

The Case
for
Climate Mobilization



**THE CLIMATE
MOBILIZATION**

This document explains the reasoning that motivates [The Climate Mobilization](#) (TCM), a campaign to save civilization launched in New York City on Sept. 20th, 2014. TCM's primary organizing tool is the [Pledge to Mobilize](#), a one-page document calling for a WWII-scale mobilization to restore a safe climate.

While “The Case for Climate Mobilization” reflects the thinking of TCM’s leadership, it is not an official organizational policy platform. When you sign the Pledge to Mobilize, you are only endorsing the text of the Pledge — not the content of this essay.

Below, you will find a series of arguments illustrating why a WWII-scale climate mobilization is our only choice if we wish to prevent runaway global warming and catastrophic climate change while preserving our democracy.

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This report was written by Ezra Silk, with Margaret Klein Salamon. Special thanks to Michael Hoexter and Philip Sutton for their invaluable assistance. For more information about the Climate Mobilization, visit www.theClimateMobilization.org.

★ ★ ★ THE PLEDGE TO MOBILIZE ★ ★ ★

Climate change is causing immense human suffering and damage to the natural world. It threatens the collapse of civilization within this century. Confronting this crisis is the great moral imperative of our time.

I CALL ON THE UNITED STATES GOVERNMENT TO:

- 1. Immediately commence a social and economic mobilization to restore a climate that is safe, stable, and supportive of human civilization.** This heroic campaign shall be carried out on the scale of the American World War II home front mobilization, and will require hard work and shared sacrifice from all Americans.
- 2. Reduce our country's net greenhouse gas emissions 100 percent by 2025** and implement far-reaching measures to remove greenhouse gases from the atmosphere.
- 3. Enlist tens of millions of Americans** in efforts to rapidly expand our carbon-neutral energy and agricultural systems, conduct groundbreaking research, and implement large-scale adaptation measures. As in WWII, full employment will be achieved.
- 4. Conduct this mobilization in accordance with the Constitution** and ensure that the essential needs of the civilian economy are met during this time of transition.
- 5. Establish the following imperatives as our nation's top foreign policy priorities:**
A 100 percent reduction of global net greenhouse gas emissions at wartime speed, and the deployment of comprehensive measures that remove greenhouse gases from the atmosphere until a safe climate is restored.

I will enlist Americans from all walks of life in this campaign. If sitting politicians fail to mobilize, we will elect leaders with the courage and foresight to enact these demands.

I WILL:

- I. Vote for candidates — on the local, state, and national level — who have signed the Pledge to Mobilize** over those who have not.
- II. Donate time and money exclusively to political candidates who have signed the Pledge.**
- III. Mobilize my skills, resources, and networks to spread** the truth of climate change and the hope of this movement to others. When I spread the Pledge to Mobilize, I will do so with respect, truth, focus and courage.

Thus I pledge to mobilize, in defense of civilization and the natural world.

Section I: What is a Climate Mobilization?

Mobilization during WWII.

- Mobilization is an emergency restructuring of a modern industrial economy, typically accomplished at rapid speed in order to fight a war. It involves all citizens and impacts all areas of society. It is a nothing less than a government-coordinated social and industrial revolution.
- The U.S. has fully mobilized the economy twice, during World War I and World War II.
- In both cases, the main problem faced by the U.S. was how to rapidly convert a 20th-century capitalist economy into a war economy. Instead of primarily producing consumer goods, workers and business needed to produce weapons and other munitions on a huge scale in order to defeat the enemy.
- Poor planning, inadequate economic controls, and a lack of preparedness in World War I caused massive inflation, chaotic supply chain breakdowns, and persistent war-time profiteering. Still, the American production effort in WWI decisively contributed to the defeat of the Central Powers.
- Experience in WWI demonstrated that greater planning, improved record-keeping, and stronger economic controls were necessary to complete a more successful mobilization.
- The World War II home front effort is considered the classic example of a successful economic mobilization.

Denial and Lack of Preparation Following World War I

- Following World War I, the war munitions industry in the United States languished, as the armistice and high taxes wrought havoc on profits. In the '30s, as the Nazis engineered a devastating new form of warfare, *Blitzkrieg*, enabled by the mass-production of modern tanks and bombers and a total war-time mobilization of the German economy, the U.S. armaments industry was in a pitiable state, characterized by low output and old-fashioned, leisurely production techniques.

- Meanwhile, the U.S. Army, neglected for years in the aftermath of World War I, was “the smallest, worst-equipped armed force of any major power,” according to *Life* magazine. In 1939, the U.S. Army ranked 17th in the world, just between Portugal and Bulgaria.
- The Axis powers, in particular Germany, had already undertaken an economic war mobilization. Their populations, especially in Germany, had been whipped up by fascist propaganda into enthusiastic support for war as a means to avenge a mixture of historical and fabricated indignities. To match and surpass the Axis war production machines, major changes were in order — disruptive interventions in the normal functioning of the society at large.
- In terms of armaments production capacity, the primary problem facing the U.S. was that its large but ultimately finite supplies of labor and raw materials were deployed primarily in peacetime production. In factories across the country, Americans working on assembly lines were transforming raw materials such as oil, rubber, and steel into consumer goods such as private automobiles. But the U.S. would not be able to defeat the Nazis with a fleet of Studebakers. The badly needed ramping up of war-production would require a forced cut-back in the consumption of consumer goods and a transfer of workers from peace-time production to war industries and the military.
- The necessary mobilization was delayed by pervasive denial. During the ‘30s, as the Axis Powers re-armed and invaded country after country, a powerful isolationist movement persuaded most Americans to ignore the gathering collapse of the international order.

Mobilization the Home Front During World War II

- Though the general public and the business community were largely unprepared to face down the Axis powers, by the early ‘40s, it was clear to some high-level U.S. government officials that the entire American economy would have to be geared toward war production as quickly as possible in order to avert disaster. This would necessarily entail large-scale, disruptive interventions in the normal functioning of the society at large.
- Despite the powerful isolationist movement, in the two years preceding the Pearl Harbor attacks, the federal government established several war-time boards and commissions and appropriated billions of dollars toward rearmament.

- After the Dec. 7, 1941 attack on Pearl Harbor, the mood of the country very suddenly flipped from isolationism to mobilization. Once it became clear that war was inevitable, most Americans enthusiastically participated in a rapid transformation of the national economy and society.
- Conservative business titans joined labor leaders and liberal bureaucrats — after years of bitter acrimony over the New Deal — to redirect and refocus America’s industrial might against the Nazis. Factories rapidly converted from producing consumer goods to producing tanks, guns, bombs, and planes — shattering all historical records for war production.
- Young men sacrificed their lives fighting for their country. Women surged into factories and planted 50 million “Victory Gardens” that supplied 40% of America’s vegetables during the war. Scientists and universities pumped out research on behalf of the war effort — leading to huge technological and intellectual breakthroughs. More than 10% of the population relocated, often across state lines, in order to find a “war job.” All hands were on deck.

The Extraordinary Conversion of the Automobile Industry

- This transition from consumer production to war production was both demanded and supported by the federal government. In early February 1942, the government banned private automobile production and essentially shut down the enormous private automobile industry for the remainder of the war, in order to utilize its tremendous capacity to produce war materiel. This ban was enacted despite initial protests from auto executives, who represented “the largest concentration of industrial power in the world,” according to Lester Brown.
- By the end of 1942, “the industry that once built 4 million cars a year was now building three fourths of the nation’s aircraft engines, one half of all tanks, and one third of all machine guns,” according to historian Doris Kearns Goodwin. This huge transformation was beneficial for the auto industry, which continued to earn profits and grow production capacity while contributing to the war effort.
- This conversion process occurred throughout the entire economy. The government banned or restricted activities that did not contribute to the war effort, such as the production of civilian refrigerators, vacuum cleaners, phonographs, and washing machines. It distributed abundant contracts to

corporations, enabling them to produce armaments instead of consumer commodities in either existing or new factories.

The Federal Government's Role

- President Franklin D. Roosevelt established 158 wartime agencies to direct the war effort. These agencies were vested with broad powers to plan and set priorities for the entire economy. FDR often selected business and community leaders to head these agencies, balancing the needs and concerns of many constituencies.
- The federal government poured money into the war effort. It employed more than 10 million Americans directly, through the vastly expanded military. The government also distributing copious war production contracts, accruing huge budget deficits in the process. In 1939, defense spending made up about 1.4 percent of the Gross National Product (the contemporary indicator of national economic activity). At the peak of the war effort in 1944, defense spending constituted about 45 percent of GNP.
- The enormous increase in federal government spending caused the greatest industrial building boom in human history. After more than a decade of depression, unemployment was quickly wiped out, dropping from 14.6 percent to 1.9 percent in five years time. Some 17 million jobs were created, wages grew 55 percent, and corporate profits boomed.
- Unlike WWI, inflation was successfully contained. The federal government's Office of Price Administration controlled prices in order to minimize inflation and prevent price-gouging. During the war, the American business community overwhelmingly supported price controls.
- The National War Labor Board set wages, in order to minimize inflation. The majority of labor unions also pledged not to go on strike during the mobilization.
- In order to maximize the amount of real resources channeled toward the war effort, the federal government encouraged saving and discouraged wasteful resource consumption. Citizens were called on to invest in war bonds. These bonds both helped to finance the war effort and created a secure savings instrument for regular Americans, while also causing a significant drop in demand for consumer goods.

- Taxes were also increased significantly, particularly on high earners, who were required to pay a steep “Victory Tax,” the most progressive tax in American history. The income tax rate on the highest earners was 94% in 1944. A tax on excess corporate profits provided 25% of revenues during the war.
- The federal government instituted a rationing program in order to ensure an equitable distribution of scarce resources on the home front. Gasoline, coffee, butter, tires, fuel oil, shoes, meat, cheese, and sugar were rationed, and every American received a fair share.
- Equal access to jobs and scarce resources was a major component of the mobilization. The combination of full employment and progressive taxation caused income inequality to plummet. Gains were made in social equality, as well, with women and African-Americans making particularly notable gains.
- The government also called on Americans, and mobilized local communities, to hold scrap drives to recycle tin, used tires, silk stockings, cooking fats, and newspapers. In 1943, scrap drives provided more than 50% of the rubber produced in the U.S. A national speed limit — or “Victory Speed” — of 35 miles per hour was imposed, and pleasure driving and automobile racing (including the Indy 500) were banned, in order to conserve fuel, and primarily, rubber.
- The federal government also partnered with universities and scientists to conduct incredible research and advance scientific knowledge in many areas, including the developments of radar and sonar technologies, code breaking, computing, and the blood transfusion procedures. The Manhattan Project, which developed the nuclear bomb and nuclear technology, is the most notable and ambitious research and development effort in history. Though destructive, violent, and morally suspect, the Manhattan Project illustrates the incredible things that are possible when the scientific community focuses on a common problem.
- However, during WWII, the U.S. also placed more than 100,000 Japanese-Americans into internment camps. The government was worried that these individuals were spies for the Japanese, when in fact they were loyal Americans, many of whom longed to fight for the United States. This was a terrible, inhumane mistake, and an illustration of the need to be vigilant about abuses of power during a mobilization. The Climate Mobilization is not calling for a curtailment of civil liberties for any ethnic or class group. On the contrary — in light of the mistreatment of Japanese-Americans during WWII, the Pledge to

Mobilize calls for the Climate Mobilization to be undertaken in accordance with the Constitution.

