2021 EDITION

IN OUR HANDS

A HANDBOOK FOR INTERGENERATIONAL ACTIONS TO SOLVE THE CLIMATE CRISIS

WILFORD H. WELCH

Praise for *In Our Hands*

"The 2021 Edition of *In Our Hands* is a persuasive and compelling read on the most critical issue of our time. I particularly recommend it for educators who are looking for an accessible, practical, and engaging book to inspire and inform their students of all ages. Wilford is a gifted writer who helps you understand how everyone needs to play a part in solving the global warming/climate crisis. Over the course of five international careers, he has explored the economic, social, technological, political and other forces driving the world, and how we can harness those forces in ways that will not only solve the climate crisis but advance humanity."

Liz Maw, President, Presidio Graduate School, San Francisco, California

"Addressing the threat of global warming and getting all of humanity to live with one another and the natural world in harmony is very possible. In this book, Wilford shows us the way."

Desmond Tutu, Nobel Peace Prize Laureate

"*In Our Hands* is a brilliant perspective from one of the world's most authentic authorities on social entrepreneurship and climate change. Wilford Welch hands us the missing link as to how we can reach across the generational gap between millennials and Boomers and evolve together the solutions to the disastrous climate change predictions. He invites us into a view of our world from 2050—an inge-

nious way to think, and subsequently act, outside the proverbial 'box.' This is a 'must read' for any age interested in our survival as a species."

Diane V. Cirincione, Ph.D.,
Attitudinal Healing International

"I have a long history with this subject matter, and this is an impressive book for many reasons: It is concise, accurate, readable, and even well-written! I don't take any of these attributes for granted when reviewing a book, so Wilford's book was refreshing for all these reasons."

Jeff Battis, Book Passage Bookstore,
San Francisco

"Wilford Welch has written a fabulous, accessible, brilliant, and critical book that empowers each of us to take action to reverse global warming and create the world we want. This is an easy read, and so inspiring and motivating that you will be in immediate action as a result. Everyone alive should have this book in their hands! I loved every word. Buy it, read it, use it, share it!"

Lynne Twist, author, The Soul of Money

"LOVED THIS BOOK! I read it a couple of times and think you have done an AMAZING JOB—causes, solutions, actions, resources. I especially like the way you start at 2050 and see the actions that were taken that made the difference, and I love all of the references you give."

Sharon Roe, Ph.D., Philosophy and Religion

"This is the quintessential book on climate change! Welch's passionate and practical easy-to-read book is filled with compelling scenarios and resources to move everyone to action. You get to choose your adventure: the possible future, or the road to ruin. Choose this book, and buy more to give to your friends. I did, and I am part of the solution!"

Barbara Meyer, Houston, Texas

"Wilford Welch's guide for intergenerational actions to solve the climate crisis is exactly what we need, exactly when we need it. As the baby Boomer generation ages and we prepare for a $50 trillion intergenerational wealth transfer between Boomers and millennials, it is essential that we bridge the age gap and begin to work together to create a more just and regenerative world for everyone. I can't wait to share this book with friends and family of all ages and to work on one of the most pressing issues of our time."

Eli Utne, educator and worker/owner at Learning By Hand

"*In Our Hands* is a very important book to help galvanize those who say they are concerned but are not really engaged to wake up and take action. It's both frightening and sobering. Also, the back section of the book—the work area and resources—is very important and an effective call to action. The book is well written and masterfully edited. None of this is far-fetched. It's happening now and will only worsen. There are no borders and impenetrable barriers to be erected to combat a potential extinction of life."

Gordon Haight, international publisher and marketing consultant

"This new book, *In Our Hands,* provides a succinct and effective overview of the issues involved in global warming and then offers a pathway to success in solving the climate crisis. It is also an accessible and valuable handbook—a guide to who is doing what and how you can get involved in the climate movement. This small book makes a big contribution to galvanizing the actions that are needed now."

Bill Twist, CEO, Pachamama Alliance

"This awesome book presents a fresh intergenerational perspective on how to approach the climate crisis. It lays out both the disastrous future we are headed toward and the positive future if we can co-create.

David B. Room, millennial activist

"The scenarios are inspired and thought-provoking. Clearly, you care deeply, profoundly, and that comes across in every page."

Susan Collin Marks, peace ambassador,
Search for Common Ground

"This slim volume is the perfect place to start tackling the greatest problem of our time. The 2021 edition of *In Our Hands* makes crystal clear why all citizens of planet Earth must immediately join the fight against man-made climate change. But this essential handbook goes way beyond mere motivation by also detailing the simple but powerful steps we all can take right now, and by cataloging the resources we can use to do so. Essential reading!"

V. Ricci, author, *Clueless*

"This concise, well-written look on the climate crisis will leave you with hope. Welch does so by suggesting positive actions we can all take to fight climate change and create a better world."

Will Parrinello, documentary filmmaker

"There is not a single existential problem facing the United States, or the entire world for that matter, that does not have one or more attainable and affordable solutions provided that there is the proper leadership and the collective will to solve them. Wilford Welch has gone a long way in this important contribution to our collective knowledge about our future by outlining the problems we face caused by our contribution to global warming and what must be done to address them before it is too late."

Peter Bergh, landscape architect

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Wilford H. Welch

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Dedication

To
Gordon Gund and Jerry Jampolsky
Two dear friends
Both now blind
Both at one time could see perfectly
Now, it seems they can see humanity's strengths and weaknesses far more clearly

And, to the next generations
Ashley, John, Shandy, Hans, Charlie, Teresa
Noelle, Aydan, Finley, Ayla, Ashley, Kennedy, Sophia
Coralie and Jackon

May we all work together to ensure that there will be seven healthy and secure generations to come

Photo by Laurie Ludes

Contents

Key Takeaways

This book has been written with the following convictions at its core—and with great hope for our common future.

- Global warming and climate change are happening and are primarily caused by human activities.
- Because of our collective failure over the past sixty years to take incremental steps to reduce fossil fuel emissions, global warming to the middle of this century is already baked in. As a result, we must take action this decade to limit the damage over the second half of this century.
- We have all the technological capabilities we need to deal with the climate emergency.
- If we all mobilize and address this crisis head on we can reduce the damage that would have occurred over the second half of this century and beyond.
- "We" means all of us doing our part—in our personal, community, and professional lives.
- These actions do not have to be difficult. They will add pleasure and value to your life as well as to the lives of your children and grandchildren.
- **The only thing we lack is the individual, collective and political will to address this crisis.**
- **It is unclear whether the human race, at its current level of development, has the maturity and wisdom, individually and collectively, to do what is needed – or in the time it is needed.**

Let's change that starting right now. The future is "In Our Hands".

Preface

My awakening to the possibility that global warming, overpopulation, overdevelopment, and economic systems based on a mindset of "economic growth at all costs" could lead to the collapse of humanity occurred in 2015 in Southern Ethiopia. My wife, Carole, and I were leading a trip there, exploring how the tribes were dealing with the many natural and human forces impacting their world. The Hamar people are the descendants of the very first humans who lived on our planet some 2.8 million years ago. For centuries, they have lived in the fertile Omo Valley raising cattle and crops.

Photo by Carole Angermeir

Author With Hamar Villagers
In Southern Ethiopia

Kala, our twenty-nine-year-old guide, told us that he feared for the future of many of the tribes who depend on continued access to their pastoral homelands. He said the weather was getting hotter and hotter, and the rains were no longer predictable. He noted how one could no longer drive down roads without seeing livestock that has died from lack of food and water. He said that much of the river water the tribes had always relied on was being diverted by the government to the large plots of land the government had taken from the tribes and leased to investors from Turkey, Saudi Arabia, and China to grow crops for export to feed their people. Kala was sure that further marginalization and even starvation lay ahead for his tribe and would lead to clashes with their national government, which seemed more interested in growing the national economy than ensuring the well-being of his people.

Photo by Wilford Welch

Villagers In Southern Ethiopia Scavenging For Fresh Water

And sure enough, a few months after we left, tribal frustrations boiled over when government soldiers put a shooting range right next to one of the villages as a form

of intimidation. The Hamar tribesmen retaliated by killing twelve soldiers. Shortly after that, government forces killed more than six hundred tribesmen over a period of several months. Kala was picked up while driving one night, interrogated, and held in jail for three days on unspecified charges. Clear that his life was in danger due to repressive government tactics, he fled to a nearby country where he went into hiding, desperately wanting to see his wife and children again and get on with building his business but fearing for his life if he returned.

My experience with Kala and his tribe in Southern Ethiopia brought into focus what I had long been concerned about but that had not moved me to take concrete actions to address the world's climate emergency. It was clear that the forces I was witnessing in Ethiopia were the same forces that could lead to the extinction of humanity if we did not change our ways. Those forces include too many lives being ravaged by global warming and governments determined to achieve economic growth without regard to the damage being done to the people they are elected to serve.

As I write this, Kala's story continues to unfold. He may someday be able to return to his family, home, and business, but none of the conditions that are threatening him, his country, and his family back in Ethiopia have changed over the past seven years. I realized that beyond being a friend and supporter of Kala, I wanted to bring whatever experience and resources I had to focus attention on the role global warming, population growth, and overdevelopment are having not only on Ethiopia but on the whole world. Thus, this small book, a labor of love that is coming from a deep concern for our common future.

CHAPTER 1

Overview

Global warming and climate change may feel like a distant concern you can do little about. Or they may produce fear, frustration, or overwhelm. Distant they are not. Fearful, frustrating, and overwhelming they do not have to be.

The purpose of this book is to help you understand the science of global warming and climate change, get past all those emotions, if indeed you have them, and embrace this as an opportunity to create a better world for yourself, your children, and your grandchildren. The human race has all the technological solutions we need to address this crisis. What it needs is the individual, collective, and political will to take the actions called for, and do so as rapidly as possible.

Please know that I am a policy person not a political person, and that to that end I have sought to avoid US national, state, or local politics throughout this book. Unfortunately, over the decades since I was in Washington as a US diplomat, it has become clear to me that political considerations based on the desire to gain power through elections, rather than good policy decisions for the common good, have become the norm. That is why it is ever more important that individual citizens determine what the truth is and take actions based on their resulting convictions.

This book suggests what is possible if, individually and collectively, we take the relatively easy actions noted in Chapters 2, 3, and 4 to address the greatest threat the human race has faced during our 300,000 years on this small planet. I hope you will join me in embracing this challenge.

- For a teacher, action may mean teaching this subject in ways that your students will not only understand but will want to engage with.
- For students, action may mean becoming aware of the opportunities you have to prepare for a profession that will contribute to the solution.
- For parents, it may mean being open to the fact that your children may not have the opportunities you have had if you do not roll up your sleeves and become a part of the climate solution.
- For corporations, it may mean changing energy sources to renewables before your customers, investors, and employees turn on you because you are making the climate worse and merely "greenwashing."
- For politicians, it may mean explaining the legislative actions you plan to vote for that will protect future generations, rather than just voting for legislation that your constituents currently want to get yourself elected.
- For national government leaders, it may mean putting this crisis front and center in ways that both the people and politicians across all parties and regions can understand and embrace. That must include addressing the pain and suffering of those men and women working in the oil, gas, coal, and related industries who face challenging futures if their employment concerns are not addressed in the energy transition that has to come.

The crisis we face, in a nutshell

These are the best global warming predictions to mid-century, and the end of this century, by America's leading climate scientists.

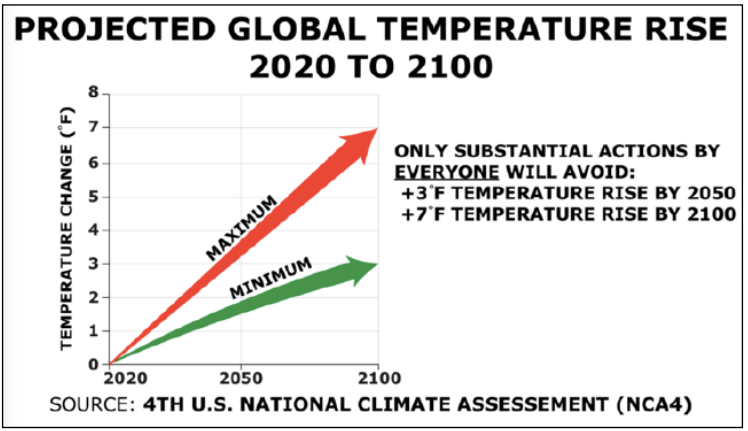


Image courtesy of Wilford Welch

Most projections by climate scientists are in Celsius and start from the advent of the Industrial Revolution. As a result, most Americans have difficulty understanding how significant the likely temperature increases will be. The original projections for this graph were taken from figure 1.4 of the US Government's Fourth Climate Assessment, (Click the link below in eBook and PDF editions). (https://science2017.globalchange.gov/chapter/1/).

To be fully transparent, as you will note from figure 1.4, some projections found there are lower than those noted in the graph above. I did not include them because I do not believe they are realistic. Many of the delegates of the 197 countries negotiating the 2015 Paris Climate Agreement were only willing to sign less stringent greenhouse emission goals to gain the support of their people and reduce strains

on their economies. Hopefully, future international climate agreements will be more aggressive in each country's commitments, and will be legally binding, not just aspirational, national commitments.

As the graph above indicates, the earth's atmosphere will warm at least 2 degrees Fahrenheit more, and as much as 3 degrees more, by 2050 than was the case in 2020. As I noted earlier, I believe, unfortunately, these increases in global temperatures and climate consequences are already "baked in" if we do not take effective, collective action and do so this decade. I stress "this decade" because it is pretty clear that our failure to take incremental actions over the past sixty years means that we have to take very substantial actions this decade to avoid the dramatic rise in temperatures projected as the worst case over the second half of this century.

If these numbers do not concern you, I request that you think again. Our world's temperature rose 1.8 degrees Fahrenheit between 1901 and 2016, and that relatively "small" rise has, in recent years, caused catastrophe after catastrophe both in the United States and around the world. In the United States alone, we have experienced desertification and far more disastrous forest fires, stronger hurricanes and storm surges, and the loss of much of the plant and animal species we need to survive, to mention just a few of the natural disasters we are now facing. Just imagine a rise of another 3 degrees by mid-century, and as much as 7 degrees more over the next 80 years.

I know this is a lot to process, and that most of us feel overwhelmed when faced with data around climate change. But there is reason for hope, and this is what this book is all about. While it is important for you to understand what's happening on the planet, it's also important to know that *you* can make a difference, a *big* difference in how our future will unfold.

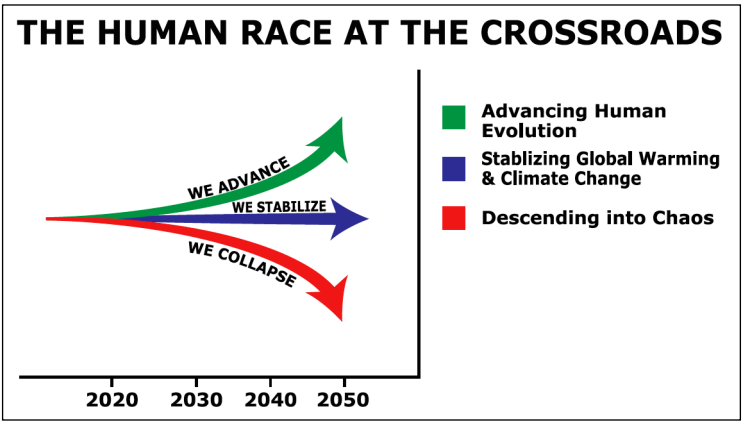


Image courtesy of Wilford Welch

We are now, in the 2020s, literally "at the crossroads," and what we do, or not do, this decade, will determine our future and the lives of those who follow us.

A little perspective

As noted earlier, humans have lived on our small planet for 300,000 years, and for nearly all of those years, the natural world played a major role in everyone's lives. The natural world was respected and, at times, feared. But since the advent of the consumer age following the end of World War II, we have behaved as if we could exploit every part of the natural world without consequence. And we happily used fossil fuels to produce all the products we wanted. My life, and all those who have lived the last half-century, have benefitted immensely from what fossil fuels have made possible.

But all those products have come with unintended, negative, consequences, which most humans were not conscious of until recently, despite six decades of increasingly dire and vocal warnings by the world's leading climate scientists.

Those negative consequences have come from the release of billions of tons of fossil fuel gasses, including carbon dioxide and methane, often referred to as "greenhouse gasses," that are trapped about six miles over our heads by an invisible blanket. These gases cause global warming and, indirectly, climate change. I say "indirectly" because it is clear to climate scientists that global warming causes more extreme climates, from drought in some areas, more hurricanes in other areas and cooling oceans in others due to the melting of the Greenland and Antarctic ice sheets. That said, supercomputers in our national labs are now analyzing billions of bytes of data in seconds to show when and where global warming will directly cause more climate disasters.

