A Brief Introduction to

Climate Change

Presented by Bloomsburg University Citizens' Climate Lobby

The Problem Within The Problem

Because climate change is a specialized problem, there is a lot of room for misunderstanding when non-specialized audiences (like us) try to understand it. This problem within the problem appears in two common forms:

1) average citizens consign the matter to the scientific community and give up trying to understand it themselves, or

2) the discussion is muddied by misinformation from bad actors and interested parties.

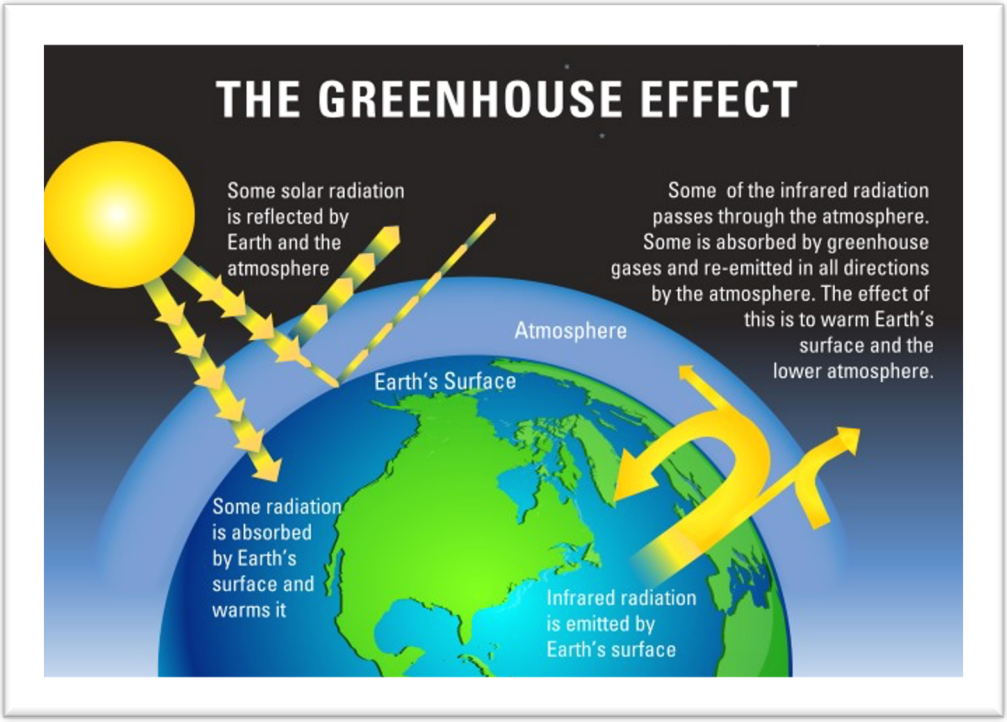
In either case, citizens become disconnected from a public issue that imposes itself directly upon their lives and futures. Nationally, the **Citizens' Climate Lobby** works to overcome these obstacles and create the conditions for democratic deliberation and action.

In a democracy, citizens need to understand the problems they face so that they can respond appropriately. That response may take a number of different forms: changes in lifestyle, phone calls to representatives, letters to the local newspaper, donations to advocacy groups, participation in relevant clubs and organizations (like CCL), or even street activism. Social change never occurs unless the people demand it, and perhaps no other problem demands social change as urgently or on as large a scale as this one.

Our intent here is to introduce the problem of climate change as clearly (and briefly) as possible, and then to offer some suggestions for further learning and action.

The Basic Mechanics

By this point, most people are familiar with the basic mechanics of climate change. Though primarily composed of nitrogen and oxygen, earth's atmosphere is also host to ***greenhouse gases*** such as carbon dioxide, methane, nitrous oxide, and water vapor. These gases are important to our wellbeing, because they retain the solar energy that keeps the planet warm and wet and able to sustain life—like a greenhouse.