Key Takeaways:

- Mobilization is not an indiscriminate use of government power. It is a specific economic approach that directs the collective force of industry away from consumerism and toward a singular national purpose. Profit-seeking behavior is either subordinated to or channeled toward the national mission.
- It is characterized by large-scale deficit spending (spending more than taxes collected), sweeping command-and-control regulations, increased taxation in order to control inflation and re-direct private sector activity, and strong government controls over the distribution of raw materials and basic goods. Although corporations can play a constructive role in mobilization, they do not drive the change process. The government does.
- Mobilization is therefore incompatible with the dominant economic paradigm today (alternatively called neoliberalism, trickle-down economics, or unregulated capitalism), which is ideologically biased toward keeping corporations in the driver's seat of the economy.
- Mobilization has many benefits beyond the driving one (saving civilization and the natural world), including increased equality, full employment, and increased attention to the importance of cultivating every citizen.
- If you accept the need to *rapidly* — not gradually — convert an economy, mobilization is clearly the most effective, egalitarian, and sensible approach.

What would a Climate Mobilization look like?

A Climate Mobilization will use many of the tools of previous wartime mobilizations toward the peaceful goal of preserving a habitable climate for humanity and saving civilization and the natural world from ecological collapse.

Rapid, Coordinated Industrial Transition

- As in war-time mobilizations past, the considerable spending power of the federal government will be used to mobilize human and material resources toward the creation of zero-net-emissions energy, transportation, and agricultural systems.
- The government will also enlist families, cooperatives and businesses in this immense building project.
- At the beginning of the mobilization, mission-critical sectors of the economy will grow rapidly, while other emissions-intensive sectors wedded to fossil energy will sharply decline.
- By the end of the mobilization, all factories, equipment, and vehicles will emit zero net emissions. A new, comprehensive greenhouse gas removal sector will be up and running.

Full Employment

- As a result of this planned national building project, full employment will be achieved in those sectors of the economy associated with emissions reduction and removal — construction, manufacturing, agriculture, forestry, energy efficiency, and related technical disciplines.
- The storage of carbon in the soils and in growing plants and trees to reduce atmospheric warming potential will be another key objective, creating employment and encouraging sustainable farming and forestry practices.
- In addition to direct employment by governments, private businesses and cooperatives will either work directly for government in exchange for payment as government contractors or work for other individuals and businesses. Markets will continue to exist but will be regulated to create progressively lower environmental-impact goods and services.

- The need for professional, skilled and semi-skilled labor drives the government and society to place a greater value in meeting citizens’ basic needs and providing them with education and job training.
- For those who are either unable to participate directly in these sectors or are laid off as a result of the shift away from fossil fuels, a government full-employment program with job training will be instituted as a means of both maintaining social stability and providing dignity and decent incomes to all working-age Americans.
- The establishment of a universal basic income should also be explored as a means of bolstering equality and maintaining economic stability throughout the mobilization.

Rapid Reductions in Energy and Materials Use

- Political leaders will call on Americans to conserve energy and other natural resources, by means of carpooling, telecommuting, cycling, electric public transportation, scrap drives, and home gardening.
- A fair-shares rationing system may also be necessary in order to both sharply cut emissions and channel scarce resources to the national net-zero carbon building project. A competently administered rationing system would likely provide the most egalitarian means to sharply reduce energy demand — and could establish a necessary spirit of shared sacrifice, equality, and cooperation during this disruptive transition period.¹

¹ A carbon rationing system has been advocated, but not implemented, in the United Kingdom. In 2011, the U.K. House of Commons All Party Parliamentary Group on Peak Oil released a report advocating a system of Tradable Energy Quotas (TEQs). TEQs are a form of modified energy rationing, or “personal carbon trading” — a concept that has been explored in European policy discussions since the mid-90s. In the proposal, the U.K. government would set an annual carbon budget that progressively declines every year. Each year, the government would distribute equally-sized, free, carbon “entitlements” — or allowances — to every adult through an electronic system. If individuals do not wish to use the entirety of their carbon allowance, they could sell the remainder to others, earning a profit. The size of the allowances would decline annually. In the 2011 TEQs proposal, about 40% of the annual carbon budget would be distributed to adults in the form of equal, per capita, allowances. The government would sell the remaining 60% to other energy users such as businesses.

As opposed to a carbon tax, which sets a price and allows market actors to determine the level of emissions reduction, the TEQ system guarantees a given level of emissions reduction, since it sets a firm national emissions budget. In a foreword to the report, Committee Chairman MP John Hemming wrote that Tradable Energy Quotas “provide the fairest and most productive way to deal with the oil crisis and to simultaneously guarantee reductions in fossil fuel use to meet climate targets.” The report also found that, “While it is tempting to think of a tightening cap on emissions as a solution in itself, the true challenge is to transform our society so that it can thrive within this limit.”

- Resource and energy efficiency standards will be mandated throughout the economy in order to substantially cut waste in the building, industrial, and transportation sectors.
- The government will supplement the conservation drive with substantial investments in bike lanes, electric vehicle charging stations, electric buses and railroads, community gardens and farms, and other public goods that will facilitate and enhance the national conservation effort and accelerate the transition to a net-zero emissions America.
- Bans on certain industrial processes will be necessary. One of the most important will be a ban on new coal-fired power plants. Federal bans would also likely be placed on new airport construction, offshore oil drilling, hydro-fracturing, and all fossil fuel exploration. A broad federal ban could also be placed on all new major capital investment in fossil fuel uses.
- Strong regulatory action will likely be needed to both shut down many existing coal-fired power plants, and ground a large proportion of air travel as the aviation industry is down-sized and converted to zero net emissions technologies.
- The government will also curtail a large proportion of meat production, which is a leading cause of global greenhouse gas emissions. The livestock sector, in general, including the dairy industries, will need to be comprehensively decarbonized, meaning that livestock production will be considerably curtailed, and agricultural methane emissions will be captured or otherwise contained. The livestock industry is a greater source of global greenhouse gas emissions than transportation.²

Progressive Taxation, Carbon Pricing, and Price Controls

- The inflationary potential of the massive amounts of government spending required for the mobilization will be counterbalanced by increased taxation in order to dampen demand for consumer goods and services. Higher taxation levels, especially on those able to afford it, will be introduced in an effort to control and direct spending in the economy, keep price levels stable and reduce demand for high-emitting activities like luxury travel.

² Bailey et al. (2014). [*“Livestock - Climate Change’s Forgotten Sector: Global Public Opinion on Meat and Dairy Consumption”*](#), Chatham House: 2014.

- Taxing greenhouse gas emissions in a way that does not harm society’s most vulnerable people or unfairly disadvantage vulnerable businesses will likely be one means of directing economic activity towards a net-zero emissions America, while also holding down inflationary pressures.
- If taxation is insufficient to prevent runaway inflation, direct price controls may be administered, as well.

Vast Government Spending and Public Investment

- Using revenues from new taxation, Climate Mobilization bonds, and money created for the public purpose, the federal government will invest large amounts of money in a variety of private sector contracts and public works projects that will accelerate the energy transition, generate economic activity, and provide employment for millions of Americans.
- Independent projections indicate that a global clean energy transition would cost somewhere between \$200 billion and \$5 trillion annually, depending on the scope and speed of the effort.³ If the Climate Mobilization ultimately requires financing on a scale similar to the WWII mobilization, government spending could reach up to \$7.5 trillion dollars annually, or about 45% of our \$17 trillion annual GDP — the peak defense spending ratio reached in 1944.
- In World War II, the government financed 26% of the war effort through the “printing press,” or money creation, with the majority of the created money spent at the beginning and end of the mobilization. Tax revenues financed 47% of the war effort, while the war bond program financed 27%.
- The end of ethanol and fossil fuel subsidies will also free up financial resources that can be invested in the Climate Mobilization building project.

Research & Development

- Engineering studies indicate that we already possess the technology available to transition to net-zero emissions. However, new innovations and technologies will allow us to reach this goal faster, remove greenhouse gases from the atmosphere more effectively, and better adapt to the ways the climate has already changed.

³ Wiseman, John. [*“Pathways to a Zero-Carbon Economy: Learning from Large-Scale De-Carbonisation Strategies”*](#), *Visions & Pathways Project*, March 2014.

- Mobilization will make climate change the superordinate national research priority and focus the attention of government laboratories, universities, and technology companies on shared goals. In WWII, many scientific fields made huge strides forward due to the incredible fruits of collaborative, goal-driven work.
- Even if global emissions stopped today, the concentrations of the greenhouse gases in the atmosphere would still be high enough to cause a climatic catastrophe. A large quantity of excess greenhouse gases must be removed from the atmosphere — a project that will require the creation of a vast greenhouse gas “drawdown” sector. Current technologies to remove greenhouse gases from the atmosphere are relatively new and can only remove carbon dioxide. Research is needed to improve existing carbon dioxide removal technologies and also to establish methods that can remove other greenhouse gases — such as methane — from the atmosphere.
- Renewable energy sources such as wind and solar power suffer from issues of “intermittency” — meaning they are most effective in producing power while the wind is blowing or the sun is shining. Although studies show that an integrated and diversified system of wind, water, and solar renewable energy technologies can reliably meet large-scale electricity needs on a more or less continuous basis, research is needed to enable these sources to store power in batteries for longer periods of time. Research into improved battery power storage in electric cars is needed, as well.

Foreign Policy

- The State Department, Executive Branch, and other federal agencies will use diplomacy, technology transfers, aid, and other non-violent means of persuasion to enlist the world community in this war-like effort to save civilization.
- Since no national effort to respond to the climate crisis can succeed without a simultaneous global effort, the United States will make the emergency elimination of global net greenhouse gas emissions its top foreign policy priority. During WWII, realizing that our fates were intertwined, the United States supplied a huge amount of the weapons and materiel — created through mobilization — to the Soviet Union and England. In this mobilization, America will use technology transfers, debt forgiveness, grants, loans, and other measures to enable our allies to rapidly remove greenhouse gases from the atmosphere and transition to carbon neutrality in the fight for civilization.

- This global, non-violent mobilization will ultimately seek to eliminate global net greenhouse gas emissions as quickly as possible, remove greenhouse gases from the atmosphere until a safe climate is restored, and establish a zero-waste global economy.
- This global effort will also use humane, voluntary family planning measures such as birth control and increased education to stabilize the human population at levels that the earth can support long into the future.
- The United States Federal Government will seek multilateral, total nuclear disarmament, negotiating an international agreement that criminalizes the deployment, testing, and possession of nuclear weapons. Climate change and the broader sustainability crisis are increasingly resulting in volatile food and energy prices, which have led to an increase in civil unrest across the planet since 2008.^{4 5} If the global climate and international relations continue to deteriorate, a nuclear exchange could become increasingly likely. If we are serious about protecting civilization, we should eliminate the weapons that can destroy it in an instant.

Elections and Life at Home

- The Climate Mobilization will be directed by government officials and not by private sector actors such as large corporations; this requires that political actors are independent and remain uninfluenced by corporate or other donations, as is currently the case. The mobilization will therefore require public finance or small donation finance of elections.
- Rather than the “everyone on their own” mentality of deregulated capitalism, mobilization summons a feeling of collective destiny and feeling of moral, public purpose. Society and the individuals who comprise it benefit in many ways.