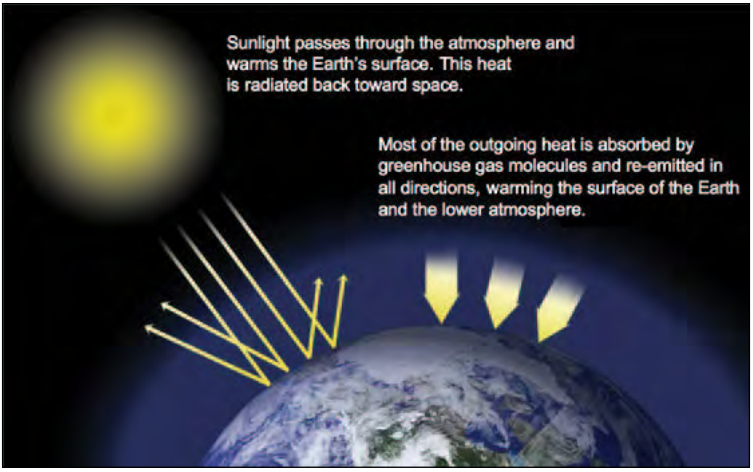


Image courtesy of NASA, https://climate.nasa.gov/causes

The invisible blanket around the Earth that traps heat

The graph below notes how carbon dioxide emissions have more than doubled since the Second World War as the consumer and industrial revolutions went into high gear, powered by fossil fuels.

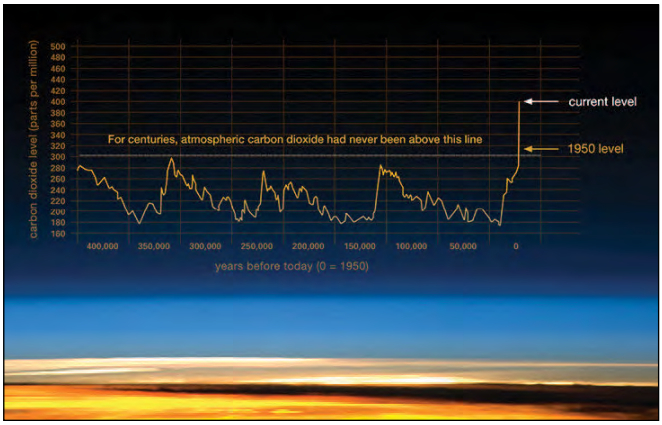


Image courtesy of NASA, https://climate.nasa.gov/climate_resources/24/

The relentless rise of carbon dioxide in the atmosphere since 1945

In response to those who believe that global warming is primarily caused by factors other than human activities, NASA has produced the following timeline. In turn, it tracks the influence of each of the following relative to the impact of human activities: Changes in the earth's orbit; Changes in the sun's temperature; Volcanic eruptions, Deforestation; Ozone pollution and Aerosol pollution.

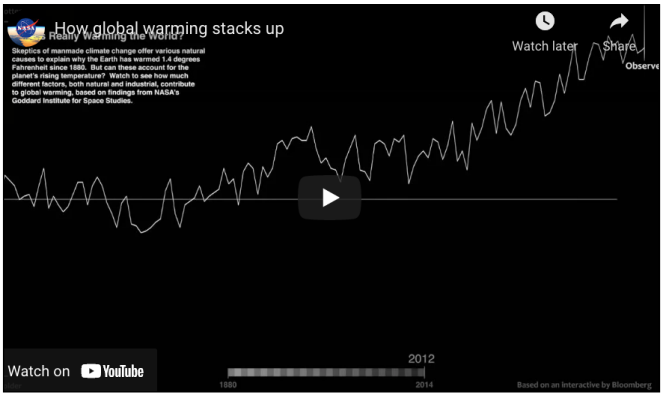


Image courtesy of NASA, https://climate.nasa.gov/climate_resources/144/video-how-global-warming-stacks-up/

https://climate.nasa.gov/climate_resources/144/video-how-global-warming-stacks-up/

Human Activities Are The Primary Cause Of Global Warming

A recent NASA summary statement reads: "Multiple studies published in peer-reviewed scientific journals show that 97% or more of actively publishing climate scientists agree: Climate-warming trends over the past century are extremely likely due to human activities."

If the catastrophic future described in Chapter 5, *The Road to Ruin*, were to have a 97% likelihood of happening, would you take that gamble with the lives of your children and grandchildren, or do all you could to prevent it?

Carbon dioxide is not "bad." In fact, life on earth could not exist without it. The problem is the amount of it that is now trapped above our heads, with 30 billion more tons being added each year by humans like you and me. We add it by the cars we drive, the planes we fly in, the heat we use to warm our houses, the cement and steel produced to build our homes and skyscrapers, and the plastic products that make our lives so convenient, to name only a few carbon-emitting products we benefit from. This is what is creating the crisis we face if we all do not wake up and play our part in addressing this challenge.

And just as concerning, are feedback loops and tipping points. For example, when the warming of the Arctic releases methane, a greenhouse gas, it traps heat in the atmosphere 28 times more effectively than carbon dioxide. For millions of years, billions of tons of methane have been frozen, and thus dormant, in the Arctic topsoil or tundra. As global warming causes the tundra to melt, it releases methane into the atmosphere and causes more global warming, which in turn will cause more methane to be released into the atmosphere and cause even more global warming. At some point, these feedback loops will cause so much warming of the atmosphere that we will not be able to stop it. We would

then have reached irreversible tipping points and the collapse of many of the natural and human systems we rely on, as outlined in Chapter 5. Let's not wake up some day in the late 2020s and say, "Gee, I wish I had known that."

And the truth is, humans are not ultimately in control, mother nature is. If stands of trees expand beyond the capacity of the soil to collect enough freshwater, the trees will die. If herds of animals expand beyond their area's ability to provide vegetation to eat and freshwater to drink, the herd will either move or die. We must not let the same happen to those millions of inhabitants of this earth who currently live on marginal lands with limited sources of freshwater, which further global warming will make much worse.

So if the global warming/climate crisis is so serious, and the world's leading climate scientists have been providing us with ever more accurate data for the past six decades, why has the human race been so slow to respond to this existential crisis? I do not feel qualified to answer this question, but I will offer some observations from my own experience.

The first is terminology. Just as most Americans cannot relate to "Celsius," I do not think they are motivated to act in response to phrases like "we are facing an existential crisis."

Second, what causes most people to jump into action is often based on emotions rather than logical, data-driven information. And most explanations of global warming and climate change are provided as data about the science rather than the probable impacts global warming and climate change will have on the lives of people and communities where you live.

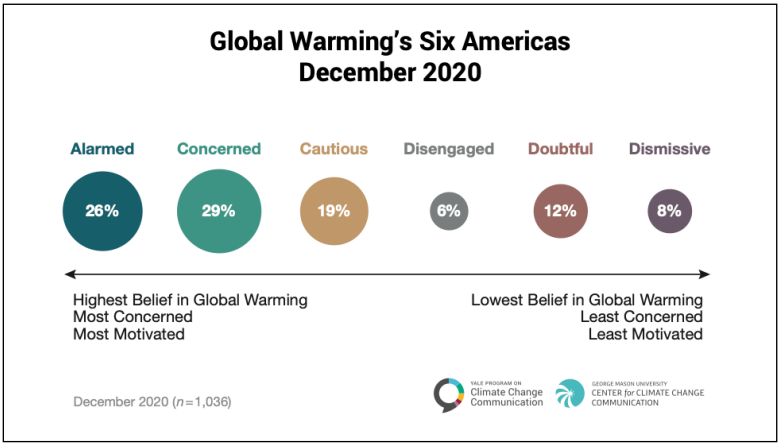
So, if you are a teacher, it may be helpful to your students if you explore with them not only the global scientific projections of

global warming and climate change but the likely impacts on your local community, how they feel about it and what they can do about it. Keep in mind, projections of the future are based on the actions we take, or fail to take. We will create the future. It is not being imposed upon us.

Third, we have a hard time understanding a threat from things we cannot see and that are slow moving. If a forest fire is heading toward your house, I am sure you would jump into action. If you are told that global warming and climate change heading your way, it is much harder to get people to take action.

Fourth, the human brain seems far more oriented to deal with near-term fears, wants, and desires than what it perceives to be long-term concerns.

The good news is that more and more Americans are realizing the seriousness of the crisis and are taking action. This illustration from the Yale Program on Climate Change Communication shows where Americans stand on the issue.



In December of 2020, 26% of Americans were "alarmed" by the global warming/climate crisis and were taking individual and collective actions to address it. Another 29% were "concerned," but not very engaged. Those 29% come from all segments of society: young and old, rich, and poor, from red and blue states, from different ethnic groups, and most professions. They, and the remaining 45%, appear to be sitting on the sidelines hoping that technological breakthroughs, government initiatives, and the efforts of those 26% who are alarmed, will solve the crisis so they can continue on with their lives. Unfortunately, that mindset will lead to our downfall. This has to be a team effort.

The good news is that every year, more and more Americans are joining the 86 million Americans, (the 26%), who are alarmed and taking action. That gives me great hope. But we all have to move fast, not at our convenience.

This book seeks to inspire all Americans, and those living outside the United States as well, to make solving the global warming/climate crisis their top priority, for the sake of their children and grandchildren. If they do, the movement will become unstoppable, and the crisis will be brought under control. As Nobel Peace Prize Laureate Desmond Tutu wrote in his assessment about this book, I am seeking to show the readers of this book a very positive, realistic way forward rather than the doom and gloom future that you will read in Chapter Five.

So, why do I use the phrase "global warming and climate change," when most of the world just uses "climate change?" It is because the release of greenhouse gasses by humans is the primary cause of global warming, which in turn is creating the climate crisis. All of us can do a great deal to stop global

warming, but we can do far less to address climate change. Stated otherwise, let's tackle the problem at its source.

The root causes of the global warming/climate crisis

I'd like to bring four root causes to your attention, in addition to our use of fossil fuels:

1) The massive growth of the world's population, (6 billion more people since World War II)
2) Massive consumption and waste to satisfy not only our needs, but our wants
3) National economic and corporate systems that seek "economic growth (and profits) at all costs"
4) Embedded values that drive our desire for "more" that in turn drive us to exploit more of the world's natural resources and use more fossil fuels

These are the many interrelated drives explored in this book, as are the many actions the average person can take, individually and collectively, to address them. There are plenty of activities to go around, many of them very rewarding.

How I have approached this challenging subject

I am not a scientist. Rather, I am a global systems thinker and futurist who has spent the past sixty years, during six international careers, (US diplomat in Asia, law school graduate who focused on the Chinese legal system, professor of international business, publisher of a world affairs publication, international business consultant, and author), seeking to understand the major forces at work that are driving the world in one direction or another and how to harness the

positive forces that are at work in ways that will make the world a better place for all. I have used this global systems-thinking approach, my education, and my experience over the years in over one hundred countries, to make the best sense I can of our predicament and suggest solutions.

Around the turn of this century, I came to realize that much of the work I was engaged in, particularly my work to improve the economic growth of developing countries and to help develop the international business strategies of multinational corporations, was doing harm as well as good. And I came to realize that the drive of nations, corporations, and individuals to maximize their economic growth and profits, would damage the lives of marginalized people and the natural world and have catastrophic consequences.

As a result, I shifted my attention in 2000 to the world's sustainability crisis, which is essentially the challenge we face from 7.8 billion of us wanting to survive and prosper in a world of finite resources, particularly fresh water and arable soil. The result was a book titled *The Tactics of Hope: How Social Entrepreneurs are Changing Our World*. In 2010, I turned my attention to the global warming/climate crisis, which is the subject of this short book, the shortest book I could write about a very complex subject.

What concerns me

Another concern is that governments, as well as individuals, have a propensity to ignore or deny the signs of global climate change that are already evident both from the science and from the events taking place every day around the world. If an event destroys the life or livelihood of someone we do not know or live near, we tend to ignore or discount

it. That indeed is understandable, but I fear it will prove very shortsighted. If you are not experiencing more hurricanes where you live, are you noticing any of the other signs of global warming/climate change, such as longer dry periods and greater winds that have increased the probability of more forest fires and reduced your crop yields? Are you experiencing more flooding? Are the flowers and other plants around you coming up sooner or later than usual? Remember when you went out for a ride on a summer day and insects got smooshed all over your windshield? Are they still landing on your windshield in such numbers? Those insects, annoying as they can be, are critical to our survival. So are the millions of plant and animal species that go extinct each year due to global warming, global population growth, and the destruction of native habitats in the name of economic development.

I fear it may take a truly catastrophic event that personally affects us to move us to take concerted, collective action. I had hoped that Hurricane Katrina, which crippled New Orleans; Hurricane Sandy, which damaged so much of the Northeast; Hurricane Harvey, which damaged so much of Houston and other areas in Texas; Hurricane Irma, which destroyed many islands in the Caribbean and damaged South Florida; and Hurricane Maria, which crippled Puerto Rico; along with the recent heat waves and devastating forest fires in the western United States, would have been enough to rally us to take more action than we have to date.

In June and July of 2021, Lytton Canada recorded a temperature of 121 degrees Fahrenheit, Portland, OR 116 degrees, Phoenix Arizona 118 degrees, Kuwait 127 degrees, and the Siberian Arctic 118 degrees. In mid July flash flooding in Germany and Belgium killed 165 people.

Photo by Wilford Welch

8,400 Structures Destroyed by Wildfire
in Santa Rosa, California, October 2017

It just might be that the COVID-19 pandemic, which showed us how interconnected everything is, will be the wake-up call we need to reexamine our relationship with the natural world and with each other. Only through collaboration will we effectively address this global crisis.

Obstacles

You probably share my concern that humans may not have the capacity to drop their animosities toward one another, as individuals, political parties, or nations, and focus on the "we" as much as the "me." Awakening to the need to come together to save our common home is now essential. Hopefully, the age of extreme American individualism, in which one feels they have have the right to do whatever they want and have little responsibility for the health, safety, and

well-being of others, will shift to a responsibility for the welfare of others. We rallied as one in December of 1941 in response to Japanese and Nazi aggression, because of strong US leadership, and took collective action. I believe we can rise to the occasion again and address the current crisis. To do so, we need to educate ourselves about the crisis we face and the actions we all can take, individually and collectively.

I am concerned that some will assume that technological advances alone will solve the challenges we are facing. Technology is critically important and progressing rapidly, especially in the development of renewable energy sources. But, as I wrote in the beginning of this chapter, the only thing we lack is the individual, collective, and political will to step forward and rise to the global warming/climate challenge.

What gives me hope

Despite all the concerns just expressed, there are many reasons to be hopeful. For one, even though it is rarely reported in the media, amazing work is being done by millions of individuals and hundreds of thousands of non-governmental organizations (NGOs) around the world to bring about the changes highlighted in the pages that follow.

And I am convinced that the younger generations, including Generation Y (millennials) and Generation Z, who will gradually take over the leadership of our institutions, have the knowledge, will, and capacity to become the change agents that are now needed. If they are to effectively lead this effort to avert climate catastrophe as fast as is needed, however, they will need to tap into the funding, contacts, and experience that the Boomers, Generation Xers, and all of us who have lived during the past many decades now have

to offer. That is why the subtitle of this book is *A Handbook for Intergenerational Actions to Solve the Climate Crisis.*

More than any other generation in history, the Boomers and older Americans have thrived during these past seventy years as a result of a "growth at all costs" economic system and a personal values system held by many of "more is better." I believe those who are members of the older generations now owe something to the generations that follow. They now must deal with the unintended consequences of all that CO_2 spewed into the atmosphere that the older generations have benefitted from. Burning so much carbon has put their lives and the lives of their children in jeopardy. Members of the older generations now have opportunities to give back, as well as to add greater meaning to our lives during retirement.

What this book seeks to provide its readers

The 2021 edition of *In Our Hands* is meant to provide something I feel is missing: a short, easy-to-understand primer on the global warming/climate crisis that provides specific actions everyone can take and a resource section with books, research papers, and films that one can use to explore all these topics further.

Chapter 2, the Possible Future, describes how we can unite around values that will support the actions we need to embrace if we are to avert the worst consequences of global warming and climate change.

Chapter 3 describes the who and how of the positive future, who stepped forward over the years to 2050 and what roles they played.

