

Why the RC Communities Prioritize Addressing Climate Change

The Re-evaluation Counseling Community recognizes the challenge presented by the rapid changing of our climate and addressing it has been a high priority since 2013 (see our goals, draft policy and draft program[\[1\]](#)). In April of 2019 Tim issued an [initiative](#) on climate change that commits the RC Community to face the challenge of finding and acting on ways to stop climate change. At the 2022 World Conference the RC Communities adopted the [Unified Goal on the Climate](#) calling for RCs to play an active role in stopping the climate emergency..

The situation continues to change rapidly, and more information is becoming available. This is our appraisal of the current situation and the research that supports our appraisal, addressing many of the key issues briefly. Much of the information in the “cause and effects” section is stark. We include this information not to restimulate fears or feelings about learning facts and figures, but rather to give you a chance to discharge your way toward having an accurate picture of the situation humankind is facing and the speed at which decisive action must be taken.

Sources for the information presented are included in endnotes, and we hope that you will find this useful as a resource in leading on these issues.

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INTRODUCTION

The climate emergency is already having a damaging effect on every continent. Our climate has permanently changed and will continue changing into the distant future. While other problems facing humanity are extremely harmful, none (other than the possibility of nuclear war[\[2\]](#)) pose such an immediate and large-scale threat to humans and all other forms of life.

Climate change calls for immediate good thinking and effective action by our governments and industries. Unless our society can dramatically reduce greenhouse gas (GHG) emissions within the next decade (we need to cut emissions in half every decade until 2050) while removing large amounts of GHG from the atmosphere, dangerously destructive global climate change will escalate.

"The climate crisis has arrived and is accelerating faster than most scientists expected. It is more severe than anticipated, threatening natural ecosystems and the fate of humanity."[\[3\]](#)

Progress can be seen globally in awareness and engagement, but emissions (and temperatures) are still rising. Scientific consensus is that we can reach drawdown (the point where the level of GHG in the atmosphere begins to decline) by mid-century by implementing a wide array of existing climate solutions now. Many of these solutions have “co-benefits” for society: improving health, creating jobs, safeguarding water and biodiversity, and advancing social and economic equity as part of a “just transition”.^[4]

Because our governments, institutions, and industries are not acting fast enough to resolve the emergency, millions of people must engage, calling for quick, decisive action. RCers can play a pivotal role in resolving the climate emergency by informing ourselves about the facts, using and sharing what we know about freeing minds from distress recordings and the role of oppression and exploitation in creating the current situation, engaging as part of the solution, and bringing many people along with us. The [Unified Goal on the Climate](#) lays out a detailed vision for the role RCers can play in resolving the climate crisis.

CLIMATE CHANGE IS HAPPENING AND THERE IS IRREFUTABLE EVIDENCE THAT IT IS CAUSED BY HUMAN ACTIVITY

The Earth is warming because of a growing accumulation of GHG emissions that have formed a warming blanket around the Earth. The most damaging of these emissions is carbon dioxide (CO₂), although other emissions and substances (methane, nitrous oxide, and black carbon, among others) are also damaging and together contribute about 50% of the warming of CO₂.^[5] Concentrations of atmospheric CO₂ are 148% of pre-industrial levels (methane 260% and nitrous oxide 123%).^[6] Human activity (from fossil fuels and land use change) is emitting 42 billion tons of CO₂ into the atmosphere annually, along with significant amounts of methane (which warms the atmosphere more quickly than CO₂) and other GHGs.^[7] At this rate, within a decade we will reach levels of GHGs that will cause unprecedented warming and related impacts long term.^[8]

Scientific measurements show that the rise in GHG results primarily from burning fossil fuels. Scientists have measured the amount of CO₂ in the atmosphere over time by drilling ice cores in Antarctica. This data shows us that the average level of CO₂ in the atmosphere for the past 800,000 years has been between 180 and 260 parts per million (ppm) of CO₂—reaching a high of 300 ppm in some periods between ice ages. In 1750, at the start of the Industrial Revolution (when humans started using fossil fuels in large quantities), atmospheric CO₂ was at 278 ppm. In January 2023 it is at 417 ppm.^[9] (It was 270 ppm in 1750, 310 in 1950, 354 ppm in 1990, 405 in 2017.)^[10]

Fossil fuel use is responsible for 86 percent of global CO₂ emissions over the past decade

Since 1965, more than one-third of global industrial GHGs can be traced to just 20 fossil fuels companies.[\[12\]](#) Other significant sources of CO₂ and methane are industrialized agriculture (including livestock production), fracking of natural gas (through leakage in production), and deforestation.[\[13\]](#) [\[14\]](#)

As emissions rise, temperature rises and negative impacts follow. The planet has warmed by 1.2° Celsius (2° Fahrenheit) since 1880.[\[20\]](#) Two-thirds of the temperature increase has occurred since 1975, the fastest rate of temperature increase in recorded history. (Nine of the ten hottest years on record have occurred in the last decade.)[\[21\]](#). The rate of warming now is twice as fast as in the 1950s and 1960s.]

Now, 2023, emissions are still increasing.

The last time the world was 0.5°C - 1°C warmer was during the last Inter-glacial (geologic time period). The seas were 6 – 9 meters (20 – 30 feet) higher than today. The last time the Earth's atmosphere was at 400 ppm of CO₂ (we are currently at 421 ppm) was a few million years ago. The climate was 2°C to 3°C above pre-industrial temperatures and sea level was some 15 - 25 meters above modern levels.[\[23\]](#)

The damaging impacts of climate change are already a reality in all parts of the globe, but worse in the tropics and the Arctic. These effects are increasing everywhere. Climate change is causing:

- heat waves (increasing uninhabitable land areas), droughts, desertification, and crop loss (a temperature increase means fewer rains, and rains at the wrong times of the year),
- severe weather events (a warmer atmosphere holds more water and results in bigger storms), many with heavy precipitation[\[24\]](#), and the consequent habitat damage and flooding,
- sea level rise (from melting ice cover) resulting in larger storm surges, erosion of coastline and salinization (destruction by salt) of crop land and coastal forests,
- increased acidification and warming of the oceans (the oceans absorb 33% of CO₂ emissions, damaging marine ecosystems),
- wildfires (increasing in number and strength as habitats get drier and the fire season becomes longer with temperature rise),
- thawing of the Arctic permafrost (releasing stored CO₂ and methane into the atmosphere at increasing rates),[\[25\]](#)
- an increase in diseases and forest infestations – warmer temperatures multiply disease vectors (such as mosquitos), pests, and expansion of their habitats,
- melting of Greenland and Antarctic ice (faster than expected, and with the released cold fresh water disrupting ocean currents as well as causing sea level rise),
- melting of glacial ice, resulting in water shortages from seasonal melting,

- shifts in climate zones (expansion of arid zones and contraction of polar zones)[26],
- species extinction (up to 30% of species are at risk at 2 - 3°C of warming[27]),
- a warming ocean damaging coral reefs and causing migration of fish into cooler waters and away from populations that traditionally fish them.

As the global temperature rises, these problems are multiplying in number and intensity.[28]

To avoid these more severe consequences, scientists agree we must limit global warming to less than 1.5 degrees Celsius. To avoid that threshold, the world can emit only a set amount of CO₂ from now into the future. This quantity is known as the carbon budget. According to the August 2021 IPCC report: “Climate Change 2021: The Physical Science Basis,” another 500 gigatons of CO₂ emissions will raise global temperature by 1.5 degrees (roughly 42 gigatons a year--the current average). Nations have about 10 more years at current emissions rates – until 2032 – before exhausting the budget.