⁴ M. Lagi, K.Z. Bertrand, Y. Bar-Yam, (2011) [*“The Food Crises and Political Instability in North Africa and the Middle East”*](#), New England Complex Systems Institute: 10 August, 2011.

⁵ The Institute for Economics & Peace (2013) [*“2013 Global Peace Index Report”*](#)

Similarities between WWII and Climate Mobilization.

- *Rapid Industrial Transformation.* We need to rapidly transition to a net-zero greenhouse gas emissions civilization.
- *Research & Development.* Research is required in a plethora of fields, including methods to remove greenhouse gases from the atmosphere, improved renewable energy power storage, and agricultural techniques that maximize resilience.
- *Full Employment.* As in WWII, full employment will be a likely byproduct of the Climate Mobilization. During the mobilization, the government should institute a job-guarantee program, especially if full employment does not occur as a result of massive federal investment.
- *Production Controls.* An outright ban on all new fossil fuel mining, processing, and power generation infrastructure may be required in order to limit fossil fuel supply and send a strong market signal that the fossil fuel era is over. The government will also order the early retirement of the nation's fossil-fueled power plants and associated infrastructure, instituting a fair and equitable retirement schedule that simultaneously accommodates the vast energy needs required to construct the new, clean energy economy.
- *Expansion of New Industries.* We need to rapidly expand net-zero carbon industries, which currently satisfy a tiny fraction of current energy demand. This expansion will be primarily accomplished through through the distribution of contracts, subsidies, and other financial incentives.
- *Deficit Spending, Money Creation, Increased Taxation, Rationing, and Price Controls.* Some or all of these economic tools will be needed in order to rapidly increase demand for zero-carbon energy technologies, rapidly reduce demand for fossil fuels, contain inflation, and equitably distribute resources during the mobilization.
- *Planning.* During World War II, federal government agencies planned national objectives in order to win the war. Historian Sarah Jo Peterson's book, "Planning the Home Front," describes the "participatory planning" approach employed by the federal government in areas such as housing during World War II — one that was determined by a mixture of federally-dictated goals that left many decisions about the "means" of reaching those goals to local communities and individuals. Interest-group politics were harnessed toward the end of mobilizing for war. Ideally, a Climate Mobilization would make use of this "participatory planning"

approach, in order to simultaneously revive American democracy while restoring a safe climate.

- *Shared Sacrifice and Restraint.* In order to ensure a fair and effective transition, corporations and wealthy individuals will need to relinquish considerable control over the federal legislative and regulatory process, as well as some of their financial wealth and incomes. Citizens will need to sacrifice the profligate use of fossil fuels and some of the services enabled by fossil fuel use. Once again, consumerism will be curtailed both in order to free up resources for the economic transformation and to reduce the burden on the planet, which is increasingly being used as a landfill for our discarded waste.
- *International cooperation.* In WWII, the U.S. allied with many nations, in a massive, cooperative effort to defeat fascism. During the Climate Mobilization, the U.S. will engage the rest of the world, including large nations such as China, India, and Russia, in a cooperative, lightning-fast transition to a sustainable, post-carbon civilization. Once again, we will supply our allies with aid and technology, in order to secure common victory.
- *Massive Public Investment.* Most private corporations have failed so far to respond to the climate threat in a meaningful way. Only the federal government, with its ability to make large-scale investments in public infrastructure, labor, R&D, and productive enterprise, can motivate the change process on the scale and with the urgency necessary.

Differences between WWII and Climate Mobilization.

- *Nonviolence:* A Climate Mobilization, as opposed to a war-time mobilization, does not require any violent conflict. No war or death is necessary. On the contrary, a Climate Mobilization would prevent violent conflict, as it would stabilize an increasingly chaotic international geopolitics, assure a continuous flow of reliable energy resources long into the future, and provide social stability, as employment and happiness levels dramatically increase.
- *Lack of Dehumanizing Propaganda.* Unlike wars, there will be no “enemy” during the Climate Mobilization, aside from the prospect of civilization collapsing. This dehumanization was at the heart of the internment of Japanese-Americans. In the Climate Mobilization, we will resist the urge to dehumanize each other, and instead focus our efforts on cooperation in order to achieve success.

- *Disarmament.* Given the understanding that the greatest threat to our safety and security is actually our own capacity to destroy human and non-human life using advanced weaponry and other dangerous technologies, a climate mobilization should actually decrease the size and budget of the military. Rather than developing new means of violence, a Climate Mobilization would seek to decommission weapons of mass destruction.
- *Creating a New Economy for a New Era.* While the WWII-mobilization had lasting consequences for the American economy, the effort could be fairly described as a temporary conversion to a war economy. After the war was over, there was a demobilization.
- Although there will be a “demobilization” following the Climate Mobilization, the effects of this effort will have a more permanent character, as our energy, agricultural, and transportation systems will remain transformed long into the future.
- As opposed to a temporary conversion to a war economy, the Climate Mobilization could be better described as the beginning of a long-term civilizational transformation. The period of climate mobilization will provide a time for us to rethink the fundamental problems in our economy and society that have led us to the brink of self-destruction. While it should be clear that infinite resource consumption growth on a finite planet can only lead to long-term disaster, how exactly to build a sustainable, democratic global society remains somewhat unclear. Ideas to consider as we build a new economy include: Revoking corporate charters from firms that do not serve the public interest, placing caps on inequality, taxing wealth, whole cost economics (so the cost of pollution is not absorbed by society), worker-owned enterprises, and the replacement of Gross Domestic Product as the dominant measure of economic success.
- Former Greenpeace head Paul Gilding describes the Climate Mobilization needed as the beginning of the “Third Great Phase of Human Progress,” with the first phase being the domestication of plants and animals, and the second phase being the Industrial Revolution.

Mobilization: A Hidden Consensus?

Our proposed decade-long mobilization may strike some as rare or radical. We understand that it is outside the scope of conventional political debate. However, a closer look reveals that a great many scientists, environmental leaders, and even politicians understand that a WWII-scale mobilization undertaken at emergency speed is necessary.

- In 2011, a host of leading environmentalists signed an open letter to Barack Obama and Chinese President Hu Jintao, calling for the United States and China to reduce their emissions 80% by 2020 through a “wartime-like mobilization.” Signers included the executive directors of the Sierra Club, Greenpeace, 350.org, the Rainforest Action Network, and Friends of the Earth.
- Numerous distinguished people have called for a WWII-style mobilization in response to climate change. The leading champion of climate mobilization has been Lester Brown, a former United States Department of Agriculture global issues specialist, who first called for a WWII-style mobilization in his landmark 1995 book, “Who Will Feed China? Wake-Up Call for a Small Planet.” In 2001, Canadian professor Dennis Bartels published the first academic paper discussing climate mobilization, “Wartime Mobilization to Counter Severe Global Climate Change,” in the journal *Human Ecology*. Brown continued to popularize the idea with his “Plan B” book series, beginning in 2003. Brown’s 2009 book, “Plan B 4.0: Mobilizing to Save Civilization,” calls for a WWII-scale mobilization that reduces global emissions 80% by 2020.
- A WWII-style climate mobilization has since been advocated in various forms by former Department of Energy under-secretary Joseph Romm, *New York Times* columnist Thomas Friedman, *Time* magazine’s Energy and Environment correspondent, Bryan Walsh, The National Research Council’s Board on Atmospheric Sciences and Climate, AFL-CIO President Richard Trumka, Former Greenpeace CEO Paul Gilding, University of British Columbia climate scientist Daniel Pauly, *American Prospect* co-editor Robert Kuttner, and Pennsylvania State University climate scientist Michael Mann.
- In a 2007 campaign speech, Hillary Clinton said, “For this generation of Americans, climate change is our Space Race. It is our home front mobilization during World War II and it is our response to the Great Depression.”

- In a 2008 speech at Oxford, Al Gore compared the “battle against climate change to fighting the Nazis during World War II,” according to news reports.
- In a Dec. 15, 2014 *New York Times* news analysis, climate science reporter Justin Gillis acknowledged that the internationally accepted +2°C target was likely too high, and wrote that the only conceivable way to stabilize temperatures even lower than the +2°C threshold would be through either “a technological miracle, or a mobilization of society on a scale unprecedented in peacetime.”
- In the same article, Gillis wrote: “Even as the 2C target has become a touchstone for the climate talks, scientific theory and real-world observations have begun to raise serious questions about whether the target is stringent enough.”
- A 2013 study conducted by Michel Den Elzen, a senior climate policy analyst at the Netherlands Environmental Assessment Agency and a lead author of the IPCC 5th Assessment Report, found that the U.S. and other developed countries needed to cut emissions in half by 2020 for a medium chance of limiting warming to +2°C.
- In 2009, Hans Joachim Schellnhuber recommended to Obama administration officials that the U.S. reduce greenhouse gas emissions to zero by 2020. Schellnhuber is the lead author of the World Bank’s “Turn Down the Heat” reports, the Chair of the German Advisory Council on Global Change and an advisor on climate science to the European Union Commission.
- A 2009 climate risk modeling report commissioned by the World Wildlife Fund determined that after the year 2014, the only possible way to avoid runaway global warming would be a “war-footing”-style “command-and-control” approach. By 2014, low-carbon industries would need to grow at rates beyond 30 percent — the upper limit in free markets. Only “by forcing the reallocation of resources” could industry growth rates exceed 30%, the report found.
- Even in 2009, the modeling in the report found that carbon pricing schemes were “not sufficient by themselves.”⁶ Whether market or government-driven, the needed response will constitute the “fastest industrial revolution witnessed in our history.”

⁶ Mallon, K. et. al. [“Climate Solutions 2: Low-Carbon Re-Industrialisation”](#), WWF: 2009.

- “We only have until 2014 to set the wheels in motion,” wrote James Leape, WWF’s international director. “Beyond this, a ‘war-footing’ may be the only option remaining, with no guarantee of success.”
- In terms of the practicalities — namely, how we can achieve such dramatic emissions reductions in such a short time — WWII provides us with an inspiring example. After the attacks on Pearl Harbor, when the United States was finally entering WWII, President Franklin Roosevelt laid out terrifically ambitious production targets for tanks, ships, guns, and airplanes. FDR set a goal of producing 60,000 planes in two years. People were deeply skeptical that such a feat could be accomplished. And yet, by 1944 the United States had produced 229,600 planes — more than three times the original, highly ambitious, goal!

Conclusion: *If we mobilize together as a society to do what is required, we will achieve amazing things. We have done it before.*

Further Reading:

[Environmentalists’ Letter to Barack Obama and Hu Jintao](#), Jan. 19, 2011.

[“Is a Two Degree Limit on Global Warming Off Target?”](#), Justin Gillis, *New York Times*, Dec. 15, 2014.

[“Climate Change: Four Degrees of Devastation”](#), Stephen Leahy, *Inter Press Service*, Oct. 9, 2009. (This story details Schellnhuber’s interaction with the Obama administration)

Section II: Why an Emergency Response?