Chapter 4 directly addresses the question most people are asking: "But, what can I do?" The recommendations in this chapter highlight the many actions we all can take in our day-to-day lives, in our lives as members of our local community, and in our business and professional lives. At the end of Chapter 4, you will have the opportunity to write down what you are actually going to do and when you will start. Neither understanding nor talking about action are substitutes for taking action.

Chapter 5, *The Road to Ruin*, describes how the world might move toward ecological, economic, and societal collapse by 2050 if we dismiss the severity of the crisis and continue business as usual. This chapter admittedly portrays a worst-case scenario. But even if it takes a few more decades to develop, this scenario is not unrealistic or overstated. This doomsday vision is not meant to scare or depress you, but to motivate you to focus and take action this decade.

Illustration courtesy of Mark Henson, markhensonart.com

The Choice We Face

Finally, Chapter 6, *Resources for Learning and Action*, is filled with over 130 carefully researched books, films, and organizations that pertain to most of the topics in this book, from the science of global warming to the shift to renewable

forms of energy, from population growth to climate refugees, from social and environmental justice issues and solutions to the degradation of our fresh water and our oceans to plastic pollution. If you have questions about anything in this book, you are likely to find the best research papers, books, and documentary films available to you right at your fingertips. The links found in the ebook and PDF formats are clickable. Please take fifteen minutes and read through the descriptions of each reference, making a note on those that you would like to look at.

My hope is that if you find this book of value that you will share it with others. Imagine what could happen if we all rose as one and took action!

Three Additional Resources That Will Add to Your Understanding of the Crisis We Face

While most people focus primarily on their every day lives and the climate where they live, some of us seek to think more globally and in systems, which can be challenging to grasp. I therefore urge that you also check out the following resources which I believe will further clarify the global crisis we face, how it will effect local communities such as yours and what you can do to address it.

1) *Breaking Boundaries – The Science of Our Planet.* This excellent 2021 Netflix documentary is narrated by David Attenborough. The film highlights experts from around the world who explain each of the nine planetary boundaries that are facing collapse and what we can do to avoid their doing so.
2) *Facing Adversity - Choosing Earth Choosing Life* is a beautiful, powerful documentary documented by

Duane Elgin. It is an invitation to every human being to turn the climate crisis into an opportunity. https://vimeo.com/520121165

3) *The Intergovernmental Panel on Climate Change, (IPCC). August 9, 2021 Summary for Policy Makers.* https://www.ipcc.ch
   This sixth IPCC report since 1990 states unequivocally that global warming is caused by human activities and that global warming to mid-century will continue, but can be moderated if we take immediate action.
4) On it's website, NASA provides up-to-date data of how the earth is changing. It is easily understandable and reliable. https://climate.nasa.gov/evidence

We will be known forever by the tracks we leave.

—Dakota proverb

CHAPTER 2

The Possible Future

How We Saved Ourselves

It took a near-death experience to wake us up, but we are now the better for it. Now, in the year 2050, the planet's temperature has not risen above the threshold scientists warned would make our planet uninhabitable.

Starting in 2021, the realities of the climate emergency galvanized the human community into greater global unity, and its worst impacts have been averted. Humanity has made its peace with the natural world and is in the process of creating a sustainable and resilient ecological civilization. The global COVID-19 pandemic, that forced the world to stand still for over a year, was in many respects a blessing as well as a tragedy, for it caused many people to stop and reflect on what we were doing to the natural world and to future generations. Here's how the transformation unfolded:

We embraced a New Story of humanity, one in which we worked in harmony with the natural world and with each other.

Back in the 2020s, we came to realize that many of the assumptions and values that had shaped our past were actually dangerous to our future. Our old values were not necessarily bad, just as fossil fuels were not inherently bad. It was the unintended consequences of both that we came to realize would destroy our future.

First was our assumption that we could destroy the earth's ecosystems to satisfy our every want without catastrophic consequence. We decimated the earth's forests, which were needed to draw down the fossil fuel emissions we were putting into the atmosphere. (A large tree in the tropical forests of the Amazon will absorb up to 50 pounds of CO_2 each year). We overfished the world's oceans and polluted the earth's sources of fresh water that future generations would need if they were to survive and prosper.

We stopped burning fossil fuels

Between 2021 and 2030, numerous climate calamities occurred worldwide: The storms became more destructive, the droughts more severe, water levels began to rise in major cities throughout the world, and hundreds of thousands of migrants died fleeing parched regions of the Middle East, Africa, Central and South America, and South Asia. Nor was North America spared, particularly marginalized communities. Climate deniers no longer held sway, and governments, the media, and the general public finally realized that we were facing a threat that could mean the end of the human species. The United States and the countries of Western

Europe, Japan, and China in the 2020s led a worldwide effort to curtail fossil fuel emissions. Almost every other country in the world followed suit, enacting policies to reduce greenhouse gas emissions through the use of renewables, such as wind and solar, energy efficiencies, and resource productivity.

We transitioned to renewable energy faster than most people thought possible

One of the most significant actions governments took was to reduce the direct and indirect subsidies the worldwide fossil fuel industries had been receiving, which the International Monetary Fund estimated was $5.3 trillion in 2015 or $10 million a minute. And we shifted those subsidies in support of renewable sources of energy, including solar, wind, hydrogen, geothermal, hydroelectric, biomass, and small-factory-produced nuclear plants that were then driven to their ultimate destinations. And we made progress in tapping the energy that exists in the atmosphere.

Offshore wind turbines

The 2017 book *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming* proved to be an invaluable resource for the 197 nations seeking to meet their commitments to the 2015 United Nations Framework Convention on Climate Change that had been forged in Paris. Drawdown highlighted proven solutions, not only in energy production and use, but in food production, transportation, building materials, and many other areas.

"Drawdown" refers to the point in time when the concentration of greenhouse gases in the atmosphere peak and begin to decline on a year-over-year basis. The book's goal is to identify, measure, and model the 100 most impactful, substantive solutions to global warming that either reduce emissions or remove greenhouse gases from the atmosphere. The 10 top solutions that the Drawdown initiative determined would have the greatest impact on reducing green-house gases were: refrigerant management (banning HFCs), offshore wind turbines, reducing food waste, shifting to plant-rich diets, tropical forest restoration, educating girls, family planning, solar farms, and silvopasture (the deliberate integration of trees and grazing livestock operations on the same land).

Image courtesy of *NewsBharati*

Solar panels

Once awake, it was not hard to see that the fossil fuels age was over. By 2021, the cost of alternative energy sources, such as solar and wind, had become lower than the price of coal, oil, or natural gas. For a few years, the political influence of the fossil fuel industry tried to stop this switch to renewables, but the economics and the withdrawal of investors from fossil fuel companies won out. There was no denying that the carbon bubble had finally burst. The fact that renewable energy projects also generated significant employment opportunities made it easier for politicians in the US and elsewhere to support the shift to a "green economy."

By then it had also become clear that the fossil fuel industry not only caused global warming but generated many costs to society that they did not pay for, including polluting our air, damaging human health as well as the land, and water resources we need to survive.

A major factor in the transition to renewables was a carbon tax. Recognizing that when you want an industry to pay for its negative impacts on society that you tax it, a group called the Citizens' Climate Lobby was finally successful in getting the US Congress to put a tax on the burning of carbon (much like the tax on cigarettes). The legislation was actually a carbon-fee-and-dividend system, a revenue-neutral carbon tax with 100 percent of the net revenue returned directly to households. People initially used their carbon tax dividend to offset the cost of their fuels, but it also enabled them to invest in electric cars, solar panels, efficient new appliances, and retrofit their homes.

On August 5, 2021 President Biden, along with the country's four largest automakers, announced new auto emissions standards and that 50% of all vehicles sold in the US by 2030 would be electric. In 2025, China no longer allowed

new gasoline or diesel-powered automobiles to be sold. And by that time, virtually all car and truck manufacturing companies in the US, Europe, and Asia were offering their versions of electric vehicles.

We perfected ways to sequester carbon dioxide in the Earth

Most important was the preservation of the Amazon rainforest. Millions of acres were put into biological preserves and protected from farming and extractive industries. Massive tree-planting campaigns were carried out throughout the world. The regenerative agricultural revolution sequestered carbon in the soil. Changes were made in the raising of livestock that reduced their methane gas emissions. Most important was humanity's realization that it made no sense to use plants to feed cattle to produce meat to eat when similar products could be made directly from plants and consumed in very delicious ways. The shift away from the massive commercial factory farming of cattle to plant production dramatically increased the amounts of fresh water available for other uses. And, humans became healthier.

We finally realized that everything is interconnected

While the fact that everything is part of a whole interconnected system had been known by scientists and philosophers for centuries, it was finally accepted by the general public in the 2020s. For example, an article in the April 19, 2021 edition of *Arctic Day* written by Yereth Rosen read:

The dramatic loss of ice in the Barents Sea in the European Arctic has created profound changes in the marine ecosystem there and triggered a process called "Atlantification"—the transformation of the once ice-dominated sea into an extension of the open Atlantic—changing habitats for marine mammals and seabirds. And now there is evidence that the warming Barents Sea water is triggering extreme winter weather in Europe. Isotope analysis of water vapor found that Barents Sea water was directly responsible for a severe 2018 storm dubbed the "Beast from the East," a newly published study has found. That storm system, with record-breaking blizzards and cold, struck the British Isles and western Europe in late February and early March of that year, snarling traffic, closing schools and businesses and causing widespread disruptions.

We came to recognize the emptiness of lives based solely on materialism and consumerism

Now, at mid-century, people find more meaning and fulfillment through connection with each other and the natural world. Those who argued that it was impossible for Americans to shift values and actions quickly were reminded of how dramatically the government and people of the United States shifted to a self-sacrificing war mentality after the Japanese bombed Pearl Harbor in 1941. Before the attack, over 95% of the American people had been against the US becoming involved in the war. Yet when the threat became real to them, they were willing to sacrifice and commit themselves fully to the war effort. So, too, in the 2020s. The world woke up to the fact that getting rid of fossil fuels was the only way we would save ourselves and our grandchildren.

We rejected the politics of fear

In response to fear-based politics, a non-violent revolution took place as more and more citizens mobilized to prevent governments from becoming authoritarian, repressive, and regressive. The "battle" was waged at every level of society as people of all ages and income levels joined forces to stop racist and reactionary programs. These activists generated a spark that spread around the world, proving the truth of the famous quote:

> *Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.*
>
> —Margaret Mead

We redefined wealth, progress, and "the good life"

At the end of the Second World War, the nations of the world adopted Gross National Product (GNP) and its sister economic measure, Gross Domestic Product (GDP), as measures of each nation's economic health and growth, primarily by adding up the value of all the goods produced. Given the devastation at the time, that made good sense, and for the next seven decades, GNP became the accepted measure of each nation's perceived economic success or failure, regardless of the types of activities counted.

Over time, however, it became clear that GNP and GDP did not take into account the negative impacts of many of these economic growth activities on the world's ecological systems, as well as on the lives of many people. For example, British Petroleum's payments to clean up after the oil spill in the

Gulf of Mexico in 2010 were counted as GNP growth while there were no reductions to GNP for the great harm done to the marine life of the entire Gulf ecosystem. Similarly, for years, Texaco, an oil company owned by Chevron, left substantial oil spills in the Amazon basin where indigenous tribes had lived for millennia, destroying their habitat. Nor did GNP or GDP take positively into account those activities that were impacting people for the better, such as improvements to their health, education, freedom, and happiness.

As a result of such realizations, economists and governments started focusing with increased urgency on new ways to redefine prosperity and national well-being. We came to realize the importance of distinguishing between "good" growth and "bad" growth.

As the world's population climbed toward eight billion people—most wanting to share in the developed world's consumerism—it became clear that the demands on the Earth's resources were far outstripping supply and destroying virtually all the earth's crucial ecosystems in the process. Since the 1980s, the planet has been in "overshoot." By 2020, humans were using 60 percent more renewable resources than the natural world could provide. People woke up to the fact that this kind of economic growth and consumption was not even close to sustainable and that humanity could not survive the destruction of its natural support systems.

After more than seventy years of living with the assumption that more is better, many people also questioned whether excess consumption-oriented materialism was adding to their lives. For decades, studies around the world had shown that beyond a certain level of income there was no correlation between money and happiness. Sometimes, well-off people were less happy, and less well-off people were happier.

Others questioned whether the pressures of the modern world had caused their lives to be out of balance. Out of balance with each other. Out of balance with the natural world. They began to embrace the wisdom embedded in many ancient cultures, such as the Hindu phrase "Tri Hitta Karana" that guide the everyday lives of the traditional Balinese. Loosely translated, it means "I will live my life in harmony with the natural world and with others in my community." They also questioned whether living at "machine speed" rather than "human speed" was adding to their lives.

As a result of such realizations, a great many people sought to move beyond their fixation with money, possessions, and speed to see other paths to happiness, such as being in nature, engaging with family and community, and being of service to others. One of the beneficial side effects of the COVID-19 global tragedy was that it created opportunities to be out in nature and to be engaged in community efforts in support of others.

But that did not mean that people had to adjust to a lower standard of living. Indeed, the quality of life improved for more people as technological developments made it possible to continually do more with less. At the beginning of the 21st century, a new understanding of nature's design processes brought dramatic changes to manufacturing. The cradle-to-cradle and regenerative-design movement pioneered by the Biomimicry Institute created products that were ecologically sustainable and recyclable and systems that were safer, more efficient, and essentially waste-free. A new, better consumerism flourished that did not harm people or the planet. Circular economies took hold in which products were designed for reuse, recycle, repair, and share.

We began to address the global population crisis

The fact that the world's population had increased by an astounding six billion people in the 70 years since the Second World War caused many people to question whether such growth in population was sustainable. It was not just a matter of the absolute number of people, but also the expectations most all 7.8 billion of us held for more of the material possessions that the developed world took for granted. Continuing to provide more and more goods for more and more people would do even greater damage to the natural world and the atmosphere. The millions of migrants fleeing starvation and violence in their native lands became daily examples of this seemingly intractable problem that would only get much worse if global warming and overpopulation continued.

The subject of curtailing population growth finally burst into public discourse in the 2020s. It was increasingly recognized that the world had more people than the Earth could sustain and that millions would die. This realization demanded a moral response to support those who already inhabited the Earth while seeking ways to slow down the rate of those yet unborn. Since populations in most advanced countries were already in decline, the key question was how best to support the health and stability of those in poorer countries where having more children had been seen for centuries by parents as a form of security. When women knew that more of their children would survive due to access to better healthcare, they had fewer children.

It was also well known that investing in the education of young girls in the poorer countries would help lead to lower birth rates, improved family health, and better standards of living. By 2025, the education of girls became the accepted norm in most countries of the world to indirectly

yet effectively address the need to slow down the growth of the world's population.

We embraced connection and cooperation

Perhaps the overarching transformation in values that took place was our recognition that we all needed to work with each other if we were to survive and prosper. "One world, one people" seemed a naïve dream at the beginning of the 21st century, but as the climate emergency knew no boundaries, and the COVID 19 pandemic showed us how we had to depend upon each other for our collective health, nations came together to prevent collective catastrophe. As countries began to collaborate to reduce CO_2 emissions and implement policies that might mitigate the impacts of global warming, a new era of international cooperation was launched.

This new consciousness reflected the ancient wisdom of many religious traditions as well as the profound knowledge of indigenous people who embodied this worldview in their teachings and way of life: The Earth is our Mother, and we are all one interdependent family. The profound wisdom of their message to the modern world, which we seemed to have forgotten in our headlong rush to modernity, was finally appreciated by more and more people. We realized that we had to work with others in community rather than solely for our own ends. The era of extreme individualism, particularly in the United States, began to be tempered by the realization that one had an obligation to work for the betterment of the whole, not just oneself, if we wanted to have a better chance of survival and a better world.

The shift from separation and competition to connection and cooperation was perhaps the most powerful factor in

saving ourselves, and it represented what might be called a New Story for modern societies. The Old Story saw humans as separate from the natural world and from each other and competing for scarce resources in a world of winners and losers. The New Story of connection and collaboration did not mean there would be no more competition. Capitalism was transformed such that cooperation was encouraged where it would protect and restore the ecological health of the planet, and competition was aimed at what could create the greatest good for the most people.

As on November 9, 1989, when most of the world was taken by surprise by the collapse of the Berlin Wall, so too it had been hard to see the small changes in attitudes and behaviors taking place under the surface in the 2020s until one day we realized that we were into a new era of human development. It was a fundamental shift in our consciousness and actions, and it spread from a small percentage of the world's population to most of us.