Once we stop emissions, temperatures will start declining within 3 to 5 years. (IPCC report and October 2021 Scientific American article:

https://www.scientificamerican.com/article/theres-still-time-to-fix-climate-about-11-years/?utm_source=Scientific+American+article+&utm_campaign=SA_article)

These climate changes can still be reversed. They can be reversed by a rapid but just transition away from fossil fuels, reducing consumption, increasing energy efficiency and conservation, improving land-based storage of GHG, and changing our diet and agricultural practices – all attainable goals, if we act now.

CLIMATE CHANGE IS A DIRECT RESULT OF OUR ECONOMIC SYSTEM

The climate emergency is a direct result of the ways that distress recordings resulting from our early history of scarcity have become institutionalized in our society. Societies are organized based on competition for resources at every level. Our current economic system supports the accumulation of wealth by the few, resulting in exploitation of people’s labor and the natural resources of the Earth. To maintain this system people are divided from and set against one another by oppressions (kept in place by internalized and oppressor distress recordings, misinformation, external threats and acts of violence), that leave people feeling powerless and inadequate to bring about change. In such a society, people tolerate tremendous harm and irrationality. The drive for profit and economic growth has enriched the ruling class and wealthy nations and left them with a perpetual desire for more.

Even in the face of clear evidence that we are speeding toward ecological collapse from a warming planet, those in power cannot or will not stop in their quest for wealth. The vast majority of people want the changes in our society that are necessary to avert

climate catastrophe, but are limited in their intention and effectiveness to bring about change by the effects of oppression, early hurts, and the lies perpetuated by society that distort their perception of what is true.

Indigenous people, people of the global majority, poor people, and vulnerable populations (disabled, elderly, and very young people) are those harmed first and most by the effects of the resulting environmental destruction (See: “Climate Change Disproportionately Impacts Frontline Nations and Communities” below). Climate change impacts all oppressed groups and compounds their oppression. Transforming our economic system and society to one that sustains all life and ends oppression and exploitation are important parts of the work of the RC Community on the climate emergency. Addressing climate change needs to be seen as an important part of each of our struggles to end oppression and exploitation. United we are powerful enough to stop and reverse climate change.

Affluence and consumerism drives climate change. The most affluent countries are mainly responsible for the historical GHG emissions and generally have the greatest per capita emissions.[\[15\]](#) Nearly 60% of global CO₂ emissions come from the world’s six largest economies – the United States, China, Russia, India, the European Union, and Japan – and must be reduced immediately.[\[16\]](#) (16% of the emissions are from the United States alone, while the U.S. population is only 5% of the global population.)[\[17\]](#)

From 1990 to 2015, a critical period in which annual emissions grew 60% and cumulative emissions doubled, research estimates that:

- The richest 10% of the world’s population (c.630 million people) were responsible for 52% of the cumulative carbon emissions – depleting the global carbon budget[\[18\]](#) by nearly a third (31%) in those 25 years alone.
- The poorest 50% (c.3.1 billion people) were responsible for just 7% of cumulative emissions and used just 4% of the available carbon budget.
- The richest 5% (c.315 million people) were responsible for over a third (37%) of the total growth in emissions and the total growth in emissions of the richest 1% was three times that of the poorest 50%.[\[19\]](#)

CLIMATE CHANGE DISPROPORTIONATELY IMPACTS FRONTLINE NATIONS AND COMMUNITIES

The harshest effects of climate change fall on people living in poverty (mostly People of the Global Majority and Indigenous people in countries long targeted by genocide, imperialism, and colonialism, but also disabled and elderly people – called “Frontline

Communities”) (map showing this [here](#))^[29]. Hundreds of millions of people are currently struggling under the effects of climate change, such as food and water scarcity, extreme storms, wildfires, and displacement.^[30]

Poor people are disproportionately affected not only because they are often more exposed and more vulnerable to climate-related shocks. They also have fewer resources and receive less support from family, community, the financial system, and social safety nets to prevent, cope, and adapt.

People with disabilities are a large and significant marginalized and vulnerable population affecting nearly every family, and which intersects with all other constituencies, yet are often omitted from discussions of the impact of climate change.

Climate change will worsen these shocks and stresses, forcing more than 132 million people into extreme poverty by 2030^[31]

Health impacts. Climate change is expected to cause 250 million additional climate-related deaths each year between 2030 and 2050 from malnutrition, malaria, diarrhea and heat stress.^[32] Under-nutrition will be the [largest health impact](#) of climate change in the 21st century. Declines in agricultural productivity of between 15 and 30% are predicted by 2080 in Africa, South Asia, and Central America.^[33] A 6% decline in global wheat yields and 10% decline in rice yields is expected for each additional 1°C rise in global temperature, with substantial impacts on under-nutrition and stunting in food insecure or poor regions. An additional 7.5 million children are expected to be stunted by 2030, increasing to 10 million children by 2050.^[34]

The IPCC notes, in its Sixth Assessment Report, that 50 to 75% of the global population could be exposed to life-threatening climatic conditions by the end of the century due to extreme heat and humidity. [34.5]. Intergovernmental Panel on Climate Change, Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (2022).

Climate refugees. The United Nations High Commissioner for Refugees estimated in 2018 that since 2008, 22.5 million people have been displaced by climate-related or extreme weather events.^[35] With the 2°C rise in temperature predicted by 2050, scientists anticipate more than 140 million additional refugees on the move annually, primarily from heat-caused food and water scarcity (driving people into cities where overcrowding leads to severe social strains), but also extreme weather events and rising tides.^[36] With migration comes suffering, including human trafficking and human slavery,^[37] and political tension.

Currently, 250 million people live outside their countries of birth and we can see the resulting anti-immigrant backlash. By 2060, 1.4 billion people could become climate change refugees.^[38]

Right-wing organizations are beginning to move away from climate denial to predicting a looming disaster that will result in massive migration of people from the Global South to the Global North, requiring stronger border protections. They are blaming migrants for environmental destruction/climate change in two ways – first, for moving to countries with higher emissions and then adding to those emissions, as right-wing figures in Arizona USA have claimed; and secondly for supposedly bringing destructive, polluting habits with them from their countries of origin. This plays into longstanding messages from the right that overpopulation in poorer countries is a leading cause of environmental harm. [\[38.5\]](#)

The number of disasters has increased by a factor of five over the past 50 years, driven by climate change, more extreme weather and improved reporting. [\[39\]](#) Disasters of equivalent strength kill between 12 and 45 times more people in poorer countries than in wealthy ones. [\[40\]](#)

Mitigating the impact of climate change on these Frontline and vulnerable populations and nations is possible but requires action sooner rather than later.

THE EFFECTS OF CLIMATE CHANGE ARE INCREASING

Climate impacts increase over time, as temperatures rise. For example, warming temperatures have caused more than a 40% reduction in Arctic sea ice since 1978. The Arctic region is warming at a rate twice that of the global average [\[41\]](#), with 2020 ice extent the second lowest recorded. [\[42\]](#) Greenland ice sheet rate of melting (the biggest contributor to sea level rise) increased five-fold between the mid-1990s and 2011. In 2014 scientists found Greenland had doubled its rate of ice loss since 2009. [\[43\]](#) And by 2018, the rate of melting from the Antarctic ice sheet had accelerated threefold in the last five years. [\[44\]](#) Global mean sea level has increased from 1.4 mm/year over the period 1901–1990 to 2.1 mm/year (1970–2015) to 3.2 mm/year (1993–2015) to 3.6 mm/year (2006–2015).