The case for a wartime-style Climate Mobilization hinges on the argument that we need to transition to a post-carbon economy at emergency speed. Most proposals suggest a 35-85 year framework for the transition to a net-zero emissions economy. Our 10-year timeframe is grounded in the alarming findings of climate science — as opposed to the politics of “politically fashionable carbon gradualism” and failure-inducing compromise.⁷

Climate science tells us, and increasingly, world events show us, that climate change threatens to cause the collapse of organized human civilization; that droughts and crop failures lead to civil disruption, failed states, and chaos.⁸ Additionally, climate change batters civilization with sea level rise, severe weather, wildfires, tropical diseases, climate refugees and ecosystem collapse.

The earth has warmed $+0.85^{\circ}\text{C}$ since 1880, causing a host of disastrous effects. But the earth would be roughly $+1.2^{\circ}\text{C}$ warmer if not for “global dimming” — a temporary cooling effect produced by emissions of aerosol particles — and another $+0.6^{\circ}\text{C}$ warmer if not for oceanic thermal inertia, the 7-31 year lag between greenhouse gas emissions and consequent global warming. Failing an immediate, large-scale effort to remove greenhouse gases from the atmosphere, concentrations of greenhouse gases in the atmosphere today are high enough to produce global warming well beyond $+2^{\circ}\text{C}$, the internationally agreed-upon, politically-determined, danger threshold, which is unacceptably high. This is why we must act now, on an emergency basis.

Overview: $+2^{\circ}\text{C}$ of Warming is Too Dangerous.

- International climate negotiations operate under the assumption that global mean temperatures should be stabilized no higher than $+2^{\circ}$ Celsius above the pre-industrial level.
- Yet allowing global mean temperatures to reach $+2^{\circ}\text{C}$ would likely be catastrophic. Even at our current level of warming, $+0.85^{\circ}\text{C}$ above preindustrial levels, a host of negative impacts are occurring.

⁷ Hoexter, M. (2013) [*“Politically fashionable carbon gradualism vs. reality”*](#), *New Economic Perspectives*: 10 July, 2013.

⁸ Brown, L. (2009) [*“Could food shortages bring down civilization?”*](#), *Scientific American*: May 2009.

- A study commissioned by 20 national governments found that the current +0.85°C of global warming above pre-industrial levels kills an average of 400,000 people every year via increased hunger and the spread of communicable diseases.⁹
- In 2014, the Pentagon released an adaptation roadmap that described climate change as a “threat multiplier” and announced that current climate change “poses immediate risks to U.S. national security.”¹⁰
- Syria’s climate change-fuelled mega-drought from 2007 to 2010, the worst in the instrumental record, illustrates how climate change acts as a threat multiplier.¹¹ After years of devastating drought, impoverished Syrian farmers migrated to urban areas shocked by high food prices and helped to ignite the revolt against the dictator Bashar al-Assad. The ensuing civil war destabilized the entire region, creating the conditions for the brutal terrorist group ISIS to emerge as a regional power.
- Left unchecked, the current +0.85°C warming has initiated a process that will cause the loss of most of the West Antarctic Ice Sheet, which would result in a global sea level rise of up to 13 feet.¹²
- Rapid regional warming could lead to a virtually ice-free summer period in the Arctic Sea by the 2030s, and possibly earlier.^{13 14}
- An increasingly ice-free Arctic Sea absorbs more solar radiation (instead of reflecting it back to space like a mirror) and could cause very sudden, global-

⁹ DARA and the Climate Vulnerable Forum. (2012) [*“Climate Vulnerability Monitor 2nd Edition: A Guide to the Cold Calculus of a Hot Planet”*](#), Madrid: Fundación DARA Internacional 2012.

¹⁰ Department of Defense. (2014). [*“2014 Climate Change Adaption Roadmap”*](#), Alexandria, VA: Office of the Deputy Under Secretary of Defense for Installations and Environment.

¹¹ Kelley, Colin, et al. (2015) [*“Climate change in the Fertile Crescent and implications of the recent Syrian drought”*](#), *Proceedings of the National Academy of Sciences*, 112: 3241-3246.

¹² Rignot, E. et al. (2014) [*“Widespread, rapid grounding line retreat of Pine Island, Thwaites, Smith and Kohler glaciers, West Antarctica from 1992 to 2011”*](#), *Geophysical Research Letters*, 41: 3502-3509

¹³ Overland, J. E., and M. Wang, [*“2013: When will the summer Arctic be nearly sea ice free?”*](#) *Geophysical Research Letters*, 40: 2097-2101

¹⁴ Wang, M., and J. E. Overland, [*“2012: A sea ice free summer Arctic within 30 years: An update from CMIP5 models.”*](#) *Geophysical Research Letters*, 39: L18501.

climate-warming releases of highly potent greenhouse gases stored in Arctic seafloor methane clathrates, which are underwater ice lattices filled with methane. It would also lead to accelerated melting of the vast Greenland ice sheet and thawing of the land-based Arctic permafrost.

Looming Threats between +.85°C and +2°C Warming.

- Global warming of +1.5°C above pre-industrial levels will likely initiate a general melt of the land-based permafrost (frozen soils) in the Arctic regions — an event that could release hundreds of billions of tons of carbon over a period of hundreds of years, massively accelerating global warming.¹⁵ The land-based permafrost contains approximately 1.7 trillions of carbon, which is more than three times the amount of carbon released into the atmosphere through fossil fuel burning since the industrial revolution — roughly 500 billion tons. Much of the carbon is expected to be released in the form of methane — a short-lived, extremely potent greenhouse gas.
- There is no conceivable way to return the carbon to the permafrost regions once it thaws. If we continue on our current emissions pathway, we will likely trigger the irreversible permafrost carbon warming feedback sometime between 2020 and 2030, when the global mean temperature is projected to increase +1.5°C above pre-industrial levels.¹⁶
- Warming of +1.6°C is likely to be enough to melt essentially all of the Greenland ice sheet, leading to a long-term 23 feet of sea-level rise, as well as the release of 8% of the world's fresh water into the oceans, which could radically alter global ocean circulation patterns.¹⁷
- Researchers at the NASA Earth Observatory describe the impact of a Greenland ice sheet collapse this way: “Scientists estimate that if the entire ice sheet melted, sea level would rise 23 feet. Depending on how rapidly such a change occurred, it could be a global-scale catastrophe because nearly one-third of the world’s population lives in or near a coastal zone. The global impact of several billion

¹⁵ Vaks, A., O.S. Gutareva et al. (2013). [*“Speleothems reveal 500,000-year history of Siberian permafrost”*](#), *Science* 340: p. 183-186.

¹⁶ Schaefer, K.M., et. al. (2011). [*“Can We Avoid the Permafrost Carbon Tipping Point?”*](#), American Geophysical Union, Fall Meeting.

¹⁷ Robinson, A. et al. (2012) [*“Multistability and critical thresholds of the Greenland ice sheet”*](#), *Nature Climate Change*, 2: 429–432

refugees and the negative impacts on coastal economic activity would be staggering.”¹⁸

- Warming of +2°C would disrupt global agriculture and the global food supply, eliminating over 20 percent of U.S. corn, African corn, and Indian wheat yields.¹⁹ In Brazil, +2°C warming could cause a 50 percent decrease in wheat yields and a 70 percent decrease in soybean yields. Warming between +1.5°C and +2°C could cause a 30 percent decline in *total* crop yields in the Middle East and North Africa.²⁰
- The +2°C target is too high. It would likely cause a host of disasters, including a global food crisis, a major increase in international fresh water scarcity, and a long-term 82-foot sea level rise that would permanently inundate many of the world’s population centers, which have developed during a period of rare sea-level stability.²¹

On Track to Exceed +2°C, Even if Global Emissions Stopped Today.

- Unfortunately, if greenhouse gas concentrations remain even at *current* levels for a long period of time, the earth will warm more than +2°C above preindustrial levels.
- The earth’s growing energy imbalance is presently disguised by several factors, such as the effect of short-lived atmospheric aerosol particles, which are released into the atmosphere through human industrial, agricultural, transportation, and construction activities. Some aerosols, such as black carbon, have a short-term warming effect, while others, such as sulfates, have a short-term cooling effect.²²

¹⁸ NASA Earth Observatory, [“Why does the Greenland Ice Sheet matter?”](#)

¹⁹ National Research Council. (2011). [“Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia”](#), Washington, DC: National Academies Press. p.161

²⁰ World Bank. (2014). [“Turn Down the Heat: Confronting the New Climate Normal”](#), Washington, DC: World Bank.

²¹ Wight, James. (2011). [“Why it’s urgent we act now on climate change”](#), *Skeptical Science*, 8 March 2011

²² Union of Concerned Scientists, [“Does air pollution - specifically particulate matter \(aerosols\) - affect global warming?”](#)

- Overall, aerosols are currently cooling the earth by approximately -1.2°C .²³ Fossil fuel burning is the source of about 72% of sulfate aerosol emissions, the primary cause of the global cooling. The aerosol effect is known as “global dimming,” since growing cumulative aerosol emissions collectively reflect an increasing amount of sunlight back into space. The aerosols generally fall out of the atmosphere after about 10 days, but are continually replenished due to human activities.
- In other words, fossil fuel burning is warming the earth through greenhouse gas emissions, but also masking a portion of the warming in the short-term through short-lived cooling aerosol emissions.
- Apart from this temporary “global dimming” effect, there is also a 6.6 to 30.7-year lag between greenhouse gas emissions and the consequent maximum warming effect, as it takes a long time for the huge mass of the oceans to warm up.²⁴ Approximately $+0.6^{\circ}\text{C}$ of warming is delayed due to this effect, which is known as “oceanic thermal inertia.”
- If all greenhouse gas and aerosol emissions had been suddenly and completely curtailed in 2005, the earth would have eventually warmed about $+2.4^{\circ}\text{C}$, according to a 2008 study published by Professor Veerabhadran Ramanathan, director of the Center for Atmospheric Sciences at the Scripps Institution of Oceanography in San Diego.²⁵ The study assumed that greenhouse gas concentrations remained at 2005 levels well into the future.
- Humans have emitted record amounts of greenhouse gases since 2005. Failing a rapid, large-scale mitigation effort, the current concentration of greenhouse gases in the atmosphere is on track to eventually cause temperatures to increase approximately $+2.65^{\circ}\text{C}$, once the net aerosol cooling effect (-1.2°C) wears off and the surface warming delayed by thermal inertia is realized ($+0.6^{\circ}\text{C}$).^{26 27} This

²³ Hansen, J., M. Sato, P. Kharecha, and K. von Schuckmann, (2011). [*“Earth’s energy imbalance and implications”*](#), *Atmos. Chem. Phys.*, 11, 13421-13449

²⁴ Ricke, K. and Caldeira, K. (2014). [*“Maximum warming occurs about one decade after a carbon dioxide emission”*](#), *Environ. Res. Lett.* 9 124002

²⁵ Ramanathan, V., and Y. Feng. (2008). [*“On Avoiding Dangerous Anthropogenic Interference with the Climate System: Formidable Challenges Ahead”*](#), Abstract. Proceedings of the National Academy of Sciences.

²⁶ Wight, James. (2011). [*“Why it’s urgent we act now on climate change”*](#), *Skeptical Science*, 8 March 2011

²⁷ Hansen, J., M. Sato, P. Kharecha, and K. von Schuckmann (2011). [*“Earth’s energy imbalance and implications”*](#), *Atmos. Chem. Phys.*, 11, 13421-13449

estimate is largely derived from an extrapolation of the calculations used in Ramanathan's 2008 study.