At the beginning of the 21st century, the Pachamama Alliance, an organization based in San Francisco, California, had articulated a vision for the future that began to spread worldwide:

> *To bring forth an environmentally sustainable, spiritually fulfilling, and socially just human presence on this planet.*

That grand vision captured the essence of the world we are heading toward in 2050. Although we are still far from fully achieving that vision, a new story is guiding the human family toward a sustainable, just, and thriving world in which global warming and the climate emergency are now under control.

The Renaissance, which had a profound influence on Western civilization, started in 1350 and ended around 1600. The world's renaissance to a sustainable future began in the 2020s and was in full force by 2050. During those thirty years humanity made great strides in a transformation from its adolescent phase into its wisdom years.

CHAPTER 3

The Possible Future

Who Made It Happen

During the 2020s, humanity finally realized that:

- We all faced a climate emergency and shared a common goal—to do all we could, as fast as we could, to stop global warming and build a sustainable ecological planet that would support the human family for thousands of generations to come.
- We all had to work together, whether we were nations, government officials, businesses, teachers, NGOs, climate activists, or other members of our societies. This was humanity's "all hands on deck" moment.
- We had to change those values and behaviors embedded in our cultures that led to the climate emergency.
- We had to change those elements of our economic and political systems that had been tied to our addiction to fossil fuels, namely:
  - Fossil fuel and related industries seeking to maximize their profits for as long as possible despite their knowledge that their actions yesterday and today were destroying the world of tomorrow.
  - US Voters demanding that their elected officials cater to their near-term wants, such as all

the conveniences fossil fuels had been providing them.
- Politicians, pandering to the near-term wants of voters to get elected.

These are the groups who rose to the occasion, and some of the things they did:

Intergenerational collaboration and action

Fifteen-year-old Greta Thunberg rose to prominence when she began protesting outside the Swedish parliament in 2015, triggering the *Fridays for Future* climate strike movement. She soon became the voice of young activists speaking truth to power, with such statements as these at major forums of world leaders:

> *The climate crisis has already been solved. We already have the facts and solutions. All we have to do is to wake up and change.*

> *We cannot solve a crisis without treating it as a crisis. And if solutions within the system are so impossible to find, then maybe we should change the system itself.*

Photo by Michael Campenellas

Greta Thunberg sits outside of the Swedish parliament on August 28, 2015

The path to the positive future we now enjoy in 2050 was ignited by younger members of our society, such as Greta, who were concerned about their futures. They were the children and grandchildren of the elder generations. These young adults were the most educated generation ever, and they recognized the dangers a warming planet would have on them and their children. Born into the greatest technological revolution in history, they were tech-savvy and connected through the internet and social media.

Many members of the younger generations questioned the 20th-century values into which they had been born. While a 2014 *Time* magazine article called the millennial generation the "Me, Me, Me Generation," a report by the Pew Research Center described them as "confident, self-expressive, liberal, upbeat, and open to change." They were very socially conscious and entrepreneurial, experimenting with new ways of living. They were suspicious of advertising that pushed

unneeded products on gullible consumers. They believed that the future called for less focus on material wealth and more on the sharing of resources, such as houses and cars. As the global climate situation grew more dire, they became more active in the movement to transition away from fossil fuels and toward a sustainable future built on renewables and doing more with less. In their passion for activism, they shared kinship with the Baby Boomer generation that came of age in the legendary 1960s.

Many members of older generations, who were concerned about global warming and climate change, started reaching out to the young activists, and in 2022, the notion of intergenerational collaboration and actions to solve the climate crisis finally took hold. Members of the older generations realized that they had benefited greatly from the extraordinary economic growth brought about by the fossil fuels that were now the source of the world's greatest problem. Many felt a moral responsibility to support the transition to a fossil-fuel-free world. Many had financial resources the younger generations needed to succeed in their passionate quest to build a better world. Many had pertinent expertise and contacts. They also had time to devote to activism and intergenerational collaboration, since many of them were now retired and most could expect decades of relatively good health. A challenge for some of the elders was to step back and let the younger generations lead, a reversal of roles that did not come naturally.

One particularly successful initiative was started by the Yale class of 1961 which created the "Yale Classmates Intergenerational Climate Initiative to Solve the Climate Crisis" during their 60th reunion. Graduates, along with their children and grandchildren, joined forces and made commitments to reduce their CO_2 emissions. Soon, reunion

classes from Harvard and other colleges and universities across the country started working together on similar intergenerational initiatives.

Another initiative started in San Francisco in 2022 when a group of millennials, supported by members of the Boomer generation, began working together to create a social network to galvanize the climate movement. They lit a spark that launched what became known as the *Global Spring Movement*. Using Facebook, Twitter, and their new social networks, they galvanized others, and by the end of 2025, over 200 million people in 112 countries were on board, exploring solutions and taking actions in their lives and professions. The movement grew rapidly in number and influence. While in 2017, only 3% of the world's population was estimated to be deeply committed to addressing global warming and climate change, that number grew to 10 percent by the early 2020s. That was enough to further galvanize other elements of each country's population. This growth proved the accuracy of the well-researched theory of change that a small number of passionate, well-organized, and focused individuals can bring about fundamental changes in their political systems if they have 10% or more of the population so engaged. Resistance from vested interests continued, but their numbers diminished over the ensuing decades.

NGOs such as Encore.org, which focused on the many ways older Americans could add meaning in their retirement years, jumped at the opportunity to get the Boomer generation to work with the younger generations to take action.

We are all activists now

Starting in the early 2020s, many average citizens become far more active. They began to explore how they were contributing to global warming and how they could be part of the solution. People realized that it was not only in their enlightened self-interest to change the ways they were living, but that it was also an exciting and meaningful challenge to take on in their personal and public lives. In a world filled with numerous challenges, all seeking to be a top priority, addressing climate change became an organizing principle.

The simplest and most potent action they took was to focus intensely on the climate emergency. They raised the issue of global warming and what to do about it with their friends, family members, and professional colleagues. Many started global-warming discussion circles along the lines of church groups, book clubs, and movie groups that had for years explored other topics. They used this book and others to get discussions going. Gradually, these groups invited others who did not share their views on climate change to join their discussion circles. One of the rules was that "discussion" did not mean having arguments, but rather the development of deep listening skills and a search for common ground and collaborative actions for the common good.

Many individuals joined existing activist organizations such as The Sunrise Movement, 350.org, the Sierra Club, the Climate Reality Project, NextGen America, and Greenpeace to participate with others and physically show up—whether at a rally in their own town or in major cities.

Image courtesy of Oregon Just Transition Alliance

Oregon Just Transition Alliance March in Portland, Oregon, April 29, 2017.

People who previously were content to sign online petitions began to show up for peaceful demonstrations. Individuals also made conscious choices to change their lifestyles—such as shifting away from fossil fuels and embracing renewable forms of energy in their homes, cars, and businesses. Aware that over 30% of our food supply is wasted—left in fields, spoiled in transit, and uneaten at the table—they changed their eating habits. They cut back on factory farmed meat and purchased more locally-grown produce that reduced transportation carbon emissions. They bought less stuff and reused and recycled more, and they shared more—bicycles, cars, even houses. They chose carefully where they purchased their goods and services, who they worked for, which companies they invested in, what media they read or watched, and who they voted for. Businesses, investors, and politicians all took notice and made changes that were responsive to the shifts in the priorities of their customers and voters.

It was clear, however, that actions taken as individuals—as critically important as they were—were not going to have

the impact needed to address a problem as all-consuming as the climate emergency, or that had to be addressed in the 2020's. As climate activist Bill McKibben had put it, "everyone needs to go from thinking about ME to thinking about WE"—what we could and had to do collectively if we were going to turn the tide. Here is how a wide range of groups, businesses, organizations, and government entities took on the greatest challenge of all time—and succeeded.

PROFESSIONAL GROUPS AND INSTITUTIONS

Scientists

Since the turn of the century, scientists have played an increasingly important role in bringing the realities of global warming and climate change into public discourse. The Union of Concerned Scientists, an alliance of more than 400,000 citizens and scientists, had for decades pushed for changes in government policies, corporate practices, and consumer choices that would slow global warming. The role of the scientific community, however, became even more crucial during the time when science was under all-out attack, with federal research programs being shut down, their funding cut, and their scientists silenced. The pushback was enormous as scientists—not usually at the forefront of resistance—organized and took bold actions to preserve their work and the truth about global warming. Their efforts paid off when the government changed hands in January of 2021, and the work of shifting to a fossil-fuel-free economy began in earnest.

Mainstream media, documentaries, and social media

At the beginning of the 21st century, the mainstream media was slow to recognize and report on the climate crisis, and

climate change leaders such as Al Gore, James Hansen, Leonardo DiCaprio, and Bill McKibben often seemed like voices crying out in the wilderness. But, as the scientific evidence became more conclusive and the calamities grew, there was no denying their tragic consequences. Media coverage increased. Many in the entertainment industry began raising the issue in films, such as David Attenborough's *Climate—The Facts, Species Extinction—The Facts,* and *A Life on Our Planet,* while other films also received wide distribution, such as *Kiss the Ground, Chasing Ice*, *Before the Flood, Merchants of Doubt, This Changes Everything*, *An Inconvenient Sequel and Seaspiracy*. Documentary film producers, such as the Sacred Land Film Project and the Goldman Environmental Prize, an international environmental awards program, gained greater recognition for highlighting the challenges and success stories of people seeking to deal with the destruction of their environments.

Social media was a particularly powerful tool, enabling information and ideas to be exchanged around the world in seconds. A positive new story emerged and began receiving widespread attention and support.

Advertisers too sensed the shift in consumer attitudes towards sustainability. America's "shop 'til you drop" culture gradually came to an end as consumers made their purchasing decisions largely on the impact their purchasing choices would have on global warming.

EDUCATIONAL INSTITUTIONS

Numerous educational institutions took up the task of educating young and old about the climate crisis. The Presidio Graduate School in San Francisco in 2021 launched a

nationwide online course for K-12 teachers throughout the United States on Climate Essentials. Previously, climate had been taught primarily in science classes. Those teaching other subjects either felt they did not have the knowledge to teach the topic, were too busy with their other duties, or did not see the connection to their subject matter. By taking this program they came to realize that the climate crisis would have major economic, social justice, and other impacts that K-12 students needed to be aware of. (https://www.presidio.edu/climate-change-k12/)

Another example was NatureBridge, an organization that for decades had been teaching environmental science and stewardship to young students in US national parks. In 2022 NatureBridge launched a "climate lab" where the experiential learning the students were receiving outdoors was supported by programs inside the climate lab. http://NatureBridge.org. By the mid 2020s, most business schools in the United States were offering courses, not only on how businesses needed to take into account climate change disruptions and opportunities, but how businesses needed to shift their focus from "shareholder capitalism" to "stakeholders capitalism" in which people and planet were also the business of business.

RELIGIOUS AND SPIRITUAL GROUPS

A great boost to the movement was the ground-breaking encyclical released by Pope Francis. In *On Care for Our Common Home,* he called for a new partnership between science and religion to combat human-driven climate change. The Pope called upon all Catholics to take the issue seriously and take action. Leaders of other faiths, including Islam, joined the call, and interfaith religious groups, such as the U.K.-based Alliance of Religions and Conservation and the US-based Interfaith Power & Light, mobilized people of

all religious faiths to join together to address the threat of global warming.

Organizations such as the Earth Charter, the Institute of Noetic Sciences, the Shift Network, Wisdom 2.0, Commonweal, NewStories, a subgroup of Elders Climate Action called Evolutionary Leap, along with hundreds of other groups around the world suggested new ways of imagining the future of humanity. People increasingly delved into the work of pioneers in these fields, including Wendell Berry, Barbara Marx Hubbard, the Dalai Lama, Desmond Tutu, Jerry Jampolsky, Duane Elgin, Marianne Williamson, Charles Eisenstein, and many others.

NONPROFIT ORGANIZATIONS

For decades, thousands of nonprofit organizations and thought leaders had sought to bring about changes in humanity's goals, values, and actions to achieve a more sustainable, resilient, and just world. As people became more aware of the climate crisis, these groups redoubled their efforts to bring about a global agenda of environmental and social programs that would not only address global warming but would improve the lives of the billions of people threatened by the loss of fresh water and arable soil.

Organizations such as the Environmental Defense Fund, the Natural Resources Defense Council, Friends of the Earth, Greenpeace, 350.org, the Climate Reality Project, the Indigenous Environmental Network, Rainforest Action Network, Bioneers, and the Pachamama Alliance were just a few of the thousands of organizations in the United States and around the world doing extraordinary work, often far from the headlines but increasingly with powerful results.

THE LEGAL PROFESSION

Throughout the societal transformation, lawyers and activist legal organizations, such as Earthjustice, the Gaia Foundation, the Earth Law Center, and the Global Alliance for the Rights of Nature, played a significant role in supporting policies and actions to slow and stop global warming. One of the most significant of these was Our Children's Trust, which represented young people in a series of lawsuits against the US government and the fossil-fuel industry. The young plaintiffs asserted that the government's failure to take actions to shift away from fossil fuels violated their generation's constitutional rights to life, liberty, and property.

WOMEN'S ORGANIZATIONS

In 2009, the Dalai Lama said, "The world will be saved by the Western woman." The truth of that quote became clear In the 2030s when women finally made considerable progress in ending the worst practices that injured and hampered women, especially in the Middle East and Africa, and implementing supportive policies and cultural changes in societies throughout the world.

GOVERNMENTAL ORGANIZATIONS

National governments

Ultimately, a former British Prime Minister's quote in December of 1941 proved prescient:

Americans can always be counted on to do the right thing—but only after they have exhausted all other possibilities.

—Winston Churchill

Since the turn of the 21st century, the United States military had been concerned about the dire social, political, and military impacts climate change would have on the world. They were also concerned about its impacts on their many military bases in coastal areas where sea-level rise and storm surges would pose a direct threat to their installations. The military leaders realized that global climate change would result in armed conflicts among people over land and resources and that mass migration would destabilize whole countries and regions. Combat commands integrated climate-related impacts into their planning. The Defense Department's response to climate change was far ahead of the rest of the US government.

Until 2021, most of the rest of the US government lagged behind not only its own military but also many Western European governments. It took years for politicians—ever-focused on the near-term wants of their constituents—to recognize that disaster was looming. Significant action finally came when the US Congress moved to reduce carbon emissions by putting a price on carbon through a carbon-fee-and-dividend system. In addition, they phased out all subsidies for oil, coal, and gas production and reallocated funds to support a rapid transition to renewable sources of energy.

In 2021, the President of the United States announced a major initiative to cut the nation's fossil-fuel emissions by 50% by 2030, a hugely ambitious goal that was difficult politically but essential for long-term stability and even survival. And

in the late 2020s, GNP and GDP measures of each country's economic growth were overhauled to reflect the impacts of certain economic activities on the sustainability of the planet and the welfare of people.

A key challenge to all governments—not just the United States—was how to move to an economic model that stopped relying on fossil fuels but would generate employment and maintain social stability. Governments did this in part by stimulating investments in renewable sources of energy, in repairing and replacing aging infrastructures and by retraining workers whose jobs had been lost in the transition away from oil, coal, and gas production.

States, cities, towns, and local communities

California, the world's fifth-largest economy, set the standard for state-mandated climate action. The state became a model for other states, and ultimately the federal government.

People took to heart the expression Think Globally, Act Locally. Cities, towns, and communities were where many climate challenges, such as flooding from rising ocean waters and shortages of fresh water for agricultural or home use, had to be addressed. They started demanding clean-energy alternatives from local utilities. They pushed for plans that mitigated rising sea levels. They took the lead in developing local resilience, adaptation, and sustainability plans. These included new urban and suburban designs, energy-efficient buildings, improved public transportation, sophisticated recycling centers, community living, local farmers markets, public gardens, and living spaces that supported healthy lifestyles, to mention just a few. The work being done at the local level served as incubators and models for action at the state and national levels.

The United Nations

The United Nations had been convening global climate summits since the 1990s and the climate summit in Paris in 2015 resulted in a 197-nation consensus about goals, timelines, and mechanisms to prevent a 1.5-degree-centigrade rise in global temperature—what had been determined to be the goal for avoiding runaway climate change. The November 2021 global conference in Glasgow Scotland was more successful.

The Intergovernmental Panel on Climate Change (IPCC) of the United Nations played a critical role. It became a trusted source of scientific projections about global warming and climate change that nations could rely upon and take action.

A UN treaty called the Kigali Amendment to the Montreal Protocol was also critical in dealing with global warming. All nations on earth agreed to phase out hydrofluorocarbons (HFCs) by 2028. HFCs are the chemicals most widely used in air conditioners, refrigerators, and other cooling equipment throughout the world that scientists estimated were up to 9,000 times more potent than CO_2 in warming the atmosphere. Scientists had also estimated that this binding international agreement, if fully adhered to, would reduce global warming by one degree Fahrenheit by 2050, the most impactful of all actions that humans could take to address global warming.

