliminate waste. Apply the old-fashioned adage of reduce, reuse, recycle. When we need to buy things, our choices should be informed and enlightened.

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Dematerialize. Consider how we made the change from vinyl, cassette tapes, and CDs to downloading or streaming music. Technology in many instances now allows us to do without material objects while still enjoying the services that they provide. Less can be more. In the near future, even individual ownership of cars may cease to exist as the dominant paradigm—the transportation we need might be offered by shared vehicles, probably self-driving and certainly electric.³³ One day consumers may come to define themselves not as owners of products but as beneficiaries of systems of service delivery. Already the world's largest provider of overnight accommodation (Airbnb) owns no buildings. The world's largest provider of personal transport (Uber) owns no cars.³⁴ This shift from ownership to stewardship will fundamentally change our relationship to consumerism. We can help accelerate it by engaging with it and welcoming it with open arms.

The story of the happy fisherman, first made popular by Paulo Coelho, has several versions. A content fisherman is relaxing on the beach in his little village after catching a few big fish. A businessman walks past, notices the bounty, and asks the fisherman how long it took to catch all those big fish. Not very long, says the fisherman. The businessman asks why then, if it didn't take long, the fisherman doesn't spend more time at sea, so as to catch more fish. The fisherman replies that the fish he caught are enough to feed his whole family, and that when he finishes with his catch, he can go home to play with his children, take a nap with his wife, then join his friends for drinks and music making in the evening.

The businessman suggests to the fisherman that he could lend him some money to be more successful. Then the fisherman can spend more time at sea and buy a bigger boat to catch lots more fish that he could sell to make more money. He can then invest the money in more boats and set up a big fishing company. Over time the fishing company can go public on the stock exchange and make the fisherman millions.

"And then what?" asks the fisherman.

The businessman proudly explains that then the fisherman can retire. He can finally enjoy spending his days as he wishes: catching a few fish in the morning, spending time playing with his children, taking an afternoon nap with his wife, and joining his friends for drinks and music making in the evenings.

It has been said that the most important things in life are not things. If, like Coelho's fisherman, we can learn to recognize what is *enough*, we might also move beyond the mindset of consumption and ownership, consciously avoiding the forces that feed that mindset. We can begin to appreciate that with a different approach to life, our capacity for happiness will increase and that our drain on the planet will dramatically slow down.

ACTION 5: *Move Beyond Fossil Fuels*

The assumption that we will always need fossil fuels comes from mental attachment to the past. In order to move beyond fossil fuels, we must let go of the conviction that they are *necessary* for humanity to thrive in the future. Only when this mindset is challenged can we migrate our thinking, finances, and infrastructure to the new energies.

Fossil fuel companies are deliberately slowing the transition. As providers of these still plentiful and potent energy sources, these companies have power that has grown exponentially, and now their influence is deep and wide.

Many businesses continue to invest heavily in lobbying to water down new regulations that would help shift the economy beyond fossil fuels.³⁵ Some individuals in senior leadership positions, however, wish to address the issue and transform their businesses. That desire is sincere—we know this firsthand. But they are in a tough spot: if they shift their companies too far and too fast, they destabilize their business model, and investors will punish them. If they delay the shift too long, the value of their company may crumble. Several are playing the dangerous waiting game to be the “last one out,” continuing to derive income from the market space left by companies that are leaving fossil fuels behind.

Almost all governments are still subsidizing fossil fuels. The fossil fuel industry may dispute it, but it receives huge government handouts. Globally, governments spend about \$600 billion every year keeping prices of fossil fuels artificially low.³⁶ That’s around three times as much as subsidies provided for renewable energy.³⁷ Governments may claim their administrations support renewable energy, but until they stop subsidizing fossil fuels, our progress will stall.

Mark Carney, the governor of the Bank of England, famously said that unless we make a smooth transition from today's fossil-fuel-based economy to the fully decarbonized economy we need in the future, at some point there will be a "jump to distress,"³⁸ meaning that high-carbon assets will suddenly drop in value by a large percentage. Carney urged us to avoid that at all costs. When you think about how much of our economy is built on a foundation of fossil fuels, his prediction comes as no surprise. Entire industries, companies, and governments could go bankrupt or lose a lot of value very suddenly if we delay transition to the point of crisis.

If we allow a jump to distress to happen, it will affect all of us. Governments rely on tax receipts from fossil fuels to finance their services. Many pensions are invested in fossil fuels and in companies reliant on them. The systemic nature of the financial services system means that if a major drop in value occurs, it will quickly affect lots of other, seemingly unrelated entities. Such a jump to distress could make the financial crisis of 2008 pale in comparison.

Given all this, the urgent shift from fossil fuels must happen in a planned and measured way and not as the result of panic. In 2017, heads of central banks came together to establish the Network for Greening the Financial System (NGFS) and are now united in their efforts to be vigilant of the impacts of climate change on global monetary stability.³⁹

A growing body of financial research and information about how countries and companies are likely to perform in a future that is fundamentally different from the past is helping investors understand the risk. For example, Moody's rating agency (one of the highly influential agencies that assess risks to companies and countries) now has a controlling stake in RiskFirst, a firm that measures the physical risks of climate change.⁴⁰ Investors are reallocating capital away from what are now commonly known as "stranded assets." That reallocation is moving markets and catching

the attention of corporate leaders, but it needs to go much further, much faster.

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Stand up for 100 percent renewable energy. In the past few years, energy generation from renewable sources has undergone an impressive surge. We are currently on track to supply 30 percent of power demand in 2023 from renewables, and 50 percent by 2030.⁴¹ Corporations are taking the lead. Almost two hundred companies, including well-known ones such as Apple, IKEA, Bank of America, Danone, eBay, Google, Mars, Nike, and Walmart, have already shifted to 100 percent renewables as sources of electricity or are on their way to doing so.⁴² Seventy-five percent of people in Europe and North America support government taking strong action for electricity to be generated by 100 percent renewable power.⁴³ To become our new reality, renewable power will have to be delivered at the systemic level by leaders in political and institutional situations of authority. Those leaders represent the priorities of the people who elect them, so let's vote for leaders who advocate clean energy.

If those in positions of power and influence today expect to be remembered as loyal public servants, responsible for representing the people, then they must look to the future with clearer vision. We should reward with our votes only the leaders who step forward with genuine insight.

We can do this with real confidence, because solar and wind power have developed at a speed and scale that few believed possible just a few years ago. With a 90 percent drop in costs for solar panels in the past decade, renewables now compete with coal on price alone in most places around the world, and increasingly with gas as well.⁴⁴ A similar story is unfolding for both onshore and offshore wind energy production. The storage solutions required to smooth out energy from solar and wind are also rapidly evolving to become economically viable.

As costs have dropped, innovators are reimagining how energy grids of the future will operate. Far more intelligent and interconnected grids are emerging.

Make a time-bound, ambitious plan. We have ten years to cut our global emissions in half and another twenty years after that, at maximum, to get them to net zero. Corporations and countries have great responsibility for leading the charge, but we can all play our part by reducing our own personal emissions. If we think clearly and act when we need to, this is enough time.⁴⁵ The 50 percent reduction necessary over the next ten years is where we must now focus our attention. That is a global figure, but the number can be averaged out in this way: those of us who have been using far more than our share should reduce our emissions more than 50 percent. Let's aim for a minimum of 60 percent, knowing that we humans tend to overestimate what we can achieve in a year and underestimate what we can achieve in ten.