- Current atmospheric greenhouse gas concentrations would cause enormous sea-level rise over a period of centuries. Between 3 and 3.5 million years ago, when atmospheric carbon dioxide levels were very close to the current level, the sea level was 66-98 feet higher than it is now.²⁸
- By the end of this century, sea levels could rise some 16 feet, if we continue on a business-as-usual trajectory and sea level rise proceeds in a non-linear fashion, according to climate scientist James Hansen, the former head of the NASA Goddard Institute for Space Studies.²⁹ More conservative projections suggest global sea levels are on track to rise between 2.6 and 6 feet by 2100.³⁰
- According to climate scientist Michael Mann, the earth is on track to warm +2°C by 2036, failing a large-scale mitigation effort starting now.

Climate Change Could Cause the Collapse of Human Civilization.

- If we continue on the present global emissions trajectory, the earth could warm +4°C as soon as the early 2060s, when today's children are scheduled to reach middle age.³¹ If the earth's climate is less sensitive to greenhouse gas emissions, the +4°C increase could arrive closer to 2100.
- An increase of + 4°C would cause "mass death" and would be "incompatible with an organized human community," according to Kevin Anderson, Deputy Director of the Tyndall Center for Climate Change Research and an adviser to the U.K. government.³² Anderson projects that only 500 million people could survive warming on that scale, meaning as many as 8 to 9 billion people could die

²⁸ Rohling, E. et al. (2009). "[Antarctic temperature and global sea level closely coupled over the past five glacial cycles](#)", *Nature GeoScience*, 21 June 2009.

²⁹ Hansen, J., and M. Sato, (2011). "[Paleoclimate implications for human-made climate change](#)", *Climate Change: Inferences from Paleoclimate and Regional Aspects*, A. Berger, F. Mesinger, and D. Šijački, Eds. Springer, 21-48

³⁰ Pfeffer et al. (2008). "[Kinematic Constraints on Glacier Contributions to 21st-Century Sea Level Rise](#)", *Science*, 321: 1340-1343

³¹ Betts et al. (2010). "[When could global warming reach 4°C?](#)", *Phil. Trans. R. Soc. A*:2011369 67-84

³² Manning, P. (2011). "[Too hot to handle: can we afford a 4 degree rise?](#)", *The Sydney Morning Herald*, 9 July, 2011.

as a result of catastrophic climate warming, if present population growth and emissions trends continue unabated in coming decades.

- Human civilization developed during the Holocene, a climatic era that was safe and stable. We are now leaving that climate and creating a new one that will be less hospitable to agriculture and civilization, in general. Scientific and archaeological research has linked the collapse of ancient civilizations, such as the Mayans and the Old Kingdom of Egypt, to climate change-caused droughts.³³
- The basic threat to civilization, as described by Lester Brown, is that extreme droughts will cause famines, leading to state failure and resource wars.³⁴
- Leading scientists are increasingly discussing climate change as a threat to civilization, itself.
- In 2010, Ohio State University paleoclimatologist Lonnie Thompson described the threat this way: “Climatologists, like other scientists, tend to be a stolid group. We are not given to theatrical rantings about falling skies. Most of us are far more comfortable in our laboratories or gathering data in the field than we are giving interviews to journalists or speaking before Congressional committees. Why then are climatologists speaking out about the dangers of global warming? The answer is that virtually all of us are now convinced that global warming poses a clear and present danger to civilization.”³⁵
- In the preface to his 2009 book, “*Storms of My Grandchildren: The Truth About the Coming Climate Crisis and Our Last Chance to Save Humanity*,” James Hansen, who is widely considered to be one of the most prescient climate scientists in the world, described climate change as a threat to the very survival of the human species: “Planet Earth, creation, the world in which civilization developed, the world with climate patterns that we know and stable shorelines, is in imminent peril. The urgency of the situation crystallized only in the past few years...The startling conclusion is that continued exploitation of all fossil fuels on Earth threatens not only the other millions of species on the planet, but also the survival of humanity itself — and the timetable is shorter than we thought.”³⁶

³³ Sohn, E. (2014). “*Climate change and the rise and fall of civilizations*”, NASA, 21 January, 2014.

³⁴ Brown, L. (2009). “*Could food shortages bring down civilization?*” *Scientific American*: May 2009.

³⁵ Thompson, L. (2010). “*Climate change: The evidence and our options*”, *The Behavior Analyst*, 33, 153-170.

³⁶ Hansen, J. (2009). “*Storms of My Grandchildren*”, Bloomsbury Press, 2009.

The Myth of the “Carbon Budget” and the Need to Restore a Safe Climate.

- Climate scientists have released “carbon budgets” that illustrate how much carbon humanity can emit before global mean temperatures rise a certain level.³⁷ These carbon budgets have become a dominant mode of analysis in the climate policy discourse in recent years. In the carbon budgets, the higher the temperature target, and the lower the chance of limiting warming to that level, the more carbon emissions are allowed.
- Many of the carbon budgets aim to limit warming to the unsafe +2°C target, while some even aim to limit warming to +3°C.
- Furthermore, the carbon budgets uniformly assume a low probability of success, ranging from 33% to 66%.
- According to the Intergovernmental Panel on Climate Change (IPCC), for a 50% chance of limiting warming to +2°C, humans could continue to emit greenhouse gases at current levels for decades to come — only exhausting that carbon budget by 2043.³⁸
- This begs the question — if +2°C has been agreed upon as the threshold between dangerous and catastrophic warming, why would we emit to the point where we give ourselves only a 50% chance of staying beneath that level of warming? Isn't that an insane risk to run?
- Such probability assessments ignore modern safety standards. Over the past 250 years, the conception of industrial safety shifted from an acceptance of an elevated risk, to an acceptance of a modest risk of failure (1 in 1000 to 1 in 10,000), to today's view that the target safety standard should be zero harm, the risk of failure should be negligible, and the design process should constantly pursue zero-failure objectives.³⁹

³⁷ Pidcock, R. and Pearce, R. (2014). [“Six years worth of emissions would blow the carbon budget for 1.5 degrees”](#), *The Carbon Brief*, 13 Nov. 2014.

³⁸ Ibid.

³⁹ Sutton, P. (2014). [“A Review of the History of Safety”](#), *Green Innovations*, 7 Sept. 2014.

- Today, industries, such as the airlines, pursue failure rates well below 1 in 1,000,000.
- Would you fly on a plane with a 50-50 chance of crashing? Would you work in a factory that had a 50% chance of burning down? These actions would be considered insanely, suicidally risky. So why do we accept the logic of a carbon budget that gives us a 50% or 66% chance of keeping warming beneath the extremely risky +2°C threshold?
- Unfortunately, if we assume even a 90% probability of success in meeting the unsafe +2°C target, climate models show that there is no carbon budget left.⁴⁰

Scientists: To Restore Safe Climate, Return CO2 Concentrations to Near Pre-Industrial Levels.

- In order to restore the Arctic summer sea-ice on a long-term basis, atmospheric carbon dioxide levels must be reduced from present levels of roughly 400 parts per million to 300 - 325 parts per million, according to a research team led by James Hansen.⁴¹ Hansen has proposed an initial target of 350 ppm, to be reassessed at a later date.
- To fully restore a safe climate, atmospheric carbon dioxide levels may ultimately need to be returned to the preindustrial level of approximately 280 parts per million, according to the renowned climate scientist Hans Joachim Schellnhuber.⁴²

Conclusion: *The federal government should immediately declare a climate emergency, rapidly transition the economy off of fossil fuels, and remove greenhouse gases from the atmosphere until a safe climate is restored. As a result of decades of delay, we have squandered the opportunity for a leisurely, non-disruptive transition.*

Further Reading: [“Dangerous Climate Warming: Myth & Reality”](#), by David Spratt.

Video: [“Dangerous Climate Change: Myths & Realities”](#), David Spratt Speech

⁴⁰ Raupach, M. R., I.N. Harman and J.G. Canadell (2011) [“Global climate goals for temperature, concentrations, emissions and cumulative emissions”](#), Report for the Department of Climate Change and Energy Efficiency. CAWCR Technical Report no. 42. Centre for Australian Weather and Climate Research, Melbourne

⁴¹ Hansen et al. (2008). [“Target atmospheric CO₂: Where should humanity aim?”](#), Open Atmos. Sci. J., 2, 217-231

⁴² Adam, D. (2008), [“Roll back time to safeguard climate, expert warns: A return to pre-industrial levels of carbon dioxide urged as the only way to prevent the worst impacts of global warming”](#), Guardian (UK), September 15 2008.

Carbon Pricing Alone is Inadequate: The Market Didn't Win WWII, and it Won't Stop Climate Change.

I. The Climate Policy Debate has Revolved Around Market-Based Mechanisms.

- Since the 1990's, many activists, economists, pundits, and United Nations bureaucrats have focused climate policy discussions on two “carbon pricing” frameworks. These are the carbon tax and the carbon permit trading system — which is also known as cap-and-trade. These systems have since been implemented in a number of countries around the world.
- With a carbon tax, governments place a steadily increasing price on every ton of carbon emissions. The rising price discourages greenhouse gas emissions, and encourages businesses and consumers to invest in goods and services that emit fewer greenhouse gases.
- Cap-and-trade systems set a total amount of greenhouse gas emissions for a national economy. The total amount of emissions are divided into numerous allowances, which are then either purchased or given away for free. If a corporation emits fewer greenhouse gases than permitted, it can sell allowances for profit on a carbon market to corporations who emit more than allowed. Over time, the government lowers the total amount of permissible national emissions. Then, theoretically, permits become more expensive, due to the shrinking supply of allowable cumulative emissions. The higher prices of allowances discourage businesses and consumers from emitting greenhouse gases, and are designed to gradually reduce total demand for high-carbon-emitting products and services.
- These approaches reflect the faith that markets are able to solve society's problems and create a fair and just society — a belief that has been especially dominant since the 1970's. In this belief system, government is an oppressive force that must be reduced and controlled, and profit-seeking is inherently good and must not be controlled. We see this bias in almost every sector of our society. Healthcare, education, and corrections have increasingly become “for-profit” fields, based on the misguided idea that profit-seeking firms can do nearly everything more effectively and virtuously than the government. Pope Francis recently called this attitude the “idolatry of markets.”

- Since both cap-and-trade and the carbon tax are “market-based” government interventions, they have dominated the climate policy discussion. They are considered market-based approaches because they attempt to affect human behavior by having the government make an adjustment to the market (by raising carbon prices) and then trusting investors, consumers, and corporations to handle the rest of the change process.
- Although these market-based approaches attempt to minimize government intervention and maximize the role of for-profit actors, they have not attracted widespread support among free-market adherents, many of whom deny or ignore the science of climate change entirely.
- Traditional direct or “command-and-control” regulation — in which the government simply sets and enforces rules for businesses and citizens, instead of trying to persuade them through price increases — has not been seriously considered by most climate policy specialists.