Predictions under a “business as usual” scenario would yield an average of **a meter of sea level rise by 2100** (and continued rise for centuries as ice cover continues to melt), [\[45\]](#) with a projected rise of between 2.6 and 6.6 feet in the Pacific by 2100 (sea level rise varies considerably in different parts of the world). [\[46\]](#) Thresholds for irreversible, multi-millennial loss of the Greenland and West Antarctic ice sheets may occur at 1.5 or 2°C global warming. The frequency of severe coastal flooding, multiplied by sea-level rise, is expected to double in the next decade. [\[47\]](#)

Climate change is **heating the oceans and altering their chemistry** so dramatically that it is threatening seafood supplies, fueling cyclones and floods, and posing profound risks to the hundreds of millions of people living along the coasts. [\[48\]](#) Our oceans

absorb more than 90% of the planetary temperature increase. But this buffering effect is weakening and may not last much longer, leading to more atmospheric heat.[\[49\]](#) The steadily rising ocean temperatures (a new record was set in 2018)[\[50\]](#) endanger coastal inhabitants and marine ecosystems, including coral reefs and plankton. Warmer waters increase the intensity of storms. Oceans absorb 33% of CO₂ emissions, leading to acidification that further endangers ecosystems.[\[51\]](#)

Heat waves impacted all parts of the world in 2018, causing death, droughts, and wildfires. Global warming has overtaken natural variability as the main driver of extreme heat waves. By 2070 (under the current “business as usual” scenario), extremely hot zones like the Sahara that now cover less than 1 percent of the earth’s land surface could cover nearly a fifth of the land, potentially placing one of every three people alive outside the climate niche where humans have thrived for thousands of years.[\[52\]](#)

Tipping points exist[\[53\]](#) and will further multiply existing threats. “These difficult to measure factors could push global temperatures past certain thresholds triggering abrupt, unpredictable, and potentially irreversible changes that have massively disruptive and large-scale impacts.[\[54\]](#)” For example, when Arctic sea ice melts, we’re left with more ocean water whose darkness absorbs more of the sun’s heat, therefore contributing to warming. This has caused the Arctic region to warm at twice the rate of the planet as a whole.[\[55\]](#)

The climate crisis has arrived and is accelerating faster than most scientists expected. It is more severe than expected; threatening natural ecosystems and the fate of humanity. Especially concerning are potential irreversible climate tipping points and nature’s reinforcing feedbacks... that could lead to a catastrophic “hothouse Earth,” well beyond the control of humans.[\[56\]](#)

It is not too late to reverse these effects. By reducing carbon emissions, planetary warming will, over time, stop and slowly reverse itself. Ice sheets and glaciers can reestablish themselves, atmospheric and ocean temperatures can drop, the seas can recede, and weather patterns can stabilize.

THE INTERNATIONAL COMMUNITY IS UNITED IN ITS COMMITMENT TO ADDRESS CLIMATE CHANGE UNDER THE LEADERSHIP OF THE UNITED NATIONS

Forty years ago, the United Nations began addressing climate change and in 1990 called for a global treaty on climate change. In 2015, at COP21 (the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change), most nations

signed a binding agreement (the Paris Agreement) to address climate change. Each nation submitted a five-year plan for emissions reduction (to be increased at COP26).

The Paris Agreement states that temperature rise should be kept to well below 2° C (making all efforts to limit it to 1.5°) to avoid the most drastic, life-threatening global climate change. (There was almost unanimous agreement among the scientific[\[57\]](#) and international[\[58\]](#) community on this point in 2015.) The intent was for global emissions to peak by 2020 (they continue to rise today [\[2023\]](#), though more slowly), even though the commitments made under the Paris Accord were insufficient to meet this target. The Agreement also requires drawing CO₂ out of the atmosphere[\[59\]](#) and strengthening the emissions reduction targets every five years. While the targets agreed upon in the Paris Agreement are inadequate, it remains a landmark agreement because of the global commitment to reduce emissions.

Intergovernmental Panel on Climate Change, October 2018 report “Global Warming at 1.5°C.”[\[60\]](#) This important report (IPCC 2018 Report) warned that global warming is likely to reach 1.5°C between 2030 and 2052 if emissions continue to increase at the current rate. The current trajectory of emissions (in 2021) puts the world on track for a temperature rise between 2.1°C and 3.9°C by 2100 (11).

To avoid 1.5°C we need to reduce emissions by 45% by 2030, reaching net zero emissions by 2050. While global efforts to reduce emissions are having some effect: energy-related CO₂ emissions are beginning to level off: emissions in 2019 were only 1% higher than in 2018, they need to peak and begin falling immediately.[\[61\]](#)

A 2021 study [\[i\]](#) finds that we will pass 1.5 degrees in 6 to 11 years if we don't start decreasing emissions at the rate they dropped during 2020 because of the COVID pandemic. That same report says that instead of aiming to get to net zero by 2050, as per the IPCC 2018 Report, we have to get to net-zero by between 2032 and 2042.

The Paris Agreement proposes limiting warming to 1.5°C with limited overshoot – going above 1.5°C and then working to reduce warming by removing CO₂ from the atmosphere (a concept that is unproven and widely criticized as a strategy[\[62\]](#)). The 2018 IPCC report finds that this is possible but would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems.

"These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed, and imply deep emissions reductions in all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in those options. If we can limit warming to 1.5°C (rather than 2°C) by 2100, we would see fewer extremes of life-threatening heat, drought, and precipitation, less sea level rise, and fewer species lost."[\[63\]](#)

Later reports confirm and expand on these findings.[\[64\]](#) New evidence indicates that major global tipping points (ice loss, sea level rise, coral reef die-off, and rainforest and permafrost degradation) are likely to be triggered at 1.5°C.[\[65\]](#)

To keep warming to 1.5°C requires reducing emissions by about 45% relative to 2010 levels by 2030 and reaching net zero (the point at which the amount of carbon released to the atmosphere is balanced by the amount removed) by about 2050.[\[66\]](#) To hold warming to below 2°C, emissions must decline by about 20 percent by 2030 and reach net zero by about 2075. (The 2018 report emphasized that the negative consequences of climate change would be much more severe under a 2°C temperature rise than 1.5°C.) Essentially, efforts need to be roughly tripled for the 2°C goal and increased five-fold for 1.5°C.[\[67\]](#) To date (January 2023), more than 70 countries have committed to working toward net zero emissions by 2050 and to enhance their international climate pledges under the Paris Agreement.[\[68\]](#)

Newer research states there is a 50% probability of 2.4 - 2.6 °C warming in the near term (2050) and 4.1-5 °C warming by 2100.[\[69\]](#)

OUTCOMES OF COP26 AND COP27 [\[69.5\]](#)

Commitments made at COP26 would only lower predicted temperature increase from 2.7° by 2100 to 2.4°. At COP26 the decision was made to meet again in 2022 instead of 2025 to revise their commitments for staying below 1.5° and reaching net-zero by 2050.

Some other important (though inadequate) agreements and proposals from COP26:

- Fossil fuels are mentioned in the agreement for the first time
- Urges doubling financial aid to poorer countries for adaptation by 2025
- A call to accelerate the “phasing down” of coal and subsidies for fossil fuels
- Agreement by 100+ countries to end deforestation by 2030, commits funding
- 100+ countries committing to reduce methane emissions by 30% by 2030
- 40+ countries committing to phase out coal (not including the US, China, Australia, or India)
- U.S.-China make a joint agreement to do more to reduce emissions
- India commits to net-zero by 2070
- Calls for a “just transition” for workers

COP26 failed to:

- Provide climate reparations for countries most harmed but who contributed the least
- Phase out coal--just “phase down”
- Adequately fund countries to respond to the damage from climate change

- Address loopholes for offsets – gives big emitters and corporations a pass cutting emissions

At COP27 the parties again failed to make significant commitments to reductions in GHG necessary to stay below 1.5°. However, COP27 closed with a breakthrough agreement to provide “loss and damage” funding for vulnerable countries hit hard by climate disasters.