FINANCIAL INSTITUTIONS, INVESTORS AND THE BUSINESS SECTOR

Investors

By the 2020s, many long-term investors were clear that the shift away from fossil fuels to renewable sources of energy

was the way of the future—not only because of impending climate catastrophe but also because the price of renewable sources of energy—had become lower than the price of fossil fuels. The US government was subsidizing the rapid development of solar, wind, and other renewable sources of energy. It did not help the fossil fuel companies that Lawrence Fink, the CEO of Blackrock, an investment management firm with $7 trillion under management, announced that Blackrock would no longer support investments in fossil-fuel companies. The handwriting was on the wall on May 20, 2021, when two active environmentalists were voted onto the ExxonMobil board, when a Dutch court ordered Royal Dutch Shell to make deeper than planned cuts in the company's greenhouse gas emissions, and Chevron lost a shareholder suit directing the company to take into account their customers' emissions when planning reductions.

In addition, hundreds of colleges and universities divested billions of dollars in investments in fossil-fuel companies from their endowments in response to pressures from their students and alumni. Most petroleum companies changed their names to "energy companies" and some companies took on initiatives to capture carbon from their operations and invest in renewables, but it was too little too late. The industry had divided into two basic groups, those like ExxonMobil, Chevron, and Saudi Aramco seeking to milk their petroleum assets for as long as possible and those companies trying to move toward a sustainable future.

Businesses

To many, the response from the business world to the challenge of climate change was surprising. Early in the 21st century, many major businesses had realized that it was in their self-interest to act, and they proved more agile than

imagined. They could see the spiraling costs of operating in climate chaos. They knew that they would not only lose money, but also the support of customers, talented employees, and investors if they did not authentically address the issues of reducing carbon emissions. The millennials, in particular, were quick to call out corporations that sought to continue business as usual or "greenwash." Examples of multinational corporations who took this challenge seriously were Barclays Bank, Mastercard, VISA, Blackrock, Jet Blue, Microsoft, UPS, Hewlett Packard, SalesForce, Unilever, Patagonia, Mars, and 7th Generation. Examples of not-for-profit organizations working with corporations to help them make the transition included BSR, CDP, Ceres, The B Team, Climate Group, and The World Business Council for Sustainable Development.

In addition, the transition from fossil fuels to renewables offered corporations new business opportunities worth hundreds of billions of dollars. For example, wind turbine power generation expanded exponentially, as did solar farms and the manufacture and installation of rooftop solar panels. Corporations in the refrigerant business, which by international treaty were required to stop using HFCs, developed environmentally safe alternatives. Cement manufacturing, which used massive amounts of electricity, shifted to materials that were more energy-efficient.

Antitrust laws were modified to enable competitors to collaborate in areas that would support a shift to a more resilient and sustainable economic and environmental future. At the same time, businesses were left to compete with each other for customers, employees, and investors, as had long been the case. Once the big corporations got behind the renewable economy, politicians started paying attention.

Entrepreneurs and intrapreneurs

Social entrepreneurs are individuals who seek to address social or environmental challenges by using business methods to make projects self-sustaining financially rather than relying primarily on philanthropic contributions. For example, they devised innovative methods of delivering small solar and wind-driven energy and fresh water throughout developing countries. They came up with significant innovations to deliver better quality health and educational programs. *(The Tactics of Hope – How Social Entrepreneurs Are Changing Our World)*

Intrapreneurs are employees who seek to improve the processes or products of the companies they work for. Instead of protesting against a company's practices from the sidewalk, they actively pushed for changes from within. They were increasingly seen as important change agents within their companies.

Image courtesy of www.SmallStarter.com

Solar panels on African huts developed by social entrepreneurs.

The transformation of farming to regenerative agriculture

The agricultural sector went through massive changes during the 2020s, 2030s, and 2040s as the American people became aware that what had been known as "farm to table" practices had become "farm factories to table" practices. Factory farming had come to dominate animal and plant production on land just as seafood factory farming had decimated the marine species in our oceans.

The list of reasons to be concerned about agricultural "factory farming" was long:

- **Harm to the atmosphere**
  Twenty-six percent of the planet's ice-free land is used for livestock grazing and thirty-three percent of croplands are used for livestock feed production. Each cow belches 220 pounds of the potent global warming gas each year. Livestock was responsible for 14.5% of global greenhouse gases in 2020.
- **Competing for diminishing fresh water**
  Beef production used a lot of fresh water. For example, it took a minimum of 880 gallons of fresh water to produce a pound of beef, while it only took 24 gallons to produce a pound of potatoes and 25 gallons to produce a pound of wheat.
- **Inhumane treatment of animals**
  In the name of efficiency, cattle, chickens and eggs were produced in huge commercial factory farms which many people considered inhumane.

Photo by Mark Reinstein

US commercial beef factory farming

Photo by Deven King

US commercial chicken factory farming

- **Damaging to the soil**
  And fourth, these practices were removing nutrients from the soils that would be needed by future generations.

The regenerative agricultural revolution helped solve all these problems. Regenerative agriculture is a system of farming principles and practices that increases biodiversity, enriches soils, improves watersheds, and enhances ecosystems. By capturing carbon in soil and above-ground biomass, regenerative agriculture helped reverse global climate change.

Locally grown food production and consumption also had a resurgence that helped combat climate change. It reduced fossil-fuel emissions resulting from long-distance trucking and long airline flights. Organic foods became the preferred choice by those who could afford it, not only for health reasons but because organic food production did not use petrochemical-based fertilizers. The Slow Food movement, which began in Italy in 1986, had chapters in more than 150 countries by 2021 and continued to expand rapidly.

TRANSPORTATION

Major investments were made in the development of electric cars and trucks, and high-speed rail systems. At the local level, the public's increasing commitment to address the threats to their lives from increased CO_2 emissions caused them to embrace mass transit, walkable cities, ride-sharing, the use of traditional and electric bikes, and mass-transit systems. The shipping industry, which used heavy crude oil, which was very damaging to global warming and overseen by the International Maritime Organization (IMO), a UN agency, was very slow to respond to international pressures because few understood the damage they were doing out at sea beyond the public's view. The airline industry was more responsive given their direct relationship, and thus pressure, from the public.

ARCHITECTS AND BUILDERS

The entire construction industry—architects, developers, builders, and building-products companies—experienced a renaissance as new energy-efficient design and resource-efficient materials made zero-carbon buildings possible.

Green buildings, using structures and processes that were environmentally responsible, became the norm. Homeowners sought to change their energy sources, roofs, windows, and lighting. Alternatives were developed for cement and other highly energy-intensive products. Plastics, a 20th century boon to most industries and consumers, but a growing scourge to the planet, were addressed by advances in recycling and a shift in consumer attitudes. The era of the one-time use of disposable plastic products came to an end as people who

were accustomed to throwing things away grappled with the question, "Where is away?"

NOW, IN 2050: A MORE RESILIENT, SUSTAINABLE, AND PROSPEROUS WORLD

The transformation that took place between 2021 and 2050 came about not only in response to global warming but by a movement to create what author Charles Eisenstein called "the more beautiful world our hearts know is possible."

In 2020, many people had given up on a positive future for humanity. Popular culture was rife with books, movies, and television shows about a dystopian future in which the Earth was ravaged, totalitarianism or violent chaos reigned, the chasm between the very few, very rich, and the very many very poor was vast and deep, and only robots and artificial intelligence could save us.

Despite this discouraging cultural mindset, there were those who envisioned a different future and planted seeds of hope and tended fields of innovation. First, they began by acting to stave off the worst policies of governments bent on dangerous short-term policies. They acted to safeguard wild places and plants and animals threatened with extinction. They fought battle after battle to finally win the war against pollution of the atmosphere. Even in the darkest days, when dystopia seemed about to swallow us, they did not give up.

Understanding the crisis we faced, knowing the work was on behalf of all of life, people gave their all to the healing of the environment and the human family. They looked ahead with the Native American vision of Seven Generations: that

all decisions and actions must take into account the welfare and well-being of seven generations to come. Their plans were ambitious, and their actions were bold. They knew the transition they were making had to be a collective effort, so they came together as never before—in communities, online, and in the streets—standing, marching, and working for the more beautiful world they knew was possible.

Now, at mid-century, many of those heroes have passed on, but many remain to see us through difficult times and to continue to envision and create an environmentally sustainable, spiritually fulfilling, and socially just human presence on this planet.[1]

> *Today, more than ever before, life must be characterized by a sense of Universal responsibility, not only nation to nation and human to human, but also human to other forms of life.*
>
> —His Holiness the Dalai Lama

[1] And Kala, the Ethiopian you heard about in this book's Preface, is now, (in 2050), sixty-two years old. He had to flee his country in 2016 in the face of imprisonment and very possibly torture and death because he had spoken out about the way global climate change, coupled with his government's economic growth-at-all-costs policies, were destroying the lives of many of the tribes in the South. In 2025, the Ethiopian government, as a result of international pressure and climate realities, granted amnesty to Kala and all those other Ethiopians who had protested and survived.

CHAPTER 4

What Specific Actions Are You Going To Take?

Now that you have read the first three chapters of this book, I hope you have come to the following conclusions:

- We are facing the most serious threat to the human species in all our 300,000 years.
- Technological solutions are at hand. That is not our problem.
- Digging our way out of the global warming/climate hole we have dug for ourselves will require all of us to do our part.
- **The only thing we lack is the individual, collective, and political will to take the actions needed.**

The goal of this chapter is to provide you with some of the many actions you can take to address the global warming/climate crisis we are facing, otherwise known as the Climate Emergency.

The question most people ask is "But, what can I do?" The answer is different for each person given that we each have unique capabilities as well as circumstances. The key is to

take on actions that you are passionate about and will stick with when other demands distract you.

And a good approach is to focus, choose, act. **Focus** on this crisis as if the lives of your children and grandchildren depended on it, for that is true. **Choose** among the many actions you could take only those actions that you would be excited about taking on and sticking with. And **Act**, for this is not an academic exercise but a real-life crisis. If you do this consciously, the actions you choose to take will soon become a part of your everyday life, your new normal, which, if all of us make the shift, will become the human family's new normal.

There are three interrelated challenges to choose from:

- **Global warming**: Actions to reduce your fossil-fuel emissions into the atmosphere.
- **Climate change:** Actions to deal with climate disruptions that will impact you, such as more severe fires, hurricanes, tornadoes, and rising sea levels.
- **Sustainability**: Actions to reduce your use of the earth's resources that are being consumed and polluted at such a rate that they will not be available for future generations to use for their survival and prosperity.

And there are three areas where you can choose to take action:

- **In your personal life**
- **In your community**
- **At your place of work**

The suggested actions that follow are organized around nine areas. Choose several to start with that you could easily accomplish.

	IN YOUR PERSONAL LIFE	IN YOUR COMMUNITY	AT WORK
GLOBAL WARMING			
CLIMATE CHANGE			
SUSTAINABILITY			

I. ACTIONS TO ADDRESS GLOBAL WARMING: The following are actions you could choose from to reduce your fossil-fuel emissions and thus reduce global warming.

a) IN YOUR PERSONAL LIFE

- **Develop a greater appreciation for the natural world.** Most people tend to treat everything in the natural world as objects that are separate from us that we can exploit without consequence. In reality, we need that tree outside, and that forest on the other side of town, for all those trees help draw down the CO_2 we release during our many daily activities, such as driving an internal-combustion-engine car powered by gasoline. A good exercise of appreciation might be to buy a tree or a plant and learn what it does for you. Or donate $1 at www.onetreeplanted.org and they will plant a tree for you wherever in the world you choose.

- **Discuss global warming with your family and friends.** Raising the issue of global warming would be a good first step toward taking action. Generally speaking,

those of the younger generations are more concerned about global warming than older generations, so discussing it with your children or with your parents is a great opportunity to start engaging in intergenerational collaboration and action.

- **Switch your lights to LEDs.** Making the switch to LED light bulbs offers significant energy savings over incandescent, halogen, and compact fluorescent alternatives. On average, LEDs consume 80% less energy when compared to other light bulbs. The initial cost will be higher, but they save on electricity, last longer, and save you money over time.

- **Sign up for 100% renewable sources of electrical energy.** Find out from your local energy provider if they offer such a plan.

- **Get your home's electricity from solar panels.**

- **Weatherize and retrofit your home to become more energy efficient.**

- **Reduce your automobile use.** Where feasible, bike, take public transportation, or rideshare.

- **Buy an electric car**. Take advantage of government subsidies to lower your cost.

- **Reduce your airplane flights**.

- **Use virtual meetings when feasible.**

- **Improve the energy efficiency of your home appliances.**

- **Paint your home a light color if you live in a warm climate or a dark color in a cold climate.** This can save up to 5,000 pounds of carbon dioxide per year.

- **Buy locally, especially at farmers markets.** You will not only be eating more healthy, fresh food, and less processed food, but will be reducing the fossil fuel emissions generated by the trucks, planes, and boats that deliver most food products found in national food chains that are often transported from thousands of miles away.

- **Learn about regenerative agriculture.** If you are a farmer, explore the potential of regenerative agriculture to absorb carbon from the atmosphere and create healthy soil.

- **If you are a student or alumni of a college or university, demand that they divest from all the fossil fuel investments held in their endowments.**

- **If you are an investor**, divest from all fossil fuel related investments, and invest in wind, solar, or other renewable sources of energy.

- **If you are a philanthropist,** support the many not-for-profits organizations, (NGOs), working to move us to a renewable future, such as the Environmental Defense Fund (EDF), and The Climate Reality Project. There are many to choose from.

- **Examine your values.** Look at the values you have that may be driving actions that contribute to the problem. Are you seeking happiness primarily through buying and consuming products that

advertisements tell you will make you happier and your life better, without considering their impact on people and the planet? What would a life of meaning look like for you that is less oriented around the consumption of resources? Being in nature? More time with friends and family?

b) IN YOUR COMMUNITY

- **Vote using global warming as your primary criteria.** Ask those seeking your vote for local, county, state, and national office where they stand on the issue of global warming and climate change? If they tell you that it is all nonsense, tell them that you will work hard to make sure they do not get elected.

- **Join local organizations** who are committed to bringing about changes in climate policies.

- **Push your power company to provide electric vehicles (EV) charging stations.**

- **Push for more public transportation and bike paths.**

- **Petition your city council to become carbon neutral.**

- **If your energy provider does not offer a plan for you to get your electricity from renewable sources of energy,** form a group of consumers to demand it, or get your legislators to pass legislation to require that such an option be available.

c) AT WORK

- **Become an intrepreneur inside the business where you work**. Suggest ideas for how the business can reduce their use of fossil fuels. Taking actions to reduce carbon emissions can very possibly save your company money and thus increase profitability. Such actions may also attract climate conscious customers, better employees, and investors.

- **If you work for a company that leaves its lights on at night for no good reason, encourage them to turn the lights off.**

Please write down some of the actions above that you might choose to take to address global warming.

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II. ACTIONS TO ADDRESS CLIMATE CHANGE

Experts in your area hopefully have studied how global warming is likely to impact where you live. If you live in an area likely to experience less water and more drought, how do you avoid fresh-water shortages? How are you going to deal with the greater likelihood of forest fires? If you live in an area prone to hurricanes, how do you protect yourselves from more severe storms? If you live in a coastal area, how do you protect your community and your home from a

rise of one foot over the next thirty years? A rise of three feet? There are various approaches to be considered. One is adaptation, the other mitigation.

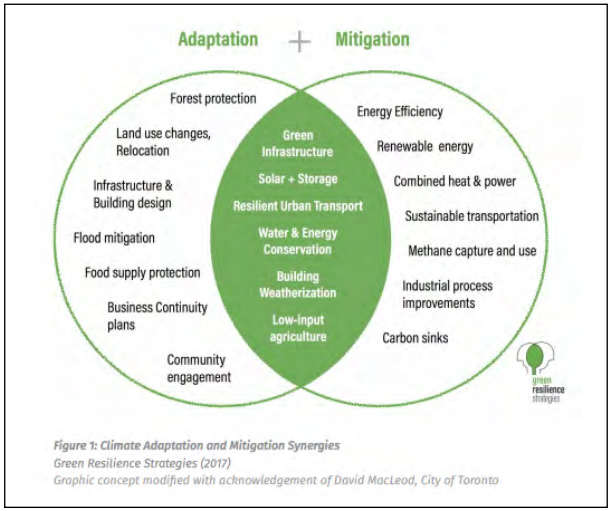

Figure 1: Climate Adaptation and Mitigation Synergies
Green Resilience Strategies (2017)
Graphic concept modified with acknowledgement of David MacLeod, City of Toronto

a) IN YOUR PERSONAL LIFE

- **Vote using a climate change lens.**
- **Clear brush and trees around your house to protect against forest fires.**
- **If you live in an ocean-front town or city, push for a study of how rising sea levels will impact your community and what actions they plan to take.**

b) IN YOUR COMMUNITY

- **If you possess the skills needed, join the local or regional body that has been set up to plan for these severe weather events.**

c) AT WORK

- **If you are in farming, explore methods to sequester carbon in your soil.**

Please write down some of the actions above that you might choose to take on to address climate change.