II. Carbon Pricing-Only Would *Gradually* Reduce Emissions, Which Would Lead to Disaster.

- Cap-and-trade and the carbon tax are not necessarily bad approaches. If we had implemented them decades ago, perhaps they could have successfully decarbonized the economy and avoided catastrophic climate change.
- However, we are in a state of crisis and the much-discussed “carbon-pricing only” policy frameworks would reduce emissions too slowly to avert catastrophe.
- The failed American Clean Energy and Security Act of 2009, which featured a cap-and-trade system, was designed to reduce U.S. emissions 17 percent by 2020 and 42 percent by 2030 (from 2005 levels). The bill also targeted an 83 percent national emissions reduction by 2050.
- A study of a carbon tax very similar to the fee-and-dividend policy proposed by the group Citizen’s Climate Lobby showed that the tax would reduce U.S. carbon emissions 33% from current levels in a decade, and 52% in two decades. A tax starting at \$10 per ton and rising \$10 per ton every year would lead to these reduction rates, according to the study. This represents one of the steeper carbon tax trajectories proposed.

- The “modest” carbon tax proposed by Adele Morris of the Brookings Institution in 2013 would reduce U.S. carbon emissions 12% within two decades by placing a \$16 tax on every ton of emissions and increasing the tax by 4% annually. Morris’ proposed tax would initially increase the price of a gallon of gasoline by 0.16 cents.
- Even the Citizen’s Climate Lobby, the foremost group advocating a carbon tax in this country, acknowledges that a carbon tax alone is insufficient. Its website describes the carbon tax as a first-step: “It’s the policy that climate scientists and economists alike say is the best first-step to reduce the likelihood of catastrophic climate change from global warming.”
- In Europe, where many carbon taxes have already been introduced, carbon taxes have reduced national emissions at a rate of about 2-7% per decade.⁴³
- The gradual, non-disruptive energy transition envisioned by “carbon-pricing only” advocates could also lock in a medium-carbon-emitting economy that primarily uses natural gas instead of coal. A transition to medium-carbon instead of a net-zero-carbon economy could guarantee the need for a very long-term use of solar radiation management, as well as disastrous ocean acidification.
- Meanwhile, the Pledge to Mobilize, which is grounded in a critical analysis of the latest climate science, calls for a 100% reduction of U.S. net greenhouse gas emissions by 2025.
- If we attempted to reduce emissions at the rate called for in the Pledge exclusively using a carbon pricing mechanism, it would require a minimum carbon price of several hundreds of dollars per ton. Such a tax would likely cause severe economic disruption.
- It could also make it difficult for businesses and consumers to transition to a zero-carbon economy, as it would indiscriminately and severely raise the price of nearly all goods and services in our carbon-dependent economy.
- Exclusively market-based approaches simply aren’t very well suited for society-wide emergency action. WWII is an example of the success of government

⁴³ Andersen, M.S., Barker, T., Christie, E., Ekins, P., Gerald, J.F., Jilkova, J., Junankar, S., Landesmann, M., Pollitt, H., Salmons, R., Scott, S. and Speck, S. (eds.), (2007). *“Competitiveness Effects of Environmental Tax Reforms: COMETR”*, Publishable Final Report to the European Commission, DG Research and DG TAXUD (Summary Report).

intervention in markets through public planning, direct regulation, and federal investment in infrastructure, industrial production, and R&D.

III. Pricing-Only Approaches are Often Neutral When it Comes to Government Investment in Infrastructure, R&D, Green Industry, and Full Employment.

- Another deficiency in the “carbon-pricing only” framework is its neutrality on the issue of government infrastructure investment. Some carbon-pricing proposals assume that businesses and consumers will be able to transition to zero-carbon technology without considerable government assistance. Many carbon-pricing frameworks use carbon price revenues to either reduce the federal deficit or as dividends to return to ordinary citizens as checks in the mail.
- But the transition could move much more swiftly, for instance, if the government invests directly in net-zero carbon rail and bus systems, instead of waiting around for the longer-range electric cars to become cost-competitive options.
- America’s infrastructure is geared almost exclusively toward the use of cheap fossil fuels, making it difficult for citizens and businesses to eliminate their greenhouse gas emissions without a major overhaul of transportation and energy systems, aided by large-scale government investment.
- Public investment in research & development is also needed to accelerate the energy transition. It is often difficult for profit-oriented corporations to conduct basic or applied research that is in the public interest and may not yield immediate or near-term profits.
- The transition will move much more quickly if the government directly invests in the production and distribution of zero-carbon goods and services, as opposed to exclusively relying on an approach of nudging businesses and consumers in the right direction with price increases.
- A direct government regulation and investment approach could also institute a full employment policy that would likely prove quite popular among the American public during a period of large-scale social, economic, and environmental disruption.

IV. History Shows: Direct Regulation Was More Effective than Pricing-Only in Reducing Acid Rain Pollution.

- The history of environmental regulation also suggests that direct government is more effective at reducing emissions than pricing mechanisms.
- The historical model for greenhouse gas cap-and-trade systems are the systems introduced in North America in 1990 to limit sulfur dioxide emissions, which cause acid rain.
- In the same period, conventional command-and-control regulation was used in Europe to reduce sulfur dioxide emissions. The European acid rain program set hard sulfur dioxide emissions limits on each power plant, forcing firms to either install pollution control equipment or shut non-compliant plants down.
- Between 1990 and 2001, straight “command and control” regulatory schemes in Germany and Italy reduced acid rain pollution far more than the U.S. cap and trade system designed to reign in sulfur dioxide. In Germany sulfur dioxide emissions fell 87%, in Italy 62%, while in the US they only fell 31% during the same time period.⁴⁴

Conclusion: *We are not opposed to carbon pricing. We just strongly disagree with the misleading notion that pricing, alone, can avert climate catastrophe. Some form of carbon pricing may be needed in a Climate Mobilization. But it will likely prove an auxiliary instrument to a series of investments, incentives, and robust, command-and-control-style regulations. To place all our chips on carbon pricing would be a move borne of dogma, naiveté and misplaced “political realism” as opposed to a clear-headed reckoning with this global emergency.*

Further Reading:

[“10 reasons a carbon tax is trickier than you think”](#), David Roberts, *Grist*, Nov. 19, 2012.

[“Why carbon prices can’t deliver the 2°C target”](#), Kevin Anderson, Aug. 13, 2013.

[“Carbon pricing is Just One Piece of the Puzzle: Towards a Comprehensive Climate and Energy Policy”](#), Michael Hoexter.

⁴⁴ Lipow, G. [“Emissions trading: A mixed record, with plenty of failures”](#), *Grist*, 20 Feb 2007.

Section III: The Big Picture.

Turning off the Oven: How to Restore a Safe Climate.

I. Zero Net Emissions.

- When you turn an oven on to 350 degrees, it takes a few minutes for it to fully warm up.
- The global climate system has a similar lag. The latest scientific research suggests that greenhouse gases don't warm the earth to their full potential until some 6.6 to 30.7 years after they are released.
- Think of the earth as an oven. Due to the greenhouse gases that have accumulated in the atmosphere since the industrial revolution, the oven is set to a very high temperature. But the oven light has not turned on yet. We're perhaps 30 to 50 percent of the way toward a fully heated oven with the red light switched on. But every year, as we emit more greenhouse gases into the atmosphere, we are turning the temperature knob on the oven a bit higher.
- We need to turn off the oven as quickly as possible.
- The best way to turn down the oven is to reduce the *total* amount of greenhouse gases in the atmosphere. To turn it off, we need to reduce the total amount of greenhouse gases in the atmosphere to approximately the level that existed during the vast majority of the 11,500 year period during which human civilization developed and expanded.
- Since greenhouse gas emissions remain in the atmosphere for a very long time, reducing the rate at which humans emit greenhouse gases does not reduce the *total* amount of greenhouse gases in the atmosphere. It simply slows the rate at which we are increasing the total amount, and therefore turning up the oven.
- In order to stop increasing the oven's temperature, we need to build a *net-zero* greenhouse gas-emitting civilization as quickly as possible. That means that human industrial, agricultural, transportation, and residential infrastructure across the planet will emit zero or near-zero greenhouse gases. Any greenhouse gas emissions that do occur will be offset. If a net-zero emissions civilization

emitted 500 million tons of carbon annually in order to produce food, it would ensure that 500 million tons are removed from the atmosphere annually, as well, either through natural or human-developed carbon “sinks.”

- The rapid construction of a net-zero emissions civilization will entail a considerable amount of greenhouse gas emissions. But once it is built, the *total* level of greenhouse gases in the atmosphere will stabilize at a constant level.
- But that level would *still* be too high, which is why carbon dioxide removal is called for. Remember, we need to turn the oven off if we want to restore a climate that is safe, stable, and supportive of human civilization.

II. Removing Greenhouse Gases from the Atmosphere

- Therefore, we need to remove excess greenhouse gases from the atmosphere. Greenhouse gases will need to be removed both during the process of constructing a net-zero emissions civilization, and after, at which point civilization will become “carbon negative” as it reduces the total atmospheric concentration of greenhouse gases. Techniques to remove carbon dioxide from the atmosphere include Agroecology, Bio-char, Bio-Energy with Carbon Capture and Storage (BECCS), Air Capture, and Reforestation, among others. Many of these techniques are referred to as “Carbon Dioxide Removal” (CDR) technologies. The list below is a brief survey of some of the most discussed options for carbon “draw down”:
- Agroecology is an agricultural system that breaks the agricultural dependence on fossil fuels by relying on principles such as crop rotation, cover crops, and using waste products for fertilizer. Agroecology, especially when utilizing biochar, can be carbon negative while also providing a food supply that is more resilient to droughts and severe weather.
- Bio-char is agricultural charcoal that can be buried in soil. Bio-char is produced by heating trees or plants (biomass) in a low or no-oxygen kiln, in order to prevent the materials from combusting. Since trees and plants extract carbon dioxide from the atmosphere as they grow, bio-char contains carbon. Decaying dead trees and plants release their stored carbon back into the atmosphere. When bio-char is

buried in soils, it can sequester the captured carbon securely in the ground for hundreds to thousands of years.⁴⁵

- Bio-Energy with Carbon Capture and Storage also makes use of biomass. In BECCS systems, trees and plants are burned in power plants to produce electricity. The carbon dioxide exhaust is captured and stored in geological reservoirs underground.
- If used at all, these techniques should be done in moderation, as Bio-char and BECCS could pose threats to arable land and food supplies, if used inappropriately or excessively.
- Air capture technologies are industrial systems that suck carbon dioxide directly from the atmosphere using fans. The carbon is then stored deep underground in geological formations for thousands of years. Air capture tends to be expensive and energy-intensive.
- Reforestation — planting trees on deforested land — can also remove carbon dioxide from the atmosphere, although reforestation projects could compete with other land uses, such as agriculture. An international effort to plant trees en masse for the rest of the 21st century could remove the amount of carbon dioxide released into the atmosphere through all historic deforestation.
- Present technologies only allow us to remove carbon dioxide from the atmosphere. We have not yet figured out how to remove other greenhouse gases, although proposals to develop technologies that remove methane and chloroflourocarbons are on the table.
- The Pledge to Mobilize calls on the government to remove excess greenhouse gases from the atmosphere — not simply carbon dioxide. The hope is that the Research & Development that is also called for in the Pledge will lead to scientific breakthroughs that enable the removal of all greenhouse gases, not just carbon dioxide.
- The Pledge does not specify which CDR techniques should be used to remove greenhouse gases from the atmosphere.