CLIMATE SOLUTIONS EXIST AND CAN BE IMPLEMENTED NOW

We know what to do to address the climate emergency: stop harmful practices (e.g. emitting GHG) as soon as possible and rapidly accelerate implementation of climate solutions (e.g. renewable energy, regenerative agriculture, and carbon sinks). Climate solutions exist now to reduce and replace the use of fossil fuels and address other emissions sources. These solutions are increasingly affordable, accessible globally, and can be implemented as fast as we find the political will to do so.

"At present, global efforts come nowhere near the scale, speed, or scope required. Yet many of the means to achieve the necessary transformation already exist. Almost daily, there is promising evolution and acceleration of climate solutions, alongside growing efforts to sunset fossil fuel infrastructure and prevent expansion of these antiquated and dangerous energy sources."[\[70\]](#)

Climate solutions must include the thinking of indigenous people, people of the global majority, and people from frontline and vulnerable communities.

The climate emergency illuminates huge inequities in our societies. The people who have contributed the least to climate change are experiencing its worst impacts first. These frontline communities and vulnerable populations (disabled, elderly, very young, incarcerated) have been ravaged over time by war, colonialism, genocide, and oppression, and many now lack the resources to address the impacts of climate change on the scale needed. But they have thinking and experience essential to successful climate solutions. Institutionalized racism and our economic system have resulted in a society where global climate solutions, policies, and practices are often developed and implemented without their input. Climate solutions must include the thinking, participation, and leadership of indigenous people, people of the global majority, and people from frontline and vulnerable communities.

THE IMPACT OF THE COVID PANDEMIC AND THE UKRAINE WAR

Restrictions due to the COVID-19 pandemic led to a global economic downturn, with implications for climate action more broadly. The economic crisis triggered by COVID-19 led to large shifts in energy consumption and consumer behavior, challenging the economic foundations of many countries. Global reactions to the pandemic showed us we can make massive changes rapidly, including by allocating large sums of money to solutions, when danger is acknowledged.

Climate activists proposed that as communities started to bounce back and conversations turned to recovery and stimulus packages, countries should consider how measures can be designed to best support a transition to a low-carbon economy. Measures for kick-starting economies could be designed in such a way that they generate jobs and infrastructure that support the transition to net zero emissions by the mid-century.[\[71\]](#)

The invasion of Ukraine led to an energy crisis and large increases in fuel costs. The fossil fuel industry use this as a pretext for expanding fossil fuel exploration and production. However, many governments also began turning to renewable energy in order to reduce dependence on external sources of energy.

SOLUTION: Stop Fossil Fuel Emissions to Limit Temperature Rise

Quickly reducing and then ending the use of fossil fuels for energy is necessary to solve the climate crisis. The use of fossil fuels for electricity, transport, and heat currently drives roughly two-thirds of heat-trapping emissions worldwide. This requires a phase out of fossil fuel use by mid-century, releasing no more than 353 gigatons of CO₂ between now and then.[\[73\]](#) (Coal mines and oil and gas wells already in production contain 942 gigatons of CO₂.) Other emissions must also be reduced significantly.[\[74\]](#) If we had begun in 2015, this would have required just over 6% carbon pollution reduction annually. In 2021 it required a 15% annual reduction.[\[75\]](#)

Ending fossil fuel production, subsidies, and financing; divesting from fossil fuels and reinvesting in renewable energy and regenerative solutions; rapidly transitioning to renewable energy sources while providing a just transition for workers and communities dependent on the fossil fuel industry – these are key steps out of the climate emergency. Unfortunately, to follow a 1.5°C-consistent pathway, the world will need to decrease fossil fuel production by roughly 6% per year between 2020 and 2030. Countries are instead planning and projecting an average annual increase of 2%, which by 2030 would result in more than double the production consistent with the 1.5°C limit. (The Production Gap, 2021)

The International Monetary Fund found the production and burning of coal, oil and gas was subsidised by \$5.9tn in 2020 (\$11 million every minute), with not a single country

pricing all its fuels sufficiently to reflect their full supply and environmental costs. [75.5] Explicit subsidies that cut fuel prices accounted for 8% of the total and tax breaks another 6%. The biggest factors were failing to make polluters pay for the deaths and poor health caused by air pollution (42%) and for the heatwaves and other impacts of global heating (29%).

Fracked natural gas was once seen as a “bridge fuel” to renewables because fewer CO₂ emissions are released. But when methane emissions are included (there is significant leakage during production), the greenhouse gas footprint of shale gas is significantly larger than that of conventional natural gas, coal, and oil. (There are other significant and harmful effects to the local environment as well. [76]) Because methane is a much more potent GHG than CO₂, but only lasts for a decade or so in the atmosphere, reducing methane emissions has an almost immediate impact of reducing warming.

This rapid transition must happen applying principles of equity and just transition. Those who have benefitted the most from fossil fuel use (the Global North and the global owning class) are most able to bear the costs of the transition and should do so. Frontline nations will need international support to develop low carbon energy and pay for adaptation, loss and damage from climate change, and just transition for workers and communities.

SOLUTION: REPLACE FOSSIL FUELS WITH RENEWABLE ENERGY SOURCES

Ninety-six percent (96%) of electricity will need to be low carbon by 2050. [77] This will require \$3.5 trillion in energy-sector investments on average each year until 2050. [78] Renewable sources can replace much of our fossil fuel use: we have the technology and can produce them to scale if the funding is there. The cost of renewable energy is now comparable to that of fossil fuel, and massive development of renewable energy should be supported. In 2020, solar photovoltaic (PV) and onshore wind are already the cheapest ways of adding new electricity-generating plants in most countries today, challenging existing fossil fuel plants. Solar projects now offer some of the lowest-cost electricity in history. Overall, renewables are set to account for 95% of the net increase in global power capacity through 2025. Total installed wind and solar PV capacity is on course to surpass natural gas in 2023 and coal in 2024. Solar PV alone accounts for 60% of all renewable capacity additions through 2025, and wind provides another 30%. [79]

Fossil fuels account for 65 percent of global electricity generation. Although renewables have seen substantial growth over recent years, they only make up 24 percent of the overall total. [80] While each year the use of new and renewable sources of energy (solar, wind, and hydropower) increases, [81] it has not increased fast enough to keep up with rising global energy demand. [82] Consumption of solar and wind energy has increased

373% per decade, but in 2018 it was still 28 times smaller than fossil fuel consumption.[\[83\]](#)

There are two major opportunities to reverse those numbers: Firstly, in the developing world, infrastructure to power economic growth is severely lacking. Secondly, countries in the developed world are facing a situation in which much of their infrastructure is reaching the end of its lifespan. Taken together, this means that somewhere in the region of \$90 trillion needs to be spent on infrastructure by 2030, giving policymakers an excellent opportunity to determine how our future energy generation systems will operate for many years to come.[\[84\]](#) A massive publicly funded increase in renewable energy investments is needed to actually replace fossil fuel use and now is the time to make that investment.