What would your life look like in ten years if you were using at least 60 percent less fossil fuel than you are now? Most of your current emissions probably come from flying, driving, and heating and cooling your house. The key culprits tend to be expensive items that we can't easily abandon, such as cars, boilers, and air conditioners. Once you have bought a car, you will use it, and while you may try to use it less, there is a limit to what you can achieve. Consider shifting to an electric vehicle within the next ten years. The increased efficiency and range of electric vehicles, combined with price drops and innovative financing models, are putting them within the reach of more and more of us. Even midrange models are now capable of driving 150 miles in one stretch, and charging stations are more abundant than ever before.⁴⁶ Others may consider moving beyond the car, and even away from car ownership, a possibility that is becoming increasingly viable.

As for heating and cooling your house, you should aspire to buy renewable electricity through the grid and to generate more at home. Improving insulation and switching to electric heating all at once may seem daunting. Take one step at a time. Start by performing an energy audit in your home to identify energy leakages and inefficiencies. This will help you to prioritize your energy upgrade investments. You can do the cheaper energy improvements first, then plan phased investments over a few years when, say, a boiler would have to be replaced anyway. Over time you will save money and reduce emissions.

Reducing flying is likely to have the biggest impact if you live in a wealthy country. Much of what is wonderful about the world has come from the fact that we can visit different parts of it, have cultural exchanges, and see amazing places. It is an unbelievable privilege for those who are able to afford it to get on a plane in one part of the world and get off, ten hours later, on the other side. If you enjoy travel adventures, take business trips, or visit family abroad, you will not find it easy to give up flying.

Only 6 percent of the world's population has ever set foot on a plane.⁴⁷ If you are among them, it is incumbent upon you to take a stance and make a plan. You might decide never to set foot on a plane again, and if you do, we applaud and celebrate you. But in reality, that may not be possible for you today, but you can still make a contribution. You can commit to not flying for holidays, or to taking the train to places within, say, five hundred miles of your home. You might commit to taking only a certain number of flights per year, or to taking meetings via videoconferencing.

However you approach it, air transportation is one of the critical issues we are going to have to grapple with on the path to a 60 percent reduction by 2030. Neither it nor the other changes discussed here have to be frightening. When people consider such lifestyle changes, they can become alarmed and feel that something precious is being taken from them. However the opposite is the case. While we may resist change, the reality is that the speed, scale, and reckless use of resources in our wasteful economy are making

few of us happy. As we focus on making thoughtful changes to help preserve what we really care about, finding a sense of purpose often improves our quality of life. Try it for yourself, and see what you find.

ACTION 6: *Reforest the Earth*

The future we must choose will require us to pay more attention to our bond with nature. Ancient stands of trees teeming with life are integral to our survival. Extracting more and more output from increasingly depleted and exhausted soil is a formula for our own destruction. If we want to thrive over the long term, we need to find the sweet spot of working to regenerate nature for its own benefit and ours, and drawing from it only what we need to support our lives. Achieving this balance on a global scale is still possible. We can be the generation to achieve it.

Forests create the conditions for forests, in a self-sustaining system. They give up moisture to the sky, which creates clouds and rain, moving water back to all parts of the forest. Microscopic fungi in vast underground networks of mycelia stretch between trees across thousands of miles and connect them, sharing nutrients. Soils build up and create the rich foundation for future generations of trees. This symbiotic interplay makes a forest vulnerable, however. If we destroy enough of it, or fragment it, thereby hindering its interconnectedness, the whole system can collapse. We will lose the great forests of this Earth the way, in an old saying, people go bankrupt: first very slowly, and then very fast.

Since the dawn of agriculture, humans have cut down approximately 3 trillion trees, or half the trees on Earth. As a result, almost half the land on our planet has been severely degraded from its natural state. In 2018 alone, 12 million hectares of forest—equivalent to thirty football fields a minute—were razed, a third of which was pristine primary rain forest.⁴⁸ If we carry on in the same vein, we will destroy everything that is left of our forests within a very few short decades. Even if we avert this fate, generations to come will wonder in astonishment at how close we came and how mindlessly we almost threw the forests away.

Almost all tropical deforestation is driven by demand for four commodities: beef, soy, palm oil, and wood. Beef cattle are responsible for more than double the deforestation of the other three combined. In the Amazon, providing land for beef cattle to graze on is directly responsible for more than 80 percent of the deforestation.⁴⁹ In addition, much of the soy is used as feedstock for chickens, pigs, and cattle. This situation is bad and about to get worse, with Brazil lifting previous forest-protecting policies,⁵⁰ and China now massively increasing its meat and dairy consumption.⁵¹

Industrial agriculture and the food industry, which often prioritize profitable food over nutritious food, are almost as big a driver of climate change as fossil fuels. Yet much of the food produced is never eaten. It doesn't even necessarily get to the people who need it. In the Global South, a lack of roads and storage facilities means that food often rots before it gets to people, and even if it does reach them in time, they might not have the money to buy it. In the Global North, food languishes in home and store refrigerators until well past its use-by date, or it is left uneaten on the plate at the end of a meal and then thrown away. Such waste then drives greater food production.

We can achieve food security for all. At least two distinguished ecologists have calculated we could feed the world adequately by making selective improvements in agricultural productivity, sharply reducing food waste, and changing our diets,⁵² which health experts recommend anyway.⁵³ We can do all these things without destroying another square inch of nature.

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Plant trees. Vast land areas around the world are potentially available for reforestation and tree planting. One study found that 900 million hectares, about the size of the entire United States, are available for reforestation without interfering with either human habitation or agriculture.⁵⁴ Once new forests were mature, they

would absorb and store 205 billion tons of carbon, while supporting biodiversity and making the planet more beautiful. That equates to absorption of nearly 70 percent of all the CO₂ released into the atmosphere since the Industrial Revolution.

In addressing climate change, few actions are as critical, as urgent, or as simple as planting trees. This ancient carbon-absorbing technology needs no high technology, is completely safe, and is very cheap. It literally reverses the process that has led to climate change, in that as trees (and all other biomasses) grow, they absorb CO₂ from the air, release oxygen, and return carbon to its rightful location: in the soil. In addition, trees provide coveted green areas in cities, reduce ambient temperature, may produce food, and stabilize aquifers in rural and suburban areas.

Unfortunately, over the past five to ten years, we have come to think of planting trees and reforestation as a penance we must pay for the sin of emitting greenhouse gases, or worse yet, as a pretended benefit that hides the reality of emissions. “Offsetting” has developed a bad reputation among some environmentalists. It is time to correct this mistake. Every single one of us should plant one tree, ten trees, or twenty. Don’t even think of it as an offset—in itself it is a critically important contribution to addressing climate change now, without the need for sophisticated energy technologies. Those will be developed, but even when we count on them, we will still need to absorb carbon out of the air to reach net-zero emissions.

In short, we could return the climate to how it was decades ago just by planting trees.⁵⁵

Massive reforestation and restoration provide real benefits for people. In China in the 1990s, vast areas of land began to resemble the Dust Bowl of the American Midwest, but China was able to halt this rapid degradation. Programs were established to reforest 100 million hectares by paying farmers directly to plant trees. The program is ongoing and highly successful. It has resulted in more stable rainfall, more fertile soil, and increased production from

farmland.⁵⁶ Ethiopia, having diminished its forest cover to a mere 4 percent of its territory, undertook a record-breaking campaign by planting 350 million trees at one thousand sites across the country, most of which were planted in a single day.⁵⁷ Not all of them will survive, but those that do will make an important contribution.

The benefits of planting trees are not limited to rural or agricultural areas. Trees will cool a city by up to 50 degrees Fahrenheit.⁵⁸ That amount can make up for the significant additional heat that cities will have to endure under any climate scenario, and as cities in India are already reaching temperatures in excess of 122 degrees Fahrenheit, it could mean the difference between life and death for millions of people. Trees also clean the air in cities by filtering fine particulate matter and absorbing pollutants. They regulate water flow, buffer flooding and increase urban biodiversity. Their impact is so pronounced that urban properties surrounded by trees are worth an average of 20 percent more than those that are not.⁵⁹ If we are to make the transition to urban living that is needed to provide space for nature to thrive, we need to bring nature into cities and integrate it as never before.