⁴⁵ Winsley, P. (2007). [*Biochar and Bioenergy Production for Climate Change Mitigation*](#), New Zealand Science Review 64 (5): 5.

- Failing a major technological breakthrough, it could take between 50 to 100 years using existing technologies to remove enough carbon dioxide from the atmosphere to restore a safe climate.

III. Avoiding a Worst-Case Scenario: The Geo-Engineering Option.

- Once our society collectively decides to respond to the climate emergency, it is possible that major scientific breakthroughs will occur, allowing humanity to rapidly remove greenhouse gases from the atmosphere in time to restore a safe climate.
- At some point in the future, there is a risk that climate warming will cause the irreversible release of highly potent greenhouse gases stored in Arctic methane clathrates and land-based permafrost that could cause severe, abrupt climate change and lock in even more severe, long-term climatic disruption. There is evidence that relatively small quantities of greenhouse gases are leaking from these sources, although it is not precisely clear when the tipping points could occur.
- In 2010, the National Science Foundation warned that if even a “fraction” of the methane stored in the floor of the shallow East Siberian Arctic Shelf in the Arctic Ocean is released into the atmosphere, it could “trigger abrupt climate warming.”⁴⁶
- About 1.4 trillion tons of methane are trapped below the shelf, and it was recently estimated that around 10 million tons leak from the shelf annually, according to researcher Natalia Shakhova of the University of Alaska at Fairbanks.⁴⁷ It is not clear when the shelf began leaking or if it is leaking because of human activities, but Shakhova and her team are concerned that the shelf is beginning to destabilize.⁴⁸
- According to Shakhova, an abrupt, decade-long release of 50 billion tons of methane is “highly possible at any time,” and would trigger a “climate

⁴⁶ Press Release. (2010). [*“Methane Releases From Arctic Shelf May Be Much Larger and Faster than Anticipated”*](#), National Science Foundation, 4 March 2010.

⁴⁷ Mason, J. (2012). [*“Arctic Methane Outgassing On the East Siberian Shelf: A Primer Plus an Interview with Dr. Natalia Shakhova”*](#), Skeptical Science, 19 January, 2012.

⁴⁸ Ibid.

catastrophe.”⁴⁹ Methane is 25 times as potent a greenhouse gas as carbon dioxide over a 100-year-period, and 72 to 100 times as potent during the 20-year period after it is emitted.⁵⁰ There is a great debate among climate scientists about whether the methane clathrates pose such a grave and imminent threat.

- A 50 billion ton belch of methane would quickly raise global temperatures +1.3°C from current levels and increase global atmospheric methane levels twelve-fold, pushing temperatures far beyond the unsafe +2°C “guardrail” and likely setting off a number of other climate tipping points. Most ecosystems generally cannot adapt to more than +0.1°C of change over the course of a decade. It has been projected that such a belch would cost the world economy \$60 trillion.⁵¹
- At the moment, the only way known to prevent such a scenario is the deployment of high-risk geo-engineering technologies that are designed to rapidly cool the earth.
- In particular, humans could use rockets, aircraft, or a giant hose to inject sulfate particles (aerosols) into the upper atmosphere and substantially cool the earth in a matter of months. This technology, the most well-known “solar radiation management” approach, is in development. It would mimic the effect of volcanoes, which spew sulfate aerosols into the atmosphere, and have demonstrably cooled the earth in the past by reflecting the sun’s rays back into space.
- Directly cooling the earth using solar radiation management could theoretically prevent both a general melt of the permafrost as well as a catastrophic, large-scale, irreversible release of methane from clathrates. It could also theoretically slow down or even halt the melting of the Antarctic and Greenland ice sheets, and give humanity a window of time to restore atmospheric greenhouse gas concentrations to safe levels.
- However, solar radiation management would likely disrupt global rainfall patterns, causing floods and droughts that would adversely affect billions of people across the planet, and possibly kill large amounts of people in the absence

⁴⁹ Pearce, F. (2013). [“Vast methane belch possible at any time”](#), *New Scientist* 2927, 24 July 2013.

⁵⁰ Romm, J. (2011). [“Carbon Time Bomb in the Arctic: New York Times Print Edition Gets the Story Right”](#), *Climate Progress*, 19 December 2011.

⁵¹ Whiteman, G. (2013). [“Climate science: Vast costs of Arctic change”](#), *Nature* 499, 401–403

of massive international assistance. As a result of these potentially horrific side effects, the use of this technology could potentially lead to war between nation-states. There could also be other side effects that cannot be predicted before the technology is deployed.

- There is no way to test these technologies at scale. We agree with writers, such as Naomi Klein, who argues that using these techniques would make all humanity and the natural world guinea pigs in an extremely dangerous experiment. However, it is also true that this extremely dangerous experiment has already begun, thanks to hundreds of years of planetary deforestation, greenhouse gas emissions and aerosol emissions that have completely transformed the earth system and initiated a new geological epoch called the “Anthropocene.” Consciously attempting to direct the entire global climate system using a relatively small, continuous atmospheric injection of pollutants would certainly constitute an entirely new phase of the experiment, raising a host of moral dilemmas.
- The use, or planned use, of solar radiation management could also provide governments with an excuse to further delay major greenhouse gas emissions reduction and removal — both of which are scientific and ethical imperatives.
- Emissions must be drastically reduced soon, in order to both stabilize global surface temperatures long-term, and to reverse ocean acidification, which is killing off key components of the ocean food chain — specifically shelled organisms — and therefore poses a threat to the entire marine food web. More than a billion people across the world rely on marine species as their primary protein source.⁵² Solar radiation management technologies do not reverse ocean acidification, which is caused by carbon dioxide emissions and is known colloquially as “global warming’s evil twin.” Only carbon emissions reduction and removal can halt and reverse ocean acidification.
- If the process of aerosol sulfate injection was completely disrupted by depression or war for several years, the cooling effect could wear off, leading to a sudden, disastrous pulse of warming that could overwhelm the ability of ecosystems to adapt. If solar radiation management was deployed in order to mask the global warming from a business-as-usual emissions trajectory and was suddenly interrupted, it would result in an *extremely* disastrous warming pulse. Even if no interruption occurred, solar radiation management would need to somehow be

⁵² National Oceanic and Atmospheric Association. [“What is Ocean Acidification?”](#), NOAA: Pacific Marine Environmental Laboratory.

deployed continuously for hundreds of years on end if it was deployed as a substitute for zero emissions and greenhouse gas removal — a truly horrible idea.

- However, it will ultimately be difficult to avoid a sudden pulse of warming, since about half of the “global dimming” effect from aerosol emissions that is currently cooling the earth by -1.2°C will wear off quickly if fossil fuel burning is rapidly curtailed. The earth would suddenly warm by about $+0.6^{\circ}\text{C}$. The sulfate aerosol particles emitted in fossil fuel burning fall out of the atmosphere after 10 days, but are continuously replenished as humanity continues to burn large quantities of fossil fuels. This means that as we curtail fossil fuel burning (and therefore sulfate aerosol emissions), the rate of global warming will likely accelerate as the short-term aerosol cooling effect wears off, although this could be tempered by sharp cuts in emissions of short-lived warming agents such as methane and black carbon.
- Meanwhile, the majority of fossil fuel carbon emissions cause a powerful climate warming effect for about 200 hundred to 2,000 years, while a substantial minority of emissions continue to impact the climate for tens of thousands of years and longer.⁵³ Delaying the date at which we curtail fossil fuel burning (and thus end the temporary global dimming effect) will not solve the problem, since fossil fuels are a finite resource that would be exhausted long before the warming impact of emissions wears off — even if we continue to burn fossil fuels at only a fraction of current levels long into the future.
- Former NASA scientist James Hansen calls this conundrum humanity’s “Faustian Bargain.”

IV. The Pledge to Mobilize is Neutral on the Solar Radiation Management Question.

- The Pledge to Mobilize does ***not*** call for the deployment of solar radiation management technology, but it does ***not*** explicitly prohibit it, either. Climate change poses such a catastrophic threat that we are not willing to categorically rule out high-risk, “least-worst” options that may be our only hope of stabilizing the climate.

⁵³ Archer D., et. al. (2009). [*“Atmospheric Lifetime of Fossil Fuel Carbon Dioxide”*](#), *Annu. Rev. Earth Planet. Sci.* 2009. 37:117–34

- The Pledge to Mobilize has been signed by individuals who support the use of solar radiation management, as well as individuals who oppose it. This makes sense, as it is one of the most complex and concerning issues ever faced by humanity.
- It is imperative, however, that humanity avoids a large-scale methane clathrate release and a permafrost general melt.

Conclusion: *The federal government should immediately commence continuous, emergency monitoring of emissions from methane clathrates and permafrost. The government should also conduct an emergency research & development effort into safe technologies to help humanity avoid methane clathrate and permafrost tipping points and also resolve the problem of how to safely end the global dimming effect.*

Further Reading:

[“Reflecting sunlight into space has terrifying consequences, say scientists”](#), Damian Carrington, *The Guardian*, Nov. 26, 2014.

[“Geoengineering: The Inescapable Truth of Getting to 350”](#), Chuck Greene, Bruce Monger & Mark Huntley, *The Solutions Journal*, October 2010.

[“Serious Talk About Geo-Engineering Better than Pious Hand-Wringing about 2 Degrees”](#), *Climate Code Red*, David Spratt, Nov. 22, 2012.

[Injecting Sulfate Particles into Atmosphere Won’t Fully Offset Climate Change](#), *Science Daily*, Jan. 25, 2012.

Infinite Growth and the Global Sustainability Emergency.

Humanity is entering a bottleneck, in which a growing human population, and its exponentially increasing use of natural resources, is placing strains on the planet's ability to sustain our species and many others. Climate change, the gravest symptom of this predicament, will severely exacerbate the problems posed by the exponential growth of human populations and resource consumption.

- Government analysts are warning of a growing sustainability crisis that could begin to climax within decades.
- A 2008 “Global Trends” report by Thomas Fingar, the chairman of the United States National Intelligence Council, found that “continued economic growth — coupled with 1.2 billion more people by 2025 — will put pressure on energy, food, and water resources.” Fingar’s report found that in 2008, 21 countries with a combined population of 600 million people, were either cropland or freshwater scarce. By 2025, the report found, 36 countries, with a combined population of 1.4 billion people, will be cropland or freshwater scarce.
- In the estimation of John Beddington, the U.K. government’s former chief scientist, humans face a “perfect storm” of energy, food, and water scarcity crises by 2030.
- It is widely acknowledged that humanity faces a peak and subsequent, uncontrollable decline in global oil production levels within decades, and possibly within years. Post Carbon Institute energy analyst Richard Heinberg has called for a WWII-scale mobilization as the best means to respond to peak oil.
- In 2013, Lester Brown warned that “peak water” is “the real threat to our future” in the pages of *The Guardian*.
- Humans have eliminated half the wildlife on earth over the past 40 years, according to scientists from the WWF and Zoological Society of London. Elizabeth Kolbert, of *The New Yorker*, has published a book, “The Sixth Extinction,” warning that humans are in the midst of causing a mass extinction of life on earth.