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III. ACTIONS TO ADDRESS SUSTAINABILITY (Reducing your use of the planet's resources)

a) IN YOUR PERSONAL LIFE

- **Get a low-flow shower head and limit your showers to under seven minutes.**

- **Get a high-efficiency toilet.**

- **Reduce your consumption of beef from crowded factory farm lots.** Only buy free-range grass-fed beef at home or when you eat in restaurants. Yes, the cost to you is a bit more, but the cost to the planet and to your health will be much less.

- **Push for better water conservation and waste management.**

- **Eat fresh, locally produced food.**

- **Eat more vegetarian meals.**

- **Recycle and reuse whenever possible.**

- **Only use single-use plastics, such as water bottles, if it is necessary for health reasons, not just your convenience.**
  Plastic shopping bags, bottles, and plastic packaging are convenient, but the amount of plastic material that gets thrown away and enters our rivers and oceans are a scourge on the planet's ecosystem. Ever heard of the Great Pacific Garbage Patch? It is a "gyre" of plastic trash in the Pacific Ocean estimated to be at least twice the size of Texas that will not dissolve for decades. It also washes up on our beaches. If your state does not already ban the use of disposable plastic bags in grocery stores, encourage your lawmakers to draw up legislation to do so.

Image courtesy of Jennifer Lavers, Institute for Marine and Antarctic Studies

Plastic refuse on Henderson Island in the South Pacific.

- **Switch to reusable shopping bags.**
- **Reduce food waste and compost your scraps.**

b) IN YOUR COMMUNITY

- **Push for better water conservation and waste management.**
- **Plant your own garden or join a community garden.**

c) AT WORK

- **Encourage your company to use gray water when fresh water is not needed.**
- **Reuse/recycle plastics.**

Please write down some of the actions above that you might choose to take to address global sustainability.

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THE ACTIONS I AM COMMITTING TO TAKE, STARTING NOW

a) IN MY PERSONAL AND COMMUNITY LIFE

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b) IN MY WORKLIFE

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CHAPTER 5

THE ROAD TO RUIN

HOW OUR ACTIONS AND INACTIONS LED TO OUR COLLAPSE

This view of the future may seem far-fetched to many of you, but I am convinced that it is not. This scenario assumes there is little change in the world's use of fossil fuels. It is indeed a worst-case scenario but is included here as a reminder of what is likely to happen if we do not wake up and take action this decade. Only if the world makes immediate, dramatic reductions in our greenhouse gas emissions and in many of our current actions can we avoid many of the outcomes described here.

Looking back from the year 2050

In this future, humanity heads down a path toward ecological disaster as well as economic and societal collapse.

Some of the forces that caused this tragedy were:

- Lack of the individual, collective, and political will to take the actions that were clearly called for, and within our reach

- Nations inciting fear of "the other," making cooperation on a global scale impossible
- Reluctance to get off of fossil fuels fast enough
- Tipping points and irreversible feedback loops reached

The 29 years between 2021 and 2050 have been the most turbulent and destructive in human history. Our missteps in some areas and inaction in others have led to our near-collapse today defined by the following:

The world's temperature is now 3.0 degrees Fahrenheit above what it was in 2020. While some parts of the world in 2021 were making major efforts to switch from fossil fuels to renewable sources of energy, most countries failed to meet the commitments they had agreed to at the 2015 Paris Climate Summit and the UN Climate Change Conference in November 2021 in Glasgow, Scotland. What they did do was "too little, too late."

By the mid-2020s, rising temperatures had caused much of the Arctic to be ice-free for much of the year. It had also caused much of the tundra to thaw, resulting in millions of tons of methane being released into the atmosphere, causing yet more global warming.

With much less ice and snow in the Arctic, the sunlight that had previously been reflected away from Earth by the snow was absorbed by the darker surface of the ocean, not only making the ocean warmer but making it more difficult for the ocean to absorb as much CO_2 that had been the case for millions of years.

The median level of the oceans is now two feet above where it was in 2020. Melting ice from Greenland, Antarctica, and

to a lesser extent, the Arctic, (because it is not a landmass but open water), has raised sea levels a couple of feet. This has been high enough to flood portions of many coastal cities around the world. Miami, New Orleans, Boston, New York, Amsterdam, Shanghai, and Venice are now among the many coastal cities impacted. Most experts expect the sea to rise another three feet by the end of the century.

Drought has destroyed agriculture and livelihoods. Millions of people in the Middle East, Africa, and South Asia are experiencing desertification of their farmlands, forcing them to become climate refugees.

Temperatures in excess of 120º Fahrenheit are commonplace around the world, including parts of the United States. Fires have consumed huge forests and some towns. Much of the Amazon rainforest, "the lungs of the planet," has dried up, in part due to continued logging and land clearing for soybean farming and beef production.

The snowpack and glaciers of the Himalayan mountains that fed the great rivers of China, India, and Southeast Asia for centuries have melted. This melt initially caused flooding, but now, many of these downstream communities are facing insufficient amounts of fresh water for farming. The glaciers of the South American Andes, where melting snow had for millennia supplied 80 percent of the freshwater to downstream populations, have also been reduced to a fraction of their former size, with equally devastating consequences. In the American Southwest, conflicts over fresh water have become frequent and intense as farmers, urban communities, developers, and natural gas frackers battle for access over ever-diminishing quantities of ground and underground aquifers.

The world's oceans have lost 90% of their marine life as a result of massive factory fishing operations and acidification. Our oceans, overfished and a dumping ground for plastics and toxins, are turning into acidic "dead zones." Massive factory fishing fleets, whose drag nets scraped the bottom of our oceans and seas for decades, and ensnared virtually every fish in their path, have emptied our oceans of most marine life. And, because the planet's oceans, making up 71 percent of the Earth's surface and 97 percent of the Earth's water, have grown warmer and warmer, they can no longer absorb as much CO_2 as in previous centuries, and their acidity has risen dramatically. Ninety percent of coral reefs around the world are now dead and no longer provide habitat for spawning fish and the fish that humans had depended upon for their food.

More than 80 percent of all species of animals alive in the year 2000 are now extinct. Climate change, overpopulation, and pollution have destroyed habitats, and poachers have killed off our most iconic mammals in the wild. Lions, tigers, elephants, bears, dolphins, and big apes exist mainly in a few zoos and "wildlife zones."

Climate refugees have no place to go and have died by the hundreds of millions. In the 2020s and 2030s, the United States, Western Europe, and other developed countries closed their borders to climate refugees. Now, in 2050, climate refugees from the Middle East, Africa, South Asia, and South America, facing ever-more-dire circumstances in their own countries, are roaming the planet.

Image courtesy of Jerome Delay/Associated Press

Somali climate refugees at a refugee camp in eastern Kenya

International trade and investment are now a fraction of their previous size. Starting in 2018, when the US erected tariff and non-tariff barriers to international trade, investment, and technology flows, other countries responded in kind in an effort to stimulate their own economies and protect jobs. Ultimately, all this disruption proved disastrous for individual countries and the global economy. The prices of commodities and consumer goods shot up in the US and other advanced economies, which had been importing from lower-cost countries. The economies of the lower-cost countries declined because of their loss of export markets.

The US economy is severely stressed, and the global economy is on the verge of collapse. Seriously stressed by ever-more-costly climate disasters, sea-level rise in major urban areas, resource shortages, agricultural failures, reduced international trade, and social unrest, the US economy has become more and more unstable. Interest payments due on the massive amounts of debt that had long sustained economic growth cannot be maintained in the US or globally.

The "politics of fear" carry the day as demagogues and authoritarian power structures have gained power everywhere. Economic and social calamities have caused people to react out of fear and scarcity. Even in previously strong democracies, ruthless politicians have preyed on their people's mistrust of "the other." The global political environment has become ever more toxic and debilitated by short-term decision-making and the vested interests holding on for dear life.

Vast economic inequality threatens the very fabric of life. The divide between the very few who can afford to live in fortress-like "gated communities" and the billions who now live in poverty, has taken its toll throughout the world. The "haves" seek protection with private armies. Some cities are armed camps, and terrorist actions are everyday occurrences.

In sum, this is life in 2050. The warnings raised in the 2015 book *Overdevelopment, Overpopulation, Overshoot* have all come to pass. Humanity was not up to the task of addressing global warming and climate change before it was too late. Humanity proved incapable of moving beyond its adolescent phase to an era in which collaboration with other human beings and harmony with the natural world would have saved us.

CHAPTER 6

Resources for Learning and Action

Introduction and organization of this section

It is important that every person reading *In Our Hands* and exploring the challenges and opportunities caused by global warming, climate change, and sustainability, have access to the very best resources available that will enable them to go deeper into virtually any subject raised in the book. This chapter provides easy access to over 130 research reports, books, articles, and documentary films for just that purpose.

As you will note in the following table of contents, the science is provided first, followed by a section on the nine greatest challenges that the global warming/climate change/sustainability crisis has created, and materials regarding solutions to each. This is followed by materials about solutions that individuals, communities, teachers, businesses, and corporations can take to address these challenges. The final section provides what other authors and organizations envision for a positive future for humanity on our fragile planet. I suggest that you read over the description of each of these now so that you are aware of the wealth of information at your fingertips.

Below is this chapter's table of contents. In the ebook and PDF editions of this book, all the links in this chapter are clickable for quick and easy access.

I. The science behind the Climate Emergency and Projections

1. Scientific research

The Intergovernmental Panel on Climate Change, (IPCC). August 9, 2021 Summary for Policy Makers.

https://www.ipcc.ch

This sixth IPCC report since 1990 states unequivocally that global warming is caused by human activities and that global warming to mid-century will continue, but can be moderated if we take immediate action.

NOAA Climate.gov Climate Data Primer

https://climate.nasa.gov/evidence/

Are you new to climate data? Ready to learn or review some of the basics? This site will walk you through some of the basics to help you understand and explore climate data. NOAA's climate.gov is a source of timely and authoritative scientific data and information about climate.

US Climate Explorer

https://toolkit.climate.gov/#steps

Explore interactive graphs and compare time-series maps showing climate projections and observations for any county in the contiguous United States. You can also explore historical temperature and precipitation observations at hundreds of climate stations, and view observed and projected days of high-tide flooding at more than 90 coastal tide-gauge stations.

Fourth United States National Climate Assessment

https://nca2018.globalchange.gov/

This is the latest US National Climate Assessment—the nation's best scientists evaluate the state of our climate emergency and update this research every four years to deliver to the US Congress. The Global Change Research Act of 1990 mandates that the US Global Change Research Program (USGCRP) deliver a report to Congress and the president no less than every four years that "1) integrates, evaluates, and interprets the findings of the Program; 2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and 3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years."

Climate Change Solutions Simulator

https://www.climateinteractive.org/tools/en-roads/

En-ROADS is a transparent, freely available policy simulation model that gives everyone the chance to design their own scenarios to limit future global warming. You can try your own experiments and assumptions and get immediate feedback on the likely impacts. The simulation, developed by Climate Interactive, Ventana Systems, and the MIT Sloan School, runs on an ordinary laptop in a fraction of a second, is available online, offers an intuitive interface, has been carefully grounded in the best available science, and has been calibrated against a wide range of existing integrated assessment, climate, and energy models.

2. Books and Articles

"The Science of Climate Change Explained: Facts, Evidence, and Proof"

https://www.nytimes.com/article/climate-change-global-warming-faq.html

An easy-to-digest article from the *New York Times*, with 16 questions and answers about climate change. Gives an excellent overview of the issue and how to address it.

The Causes of Climate Change

https://climate.nasa.gov/causes/

NASA's breakdown of climate science.

Union of Concerned Scientists on Climate Science

https://www.ucsusa.org/climate/science

The Union of Concerned Scientists was founded in 1969 by scientists and students at the Massachusetts Institute of Technology, (MIT). This is their primer on climate science. Also see their Global Warming FAQs.

"What is Climate Change? A Really Simple Guide"

https://www.bbc.com/news/science-environment-24021772

The BBC's explainer on climate science and global warming.

Climate Change: What Everyone Needs to Know

An accessible exploration of the science of climate change written by Joseph Romm, a former acting assistant secretary of the US Department of Energy.

Dire Predictions: Understanding Climate Change

Graphical explanations and clear writing from climate scientists Michael E. Mann and Lee R. Kump

communicate the scientific basis for understanding climate change.

3. Films and Videos

An Inconvenient Truth

www.algore.com

Featuring former Vice President Al Gore, this famous documentary film shines a light on the causes and effects of global warming and calls on the human race to address this critical issue while there is still time.

An Inconvenient Sequel: Truth to Power

https://inconvenientsequel.tumblr.com

A decade after *An Inconvenient Truth* brought climate change into the heart of popular culture, this follow-up shows just how close we are to a real energy revolution.

Anthropocene: The Human Epoch

https://theanthropocene.org/film/

A stunning sensory experience and cinematic meditation on humanity's massive reengineering of the planet, *Anthropocene: The Human Epoch* is a years-in-the-making feature documentary from the award-winning team behind Manufactured Landscapes and Watermark and is narrated by Alicia Vikander. The film follows the research of an international body of scientists, the Anthropocene Working Group who, after nearly 10 years of research, argue that the Holocene Epoch gave way to the Anthropocene Epoch in the mid-twentieth century as a result of profound and lasting human changes to the Earth.

Before the Flood
www.beforetheflood.com
This documentary film, narrated by Leonardo DiCaprio and directed by Fisher Stevens, looks at the changes occurring on the planet due to climate change and the actions we can take to bring about a better future.

II. Related Challenges

1. Human disconnect from the natural world

A. ***The Connectivity Project***
https://www.connectivityproject.com/
The Connectivity Project helps to build awareness of this interdependence, encouraging a deeper understanding of the potential impact of our actions—large and small—with empowering films, engaging curriculum, and a curated collection of related resources.

B. ***Sacred Passage - Way of Nature***
http://SacredPassage.com
John P. Milton is was one of America's early environmentalists focused on global warming and humanity's connections to the natural world. Since the 1950's, he has guided many people into the wilderness, sharing with them a profound connection with Nature.

My Octopus Teacher
This beautiful Netflix documentary is a love story every age group can relate to. It shows a grown man developing a deep connection with an octopus that lives in the waters near his ocean home.

C. ***A Global Vision: General Principles for a Sustainable Planet***
This book by Jim Sloman explores the interconnectedness of ecology, energy, finance, geopolitics, and other dimensions of our society, and how our choices now will determine our future.

D. ***Sacred America, Sacred World: Fulfilling Our Mission in Service to All***
A unique and beautiful synthesis of modern politics and spirituality, this book by Stephen Dinan offers the perspective that by bringing these two seemingly disparate worlds together we can create a vibrant future for the United States.

E. ***Planet Earth, Blue Planet, and Blue Planet II***
Timeless documentary series by the BBC that explore the wonder and beauty of our amazing planet home.

F. ***David Attenborough: A Life on Our Planet***
A 2020 British documentary film narrated by renowned natural historian David Attenborough. The film acts as a "witness statement," through which Attenborough shares first-hand his concern for the current state of the planet due to humanity's impact on nature and his hopes for the future.

G. ***Facing Adversity: Choosing Earth, Choosing Life***
https://choosingearth.org/choosing-earth-documentary/
A 70-minute documentary that explores the speed, depth, and magnitude of our growing planetary crisis, and the opportunity to meet this crisis consciously. The film begins with a visual exploration of key adversity trends facing humanity (climate change, economic growth, inequity, and more) and offers

a wider whole systems perspective and a deeper inquiry into what is being called forth from humanity. Learning to work with this paradox—an unfolding global crisis and the opportunity to awaken to and care for the well-being of all of life—is the work ahead. The film includes in order of appearance: Duane Elgin, Victoria Santos, Jack Kornfield, Joanna Macy, Nate Hagens, Beena Sharma, Lynne Twist, and more, as well as stories from around the world on impacts of our time of transition.