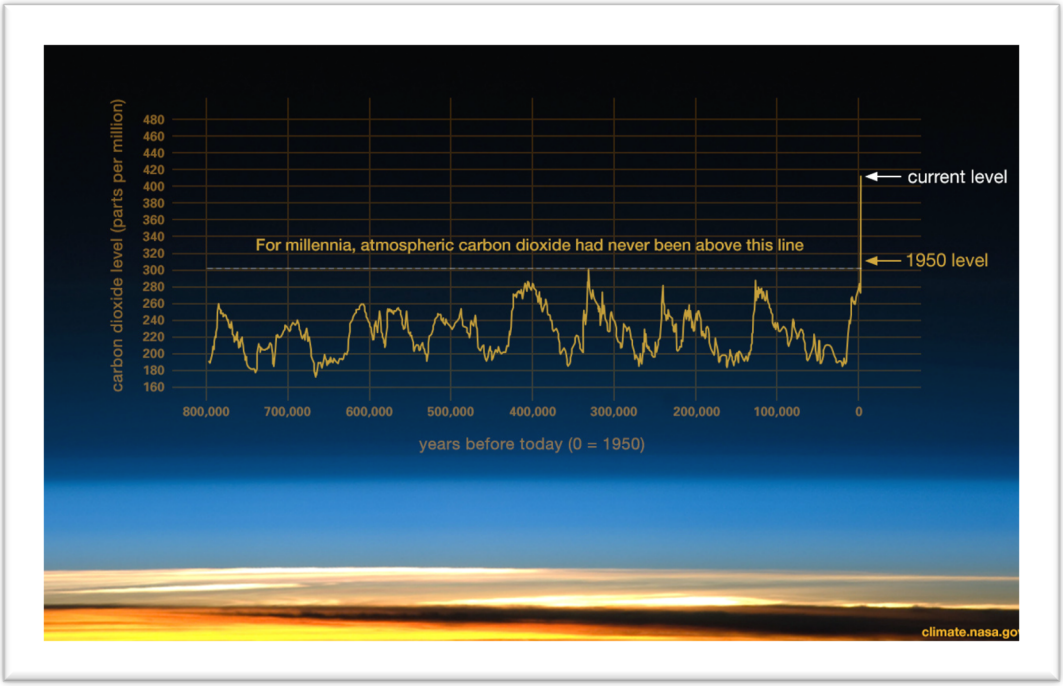


But problems arise when greenhouse gas levels begin to climb. The higher their concentration in the atmosphere, the more solar radiation they capture, and the warmer the planet gets. If the earth gets *too* warm, it will become a very inhospitable place for human beings to live.

Scientists are raising the alarm today because this is exactly what's happening.

An Historic Outlier

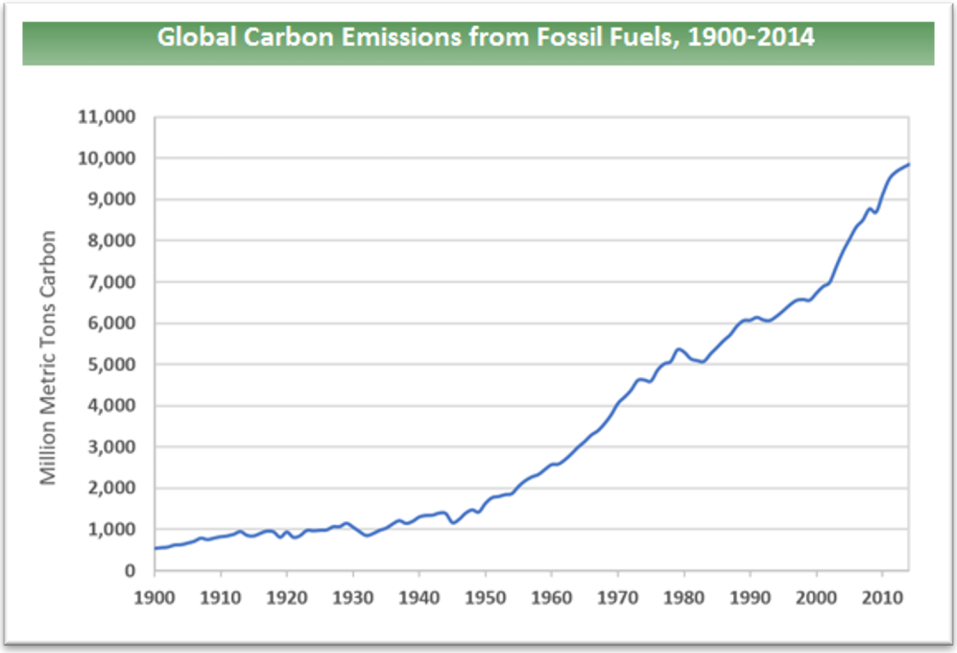
Though the earth has always gone through cycles of warming and cooling, at times dramatically, these have always occurred slowly—spread out across tens of thousands of years. Today, scientists are focused on the *pace* of change, which is moving far faster than anything that we've seen in the past. Using ***ice cores***—read sort of like tree rings—they can track atmospheric carbon levels and temperatures across the ages and follow the correlation between. They've found that, over the past 800,000 years or so, atmospheric carbon had hovered around 250 parts per million (ppm), with modest rises and falls, and temperatures had stayed comparatively mild. At no point did the figure ever rise above 300 ppm, and so the earth was primed for human life.