SOLUTION: INCREASE ENERGY EFFICIENCY AND ENERGY CONSERVATION

Aggressive policies addressing energy efficiency will play a key role in meeting emissions reductions targets.[\[85\]](#) GHG emissions can be significantly reduced (enabling the world to achieve more than 40% of the emissions cuts needed to reach its climate goals without new technology)[\[86\]](#) by conserving energy and improving energy efficiency. Despite new sources of electricity demand growth in advanced economies, including digitalization and the electrification of heat and mobility, energy demand has fallen in over half of these countries because of increased energy efficiency. Energy efficiency measures adopted since 2000 saved around 20% of overall current electricity use. These measures include energy efficiency standards for appliances and electric motors used in industry, and changes in lighting. **Energy efficiency saved more energy in 2016 than was supplied by oil.**

OTHER ENERGY SOLUTIONS

Electrify everything to replace fossil fuels as an energy source: transportation, buildings (buildings contribute 40% of the CO₂ emissions in the U.S.[\[87\]](#)), industry, heat.

Reduce other pollutants: Promptly reducing the emissions of short-lived climate pollutants, including methane, black carbon (soot), and hydrofluorocarbons (HFCs), could slow climate feedback loops and potentially reduce the short-term warming trend by more than 50% over the next few decades while saving millions of lives and increasing crop yields due to reduced air pollution.[\[89\]](#)

A **publically-owned energy sector** will be essential for us to be able to make these changes under a market-based model in the short timeline that we have. Renewable

energy will also need to be publicly owned, and not subject to the necessity of generating sufficient profits to satisfy private investors.

End the use of cryptocurrency. Bitcoin – the world’s oldest and most popular form of cryptocurrency, with a total market value that topped \$1.3 trillion – now eats up half a percentage point of all the electricity consumed in the world.[\[89.5\]](#)

These are achievable goals if we act now. Organizations, governments, and industries worldwide are working toward these ends. By delaying, we increase the magnitude of future efforts we must make.

SOLUTION: STOP LAND USE EMISSIONS TO LIMIT TEMPERATURE RISE

Agriculture and land use are responsible for about a quarter of human emissions.[\[90\]](#) Most of these emissions come from land use (especially deforestation), methane emissions (mostly from cattle), and nitrous oxide emissions (primarily from fertilizer overuse and manure).[\[91\]](#) Rising demand for meat and biofuel is the main cause of deforestation, which causes tremendous emissions of carbon dioxide. Livestock produces 80% of agricultural emissions, uses 65% of farmland, 33% of crops grown worldwide are used as livestock feed, and consumption constitutes 10% of caloric intake.

There are also advantages of livestock. Livestock can be raised in places where crops can’t be grown, can eat plants that people can’t and turn them into food, and can cycle nutrients to improve soil fertility. There are climate friendly livestock systems, but all of them use a disproportionate amount of land for the food produced.[\[92\]](#)

There are also many ways to reduce emissions from agriculture and livestock[\[93\]](#) and make farm and grazing land more productive with agroecological[\[94\]](#) techniques, which can also reduce pressure on forests. Methods of “carbon farming” not only avert and sequester large quantities of GHG, they also are diversely productive and more resilient, reducing risk for farmers.[\[95\]](#)

Reducing consumption of livestock protein[\[96\]](#) **in the Global North** and putting **strong limits on biofuel** can greatly reduce pressure on forests. A global commission recently called on the world to make a “comprehensive shift” in its diet toward plant-based foods to meaningfully reduce GHG and improve health.[\[97\]](#)

The nutrition research suggests that the ideal diet consists “mostly of vegetables, fruits, whole grains, legumes, nuts, and unsaturated oils, including a low to moderate amount of seafood and poultry, and includes no or a low quantity of red meat, processed meat, added sugar, refined grains, and starchy vegetables.” . Under their recommended diet, global consumption of red meat will have to drop by 50 percent and consumption of

vegetables, fruits, nuts and legumes will have to double. The shift could save between 11 and 12 million lives a year by lowering diet-related conditions and diseases, such as obesity and diabetes.[\[98\]](#)

Creating a sustainable food future. Climate change, including increases in frequency and intensity of extreme climate events, has adversely impacted food security and terrestrial ecosystems as well as contributed to desertification and land degradation in many regions.[\[99\]](#)

We must plan to feed close to 10 billion people in 2050 without increasing emissions. The world can achieve a sustainable food future by meeting growing demands for food, avoiding deforestation, and reforesting or restoring abandoned and unproductive land. We can do all this in ways that help stabilize the climate, promote economic development, and reduce poverty. This takes planning and new policy initiatives.[\[100\]](#) Improved diets and decreases in food waste are essential to deliver emissions reductions, and to provide global food security in 2050. Eating lower on the food chain and ensuring what's grown gets eaten lowers farming inputs, land-clearing, and all associated emissions.

Consumption of meat and dairy, as well as overall calories, often exceeds nutritional recommendations. Paring down and favoring plant-based foods reduces demand, thereby reducing land clearing, fertilizer use, burping cattle, and greenhouse gas emissions.[\[101\]](#)

Meat and dairy specifically accounts for around 14.5% of global greenhouse gas emissions, according to the UN's Food and Agricultural Organization.[\[102\]](#)

Reduce food waste. Food waste (from farm to market, and in our homes) contributes 8% of global emissions, from the 25-30% of food wasted globally across the food chain.[\[103\]](#) If food waste were a country, it would be third in emissions: after China and the U.S.[\[104\]](#)

Reducing food waste, protecting forests, promoting healthier diets, reducing the overuse of fertilizers and manure on farm fields, and promoting regenerative agricultural practices could significantly contribute to improving the health, economic, and local environmental benefits of the food system – and help address climate change at the same time.

SOLUTION: END WAR AND MILITARY CONFLICT

War not only causes tremendous loss of life, it also unleashes environmental destruction – destroying land; contaminating soil, water, and air; speeding up desertification; and causing large scale migration. In addition, militaries use huge amounts of fossil fuels. For example, the U.S. military uses 100 million barrels of oil a

year.[\[105\]](#) Significantly more fossil fuels are consumed in war and conflicts than in peacetime. Oil stockpiles are often targets, releasing huge quantities of CO₂ when burned. Many wars have been and are being fought over control of fossil fuel resources.[\[106\]](#)

The IPCC warns, “Human security will be progressively threatened as the climate changes. Climate change is an important factor threatening human security through: 1. undermining livelihoods, 2. compromising culture and identity, 3. increasing migration that people would rather have avoided, and 4. challenging the ability of states to provide the conditions necessary for human security. Researchers estimate that at 2°C, climate change will endanger 2.7 billion people in 46 countries by fueling violent conflict.[\[107\]](#)

Human’s ability to recover from cataclysmic events (like war) that could be manageable during times of greater stability will be compromised by climate change.

SOLUTION: BUILD A WORLDWIDE MOVEMENT

Huge changes are required to end climate change, and to be successful we need a movement of hundreds of millions of people who work together with millions more to bring about the needed changes. No one can be left out. The movement must include the movements to end racism, genocide, poverty, sexism, exploitation, classism, war. It must include the labor movement, students, parents, and religious and lay organizations—every group working for human liberation, justice, and the end of environmental destruction.

To do this we will need to reach beyond those who understand the urgency of the climate emergency. We will need to listen to those who disagree with the information presented herein. We can treat people with respect, ask for their thoughts, appeal to common interests, and refuse to position ourselves in opposition, but rather build on our relationships to find common ground and welcome them as our allies.

Climate change is illuminating the global harm caused by the actions of a profit-driven society, demonstrating that it is in everyone’s interest to work toward a society that sustains all life and rejects exploitation of people and our planet. There is worldwide acceptance of this goal.