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Let nature flourish. The term *rewilding* has been coined to describe the growing practice of allowing land to return to its natural processes. Rewilding has the potential to radically change the carbon balance of the atmosphere and to preserve the web of life. Multiple large- and small-scale rewilding initiatives are already taking place all over the world. An excellent example is the Knepp Wildland Project in West Sussex, England. In 2001, the project obtained more than 3,500 acres of land that had been farmed intensively since World War II. The land was severely degraded, and the farm had rarely made a profit. Knepp Wildland's ethos is to allow natural processes to play out rather than aiming for any particular goals or outcomes. Free-roaming grazing animals—cattle, ponies, pigs, and deer—drive this process-led regeneration, acting as proxies for herbivores that

would have grazed the land thousands of years ago. Their different grazing preferences create a mosaic of habitats from grassland and scrub to open-grown trees and wood pasture. These animals need minimal intervention. At low cost, they provide wild-range, slow-grown, pasture-fed organic meat for which the market is growing. In just over a decade, Knepp has seen astonishing results in biodiversity. It is now a breeding hotspot for purple emperor butterflies, turtle doves, and 2 percent of the UK's population of nightingales.

Go plant-based. If you eat less meat and dairy, your carbon footprint will decrease, and your health will improve. Eating less meat and dairy is better, and eating none at all is best. While this may feel like a stretch for most of us, for the vast majority of human history we ate very little meat.⁶⁰

Many countries are already shifting toward plant-based diets. Even if you feel that you cannot completely forgo meat and dairy, adopting a flexible diet in which you enjoy other foods for certain meals or certain days of the week can have a huge impact. In reality, this is likely to be where the biggest dietary changes will come in the next years. In many countries the number of people planning to become vegan or vegetarian is relatively low, but fully 50 percent of the U.S. population would like to eat *less* meat. Plant-based meat replacements are already becoming cheaper, more efficient, and more delicious. By 2040, these products are expected to make up 60 percent of the market, up from 10 percent today.⁶¹ The market is beginning to recognize the future of plant-based food. You have the chance to join a food revolution by adopting and normalizing a more plant-based diet.

Boycott products contributing to deforestation. Too many ingredients in the products we consume every day come from deforested land. In 2010, Greenpeace released an advertisement featuring an office worker opening a Kit Kat candy bar. However, the bar was made not of chocolate but of orangutan fingers, and as the office worker took a bite, blood poured across his keyboard.⁶² The video hit a nerve, helping people make the connection between candy ingredients and the mass destruction of the orangutan's natural habitat. More than two hundred thousand e-mails were sent to Nestlé; protests were held outside its offices. Within six weeks one of the largest companies in the world completely reversed its policy, committing to zero-deforestation palm oil.⁶³

It's easy to forget how much power we all have if we choose to use it. If a company is engaging in destructive land practices, we can work to make that fact clear to everyone. As that happens, you can remove your consent from that company by refusing to buy its products.

We are not powerless.

ACTION 7: *Invest in a Clean Economy*

A linear model of growth rewards extraction and pollution. We need to move from that model toward one that regenerates natural systems. We are going to require a clean economy that operates in harmony with nature, repurposes used resources as much as possible, minimizes waste, and actively replenishes depleted resources.

This new economic model will need better policies and strong institutions so that the great market forces of investment and entrepreneurialism can work toward regeneration instead of extraction. Finance and investment will play a key role. While we have managed capitalism moderately well over the centuries, with successful institutions such as law, taxation, and charity, we have not yet perfected it. Now is the time to do so.

We are used to thinking of the economy as the primary indicator of how we are performing as a species. More economic growth is good, less is bad; negative growth, or a recession, is a disaster. Politicians will do anything in their power to keep the numbers moving in the upward direction, and most regard this as their principal responsibility.

Economic growth is currently measured by GDP, or gross domestic product, the market value of goods and services produced in a year. The idea that endless GDP growth is the aim of responsible countries is highly embedded into our cultures and becomes self-perpetuating, as the media, politicians, business leaders, and others constantly refer to it as second nature.⁶⁴

But GDP is a poor marker of what human beings need in order to thrive, as it is all about extracting, using, and discarding resources. As a marker of success, it does not effectively take into consideration the impacts of pollution or inequality, or prioritize the value of health, education, or even happiness. It also places no value

on the actions that regenerate degraded lands or that bring ailing oceans back to health. To illustrate the point, if you drink coffee from a disposable cup every day, GDP will go up, but the forests will disappear and emissions will go up too. If you drink coffee from a reusable ceramic mug, GDP will go down. If you throw away your ceramic mug every day and buy a new one, GDP will go through the roof.

In the current transition, strictly linear GDP growth can no longer be the priority. More stuff does not mean a better life, and indeed it is contributing to our existential crisis. Moving away from quantity of products that can be purchased, we must reorient our underlying sense of value toward quality of life, including within all of Earth's ecosystems. Prioritizing growth according to its contribution to the Sustainable Development Goals (SDGs) would be a good place to start. These seventeen interconnected goals aspire to sustainably increase global prosperity, equality, and well-being.⁶⁵

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Put your money where it matters. Capital tends to flow toward investments that have worked in the past, as if the future will resemble the past in any meaningful way. The world's capital is guarded by ranks of extremely cautious people who are looking to secure a good return, and their top priority is often to avoid risking a loss of value. This is technically right, of course, but it presents us with a problem. We're not going to create the future we want without some risk.

In June 2019, the Norwegian parliament voted into law new plans for its sovereign wealth fund (the world's largest, managing \$1 trillion in assets). It will divest more than \$13 billion of investments in fossil fuels and invest up to \$20 billion in renewables, beginning with wind and solar projects in developed markets.⁶⁶

You can help precipitate similar seismic shifts in allocation of capital. In 2012, Bill McKibben and 350.org began a grassroots divestment campaign to encourage financial institutions to stop

investing in projects and companies that perpetuate the causes of climate change.⁶⁷ It has grown into one of the most successful campaigns in history. Financial firms with more than \$8 trillion in combined assets have divested their fossil fuel holdings. This has made money available for climate solutions and sent a warning signal to those still building the past. In 2016, Peabody, the world's largest coal company, listed divestment as one of the reasons for its bankruptcy.⁶⁸ Shell has listed divestment as a material risk to the future of its business.⁶⁹

Divesting from the past and reinvesting in the future can be done right now. Your money has the power to destroy or to build, and it is no longer acceptable to remain oblivious to the fact. If you have a pension fund or savings, find out where your money is invested. Do not underestimate the power of the default option in defined pension schemes—if you work for a company that has such a scheme, request that it shift away from fossil fuels. Write to your pension fund trustees and find out if they are divesting from the old economy or how they propose to change the behavior of corporations they are invested in so as to promote the clean economy. Encourage your friends and colleagues to do the same.

Once capital starts flowing in increasing amounts to companies and projects that are advancing the future—and we are making serious progress in that direction already—a moment will come when we reach the zenith of our uphill efforts and things will start to roll more easily in the right direction. We are already seeing that dirty, polluting, irresponsible investments perform less well than the alternatives. Companies that shy away from considering the future of the planet are also getting awkward questions from customers (keep asking them!) and investors, and are struggling to find bright young people to work for them. With continued pressure, the money and momentum will start flowing to those who are building the clean economy.