In the 20th century, however, human industrial life began to push us off the beaten path. Around 1950, atmospheric carbon passed 300 ppm for the first time. In 1990, it passed 350. In 2015, it passed 400. Today (in September 2020) we find ourselves at **415 ppm** and rising. In seven short decades, earth's atmosphere has changed more than it had at any point in the previous 800 millennia, with intensified droughts, wildfires, hurricanes, and floods occurring in consequence.

An Unnatural Cycle

The sharp, unprecedented rise in atmospheric carbon during the industrial 20th century is not a coincidence. It is directly traceable to increases in greenhouse gas emission by human activity during the same period.

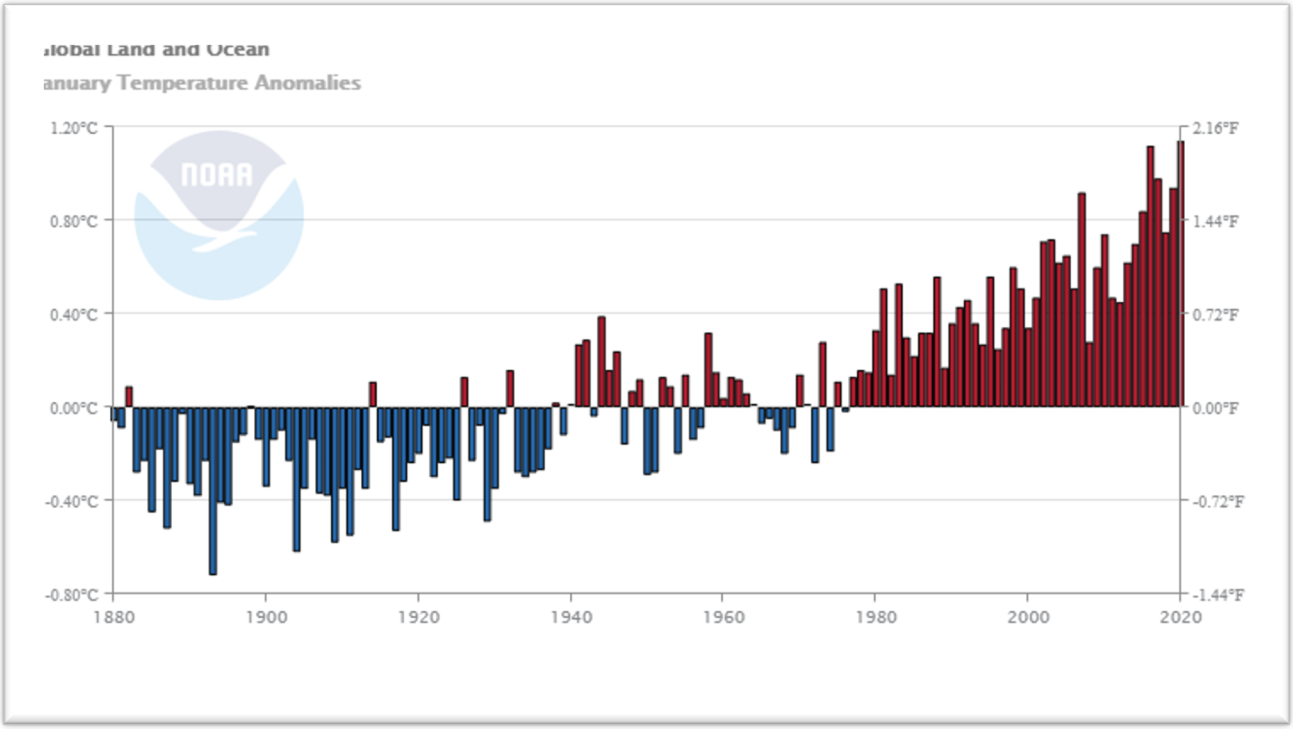


As the earth's population has increased and economies have modernized—especially in western "developed" nations— fossil fuels have provided the energy that has driven the process. Consequently, carbon that had been stored within the earth has been converted into a gas and emitted into the sky on an enormous scale.