SOLUTION: END PROFIT AS THE BASIS OF OUR ECONOMIES

Our economic system seeks growth and profit with little regard for people, other life forms, and the Earth. It keeps people struggling for survival. It relies on oppression to divide us from each other so we cannot unite for change. The climate emergency is

exposing the destructiveness of these systems in new and unprecedented ways. As people see and face how destructive these systems are, they understand the need for a system that supports all people without exploitation or harm to our ecosystems. Such a system is in the interest of all people, including those now carrying out the current mistaken and destructive policies (as it is in the interest of their children).

Despite large growth in the renewable energy sector, global energy consumption has remained about 80% fossil fuel since the 1990s, because of expanding economic growth. # "Renewables 2021 Status Report Key Messages for Decision-Makers," ren21.net. Planned for private investment in renewables is "not yet consistent with the transition to a low-carbon energy system envisaged in the Paris Climate Agreement" because of smaller profits in low carbon solutions.[\[108\]](#) Meeting emissions reductions goals will require large public investments in renewable energy sources. Energy resources should be under public or community ownership and/or governance, not operated on a for-profit basis.

The manifest refusal of leaders to deal with massive inequality stands in the way of urgently needed climate ambition. We need a Just Transition, for workers, their families and communities at all levels, from the work floor, in economic sectors, at the national level and at the global climate negotiations. We need climate justice and a voice at the table for those most affected by the climate emergency. Sharan Burrow, General Secretary of the International Trade Union Congress[\[109\]](#)

More and more people are questioning our economic system and its exploitation of people and the planet. We can develop new economies that support rather than exploit life and the planet.

SOLUTION: SUPPORT INTERNATIONAL AND LOCAL EFFORTS

The United Nations has played a leading role in addressing climate change globally. The Paris Agreement, which entered into force in November 2016, was signed by almost all nations and is the first global climate change agreement. Signatory countries each pledged to reduce emissions and report on their progress. But the Paris Agreement is not binding and the total pledged reductions if fully implemented, would still allow a 2.7° - 3.5°C rise, which would be catastrophic. Additional reductions are needed.[\[110\]](#) The agreement is also widely criticized as conservative and misleading, downplaying more damaging outcomes.[\[111\]](#) Nonetheless, the Agreement is a global acknowledgement of the reality and destructiveness of climate change and an important step toward resolving it, so long as we bring temperature rise back to 1.5C° or lower. There is no other international body addressing this issue. Every country strengthening their commitments and working cooperatively will be necessary for success.

Wealthy nations are most able to help Frontline Nations adapt to climate change and gain access to renewable energy. Much of the wealth of the wealthy nations comes from exploiting the resources of Frontline Nations. The Green Climate Fund was established by the United Nations in 2011 to raise \$100 billion from the wealthy nations per year by 2020, but to date only \$10.3 billion has been pledged.[\[112\]](#) Significant funds must be raised and allocated to developing nations, yet lack of adequate support for measures of finance and adaptation for Frontline nations continues to be a major stumbling block at the negotiations and is a major issue at the COPs. A key finding of the IPCC October 2018 Report is that without a dramatic increase in the provision of climate finance, the possibility of limiting warming to 2°C (to say nothing of 1.5°C) will irretrievably slip away.

Loss and Damage

The political climate prevents national policy measures sufficient to meet the agreed upon goals in most countries. However, important local measures are happening everywhere that can serve as models for national action once the political situation.

SOLUTION: EXPAND NUCLEAR ENERGY?

Nuclear power is a significant source of low-carbon electricity in parts of the world, and much research and debate surrounds the topic. The Union of Concerned Scientists (UCS) and IPCC report line up pretty closely in their recommendations.

UCS: Policymakers considering temporary financial support to avoid the early closure of nuclear plants should couple that support with strong clean energy policies, efforts to limit rate increases to consumers, and rigorous safety, security, and performance requirements. [\[88\]](#)

IPCC: Continued use and expansion of nuclear energy worldwide as a response to climate change mitigation require greater efforts to address the safety, economics, uranium utilization, waste management, and proliferation concerns of nuclear energy use. [\[88.1\]](#)

Some of the points raised: Renewable energy can now supply our needs more quickly, cheaper, and safely. Nuclear power is expensive and unsafe, we have no safe way to store waste, and uranium mining is dangerous and polluting. But nuclear power provides 14% of the world's energy (75% in France, 20% in the U.S.), with many reactors scheduled to be retired in the near future. If reactors are replaced with fossil fuel plants, emissions will rise significantly. Some recommend investing in existing plants to keep them online and **not replacing nuclear reactors until they can be replaced with renewable energy sources** instead of fossil fuels. Others recommend smaller scale 4th generation reactors or reactors powered by depleted uranium. [\[88.5\]](#)

From the Bulletin of Atomic Scientists: “Much needs to happen, and happen quickly, to avoid the worst climate catastrophes. Despite its low-carbon virtues, nuclear energy is anything but quick. At its best, nuclear energy might provide some load-balancing ballast for renewable energies; at its worst, it will slow the transition to a net-zero emissions future and should therefore be trimmed from our set of options. Continuing to support nuclear energy at the expense of faster and cheaper alternatives for cutting greenhouse gas emissions is a losing strategy.”
<https://thebulletin.org/?s=nuclear+energy>

SOLUTION: CARBON PRICING MECHANISMS?

Considerable attention has been given to mechanisms (e.g. carbon taxes, carbon trading, carbon offsets^[126]) that “put a price on carbon emissions.” Emissions trading systems and carbon taxes cover about 22 percent of global GHG emissions and governments raised more than \$45 billion from carbon pricing in 2019.^[127] Despite carbon prices increasing in many jurisdictions, they remain substantially lower than what is needed to be consistent with the Paris Agreement. The High-Level Commission on Carbon Prices estimated that carbon prices of at least US\$40–80/tCO₂ by 2020 and US\$50–100/t CO₂ by 2030 are required to cost-effectively reduce emissions in line with the temperature goals of the Paris Agreement, while the global average price today is \$2/t CO₂.^[128]

The climate justice community has criticized carbon pricing mechanisms as allowing the fossil fuel industry to continue to explore, produce, and burn fossil fuels while continuing to generate huge profits.^[129] They have branded these mechanisms as “false solutions”^[130]:

Rather than keep fossil fuels in the ground, carbon pricing mechanisms pretend to remedy the situation after the fact. Carbon taxes will always be low, always be evaded, and do not cut pollution to the degree needed. They help governments and corporations keep extracting and burning fossil fuels. Revenues generated never compensate for the destruction and pollution wrought by their extraction and use.^[131]

Indigenous forest communities are being destroyed by carbon offsets. And the cost of carbon is passed down to workers in the form of lower wages, fewer hours, and / or reduced benefits, and to consumers who depend on fossil fuels in their work, eg: transportation. We should expose and reject these false “solutions” developed to enable continued profiteering by the petrochemical industry.

At COP26 negotiators announced a major deal on how to regulate the fast-growing global market in carbon offsets, in which one company or country compensates for its own emissions by paying someone else to reduce theirs. Vulnerable countries are asking for rich nations to grant them a share of proceeds from carbon market transactions to help them build resilience to climate change. The United States and the European Union have opposed doing so, but island nations in particular want a

mechanism to ensure that carbon trading leads to an overall reduction in global emissions.