H. ***The Uninhabitable Earth: Life After Warming***
The Uninhabitable Earth by David Wallace-Wells is both a travelogue of the near future and a meditation on how that future will look to those living through it—the ways that warming promises to transform global politics, the meaning of technology and nature in the modern world, the sustainability of capitalism, and the trajectory of human progress. *The Uninhabitable Earth* is also an impassioned call to action. For just as the world was brought to the brink of catastrophe within the span of a lifetime, the responsibility to avoid it now belongs to a single generation—today's.

I. ***"A Good Day" With Brother David Steindl-Rast***
https://gratefulness.org › grateful-day
This beautiful, 5-minute video meditation connects us to the heart of what matters, every day.

2. Overpopulation

A. ***"The Earth Is Full"***
www.ted.com/talks/paul_gilding_the_earth_is_full
In this sobering TED Talk, Paul Gilding explains how we've already passed many tipping points for resource

use and population on this planet, and how this is a critical time to take action.

B. ***Overdevelopment, Overpopulation, Overshoot***
https://populationspeakout.org/the-book/
A collection of powerful images depicting the impact, both environmental and social, of overpopulation and overdevelopment.

C. ***World Population Awareness***
www.overpopulation.org
Find articles and recent news related to overpopulation and efforts to address it.

3. Overdevelopment and consumption

A. ***The Story of Stuff Project***
https://storyofstuff.org
After the success of her 2007 documentary film, *The Story of Stuff*, Annie Leonard started the Story of Stuff Project to launch an ongoing conversation about our consumption-crazed culture.

4. Degrading land, water, and ocean resources

A. ***Outgrowing the Earth: The Food Security Challenge in an Age of Falling Water Tables and Rising Temperatures***
Author Lester R. Brown explores the growing threat of food shortages and rising food prices and how addressing these issues must involve moving away from fossil fuels and drastically curbing overpopulation.

B. ***Millions Face Hunger by 2030 Without 'Deep Transformation' of Agriculture according to the UN***
www.commondreams.org/news/2016/10/17/millions-face-hunger-2030-without-deep-transformation-agriculture-un
This article published by Common Dreams outlines the content of a 2016 UN report that warns that many millions of people could be forced into poverty due to the effects of climate change.

C. ***Kiss the Ground Stewardship Program***
https://kisstheground.com/stewardship/
The program educates existing and emerging leaders about the solutions that lie within the soil and train them to be influential advocates in their homes, communities, and in their businesses to drive structural change towards regeneration through grassroots action. We develop online and in-person courses and workshops to support your regenerative journey whether you are a student, parent, teacher, consumer, concerned citizen, or a business owner.

D. ***Cowspiracy***
https://www.cowspiracy.com/about
Cowspiracy: The Sustainability Secret is a groundbreaking feature-length environmental documentary following intrepid filmmaker Kip Andersen as he uncovers the most destructive industry facing the planet today—and investigates why the world's leading environmental organizations are too afraid to talk about it.

E. ***Moo's Law: An Investor's Guide to the New Agrarian Revolution***
Moo's Law is the latest title from successful investor Jim Mellon to help readers understand the investment landscape in cultivated and plant-based proteins and materials.

F. ***Oceans: The Threats to Our Seas and What You Can Do to Turn the Tide***
A guide by Jon Bowermaster that explores the health of our oceans and what we can do to improve it.

G. ***The Rising Sea***
This book by Orrin H. Pilkey and Rob Young explores the impact of sea-level rise on coastal areas and what we can do to address the root causes.

H. ***50 Ways to Save the Ocean***
David Helvarg's book outlines simple and practical steps one can take to preserve our planet's oceans.

I. ***Blue Covenant: The Global Water Crisis and the Coming Battle for the Right to Water***
One of the most important books written about the water crisis by Maude Barlow, the head of the Council of Canadians and the Blue Planet Project.

J. ***Seaspiracy***
https://www.seaspiracy.org/
Passionate about ocean life, a filmmaker sets out to document the harm that humans do to marine species—and uncovers alarming global corruption.

K. ***Water: The Epic Struggle for Wealth, Power, and Civilization***
This book by Steven Solomon tells the story of the rise and fall of civilizations throughout history using water as the connecting theme between all of them.

L. ***Fixing Climate: What Past Climate Changes Reveal About the Current Threat—and How to Counter It***
With Wallace S. Broecker as his guide, award-winning science writer Robert Kunzig looks back at Earth's volatile climate history to shed light on the challenges ahead.
https://www.theguardian.com/commentisfree/2021/may/06/stop-rising-sea-levels-scientists-climate-forecast
This humbling article in *The Guardian* looks critically at what will likely be unavoidable sea level rise and the impact this will have on coastal regions.

M. ***Mission Blue***
www.mission-blue.org
An initiative of the Sylvia Earle Alliance (S.E.A.), Mission Blue works to raise public awareness for the protection of key areas critical to the health of our oceans.

5. Conflicts

A. ***The Age of Consequences***
www.theageofconsequences.com/
Through the lens of national security and global stability, this film looks at the impacts of climate change on increased resource scarcity, migration, and conflict.

B. ***American Exodus: Climate Change and the Coming Fight for Survival***
Written by Giles Slade, this book looks at how the changing climate may reshape North America.

C. ***Climate Wars: What People Will Be Killed For in the 21st Century***
Written by Harald Welzer, this book examines the struggles over drinking water, new outbreaks of mass violence, ethnic cleansing, civil wars in the Earth's poorest countries, endless flows of refugees: the new conflicts and forces shaping the world of the 21st century.

D. ***Search for Common Ground***
www.sfcg.org
For the past thirty-five years, Search for Common Ground has been working tirelessly in numerous countries in Africa, the Middle East, and Asia to end conflicts that often create climate refugees seeking safety. As they note: "Conflict and differences are inevitable. Violence is not."

6. Human Health Impacts and Inequities—Social and Environmental Justice

A. ***Climate Change's Effects on Human Health in the United States***
https://www.cdc.gov/climateandhealth/effects/default.htm
The Center for Disease Control (CDC) uses the best science to explain how climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways. Some existing health threats will intensify

and new health threats will emerge. Not everyone is equally at risk. Important considerations include age, economic resources, and location.

B. ***Environmental Justice Toolkit***
https://www.learningtogive.org/resources/environmental-justice-us
Service-Learning Project Ideas Related to Environmental Justice: This toolkit guides classroom instruction and provides ideas for service project ideas and community resources. This is designed to spark ideas for learning and actions related to understanding and impacting environmental justice.

C. ***"Turning up the Heat: Climate Change has worsened global economic inequality"***
https://earth.stanford.edu/news/climate-change-has-worsened-global-economic-inequality#gs.1njuks
The gap between the economic output of the world's richest and poorest countries is 25 percent larger today than it would have been without global warming, according to new research from Stanford University.

D. ***All We Can Save: Truth, Courage, and Solutions for the Climate Crisis***
All We Can Save is the collected essays of dozens of diverse women leading on climate in the United States—scientists, journalists, farmers, lawyers, teachers, activists, innovators, wonks, and designers, across generations, geographies, and race—and aims to advance a more representative, nuanced, and solution-oriented public conversation on the climate crisis. These women offer a spectrum of ideas and insights for how we can rapidly, radically reshape society.

E. ***Movement Generation***
https://movementgeneration.org/
Movement Generation Justice & Ecology Project inspires and engages in transformative action towards the liberation and restoration of land, labor, and culture.

F. ***"Inequality is decreasing between countries—but climate change is slowing progress"***
https://www.nationalgeographic.com/environment/article/climate-change-economic-inequality-growing
Forecasts have painted a difficult picture for the future. But one new study argues that climate change has already imposed an economic penalty on many countries.

G. ***"Climate Change Has Already Increased Global Inequality. It Will Only Get Worse"***
https://time.com/5575523/climate-change-inequality/
Scientists have long predicted that warmer temperatures caused by climate change will have the biggest impact on the world's poorest, most vulnerable people. New research now indicates that's already happened over the last several decades.

7. Climate refugees

A. ***The UN's Sustainable Development Goals:*** **Let's Talk About Climate Migrants, Not Climate Refugees**
https://www.un.org/sustainabledevelopment/blog/2019/06/lets-talk-about-climate-migrants-not-refugees
Dina Ionesco, the Head of the Migration, Environment and Climate Change Division at the UN, on climate

migration and the international effort to create policy and programs to address this challenge.

B. ***The Climate Crisis, migration, and refugees***
https://www.brookings.edu/research/the-climate-crisis-migration-and-refugees/
A 2019 brief by the Brookings Institute on climate change-imposed migration facts and policy.

8. Species Extinction

A. ***The Sixth Extinction: An Unnatural History***
Elizabeth Kolbert reports in this book how we are currently in the midst of a man-made sixth extinction.

B. ***The Fate of the Species: Why the Human Race May Cause Its Own Extinction and How We Can Stop It***
In this book, Fred Guterl examines many possible scenarios for the future, laying out the existing threats and offering his perspective on the means to avoid them.

9. Plastics

A. ***Plastic: A Toxic Love Story***
The story about how plastics has taken over every aspect of our life, by Susan Frienkel.

B. ***Plastic-Free: How I Kicked the Plastic Habit and How You Can Too***
Written by Beth Terry, how one consumer of plastics awoke to the problems plastics were creating and broke the habit.

III. Solutions and Actions

1. By individuals and communities

A. ***Sustainable World Sourcebook***
The Sustainable World Sourcebook is a beautifully illustrated handbook that provides straightforward solutions and actions for individuals and communities. An essential guidebook for every concerned citizen.

B. ***The New 50 Simple Things Kids Can Do to Save the Earth***
In *The New 50 Simple Things Kids Can Do to Save the Earth*, Sophie and John have revised the original bestselling book for a concerned and vibrant youth market. Its easy-to-do and kid-friendly projects show that kids can make a difference, and each chapter is packed with tons of links to groups and resources.

C. ***Ignition: What You Can Do to Fight Global Warming and Spark a Movement***
Edited by Jonathan Isham and Sissel Waage, *Ignition* brings together some of the world's finest thinkers and advocates to jump-start the ultimate green revolution.

D. ***The 12 Questions Every Climate Activist Hears and What to Say***
https://www.climaterealityproject.org/content/12-questions-every-climate-activist-hears-and-what-say
This handy resource offered by the Climate Reality Project lists twelve of the most common arguments against climate change and ways you can respond to them.

E. ***"51 Ways to Restore Our Earth"***
https://www.earthday.org/earth-day-tips/
EarthDay.org's list of actions individuals and communities can take on climate change and to protect our planet.

F. ***The End of Nature***
This famous work by Bill McKibben looks at the impact we're having on the planet and how a philosophical shift in our relationship to the natural world is necessary to make the changes that are needed.

G. ***This is Not a Drill: An Extinction Rebellion Handbook***
Extinction Rebellion is a global activist-movement of ordinary people, demanding action from Governments. *This is Not a Drill* is the movement's essay collection on all aspects of the climate crisis. Governments must create and be led by the decisions of a Citizens' Assembly on climate and ecological justice. Halt biodiversity loss and reduce greenhouse gas emissions to net zero by 2025.

2. By schools and teachers

A. ***K-12 CLIMATE ESSENTIALS FOR ALL EDUCATORS***
https://www.presidio.edu/climate-change-k12/
The Presidio Graduate School, founded in San Francisco in 2002 offers MBA and MPA degrees in sustainable development. In 2021, it launched a nationwide program for all K-12 teachers throughout the United States to enable them to teach climate change.

B. ***CLEAN***
https://cleanet.org/index.html
The Climate Literacy and Energy Awareness Network (CLEAN) Portal was launched in 2010 as a National Science Digital Library (NSDL) Pathways project. It is led by the science education expertise of the Cooperative Institute for Research in Environmental Science (CIRES) at the University of Colorado Boulder and the Science Education Resource Center (SERC) at Carleton College. As of 2012, CLEAN has been syndicated to NOAA's climate.gov portal.

C. ***CK-12***
https://www.ck12.org/search/
CK-12 will provide open-source content and technology tools to help teachers provide learning for students in a global world. Free access to high-quality, customizable educational content in multiple modalities suited to multiple student learning styles, levels, resources, and use content acceptance will allow teachers, students, and others to innovate and experiment with new models and modalities of learning. CK-12 help students and teachers alike by enabling rapid customization and experimentation of teaching and learning styles.

D. ***Climate Gen***
https://www.climategen.org/
Climate Generation understands that climate change is a highly complex issue and that just and equitable solutions cannot be found if we proceed with the climate science and policy lens alone. We must take a comprehensive perspective of climate change impacts and solutions if we are to reach our goal and create the future we want to live in. We are committed to

addressing the intersection of climate change and economic, social, and racial disparities, and working closely with partners who understand this interface. The climate fiction and nonfiction reading guide "will help you bring climate change books to your English/Language Arts classes, book clubs, science classes, and beyond. Climate change fiction and non-fiction books are included, along with book summaries, reading levels, discussion questions, and relevant news articles to bring the content to life."

E. ***Green Ninja***
https://web.greenninja.org/
Green Ninja is a phenomena-based science program for grades 6-8. Our program engages students by providing them with opportunities to use science and engineering to solve real-world environmental problems. The program is thoughtfully packaged and flexible, making it easy for teachers and students to access content through a digital platform and through printed materials.

F. ***Earth Echo International***
https://www.earthecho.org/educator-resources
EarthEcho International's Educator Resources are a collection of videos, lesson plans, and other materials designed to support high-quality classroom experiences. They are unique tools to assist educators as they equip young people to explore and protect their local natural resources. Many of the resources are designed to satisfy Common Core and Next Generation Science Standards.

G. ***Global Oneness Project***
https://www.globalonenessproject.org/
Welcome to the Global Oneness Project. We believe that stories play a powerful role in education. Founded in 2006 as an initiative of Kalliopeia Foundation, we aim to plant seeds of empathy, resilience, and a sacred relationship to our planet. Using stories as a pedagogical tool for growing minds, we bring the world's cultures alive in the classroom. Committed to the exploration of cultural, environmental, and social issues, we offer a rich library of multimedia stories comprised of award-winning films, photo essays, and essays. Companion curriculum and discussion guides are also available.

H. ***Learning to Give***
https://www.learningtogive.org/resources/humans-and-environment
Service-Learning Project Ideas Related to Environmental Justice: This toolkit will guide instruction and provides ideas for service project ideas and community resources. This is designed to spark ideas for learning and actions related to understanding and impacting environmental justice.

I. ***Project Look Sharp***
https://projectlooksharp.org/index.php
A nonprofit, mission-driven outreach program of Ithaca College. Their mission is to help K-16 educators enhance students' critical thinking, metacognition, and civic engagement through media literacy materials and professional development.

J. ***EarthDay.org's 2021 Restore our Earth Climate Education Week Toolkit***
https://www.earthday.org/restore-our-earth-climate-education-week-toolkit/
This toolkit provides a wealth of resources for you to incorporate and utilize whenever they best fit into your curriculum at any point in the year. By using resources like this, we can work to build climate and environmental literacy in students all year long, not just during one week in April.

K. ***Our Climate, Our Future***
https://ourclimateourfuture.org/
Our Climate, Our Future is a project of the Alliance for Climate Education. ACE's mission is to educate young people on the science of climate change and empower them to take action. Since 2009, ACE has educated two million students and trained over 4,000 student leaders.

L. ***National Marine Sanctuaries Education Program***
https://sanctuaries.noaa.gov/education/teachers/
The NOAA Office of National Marine Sanctuaries aims to provide teachers with resources and training to support ocean literacy in America's classrooms. You will find curriculum, lesson plans and activities that will excite your students about science and technology.

M. ***US Partnership for Education for Sustainable Development***
https://uspartnership.org/
The US Partnership consists of individuals, organizations, and institutions in the United States dedicated

to education for sustainable development. It acts as a convener, catalyst, and communicator working across all sectors of society.

N. ***Teaching Resources to Integrate Climate Topics Across The Curricula***
https://tropicsu.org/
Our innovative educational resources, with detailed step-by-step descriptions for use in regular lectures, are designed and packaged so that teachers in schools and colleges/Universities across the world can use them to: 1) introduce examples and case studies from climate science and climate change while enhancing the conceptual understanding of topics in the sciences, mathematics, social sciences, and other disciplines, and 2) impart interdisciplinary training that is essential for research on climate change.

O. ***Yale Program on Climate Change Communication for Educators (Grade 6-12)***
https://climatecommunication.yale.edu/for-educators/
We conduct scientific research on public climate change knowledge, attitudes, policy preferences, and behavior, and the underlying psychological, cultural, and political factors that influence them. We also engage the public in climate change science and solutions, in partnership with governments, media organizations, companies, and civil society, and with a daily, national radio program, Yale Climate Connections.