The building blocks for a regenerative economy are already robust and thriving around the world. In January 2019, Jacinda Ardern, Prime Minister of New Zealand, announced that her government would soon present a “well-being budget” to gauge the long-term impact of policy on the quality of people’s lives. “We need to address the societal well-being of our nation, not just the economic well-being,” she said. This type of thinking, Prime Minister Ardern argued, could help us shift beyond short-term cycles and learn to see politics through a lens of “kindness, empathy and well-being.”⁷⁰ This is what we are called to do, as we work to build the infrastructure and systems that will benefit us, and retire those that are harming us.

Economic growth can deliver tremendous benefits, and economic growth has lifted more people out of poverty than any other model in history. But the days of valuing how quickly we can dig stuff up and turn it into trash have to come to an end, not as a matter of ideology or policy but as a matter of survival. The reduction of poverty under the old model may well be temporary, since our structure of prioritizing short-termism and GDP will likely send many people back into unforgiving poverty as climate change accelerates. The good news is that economists increasingly consider the seventeen Sustainable Development Goals to be sensible objectives. Advancing the SDG framework makes it absolutely possible for us to achieve sustainable growth, effect emissions reductions, and reduce poverty in consonance with one another in mutually reinforcing systems.

In Costa Rica, President José Figueres Ferrer, Christiana’s father, made the decision in 1948 to abolish the army. He invested in education and expanded forest cover from a low of less than 20 percent. Now Costa Rica has one of the highest literacy rates in Latin America,⁷¹ forest cover is more than 50 percent,⁷² and the nation’s electricity is provided almost exclusively by renewable energy. Costa Rica measures its progress both by GDP and by indicators that help the government make decisions that maximize

well-being. On the Happy Planet Index, Costa Rica ranked number one as the happiest place on Earth in 2009, 2012, and 2018.⁷³

ACTION 8: *Use Technology Responsibly*

Evolving new technologies have enormous potential for delivering emissions reductions. We must embrace them carefully but rapidly and not rely on them as a silver bullet. As we grow more comfortable with machines being part of our lives, we will need to use technology responsibly, mindful of its power and influence, and ensure that proper governance systems are in place.

If we make it through the climate crisis and arrive on the other side with humanity and the planet intact, it will be largely because we have learned to live well with technology.

Artificial intelligence (AI) supported by sensors (to gather data) and robotics (to automate physical activities) together with the network of smart devices known as the “internet of things” have huge potential to become our greatest allies in the fight for survival.⁷⁴ But these very same technologies are also the ones that could destroy that better future. For example, autonomous self-driving electric vehicles could eliminate the need for unnecessary private ownership of vehicles, but on the downside, they could also allow unscrupulous governing bodies to track and control the movements of every citizen.

A fire that warms you on a cold night is good; one that consumes your home is bad.

Likewise, technology is neither inherently good nor inherently bad. It just has to be managed properly.

Many people alive today will at some point likely encounter a machine that is smarter than they are in almost every way. The world famously got a taste of what that might be like in 2017. The AI program AlphaGo Zero figured out how to win at the ancient and notoriously difficult Chinese strategy game of Go, learning entirely by itself, essentially accumulating thousands of years of human knowledge, and improving on it, in just forty days.⁷⁵

Deep Mind, the company that developed AlphaGo Zero, says the technology is not limited to machines that can outcompete human beings in strategy games but is intended to be used to inform new technology that will positively impact society.⁷⁶ But we can't rely on the promises of corporations to ensure that a technology is aligned with our goals for regenerating nature and pursuing the conditions that will help humanity thrive.

AI machines learn quickly, although we may not be able to predict exactly what they will be used for. Machines could become better at extracting what resources remain on Earth and hoarding them for those who control the technology—which is why protection against the abuse of AI needs to be woven into policy oversight and governance from the start.

Politicians and CEOs who are unwilling to lead or do what we need to confront the climate crisis have often touted future technology as a solution. But if we allow the potential of future technology to blind us to the scale and urgency of what we need to do today, we will be taking a terrible risk. Not only might innovations not arrive in time, but new technology will only fit well into a society that is already moving in the right direction. Belief in innovation is no excuse for lack of a plan.

To be sure, we need technology to avert climate disaster, but technology also has huge potential to increase the already-vast wealth disparities in our societies. In a world where 70 percent of the population has to survive on a share of only 2.5 percent of global wealth,⁷⁷ the rise of automation could exacerbate inequality and social instability and complicate the advance of solutions to complex problems like climate change.

For all the talk in certain political circles about immigration taking jobs away from native citizens, it is automation that is driving the vast majority of job losses around the world.⁷⁸ This problem will worsen in coming decades. Likewise, the decline of meat consumption, as it is replaced with plant-based and lab-grown alternatives, will transform the economies of whole countries. In

Brazil, more than 20 million people are involved in the agriculture industry.⁷⁹ Up to two-thirds of them either raise cattle for beef, or grow soy to feed cattle. To switch to more sustainable agriculture, they could convert the land to biofuel production, assuming increased demand for such in the near future. The shift away from beef and toward advanced biofuels will have huge benefits ecologically, but if the transition is managed badly, without supporting alternative training or jobs, the sudden unemployment of millions could result in enormous human hardship, increasing the appeal of extremist politicians. Even if we develop all the technology needed to address the climate crisis, humans may be so impacted by the transition that we will elect leaders who pander to populist impulses and divert our focus from the narrow gate toward a regenerative future.

If properly managed, machines might make all the difference in our ability to deal with the climate crisis in time. Almost every sector that requires breakthroughs to bring about a regenerative future will be massively aided by machine learning. For example, one of the big problems associated with securing large amounts of renewable power on energy grids is that its generation is intermittent—producing only when the sun is shining or the wind is blowing.

With AI algorithms, it is now possible to completely redesign our centralized energy grids. AI-informed energy grids can be much more decentralized, acting as neural networks, dynamically predicting what power is needed when. AI-informed grids would “intuitively” map supply and demand, flexing between storage and energy flow so that greater amounts of renewable energy can be produced, thus reducing gas and coal use, perhaps completely.⁸⁰

AI is accelerating our decarbonization efforts in many other areas. Machine learning is being used to prevent the leakage of methane from gas pipelines, to accelerate the development of solar fuels (synthetic chemical fuels produced directly/indirectly from solar energy), to improve battery storage technologies, to optimize freight and transport for better efficiency, to reduce energy use in

buildings, to plant forests using drones, and much more.⁸¹ AI is also showing promising signs of improving our ability to predict extreme weather and even of removing greenhouse gases directly from the air.

Reaching the Paris Agreement was complicated, but agreeing on a collective global approach to governing AI could be even more so. Right now countries are in a race to develop the skills and conditions to be leaders in this new field, and different populations have different attitudes about the acceptable degree of involvement of AI in our lives. For instance, people in Nigeria and Turkey would be happy to have AI systems perform major surgery on them, but people in Germany and Belgium would not.⁸² Governments experience different degrees of pressure to develop appropriate guidelines for managing AI, and as a result some are very lax and some are highly stringent.⁸³

Understandable as this is, it isn't really good enough for something as important as dealing with the climate crisis. The effort of the French and Canadian governments to create an International Panel for Artificial Intelligence is a good start.⁸⁴

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Find out if your government, your local community, or the company you work for is investing in AI, and what they are using it for. **Take responsibility for pressuring them, in whatever way you can, to look to the international efforts already under way, and to put policies in place to ensure that the AI they support will also accelerate the regenerative future, not hinder our chances of success.**

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In a few decades more than 9 billion people could inhabit the planet, possibly more than 10 billion. It will be impossible for so many people to live here if we have the same impact per capita on our atmosphere as we do today. Technology, specifically machine

learning and AI, has the potential to transform our presence here. Issues and problems, including how we can effectively use natural resources in a circular rather than linear way, that have long eluded us may finally be unlocked.