- An effort to focus strictly on greenhouse gas emissions and climate change could backfire, as we could find ourselves in a situation where we have averted runaway warming, but run out of adequate supplies of fresh water or other critical resources due to population growth and exponential resource consumption.
- The Global Footprint Network estimates that humans annually use the equivalent of 1.5 Earths to provide natural resources and absorb our waste — meaning it takes the Earth 18 months to regenerate what we use in a year. If current population and consumption trends continue to 2030, humanity will need the equivalent of two Earths every year, the network found.
- A Climate Mobilization would respond to these gathering sustainability crises, as well. It is clear that major changes need to happen throughout our economy and society in order to achieve safety and sustainability. This will likely require shrinking the *physical size* of the economy through humane energy and resource demand reductions, transitioning to renewable energies, establishing zero-waste, efficient consumption practices, recycling all re-usable materials, systematically conserving water, and widely promoting and incentivizing humane, voluntary family planning practices. These measures would be instituted with the goal of returning humanity’s global footprint to a steady equivalent of approximately 1 Earth per year or less.⁵⁴
- “The scale, speed and complexity of twenty-first century challenges suggest that responses based on marginal changes to the current trajectory of the human enterprise — ‘fiddling at the edges’ — risk the collapse of large segments of the human population or of globalised contemporary society as whole. More transformational approaches may be required.” - 2011 Royal Swedish Academy of Sciences paper, [“The Anthropocene: From Global Change to Planetary Stewardship”](#), authored by several of the world’s leading climate scientists.

Conclusion: *Recognizing the global crisis that we face and dedicating ourselves to fighting it through a full-scale mobilization will give us time to rethink our assumptions about the free market, GDP, growth, and what constitutes a good life.*

⁵⁴ During World War II, the War Production Board instituted the Controlled Materials Plan, a complicated system for rationing the key commodities of steel, copper, and aluminum throughout the economy. The goal of the CMP was to contain the “mad scramble” for raw materials, and prioritize their distribution. According to economist Hugh Rockoff, the CMP represented a retreat from earlier attempts to centrally control and micro-manage the mobilization. Total central planning, while demanded by public opinion, had been found unworkable. The CMP, which many liberal historians believe was key to the munitions “production miracle” (Rockoff disputes this), could be a model for future attempts to shrink the physical size of the economy, contain demand for raw materials, and set economy-wide priorities.

Further Reading:

[“How to Shrink the Economy without Crashing It: A Ten-Point Plan”](#), Richard Heinberg

[“Research Report - Resource constraints: sharing a finite world. Implications of limits to growth for the actuarial profession”](#), Aled Jones.

Videos on the Big Picture:

[“The Earth is Full”](#), Paul Gilding.

[“Extracted”](#), Ugo Bardi

[“Who Killed Economic Growth?”](#), Richard Heinberg

[“The Crisis of Civilization”](#), Nafeez Ahmed.

Further Questions: Rapid Emissions Reductions, Nuclear Power, Growth, Capitalism, and Industrial Civilization.

1. Why does the Pledge to Mobilize call for such a fast emissions decline?

We are already in very dangerous territory, given how long meaningful emissions reductions have been delayed. Some distinguished climate scientists are now indicating that extreme geo-engineering technologies may need to be deployed for decades in order to prevent an irreversible climate catastrophe. The longer we wait to get to zero net emissions, the greater the risk we run that the planet will warm dangerously for a very long period of time, leading either to the collapse of civilization or a very long-term, extraordinarily risky use of solar radiation management — a planetary ecological intervention that could induce civilizational disruptions or breakdown if deployed recklessly or suddenly interrupted.

The faster we reduce greenhouse gas emissions, the greater the likelihood that we can eliminate the need for a dangerous, long-term geo-engineering “solution.” The faster we reduce emissions, the greater the likelihood that we can save the marine ecosystems threatened by ocean acidification and prevent an 82-foot sea level rise.

We won’t know if reducing America’s net greenhouse gas emissions to zero by 2025 is possible until we try. If it is truly economically impossible, then perhaps the date at which we reach zero emissions will arrive a few years later.

With civilization, the natural world, and billions of lives on the line, we see much less risk in picking a scientifically and ethically justified target than in choosing a politically “realistic” target that will lead to a +3°C or +4°C global warming, thereby *ensuring* either the collapse of civilization or an attempt at protecting civilization through a century or even multi-century-long deployment of solar radiation management — a dubious undertaking that would likely result in cataclysm.

While a few of our expert advisors feel a 15-20 year national transition is more feasible economically, most of our advisors have told us that the proposed decade-long transition proposed in the Pledge is ambitious but economically feasible. Groundwork has already been laid and trails have been blazed by pioneers in renewable energy, agroecology, and other sustainability practices. All we need to do is implement these measures on a vast scale, at emergency speed. Our hope is that deep emissions cuts begin immediately, and that the next President of the United States takes America to zero net greenhouse gas emissions by the end of his or her second term.

2. What is the Climate Mobilization’s position on nuclear power?

For many years, a great debate has raged between advocates of 100% renewable energy and advocates of nuclear energy. The Climate Mobilization does not have a dog in this fight. We are in favor of a rapid, large-scale deployment of renewable energy technologies, such as solar, wind, tidal, hydroelectric, and geothermal. If nuclear energy development is needed to rapidly decarbonize civilization, then so be it, as long as it is done safely and rapidly — two hurdles that might prove insurmountable. We welcome both 100% renewables advocates and advocates of a hybrid nuclear/renewables energy supply to take the Pledge to Mobilize, which does not proscribe what forms of net-zero carbon energy sources will be used in the Climate Mobilization.

3. What is the Climate Mobilization’s position on economic growth?

In order to ensure long-term sustainability and human species survival, the **physical** size of the economy must shrink considerably. We cannot continue consuming greater quantities of finite raw materials than the earth can reliably provide in the long-term; doing so will inevitably lead to conflict and collapse. To date, economic growth has traditionally been strongly correlated with exponential natural resource consumption and greenhouse gas emissions. However, if economic

growth is 100% decoupled from greenhouse gas emissions and the use of material resources, growth could theoretically continue, even as the physical size of the economy shrinks. It would continue, in this scenario, in the form of dematerialized economic activity — such as certain components of the service industries — as well as through innovation. The information and communications revolution, for instance, could be viewed as the beginning of absolute decoupling. In 2014, global emissions flatlined while the economy grew 3% — rekindling hopes that 100% decoupling is possible. Whether absolute decoupling is possible or not, the Climate Mobilization will cause huge waves of innovation as we rapidly transition the economy, and in its early years, could cause a more traditional, resource-intensive economic boom, as it prepares the physical economy for a steep contraction.

Continuing exponential raw materials consumption growth forever is not an option, as it will inevitably lead to global ecological and economic collapse, due to the Earth's finite ability to absorb our wastes and provide non-renewable resources. Our civilization's rate of raw materials consumption will either decrease through planned intervention or through catastrophic collapse. It's hard to know precisely what a shrinking physical economy would look like. But we believe that it will look much better than the forced contraction of uncontrollable collapse.

The Climate Mobilization is focused on what needs to be done now in order to restore a safe climate, rather than attempting to ensure infinite resource consumption growth continues forever. The 10-year climate mobilization will give us a period to rethink and consider what shape the post-mobilization economy should take. We must not be slaves to an economic doctrine that is leading us to ruin.

4. What is the Climate Mobilization's position on capitalism?

As with nuclear power and economic growth, there is a passionate debate over whether saving civilization from climate change requires the super-cession of capitalism. It seems clear to us that the Climate Mobilization needed to save civilization will use economic tools and approaches that are alien to our modern, deregulated form of capitalism, such as strong command-and-control regulations and national public planning. These tools are less alien to some of the forms of “mixed-economy” capitalism that were more popular during the mid-20th century. On the other hand, there should be no doubt that as in WWII, the Climate Mobilization will restrain capitalism in order to save democracy. Again, we do not feel particularly strongly about this significant, but ultimately distracting debate. Let historians determine what “ism” was used to save civilization.

5. Is the Climate Mobilization in favor of industrial civilization?

We are in favor of a rational, moral, organized human civilization. Although industrial civilization has led us to the brink of cataclysm, we think some form of civilization is worth saving, as it represents the accumulation of all human achievement throughout history, and sustains life for billions of people. Passivity or cynicism in the face of this crisis — the disturbingly widespread view that “civilization will inevitably collapse, and perhaps that is for the best” — is the tacit acceptance of the deaths of billions of people. We believe those lives have infinite, priceless value, and must not be thrown away.

The Climate Mobilization represents a new wave of civilization, one that will look quite different than the industrial wave that preceded it. We believe that humanity has the ability to change, grow, and mature. In the brief history of civilization, this has happened many times, whether through the abolition of slavery or the defeat of fascism. Psychotherapists say to suicidal individuals that, “Suicide is a permanent solution to a temporary problem.” This is true for humanity as a whole. We can create a durable, humane civilization that does not lead to mass extinction and collapse. It is hard, even impossible, to imagine precisely what it will look like, but the first step is clear: An all-out, emergency effort to restore a safe climate.

Concluding Quotations.

“We now have a choice to make. We can accept much higher levels of warming of 3–5°C that will catastrophically affect the world's natural and human systems in a manner more forthright scientists say are incompatible with the maintenance of human civilisation; or we can conceive of a safe-climate, emergency-action approach which would aim to reduce global warming back to the range of conditions experienced during the last 10,000 years, the period of human civilisation and fixed settlement.

“This would involve fast and large emissions reduction through radical energy demand reductions, whilst a vast scaling-up of clean energy production was organised, together with the remaking of many of our essential systems such as transport and food production, with the target being zero net emissions. In addition, there would need to be a major commitment to atmospheric carbon dioxide drawdown measures. This would need to be done at a speed and scale more akin to the ‘war economy’, where social and economic priority is given to what is perceived to be an overwhelming existential threat.”

—**David Spratt**, “The real budgetary emergency and the myth of ‘burnable carbon,’ ” May 22, 2014.

“To turn potential into actual production capacity was a titanic and complicated task. It demanded policy decisions of extraordinary difficulty, and then the translation of policy into the infinite detail of execution. It touched every aspect of the complex social and economic mechanism of the Nation. It required the transfer of scientific genius from the research of peace to the development of new weapons of war. It enlisted the services, not merely of those in the prime of life, but of young and old, of women as well as men, and of even the partially crippled as well as those sound of limb. It even reached into our penal institutions, where valuable contributions were made to war supply. It entailed teaching those without mechanical experience and skill how to build tanks, airplanes, and the many other instruments of war. It compelled millions of people to move from communities in which they had long been settled to places which were crowded and uncomfortable. It asked business men to limit profits and workers to forego wage advances. In short, it involved a mass migration and a social and economic revolution of vast dimensions, much of it accomplished voluntarily under government direction, in order that our forces and those of our allies might have the superiority in weapons which is essential to victory in modern war.

“As a result of this immense effort, the goal of President Roosevelt, to make America ‘the arsenal of democracy,’ was fulfilled. American weapons were employed on every battlefield. American raw materials and American machinery increased the output of the factories of our allies. The head start of the Axis was overcome, and it collapsed in defeat under our crushing material superiority.”

—**Troyer S. Anderson**, “Munitions for the Army: A Five Year Report on the Procurement of Munitions by the War Department Under the Direction of the Under Secretary of War,” 1946.