Now, as massive wildfires consume forests and Arctic permafrost melts, even more carbon is being released—a phenomenon that scientists refer to as a ***feedback loop***. A warmer atmosphere creates the conditions for greater emissions, which warm the atmosphere, which creates the conditions for greater emissions, and so on. If the cycle isn't halted, it accelerates.

Our Hot Future

The last time our atmosphere contained as much carbon as it does now was several million years ago, in the Pliocene Epoch, when the average temperature was four degrees (Celsius) higher and the oceans were 60 feet deeper. Today, carbon levels have outpaced global temperatures and their effects, but the temperatures are rising fast to catch up. This explains why the last twenty years have been the warmest in human history, and it's clearly predictive of a hotter, more combustible future to come.

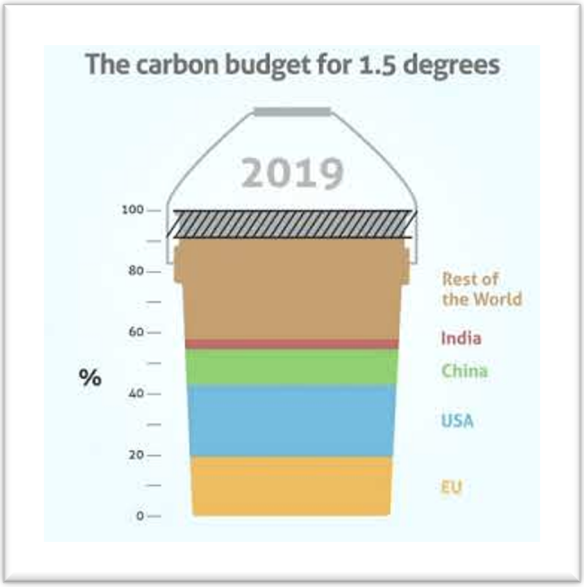


Though 2020 is likely to end up the hottest year we've ever experienced, it is also likely to be the coolest year that we will ever experience again. That's a frightening prospect.

Living on a Budget

In 2018 and 2019, following the release of major reports from the International Panel on Climate Change and the National Climate Assessment, media outlets began to report that human beings had only about one decade to decarbonize on a colossal scale in order to stave off irreparable damage.

Essentially, the IPCC and NCA reports observed that, because we are able to measure carbon emission, carbon concentration, and temperature rise over time, we are able to calculate how much carbon we can afford to emit before reaching certain temperature thresholds. They refer to this as our ***carbon budget***, and often imagine it as a bucket that we are in the process of filling:

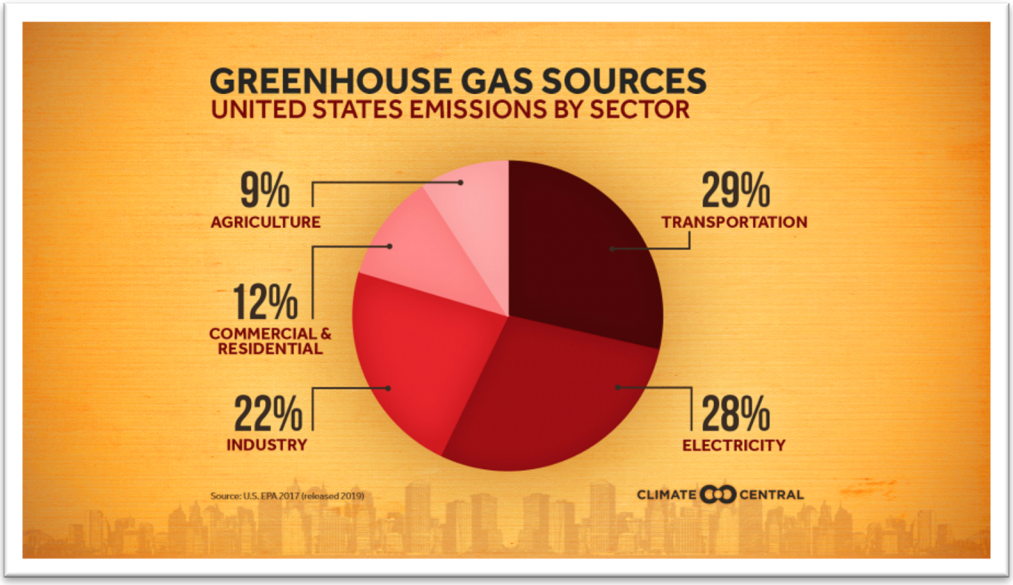


As of 2019, the combined carbon emissions of the world's nations—especially the USA, the EU, China, and India—had filled approximately 91% of our 1.5 degree budget, leaving only 9% to be divided between all of the nations of the globe in order to meet the target set by the Paris Climate Agreement. Therefore, they wrote, we need to start cutting emissions quickly and drastically if we want to keep from overflowing the bucket. Otherwise, we will push the world beyond the 1.5 degree threshold and into greater, more destructive warming.