When AlphaGo Zero was learning to play and win at Go, the developers noticed that as it taught itself techniques perfected by professional players over generations, it occasionally made decisions to discard those techniques in favor of new, better ones that human beings had not yet had time to learn. In a race against time, the speed of learning that AI offers has extraordinary—exponential—potential to accelerate climate solutions, if it is deployed and governed well.

A humbling story of how this might unfold took place at Google's data centers in 2016. For more than ten years Google engineers had been at the cutting edge of optimizing their data systems. Their servers were among the most efficient in the world, and it seemed that any improvements from then on would be marginal. Then they unleashed DeepMind algorithms on the system. Energy demand for cooling was consistently reduced by 40 percent.⁸⁵ This illustration is just a tiny example of the power of AI to make possible what seems impossible to the human mind.

At present, investment in applying AI to the climate crisis is lower than it should be. In the future, governments and corporations around the world will have to carefully support the responsible application of AI and invest quickly in its capacity to deliver material breakthroughs in emissions reductions. In that scenario, technology may be our greatest ally on the road to a brighter future.

ACTION 9: *Build Gender Equality*

We must ensure that decision making at all levels of society involves increasing numbers of women, because when women lead, good things happen. That is the unequivocal conclusion of years of research. Women often have a leadership style that makes them more open and sensitive to a wide range of views, and they are better at working collaboratively, with a longer-term perspective. These traits are essential to responding to the climate crisis.⁸⁶

We know this because the early evidence is already in. Companies, countries, NGOs, and financial institutions all take stronger climate action when they are led by women or have a high proportion of women in decision-making roles.⁸⁷ Recasting our society so that women play at least an equal role in decision making at all levels (family, community, professions, government) is now a matter of survival.

In many countries, discrimination based on gender is assumed to be a thing of the past. Yet studies show that all industries still strongly tend to overestimate male performance and underestimate female performance. While women are aware of this discrepancy, men tend to dismiss it. The vast majority of leadership role models remain male: just look at any photo of G20 leaders from any year. The well-publicized pay gap (women are paid 20 percent less than men for the same work) is another manifestation and shows that many perceptions continue to be subjective and discriminatory.⁸⁸

Before we can work to correct the imbalance of power and decision making, we have to acknowledge that it exists, often but not always based on structural unconscious bias. Right now that is still lost on many.

Nonetheless many women have recognized the unique gravity of our situation on climate change. Intrepid leaders like Natalie Isaacs, Isra Hirsi, Nakabuye Flavia, Greta Thunberg, and Penelope Lea have

mobilized millions of young people who are now demanding urgent climate action and implementing it themselves. Women are at the forefront of collaborative efforts to support each other in the face of our changing climate. In many countries, women's intimate knowledge of the land means they are quicker to spot environmental changes, to learn from them, and out of necessity, find ways to adapt. Women are pioneers of innovative climate solutions within their communities, and they are instinctively good at deep listening, at empathy and collective wisdom gathering, especially in times of transition. These qualities have never been more important or necessary.

A world with true gender equality would look different from ours. Some seem to assume that it would look the same but with a tilted gender power balance. But the interesting element of gender equality, apart from its evident moral rightness, is the opportunity it provides for all of humanity to co-create a world that is regenerative and in which we can thrive together. Nations with greater female representation in positions of power have smaller climate footprints. Companies with women on their executive boards are far more likely to invest in renewable energy and develop products that help solve the climate crisis. Women legislators vote for environmental protections almost twice as frequently as men, and women who lead investment firms are twice as likely to make investment decisions based on how companies treat their employees and the environment.⁸⁹

It is imperative that women be afforded educational opportunities worldwide. Educated women can work, be economically more productive, and help society make better decisions. Crucially, education helps women stand up for themselves and empowers them to make their own choices, in particular about their reproductive health. Keeping girls in school means they are less likely to marry young or have as many children. According to the Brookings Institution, in certain parts of the world, a girl with twelve years of education compared to one with no schooling will have up to five fewer children in her lifetime.⁹⁰

Today 130 million girls are being denied the right to attend school, condemning a massive number of future women to constant pregnancy, bringing more and more children into parts of the world that will scarcely be able to support them. By these calculations, 100 percent enrollment of girls in school today would lessen the anticipated global population in 2050 by 843 million people,⁹¹ a boon in confronting the climate crisis.

If you are a woman, now is the time to consider running for public office or being more assertive about a deserved promotion at work. If you are a man, now is the time to support and encourage your female colleagues, partners, friends, and family members. Women may feel particularly empowered by joining a wider movement or a cohort that shares their aims. The Brand New Congress movement in the United States, which played a significant role in a record number of women being chosen for the 2018 primaries, is a powerful example.⁹² Female candidates, including Alexandria Ocasio-Cortez—now a seriously influential leader on climate action—drew on huge reserves of confidence to run for office by standing shoulder to shoulder with other women.⁹³

We will be able to manage climate change better if we can improve the ratio of women making the decisions about how to do it. It's time to either become one of those decision makers or support women you know to become one.

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In the remote, sun-cracked desert of India's westernmost state, Gujarat, women are harnessing renewable power and improving their livelihoods by acting collectively. Gujarat, the source of nearly 76 percent of India's salt, remains largely disconnected from the electrical grid. For decades, more than forty thousand salt-pan worker families (locally called *agariyas*) have relied on diesel-powered pumps—often spending more than 40 percent of their annual revenue for the season's production. Now that is all changing. With visionary leadership and support from Reemaben

Nanavaty, a native of Gujarat and director of the Self Employed Women's Association (SEWA)—which, with 2 million members, is the largest trade union for informal workers in the world—the *agariyas* are shifting to solar. The first one thousand women who made the shift have benefited from a doubling of their income—helping them to achieve greater financial and social independence and enabling them to send their children to middle and high school. When rolled out to the 15,000 SEWA members who work on the salt pans, the project will prevent the emission of 115,000 metric tons of carbon dioxide—the equivalent of taking nearly 25,000 cars off the road.⁹⁴

Solar Sister, a social enterprise operating in Nigeria and Tanzania, recruits women and trains them to sell affordable, renewable energy sources, like solar lamps and clean cookstoves. Deforestation and climate change mean women must often walk farther than they used to in order to collect water or find firewood for cooking. If they don't collect enough water or firewood, they are more likely to experience domestic violence. The increased workload also means that they have less time to spend on education or income-generating activities. Solar Sister has recruited and trained four thousand women who are now entrepreneurs and have brought clean energy solutions to 1.6 million people in Africa and relieved some of the pressure on women.⁹⁵

These are just two examples of women improving their own lives and livelihoods and those of their sisters when given the resources and freedom they need.

The potential is global.

ACTION 10: *Engage in Politics*

Finally, the action that we feel is ultimately the most important. Democracies are threatened by the climate crisis and must evolve to meet the challenge. In order to help them do so, we all need to actively participate.

The transition to a regenerative world is possible only if we have stable political systems that are responsive to our planet's changing needs and our citizens' changing desires. Since climate change threatens political security itself,⁹⁶ stability is both an essential condition for the transition and an outcome of managing it successfully.

If the first duty of government is to protect its people, then across much of the world the form of democracy we have become used to is failing. Climate change is an existential threat and is likely to intensify faster than most people today realize. If our systems of government can't protect us from that existential threat, they will in time be replaced. But those replacements may take a long time to evolve and will not necessarily be any better at advancing us toward a regenerative future in the available time frame.