Supporters of carbon taxes argue that, given the massive amounts of emissions and the urgent need to reduce emissions now, some form of carbon taxes that are carefully drafted so the funding stream goes to those harmed by fossil fuels and systemic changes (like a public energy sector) may be useful. They argue that in these political times, where the majority of those in government have not yet made the decision to fully pivot to renewables, carbon taxes can be a step to phasing out fossil fuel use and reducing emissions now. [\[131.5\]](#) Does using the revenue from carbon taxes to fund “good,” community-based initiatives foster a dependency on those funds and lead to compromised support of the fossil fuel industry, or slow our efforts to shut it down?

SOLUTION? CAPTURE AND STORE CARBON TO LIMIT TEMPERATURE RISE

It is too late to avert 1.5°C or more of global heating solely through reduction of emissions. Most models for keeping temperature increase below 2°C predict we will “overshoot” 2°C, and then have to rapidly reduce emissions by drawing them out of the atmosphere while continuing to reduce emissions at the source. The Paris Agreement and subsequent proposals incorporate the use of Negative Emission Strategies (NECs), or “carbon capture,” to achieve agreed-upon international goals. The major NECs currently proposed are “Bio-Energy with Carbon Capture and Storage” (BECCS) or direct air capture. BECCS involves cultivating fast growing plants, burning them, capturing and storing their emissions. “The consequences of deploying these at the scale required could cause humanitarian and/or ecological disaster or may themselves push us past climate tipping points.” [\[113\]](#) We want to avoid these measures as much as possible.

“The impacts of large-scale carbon dioxide removal (CDR) deployment can be greatly reduced if a wider portfolio of CDR options is deployed, a holistic policy for sustainable land management is adopted, and if increased mitigation effort strongly limits demand for land, energy, and material resources, including through lifestyle and dietary change.”[\[114\]](#)

China will promote large-scale carbon capture projects [as well as backing] “nature-based solutions” aimed at tackling the causes of climate change, including reforestation and wetland restoration programs.[\[115\]](#)

Today half of the human-caused carbon emissions are captured by natural ecosystems, keeping the emissions out of the atmosphere.[\[116\]](#) Use of natural climate solutions could achieve up to 37% of carbon capture goals. Carbon and methane sinks – natural ecosystems on land and in the ocean that absorb or hold GHG emissions, specifically

plants, forests, soil, peatlands, and the ocean itself – are crucially important. Ecosystems store tremendous amounts of carbon.

It is important to protect and restore these natural carbon sinks with full engagement of, inclusion of, and leadership by the people who inhabit that place. When indigenous and tribal people have sovereign rights to their forest land, emissions from deforestation and degradation are greatly reduced. Undisturbed forest landscapes, many of them in the hands of indigenous people and local communities, absorb more than 25% of the CO₂ in the atmosphere.[\[117\]](#) Recognizing land rights and management by indigenous people could avoid significant deforestation.[\[118\]](#)

We can also create additional carbon sinks by adopting regenerative agricultural practices (e.g. agroforestry, perennial cropping, managed grazing) that trap rather than release carbon from the soil, and remove gasses from the atmosphere.[\[119\]](#)

We will need to enhance existing sinks and develop new sinks with the GHG storage capacity of the world's ocean.[\[120\]](#) [\[121\]](#) Pursuing these solutions will require substantial changes in policy, business practices, capital, and behavior. But most of these would generate huge economic and social co-benefits.

SOLUTION? GEOENGINEERING

Since it is too late to avert 1.5°C or more of global heating solely through reduction of emissions, and those invested in the fossil fuel industry have put substantial energy into finding solutions that don't require us to replace fossil fuels, there has been extensive research into geoengineering. The IPCC has sanctioned possible future use of geoengineering if we cannot find other means to reduce emissions sufficiently.

There are currently two main approaches under the geoengineering umbrella: carbon-dioxide removal (CDR) and solar radiation management (SRM). Each of these requires high intensity engineering. It is questionable whether the technology is adequate at this time. There are other proposals requiring less geoengineering technology, which might merit consideration now (see below).

CDR tackles the root cause of global warming by removing greenhouse gases from the atmosphere and either reusing or storing them. Capturing CO₂ from the atmosphere through chemical processes with subsequent storage of the CO₂ in geological formations is one such method. But while the theoretical potential for this method of CDR is mainly limited by the availability of safe and accessible geological storage, the CO₂ concentration in ambient air is 100–300 times lower than at gas-or coal-fired power plants thus requiring more energy than flue gas CO₂ capture. CDR at power plants (where CO₂ concentration is high) is possible but requires both extra energy and large amounts of water for the chemical and physical processes involved.[\[122\]](#) The costs for both are high and impacts unknown. As of 2019, the 19 existing CDR projects have

captured only 1% of the amount needed to be captured and stored by 2050 to meet the Paris targets.

SRM leaves greenhouse gases untouched but offsets their impact by reflecting sunlight away from the earth. The science, which is still largely based on theoretical models, has been criticized for being untested, risky, subject to rogue application, and offering a false promise of salvation in a moment when policy-makers need to make difficult decisions. The Intergovernmental Panel on Climate Change 1.5 study (2018) says there is high agreement that the injection of millions of tons of sulfur dioxide into the stratosphere could help limit temperature rises to 1.5.

"If mitigation efforts do not keep global mean temperature below 1.5 degrees Celsius, SRM (solar radiation modification) can potentially reduce the climate impacts of a temporary temperature overshoot," says the IPCC report.[\[123\]](#)

But the IPCC warns there are major uncertainties about the social, environmental, and ecological impacts. They say the world would be far better off if policymakers strengthened natural cooling systems such as forests and accelerated efforts to reduce carbon emissions. It is also uncertain that the technology could be developed quickly enough, cheaply enough, safely enough, and at a large enough scale to meet the objectives.[\[124\]](#)

This all needs a lot of thought and discharge. Natural solutions are a high priority and we know how to implement these now. But we need to think about what might be feasible if we pass 1.5 or 2 degrees; would we consider these desperate measures?

The large ethical questions around SRM include international responsibilities for implementation, who finances it and what power do they have, compensation for negative effects, who is involved in decision-making, will be it public or private, patenting, informed consent by affected publics, intergenerational ethics because SRM will need to continue for generations in order to avoid termination hazards (rapid heating if deploy stops), the danger of unilateral action by a country or wealthy individual, the probability of negative precipitation or extreme weather effects across borders. There is agreement that both because SRM is not ready technologically and because these ethical issues are unresolved, it is premature to consider this form of geoengineering now.

Ocean fertilization involves adding nutrients to the ocean resulting in increased biologic production, leading to carbon fixation in the sunlit ocean and subsequent sequestration in the deep ocean or sea floor sediments. This too is on the table but there is limited evidence and low agreement on the readiness of this technology.

Could other ideas be worth considering in the near future if they can be deployed ethically and using renewable energy sources? Ideas like refreezing Arctic ice by pumping Arctic sea water onto the ice in the winter to thicken the ice and sprinkling

white sand on the dark spots on ice in Greenland and Antarctica to reflect instead of absorb sunlight.

AN INTRODUCTION TO SOME SPECIFIC SOLUTIONS

Publically-owned energy sector

A centralized, publically owned, renewable energy system is important for a number of reasons. A public energy system lets us address what we really need without considering profit. Debates about what to do now are happening under a capitalism framework. The private market is not working to generate enough investment in renewables or slow down the fossil fuel industry. A successful transition will have to be publicly funded, and should be publicly owned. A public system creates the conditions to fight for the system you want.

Energy supply and demand have to be matched; discrepancies can cause damage to the grid. Integration of different small projects poses many challenges. New technologies are needed and possible, but are currently developed based on their potential for profit, not on efficiency and sustainability. Only public investment can create the size of renewable energy system needed to replace fossil fuels.