With each tenth of a degree of additional warming, we can expect to see increasingly devastating effects. The likely scenarios are explored at length in David Wallace-Wells' bestselling 2019 book, *The Uninhabitable Earth.*

So What to Cut?

Human industrial activity contributes to climate change in many ways, but the primary drivers are divided across five key categories: transportation, electricity, industry, commercial and residential expenditures, and agriculture:



Experts are exploring ways to cut emissions in each area, including mass electrification and conversion to renewable energy sources, sustainable urban planning, and even the development of plant-based meat products. They are also working to adapt our infrastructure to changing conditions and experimenting with means of ***carbon capture and sequestration***—technologies for extracting carbon from the atmosphere and storing it underground.

In order to prevent the worst effects of climate change, we need to reach net zero emissions by 2050, which is a very difficult thing to do. That's why we need to be moving fast and making strong incremental progress now.

The Civic Response

Because of the enormity of the problem and the scale of the adaptation, climate change can leave people feeling depressed and disempowered. But, like other serious challenges that we have faced in the past—two World Wars and a Great Depression, for example—the climate crisis presents us with an opportunity to rise to greatness. If we can create the collective will to address the problem before it's too late, we can still prevent catastrophic warming, reinvigorate our public institutions, develop sustainable energy grids and jobs, live out our lives in happiness, and provide our children with a future in which they can thrive.

That civic response depends upon many millions of people informing themselves on the particulars of the issue, examining their personal lifestyles, prioritizing efficiency, communicating with their elected representatives, and voting for candidates who take the crisis seriously. At this late point in the game, we can cut our emissions and preserve a livable planet only if everyone signs on for aggressive collective response. That will require an unprecedented volume of civic action, driven by active citizens—everyday people who care.

For more resources and information, we invite you to visit our parent site, **citizensclimatelobby.org**. There you can learn more about the climate crisis, how to get connected to a local chapter, what to do to erase your own carbon footprint, and why you should do all of these things as quickly as possible. You can also read up on the **Energy Innovation and Carbon Dividend Act**, the legislation that CCL has proposed for cutting America's carbon emissions by 40% over 12 years.

Though climate change is overwhelming, we don't need to sit helplessly by. Please feel free to contact us through **bloomccl@gmail.com**, visit our site at **bloomccl.org**, follow us **@bloomccl** on Twitter, and review each of the recommended reads listed below. Thanks!

Anna E. Sassaman

Ryan J. Williams

Nancy C. Bucci

Autumn J. Gunn

Claudia Frantz

Eric C. Miller

Executive Board, Bloom CCL

Recommended Reading:

Kerry Emanuel, *What We Know About Climate Change* (Cambridge: MIT Press, 2018).

Christina Figueres and Tom Rivett-Carnac, *The Future We Choose: Surviving the Climate Crisis* (New York: Knopf, 2020).

McKenzie Funk, *Windfall: The Booming Business of Global Warming* (New York: Penguin, 2015).

Amitav Ghosh, *The Great Derangement: Climate Change and the Unthinkable* (Chicago: University of Chicago Press, 2017).

Paul Hawken, *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming* (New York: Penguin, 2017).

Katharine Hayhoe and Andrew Farley, *A Climate for Change: Global Warming Facts for Faith-Based Decisions* (New York: Faithwords, 2009).

Hope Jahren, *The Story of More: How We Got to Climate Change and Where To Go From Here* (New York: Vintage, 2020).

Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Picador, 2016).

Bill McKibben, *The End of Nature* (New York: Random House, 2006).

Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Climate Change* (New York: Bloomsbury, 2011).

Varshini Prakash, *Winning the Green New Deal: Why We Must, How We Can* (New York: Simon and Schuster, 2020).

Nathaniel Rich, *Losing Earth: A Recent History* (New York: Farrar, Straus, and Giroux, 2019).

David Wallace-Wells, *The Uninhabitable Earth: Life After Warming* (New York: Tim Duggan Books, 2019).

Images courtesy of the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the Global Carbon Project, and Climate Central.