P. ***Young Voices for the Planet***
https://www.youngvoicesfortheplanet.com/
The mission of ***Young Voices for the Planet*** (YVFP) is to limit and mitigate the magnitude and impacts of climate change by empowering youth, through

uplifting and inspiring success stories, to take an essential role in informing themselves, their peers, and their communities—becoming leaders and changing laws, changing minds, and changing the world.

Q. ***Alliance for Climate Education***
https://acespace.org/our-work/youth-action-network/
The Alliance for Climate Education educates young people on the science of climate change and empower them to take action.

R. ***Mocomi Kids Presents "What is Sustainability?"***
https://www.youtube.com/watch?v=gTamnlXbgqc
An informative kids' video on sustainability. For humans, sustainability is the potential for long-term maintenance of well-being, which has ecological, economic, political, and cultural dimensions.

3. By governments

A. ***How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need***
In this urgent, authoritative book, Bill Gates sets out a wide-ranging, practical—and *accessible*—plan for how the world can get to zero greenhouse gas emissions in time to avoid a climate catastrophe.

B. ***Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming***
Drawdown, edited by Paul Hawken, maps, measures, models, and describes the 100 most substantive solutions to global warming to determine if we can reverse the buildup of atmospheric carbon within thirty years.

C. ***"Six ways to remove carbon pollution from the sky"***
https://www.wri.org/insights/6-ways-remove-carbon-pollution-scky
The World Resources Institute, a leading science-based organization, iterates the methods of removing carbon pollution from the sky.

D. ***Climate of Hope: How Cities, Businesses, and Citizens Can Save the Planet***
Michael Bloomberg, former mayor of New York, and Carl Pope, former head of the Sierra Club, team up to propose how we all might solve the climate crisis.

E. ***Hot, Flat, and Crowded: Why We Need a Green Revolution—and How It Can Renew America***
A proposal by Thomas Friedman to marshal the United States' public and private resources in service of a green revolution.

F. ***This Changes Everything***
www.thischangeseverything.org
Written by Naomi Klein, this book and its companion film links climate change and capitalism to uncover the basis of environmental destruction and questions fundamental assumptions about the causes and solutions.

G. ***On Fire: The (Burning) Case for a Green New Deal***
With signature moxie, Naomi Klein takes on climate reform through a series of essays that examine where we are, how we got to this point, and where to go from here. Her indefatigable efforts and journalistic integrity continue to blaze an enduring path of hope.

H. ***Plan B 4.0: Mobilizing to Save Civilization***
www.earth-policy.org/images/uploads/book_files/pb4book.pdf
This book by Lester R. Brown explores our transition to a new energy economy based on renewable energy sources and how it will affect our daily lives.

I. ***A World at War: We're under attack from climate change—and our only hope is to mobilize like we did in WWII***
www.newrepublic.com/article/135684/declare-war-climate-change-mobilize-wwii
In this article in the *New Republic*, Bill McKibben likens our current struggle against climate change to a World War and argues that we must mobilize in a similar drastic manner if we want to turn current trends around.

J. ***Our Choice: A Plan to Solve the Climate Crisis***
In this follow-up to *An Inconvenient Truth*, Al Gore presents the solutions to climate change as being already at hand and discusses how the real breakthrough needs to come in the form of collective commitment.

K. ***Eaarth: Making a Life on a Tough New Planet***
This look at the current impacts of changing climates from longtime writer and activist Bill McKibben explores the contributing economic and cultural trends and proposes new approaches to stave off the worst of the possible outcomes.

L. ***A Better Planet: Forty Big Ideas for a Sustainable Future***
https://yalebooks.yale.edu › book › better-planet
This timely book, edited by Yale professor Daniel C. Esty, offers fresh thinking and forward-looking

solutions from environmental thought leaders across the political spectrum.

4. By businesses

A. ***Field Notes From a Catastrophe***
Writer Elizabeth Kolbert provides first-hand accounts of the impacts of climate change, conversations with climate scientists, and a look at corporate lobbying and complicit governments that stand in the way of policy changes.

B. ***Harvard Business School: Confronting Climate Change***
https://www.hbs.edu/environment/climate-change/Pages/default.aspx
HBS identifies the key industry sectors that contribute to and are impacted by climate change as well as the promising business innovations that are helping to address this problem.

C. ***Conscious Capitalism***
www.consciouscapitalism.org
Conscious Capitalism supports organizations and individuals to practice conscious capitalism, a way of thinking about capitalism and business that better reflects where we are in the human journey, the state of our world today, and the innate potential of business to make a positive impact on the world.

D. ***The Real Wealth of Nations: Creating a Caring Economics***
This book by Riane Eisler looks at economics from a larger perspective than the powers of the market, arguing that we must give visibility and value to the

socially and economically essential work of caring for people and the planet if we are to meet the enormous challenges we are facing.

E. ***The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability***
Author James Speth draws connections between the current environmental crisis and modern capitalism, and suggests that we must change the basic operating structures of our modern economy to address environmental degradation and climate change.

F. ***The Green Collar Economy: How One Solution Can Fix Our Two Biggest Problems***
Van Jones, noted TV commentator, activist, and author, makes the case in this book for embracing renewable energy sources to address two of the biggest problems facing humanity: environmental degradation and struggling economic systems.

G. ***"Cradle to Cradle Design"***
www.ted.com/talks/william_mcdonough_on_cradle_to_ cradle_design
Architect and author William McDonough explores in this TED Talk how the design of our products and buildings could change to create a sustainable future for "all children of all species for all time."

H. ***The Tactics of Hope: How Social Entrepreneurs Are Changing Our World***
Author Wilford H. Welch presents twenty-seven case studies of extraordinary social entrepreneurs who have created initiatives to address challenges in health, education, microcredit, fair trade, human

rights and social justice, disaster relief, and rehabilitation of the environment.

I. ***Reinventing Prosperity: Managing Economic Growth to Reduce Unemployment, Inequality and Climate Change***
Jørgen Randers and Graeme Maxton make a persuasive economic argument in this book that proves we can all live better lives in this finite world.

J. ***Agenda for a New Economy: From Phantom Wealth to Real Wealth***
In this book, David Korten describes his vision of the alternative to the corporate Wall Street economy: a Main Street economy based on locally owned, community-oriented "living enterprises" whose successes are measured as much by their positive impact on people and the environment as by their positive balance sheet.

K. ***The End of Growth: Adapting to Our New Economic Reality***
This book by Richard Heinberg posits that the expansionary trajectory of industrial civilization is colliding with non-negotiable natural limits and explores the resulting impact on our economic systems.

L. ***Confessions of a Radical Industrialist***
With practical ideas and measurable outcomes that every business can use, Ray C. Anderson shows in this book that profit and sustainability are not mutually exclusive; businesses can improve their bottom lines and do right by the planet.

M. ***The Necessary Revolution: How Individuals And Organizations Are Working Together to Create a Sustainable World***
Peter M. Senge, Bryan Smith, Nina Kruschwitz, Joe Laur, and Sara Schley explore in this book how individual people, in their personal lives and business, are supporting a powerful shift toward more sustainable ways of living and working.

IV. Visions of a Positive Future for Humanity

1. Shifts in values and consciousness

A. ***The Power of Now: A Guide to Spiritual Enlightenment***
A beautiful look at the power and opportunity of living in the present moment, this world-renowned book by Eckhart Tolle provides sage advice for how to stay present in the day-to-day challenges of life.

B. ***Living Deeply: The Science and Art of Transformation in Everyday Life***
This book, part of the Living Deeply project offered by the Institute of Noetic Sciences, reveals the perennial wisdom across religions, cultures, and traditions that can help you to live more fully and deeply.

C. ***Thrive: The Third Metric to Redefining Success and Creating a Life of Well-Being, Wisdom, and Wonder***
In this book, co-founder and former editor-in-chief of the *Huffington Post* Arianna Huffington calls for a reexamination of our modern standards for success.

D. ***"Less Stuff, More Happiness"***
www.ted.com/talks/
graham_hill_less_stuff_more_happiness
In this TED Talk, Graham Hill makes the argument that living with less stuff and taking up less space can lead to greater happiness and outlines three guidelines for making this happen.

E. ***The Power of Meaning: Crafting a Life That Matters***
In this book, Emily Esfahani Smith explores the idea that the search for meaning, as opposed to a search for personal happiness, is what can bring deep fulfillment in life.

F. ***Living in Gratitude: A Journey That Will Change Your Life***
This book by Angeles Arrien combines teachings from social science with simple practices and prayers to support people in cultivating a daily practice of living in gratitude.

G. ***Love Is Letting Go of Fear***
This classic guide to personal transformation by Gerald G. Jamplosky is designed to help us let go of the past and stay focused on the present as we step confidently toward the future.

H. ***Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change***
Written by George Marshall, this book provides insight gleaned from interviews with psychologists, climate scientists, and activists on both sides of the issue. Explores whether humanity can accept the research on climate change.

I. ***Forgiveness: A Time to Love and a Time to Hate***
In this two-part documentary film, writer, producer, and director Helen Whitney examines the power of forgiveness through stories that range from the intimately personal to global scales.

J. ***The Soul of Money: Reclaiming the Wealth of Our Inner Resources***
Author Lynne Twist explores our relationship with money, what it tells us about our values, and how that awareness can add value to our lives and the lives of others.

K. ***The Wayfinders: Why Ancient Wisdom Matters in the Modern World***
This book by Wade Davis explores how understanding the wisdom of the traditional cultures of the world will be our mission for the next century.

L. ***Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder***
In this influential work about the staggering divide between children and the outdoors, child advocacy expert Richard Louv directly links the lack of nature in the lives of today's wired generation—he calls it nature-deficit—to some of the most disturbing trends, such as the rises in obesity, attention disorders, and depression.

M. ***Meaning in the Second Half of Life: How to Finally, Really Grow Up***
In this book, James Hollis explores the ways we can grow and evolve to fully become ourselves when the traditional roles of adulthood aren't fulfilling, revealing a new way of uncovering and embracing our authentic selves.

N. ***Composing a Further Life: The Age of Active Wisdom***
A collection of stories, this book by Mary Catherine Bateson relates the experiences of men and women who, upon entering their second adulthood, have found new meaning and new ways to contribute, composing their lives in new patterns.

O. ***Change the Story, Change the Future***
Author David Korten believes that the stories we tell ourselves help determine our future, and that if we want a different future, we must believe that a new story is possible.

2. Shifts in individual, collective and political will

A. ***Laudato Si: On Care for Our Common Home***
In his second encyclical, Pope Francis draws all Christians into a dialogue with every person on the planet about our common home and what we can do to preserve and celebrate it.

B. ***5 Buddhist Practices to Help Tackle Climate Change***
https://www.lionsroar.com/5-practices-to-help-you-skillfully-contemplate-climate-change/

C. ***The Living Universe: Where Are We? Who Are We? Where Are We Going?***
In this book, Duane Elgin sources from the fields of cosmology, biology, physics, and his participation in psychic experiments to show how we are always connected to a living field of existence that makes up reality as we know it.

D. ***New Consciousness for a New World: How to Thrive in Transitional Times and Participate in the Coming Spiritual Renaissance***
Kingsley L. Dennis calls for a paradigm shift in human thinking in recognition of the interconnectedness of all things.

E. ***Reason for Hope: A Spiritual Journey***
Noted scientist and environmentalist Jane Goodall explores her beliefs about spirituality and moral evolution in this spiritual autobiography.

3. What a positive future for humanity might look like

A. ***Promise Ahead: A Vision of Hope and Action for Humanity's Future***
A powerful counter-narrative to dark predictions about the state of the world, this book by Duane Elgin provides a compelling blueprint for a possible future that is both hopeful and doable.

B. ***Leading from the Emerging Future: From Ego-System to Eco-System Economies***
This thought-provoking guide by Otto Scharmer presents proven practices for building a new economy that is more resilient, intentional, inclusive, and aware.

C. ***The More Beautiful World Our Hearts Know Is Possible***
This powerful and thought-provoking book by Charles Eisenstein uses individual stories to show that by fully embracing and practicing the principle of interconnectedness—called interbeing—we become

more effective agents of change and have a stronger positive influence on the world.

D. ***Dreaming the Future: Reimagining Civilization in the Age of Nature***
Through a series of short essays, Kenny Ausubel introduces readers to people around the world taking action and shifting thought paradigms to bring about a new future.

E. ***Active Hope***
Active Hope, by Joanna Macy and Chris Johnstone, shows us how to strengthen our capacity to face the current crises so that we can respond with unexpected resilience and creative power through processes informed by an intersection of spirituality, psychology, and science.

F. ***Wendell Berry on Climate Change: To Save the Future, Live in the Present***
http://www.yesmagazine.org/issues/together-with-earth/wendell-berry-climate-change-future-present
Noted poet and farmer Wendell Berry looks at the challenges we face and why we need to live more firmly in the present moment.

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It has been a dream of mine to connect with a business school which would create cutting edge courses on the climate emergency. My hat goes off to Liz Maw, president of

the Presidio Graduate School in the San Francisco Bay area, for taking on this challenge and driving the execution of the program. And to Alyson Mike, a former middle-school science teacher who is brilliant in the design of K-12 educational programs. It is now a dream team that has made the Presidio Graduate School's K-12 Climate Education for All a reality. I am honored to be a member of such a committed and competent team.

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San Rafael, California

About the Author

Image courtesy of Will Parrinello, Mill Valley Film Group

Wilford Welch is a systems thinker and futurist. He has been exploring the driving forces impacting our world for over five decades—as a US diplomat in Asia; as an economic development and business consultant in Asia, the Middle East, Europe, and the US; as the publisher of a world affairs magazine that appeared in 26 countries in six language editions; and as the leader of educational trips to numerous countries and cultures.

For the past two decades, Wilford has focused on the following three deeply entangled challenges the world faces: the global sustainability crisis, the global warming crisis and the global climate crisis. For the past two years he has

been working with the Presidio Graduate School in San Francisco to develop a national online program to teach climate change essentials to K-12 teachers in all subject areas and grade levels throughout the United States. The 2021 edition of his book is the primary text, and he is the lead teacher. https://www.presidio.edu/climate-change-k12/

Wilford developed future planning scenarios for a number of multinational corporations, including Citibank and Toyota. He was the leader of a research team in 1992 that developed The Wealth of Nations Index using 63 variables to measure each nation's economic, information technology, and social well-being. In 2008, he was the author of the book *The Tactics of Hope: How Social Entrepreneurs Are Changing Our World.*

Wilford has also been deeply involved in outdoor and environmental education, including being chair of the board of the NatureBridge Golden Gate campus and of the National Outdoor Leadership School (NOLS). In 1994 Wilford led the support team on Mount Everest of NOLS instructors, which removed 5,000 pounds of trash off the high camps and introduced the notion of "Leave No Trace" to Everest mountaineering.

Over the past decades, Wilford has created and led several large conferences exploring the issues addressed in this book, including two Quest for Global Healing gatherings in Bali, Indonesia, in 2004 and 2007 for over 1,000 participants from forty countries, and the Beyond Sustainability conference that took place at the Kilauea volcano in Hawaii in 2010. Wilford has a BA from Yale, a law degree from University of California, Berkeley, and a PMD degree from the Harvard Business School. He lives in Sausalito, California. Visit him at www.WilfordWelch.com

What will the world look like in 2050 if we take action to get global warming under control?

What will the world look like if we don't?

Imagining a world in which these two scenarios play out, *In Our Hands: A Handbook for Intergenerational Actions to Solve the Climate Crisis* looks at the individual and collective actions we must take to shape our future and avoid environmental and societal collapse.

At this crucial point in time, *In Our Hands* is more relevant than ever. Packed with information, ideas, and resources, this book inspires us to move from concern to action. The choice is literally in our hands. By collaborating across generations, we can build a more resilient and healthier world.

Addressing the threat of global warming and getting all of humanity to live with one another and the natural world in harmony is very possible. In this book, Wilford shows us the way.

— DESMOND TUTU, NOBEL PEACE PRIZE LAUREATE

Wilford Welch has been exploring the driving forces impacting our world for more than five decades as a U.S. diplomat, an economic development consultant, a professor of international business management, and publisher of a world affairs magazine. He led the research team that developed the Wealth of Nations Index and is the author of *The Tactics of Hope: How Social Entrepreneurs Are Changing Our World*. A longtime steward of the natural world, Welch participated in an expedition on Mount Everest that removed 5,000 pounds of trash off the high camps and introduced the notion of "Leave No Trace" to Everest mountaineering. He lives in Sausalito, California.

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