In many countries today, corporate interests have captured our democracies. Just as with the tobacco industry, a small minority of companies have used a relatively limited amount of money to purchase extraordinary influence in major legislative capitals and thereby have prevented elected representatives from protecting the people. Often this occurs through trade associations, so even when corporations themselves do not directly lobby for an outcome, it is done on their behalf.⁹⁷

This has become a major issue. In the United States, for example, in 2016, the National Association of Manufacturers (NAM) won a long-fought battle to delay implementation of the Clean Power Plan.

In 2017, NAM supported the U.S. withdrawal from the Paris Agreement. Companies such as Microsoft, Procter & Gamble, Corning, and Intel are all members of NAM, yet all claim to support strong climate action under the Paris Agreement.⁹⁸

On a national level, voter action (or inaction) and intent underpin larger global moves. Over the last twenty years, climate change has been steadily climbing up the list of voter priorities.⁹⁹ While this is good news, no significant proportion of voters actually see climate as their highest priority. That is a serious problem. In the United States, new presidents have a very short window of time to actually get big things done. For example, Barack Obama came into office very committed to taking strong action on climate, and he had a majority in both houses of Congress. He could have chosen to prioritize—and would probably have passed—ambitious climate legislation. However, instead he made a decision to pursue health-care reform, another campaign pledge and a domestic priority. Passing health care required Obama to use up a significant part of his political capital, and it built a knot of fierce resistance to his other policies in the Republican Party, to the point that they stonewalled anything he proposed. As a result, not until his second term was he able to turn his political attention to climate change. Even then, it was only by using executive power that he made progress, not through legislation.

Rather than wait for things to get worse, we must embrace engagement at all levels of politics. We must see it as one of our most pressing responsibilities, and we must hold every politician to account. We must elect only leaders who see far-reaching action on climate change as their absolute first priority and who are prepared to act on the first day they assume office. Large numbers of people *must vote on climate change* as their number-one priority. As we are in the midst of the most dire emergency, we must urgently demand that those who seek high office offer solutions commensurate with the scale of the problem. Their policy platforms must strictly be informed by science.

It's time to participate in nonviolent political movements wherever possible.

In April 2019, the group Extinction Rebellion, building on years of work by various nonprofit organizations, some politicians, and other activists, seized the moment and began a series of global protests, the first of which was to take over central London for ten days in nonviolent protest. Thousands of first-time activists, people who had never marched or signed a petition in their lives, blocked roads, linked arms, and planted trees on Waterloo Bridge. Within two months of that initial protest, the UK declared a climate emergency, adopted a target of net-zero emissions by 2050 (less ambitious than what Extinction Rebellion was calling for, but still a big step), and established a citizens' assembly to look at how it could be achieved.¹⁰⁰

Civil resistance by members of the public can outdo efforts by political elites to achieve radical change. This is not an aberration; it is how change happens, typically when injustice in the prevailing system becomes too great.

Civil disobedience is not only a moral choice, it is also the most powerful way of shaping world politics.¹⁰¹ Historically, systemic political shifts have required civil disobedience on a significant scale. Few have occurred without it. The numbers required may seem large, but they are not impossible. History has shown that when approximately 3.5 percent of the population participates in nonviolent protest, success becomes inevitable.¹⁰² No nonviolent protest has ever failed to achieve its aims once it reached that threshold of participation. In the UK, this would be 2.3 million people. In the United States, 11 million.

These numbers are now within our reach.

The remarkable rise to prominence of Greta Thunberg and the Fridays for Future movement is showing us that the world is ready for the next phase of direct action.¹⁰³ Greta's single, defiant act of civil disobedience—striking from school every Friday—has captured the zeitgeist. She inspired, in a relatively short period of time, a

peaceful process for igniting and harnessing the anger of millions of young people in many countries and enrolling them in regular climate activism.

Adding further momentum to the successful capital divestment movement (in which money is moving away from assets linked to fossil fuels), in 2019, the head of the Organization of Petroleum Exporting Countries (OPEC) described the mass mobilization of world opinion against oil as the greatest threat its industry faces.¹⁰⁴ This mobilization has as its motivating force people from all walks of life, spanning all generations, across all continents. Every additional person who chooses to participate will bring us closer to the tipping point for success.

We acknowledge that participating in school strikes or civil disobedience demonstrations is not always possible or, in undemocratic societies and even in some democracies around the world, safe. What is important is for you to assess the avenues that might be open to you to engage in the political process and to find ways to work within them.

Beyond directly addressing governments, other political actions are needed. Corporations and trade associations fund and engage in political lobbying against citizen action on climate change. We need to remove our consent from these corporations. The simplest way is to vote with your money: stop buying their stocks, and stop buying their products and services where alternatives exist. Talk to your bank, talk to the institutions that manage your insurance products or debts. Find out if your money is invested in these corporations and ask for alternative options. Some financial institutions are already taking protective action, but others may not yet feel sufficient pressure from their customers to make a serious shift in capital allocation.

Governments that are stable now and trying to find ways to meet this challenge should be worked with, not dismantled. We all have a responsibility to exert what leverage we can inside the traditional power systems and push them as far and as fast as we can. As we press both inside and outside the system for the overdue political

changes that need to occur, we should also be mindful of the role that institutions have played in upholding our basic rights and our ability to weather transitions together. For hundreds of years—thousands, in some cases—our institutions of government, learning, communication, law, and religion have held us to a norm. It is possible to argue that this is what has kept us back, and at times in history that has been true. But equally true is that they have protected us from our worst instincts at moments of rage and insanity. Let's be mindful of what they have given us and find ways, when appropriate, to protect them. Once they are gone, they cannot be easily replaced.

Because climate change is unlike any other challenge that humanity has had to face, we have no template for the kind of political, economic, and societal transformation needed now—but there are a range of extraordinary examples we can learn from. Movements of civil disobedience from the early twentieth-century suffragettes to Gandhi's drive for Indian independence to Martin Luther King, Jr., and the 1960s civil rights movement to the 2003 Rose Revolution in Georgia—to name just a few—are all inspirational insofar as they mobilized vast numbers of people to champion their causes. An open, inclusive narrative and a sense of working collectively to change history for the better took them further than they ever imagined possible. As Nelson Mandela said, "It always seems impossible until it is done."

Now is the time for us to participate—in our schools, businesses, communities, towns, and countries—to ensure that the battle to survive the climate crisis becomes the biggest political movement in history. It is not about changing governments or political leaders. It is about waging sustained political action and engagement. The ingredients to achieve our goal are ripe. We have huge momentum with millions of people on the streets calling for change. Corporations, cities, investors, and governments all over the world are taking highly sophisticated and coordinated action toward a 1.5-degree-Celsius future, and are open and listening to the calls of emergency from the streets.

If democracy is to survive and thrive into the twenty-first century, climate change is the one big test that it cannot fail.

CONCLUSION

A New Story

We want you to know two things.

First, even at this late hour we still have a choice about our future, and therefore every action we take from this moment forward counts.

Second, we are capable of making the right choices about our own destiny. We are not doomed to a devastating future, and humanity is not flawed and incapable of responding to big problems, if we act.

Future generations will most likely look back at this moment as the single most significant turning point for action.

But the path we have set out is not easy, and success is not assured. The road ahead is winding. We are at a moment of real darkness, but there is no turning back. We may kick against this reality, but actually, it is a moment of truth, just as we find in all good stories. What is needed now is a steadfast commitment to the task and an understanding that failure is not an option.

We can be informed by art, literature, and history as much as by science. Meeting the challenge of climate change needs to become part of a new story of human striving and renewal.

Right now, the predominant stories we are telling ourselves about the climate crisis are not very inspiring. But a new story can reinvigorate our efforts.

When the story changes, everything changes.

In October 1957, Americans looked upward as the Soviet Union's Sputnik I satellite crossed over the country.¹ For the first time, there was a satellite in the sky, and their "enemy" had beaten them to it. That night, from Pennsylvania to Kansas to Colorado, families realized in dismay that the enemy could see them, was watching them.

How did the country respond? Within a few years, President John F. Kennedy gave his famous speech about landing a man on the moon within that decade, a feat far more challenging than launching a satellite.² He spoke of it without knowing whether it could be done, and without a detailed budget, plan, or timeline. He was reclaiming the narrative and placing Americans inside a story that was hopeful and in which they could prevail.

The speech both terrified and electrified NASA. Within a few months it reorganized itself in line with this new goal. Teams worked harder than ever to innovate, which was particularly galvanizing and thrilling for young people; the average age of the team that launched the Apollo missions was twenty-eight.³ Everyone was part of a shared endeavor that gave their lives meaning.

When Kennedy first paid a visit to NASA Mission Control, at one point he came across a janitor who was cleaning the control room. "And what is your role here?" he asked.

"Mr. President, sir," came the reply, "I'm putting a man on the moon."⁴

The compelling vision made this man feel that he was part of something great, and he was. Someone had to keep the room clean: it would not have been possible to put a man on the moon if that didn't happen. Imagine how the janitor would have felt, however, if he had been cleaning a control room for a government agency that had been bested by a rival and was facing relative decline. It was the story that motivated him to action.

Consider also the story that Great Britain told itself as it was enduring the blitzkrieg raids of 1941. As late as 1939, Britain had

torn itself to pieces over different ideas of how to deal with Hitler. Prime Minister Neville Chamberlain was committed to a policy of appeasement and had great support. With the memories of the First World War still fresh, a good proportion of people would have done anything to avoid facing the reality that Hitler would stop at nothing to conquer Europe. Eventually, Chamberlain fell, and in his place came Winston Churchill. Churchill is remembered for many things, not all of them positive, but his most remarkable achievement in those early days was embedding a new story into the national psyche that prepared people for what was to come. An island alone. A greatest hour. A greatest generation that would fight them on the beaches and fight them in the hills and in the streets. A country that would never surrender.

Countless interviews with those who lived through that time have again and again described how a spirit of shared endeavor infused all actions, from the pilots in the Battle of Britain, to the people who turned their gardens and green spaces into food production on a massive scale. The simple task of pulling potatoes from the soil became an act of service in support of absent loved ones at the front and part of the pursuit of victory.

Even with the Paris Agreement, for the longest time, the story that prevailed was that climate change was too complicated; it was impossible to get countries to agree, and the structure of the UN would not allow agreement. The negotiations were populated with thousands of people who could explain in great detail and for many hours why there was absolutely no way through the myriad complexity to reach agreement. Changing that mindset was the hardest but most critical step we took. The journey from the failure in Copenhagen to the culmination in Paris was marked by a gradual buildup of momentum, and as the momentum built, the story changed.

At first there were only a few, but over time, thousands of people became convinced that the moment for progress was possible and that they had an important role to play. As each country made a commitment, more people believed in this possibility. The price of

solar panels fell, cities took leadership positions, people marched in the streets, corporations took action, and investors moved money out of fossil fuels. They all became steps on the journey to a new story.

At this moment, when we have reached the limits of the planet's ability to sustain life in the form in which we know it, we have also reached the limits of the stories that define our lives. Personal achievements through individualistic competition, continuous consumption, skepticism about our ability to come together as humanity, and an inability to see the deeper impacts of what we are doing to the planet—all are no longer useful.

Now we must move toward understanding our shared existence on this planet, not because it is a nice addendum to what we do but because it is a matter of survival. Our current quest for a regenerative future has even higher levels of complexity and is decisively more consequential than the U.S. quest to put a man on the moon or the UK's determination to defeat Hitler.

This is not the quest of one nation. This time it's up to all of us, to all the nations and peoples of the world. No matter how complex or deep our differences, we fundamentally share everything that is important: the desire to forge a better world for everyone alive today and all the generations to come.

Imagine, just for a moment, a world in which we had achieved this quest. It may seem far-fetched to you, utopian even, but since the very survival of humanity is at stake, ironically we believe that our chances of rising to this challenge are greater now than they have ever been. Humanity is capable of coming together to do this. Whether we will succeed in doing so will become apparent in a few short years.

With this book, we have begun to weave together some of the elements of our new story.

We can, together, reimagine our place in this world. As human beings, we all have the outrageous fortune to be here on this planet at this moment of profound consequence.

When the eyes of our children, and their children, look straight into ours, and they ask us “What did you do?” our answer cannot just be that we did everything we could.

It has to be more than that.

There is really only one answer.

We did everything that was necessary.

So let us begin today to tell the story of how we did not balk at this seemingly insurmountable challenge, of how we were not defeated by the multiple setbacks we encountered. Let us tell the story of how we made the choice to pull away from the brink of peril, of how we took our responsibility seriously and did everything that was necessary to emerge from the crisis while rekindling our relationships with each other and with all the natural systems that enable human life on Earth.

Let it be a story of great adventure, against overwhelming odds.

A story of survival.

And of a thriving existence.

WHAT YOU CAN DO NOW

This Action Plan is part of a growing movement of stubborn climate activists committed to fulfilling the vision of a regenerative world. We can only do this together and we hope you will join us at www.GlobalOptimism.com.

RIGHT NOW

- Take a deep breath and decide that collectively we can do this, and that you will play your part. You will be a hopeful visionary for humanity through these dark days. From this moment, despair ends and tactics begin.
- Decide that you will be part of the politics of the future. You will vote for, campaign for, and support candidates who champion emissions reductions. Reject the politics of nostalgia. For the next ten years, this will be your number-one political priority.
- Commit to reducing your impact on the climate by more than half of what it is today by 2030. Aim for 60 percent. Just because right now you don't know how you will do so does not need to stop you. We are all learning.

TODAY OR TOMORROW

- Determine where your principal elected officials stand on climate change; write to them about your commitments and let them know. Tell them you are watching.
- Choose at least one day of the week to go meat-free, and decide how soon you will add more days to that commitment.
- Think big. How do you most impact climate change, and what big things can you do to effect a regenerative future?
- Tell others about your commitments, in person or on social media. Don't be shy! Invite others to follow suit. Your example will motivate them.

THIS WEEK

- Share your personal plan to reduce emissions by more than half with your partner, kids, and friends, and invite them to do so as well. Preserving the future of all life should be joyful. Have fun with it.
- Take some actions and stick to them over time—it will give you momentum. Reduce daily energy use, bike instead of driving a car, switch your energy supplier to 100

percent clean. It's all good and all needs doing. Consider what else you can do, while remembering there is still much to be done.

- Go outside and look around. This world is damaged and hurting, but it is also beautiful and intact and whole. Pay attention to something you have forgotten—emerging leaves in the spring or frost on dead leaves in winter. Feel the gratitude we owe the Earth for her bounty and beauty.

THIS MONTH

- Find out who in your vicinity is organizing political action involving climate change. Attend meetings and meet the concerned citizens. Go to demonstrations and marches! Allow yourself to be inspired by the miracle of committed groups intent on changing the world.
- Start a conversation with someone who is not active on climate change with a view toward understanding their stance and gently enlarging their awareness of the crisis from their perspective.
- Enact your commitments: What precisely will you do this year? How will it affect you and your family? How will you begin to apply the changes you plan to make?
- Challenge your consumerism. Look at what you have bought, and ask yourself whether it brings you joy. Question your impulses to buy more, and begin to see how liberating it is to buy less.
- Start a mindfulness practice, perhaps a breathing exercise of gratitude. Do it every day, if only for a few minutes. Learn to create a gap of light between yourself, the world, and your reactions.
- Plant trees. As many as you can. Look for a local group doing tree planting. Get out there when you can, and when you can't, support others to do so.
- Understand your privilege in relation to others, and commit to helping level the playing field for all.

THIS YEAR

- Be political in your daily life. Seek collective opportunities to advance the cause of emissions reductions. It will inspire you and help you feel you are part of a shared endeavor. Engage regularly in direct action if that is possible where you live. VOTE!
- Be consistent. You may have changed your electricity supply to 100 percent renewable energy, rethought your commute, changed your air travel habits, and altered your diet. If you can sustain your effort for the first year, you stand a good chance of doing so every year. Recognize your accomplishment.

BY 2030

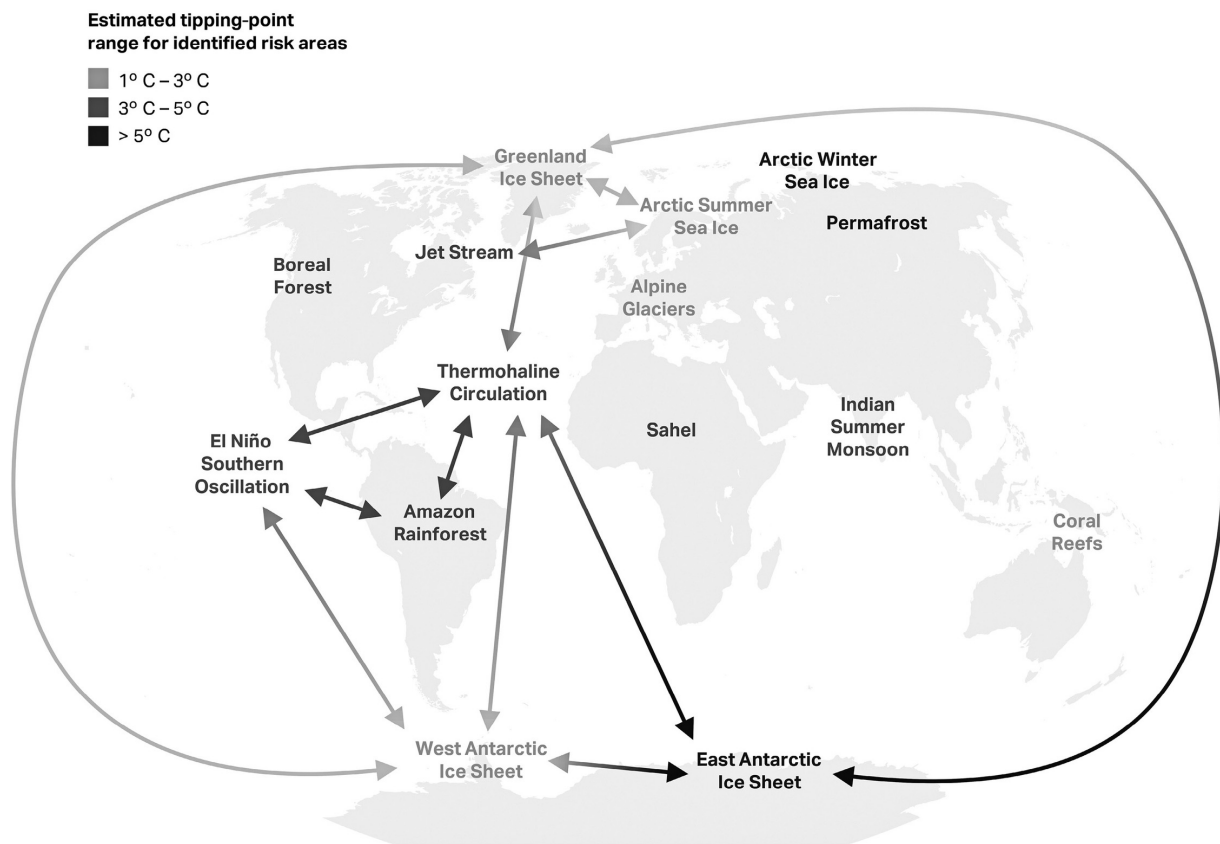
- Deliver on your plan to cut your emissions by more than half. Celebrate your achievement.
- Finance others to plant more trees as a symbol of the fact that you still have some way to go. Trees are good, and the world needs more of them.
- Ensure you have voted in line with these priorities in national and regional elections and been vocal about the fact that you have done so.
- Continue to practice the other new habits you have developed.
- Encourage those closest to you—family, friends, loved ones—to be climate conscious.
- Start the plan to reduce your emissions again by more than half over the next decade.

BEFORE 2050

- Be at net-zero emissions, having been part of the generation that chose a better future for all of us.

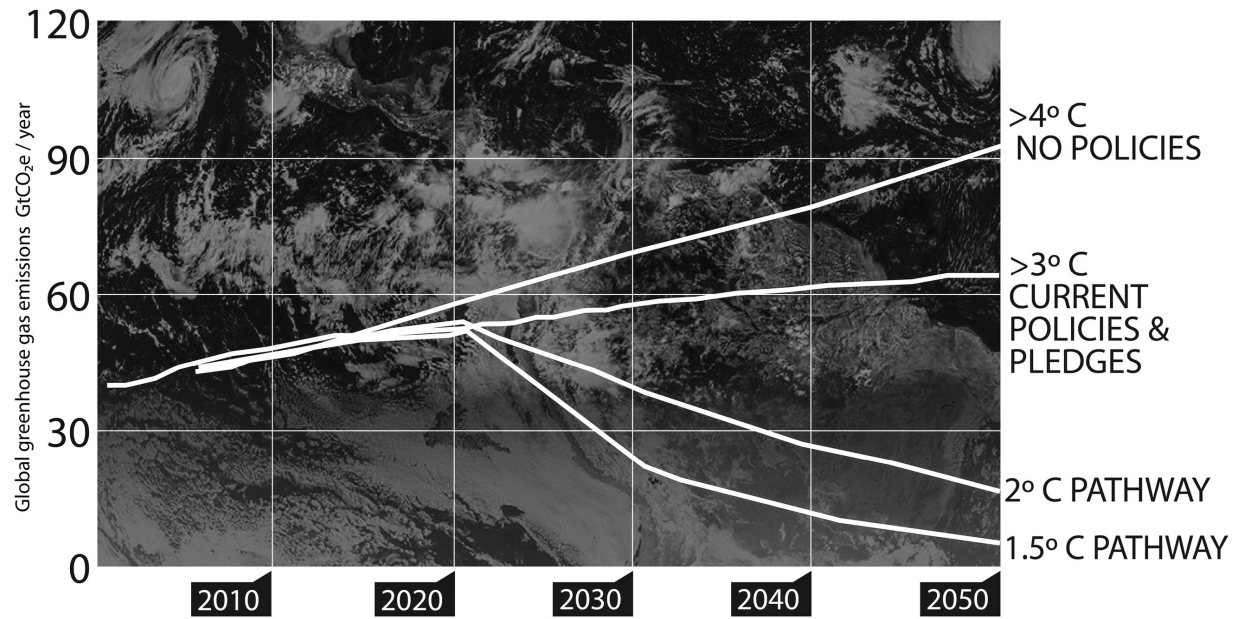
APPENDIX

Tipping Points



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Temperature Scenarios



Temperature Scenarios. Adapted from Climate Action Tracker
(<https://climateactiontracker.org/global/temperatures/>)

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ScienceAlert.com

ScienceDirect.com

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Skeptical Science: Getting skeptical about global warming skepticism,
<https://skepticalscience.com/>

Water Scarcity Atlas, waterscarcityatlas.org

World Health Organization, who.int

Drawdown.org: <https://www.drawdown.org/references>



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