"Energy Democracy" is an approach to building energy sustainability that seeks to transfer ownership and governance of energy resources from the energy establishment to the public and communities, empowering working people, low-income communities and communities of color to control and benefit from their energy systems. Energy democracy should be an anchoring framework that has a strategic purpose both as facilitating decarbonization as well as advancing justice. The Trade Union Program for a Public, Low-Carbon Energy Future proposes a model. [\[124.5\]](#)

1. Get energy companies out of a market based system. Not working, not enough return on investment, will have to subsidize. Don't give public money to corporations to create solar and wind and then charge us for it.
2. Make electricity a service (common good) everyone has access to (water is a public good that everyone has access to so way to control pricing). International cooperation across borders, so everyone shares technology.
3. Need a new grid – energy grid designed for fossil fuels, renewable messes it up with the stopping and starting. Need wide-scale coordination.
4. Create governance system so people can engage with the decision making. True democracy.
5. Assess type of energy based on local needs independent of profitability. Global vision with local engagement.

6. Global south 9 years ago at the COPs said we can't do this energy transition in the capitalist model. Unions came together and said take the energy sector out of a profit driven model. Make energy sector government owned. Democratic, so accountable to the public.

A Green New Deal

A Green New Deal is a big, bold transformation of the economy to tackle the twin crises of inequality and climate change. It would mobilize vast public resources to transition from an economy built on exploitation and fossil fuels to one driven by dignified work and clean energy. A Green New Deal would upgrade the infrastructure, revitalize the energy system, retrofit buildings, and restore ecosystems. In so doing, a Green New Deal would cut climate pollution while creating millions of family-sustaining jobs, expanding access to clean air and water, raising wages, and building climate resilience. To counteract inequality, those benefits would go first and foremost to the working-class families and communities of color that have endured the brunt of the fossil fuel economy.

Such a massive transformation is unlikely to garner sufficient political support to be implemented on a national level in many countries in the near future. Local and Regional Green New Deals, and partial Green New Deals, are gaining traction in some locations.

Just Transition

Just Transition is a framework for a vision-led, unifying and place-based set of principles, processes, and practices that build economic and political power to shift from an extractive economy to a Regenerative Economy. ... The Just Transition framework focuses on stopping the bad to build the new by divesting from the exploitation of labor and extraction of resources and investing in cooperative labor and regeneration. Just Transition challenges the dominant worldview of colonialism, consumerism, and the concentration of power governed through violent force and advances a worldview of sacredness and care, as well as ecological and social well-being governed through deep democracy.[\[125\]](#)

SOLUTION: PAYING FOR CLIMATE SOLUTIONS

Over the next 15 years, the world will require about \$90 trillion in new infrastructure for an orderly transition to a low carbon, resilient global economy, most of it in developing and middle-income countries.[\[132\]](#) Historically, this funding has come from public funding (government budgets), private investment, and carbon taxes – none of which have been adequate to make the changes needed at scale and in the time frame we have.

Addressing the climate emergency is the most important use of resource in this period. The amounts of money needed are enormous, but human societies have generated enormous resources. It's a question of taking the resources that exist wherever they are and using them for the survival of the world. Where are these resources now?

We can tax wealth. There are two sources of sufficient wealth on our planet that humanity can dedicate to this cause. The first and most likely (and already planned for in the Paris Agreement) is from the wealthy nations and corporations. Implementing the following measures won't be a hardship: a billionaire's tax[\[138\]](#), a tax on large estates, a financial transactions tax, closing tax havens, imposing a global minimum tax. We can end fossil fuels subsidies and shift those funds to subsidizing clean energy projects. Implementing tax codes fully can also generate substantial amounts of income in the wealthy nations.[\[139\]](#)

We can tap into the military budgets. The second source of sufficient wealth is from the funds expended globally on military and war. Globally the world spends \$1.8 trillion on the military, with just the U.S. and China contributing one half. The U.S. budget is \$750 billion annually. U.S. taxpayers are currently paying as much as \$70 billion per year for nuclear weapons related costs alone.[\[140\]](#) The Pentagon would be the world's 55th largest CO2 emitter if it was a country.[\[141\]](#) Cutting the budgets of top ten largest military budgets by just 25% will yield \$325 billion a year.

Public funding of renewables will be necessary to meet the time frame we are in, but increased investment in renewable energy will help. Private investments in renewable energy stocks in 2019 are outperforming the fossil fuel market, driven by three structural trends: improving economics of low-carbon energy; regulatory and political tailwinds driving adoption of "clean" technologies; and growing investor concern with environmental, social and governance issues.[\[133\]](#)

"Clean energy could drive \$1-\$2 trillion a year in infrastructure investment and create 15-20 million jobs globally. Meanwhile the high cost of capital for fossil fuel developments is leading to underinvestment. Renewable power will become the largest area of spending in the energy industry in 2021, on our estimates, surpassing upstream oil and gas for the first time in history which could lead to higher oil and gas prices that in turn spur a faster energy transition."[\[134\]](#)

Yet investors[\[135\]](#) and banks continue to be wedded to the fossil fuel industry. Phasing out fossil financing will require banks to adopt restriction policies, and they are increasingly doing so – in response to pressure to stop fueling the climate crisis from the public, from inside the financial system, and from regulators and legislators. Most of the policies to date address coal, but a growing number are now starting to restrict some oil and gas funding, especially for tar sands oil and Arctic oil and gas. However,

major global banks' fossil financing has increased each year since Paris and banks continue to finance all forms of fossil fuel exploration and production.[\[136\]](#)

Using the COVID pandemic to spur a green recovery. The global oil market is currently being impacted by three converging factors: an unparalleled decline in demand for energy driven by the COVID-19 pandemic, an oil price shock, and long-term structural decline of the fossil fuel industry driven by renewables and the pressing need for decarbonization. The COVID-19 crisis poses a threat to people's health, their jobs, and their lives, and like all crises, exacerbates already existing inequalities. Trillions in public finance will be needed to get through this crisis. There is a strong case to be made that continuing to rely on fossil fuels is not compatible with long-term recovery. It does not make sense to use the COVID-19 stimulus packages to try to revive a sunset industry which will not deliver on economic recovery, only to shut it down a few years later to meet climate goals. Instead, this is the moment to fund a just transition off of fossil fuels that protects workers, communities, and the climate. Governments should invest in a green recovery that protects and creates long-lasting jobs, builds resilient economies, and accelerates climate action.[\[137\]](#)

Carbon taxes can be used to invest in community solar projects, a publically-owned energy sector, and other projects that benefit the people most impacted by climate change.

IMPLEMENTING CLIMATE SOLUTIONS YIELDS SIGNIFICANT SAVINGS

The savings generated by implementing climate solutions significantly outweigh costs. Savings exceed costs four to five times over (shifting to these practices would save \$143 trillion by 2050, at a cost of \$26 trillion).[\[142\]](#) Climate change could (assuming current trends continue) directly cost the world economy \$7.9 trillion by mid-century as increased drought, flooding and crop failures hamper growth and threaten infrastructure, new analysis showed Wednesday. The Economist Intelligence Unit's (EIU) Climate Change Resilience Index measured the preparedness of the world's 82 largest economies and found that based on current trends the fallout of warming temperatures would shave off three percent of global GDP by 2050.

In general, developing nations fair poorer in terms of resiliency than richer ones. Richer nations are more resilient towards the impacts of climate change, so this really threatens the economies of the developing world. Of the countries evaluated, Angola stands to lose the most – as much as 6.1 percent of gross domestic product. Nigeria (5.9 percent loss of GDP), Egypt (5.5 percent), Bangladesh (5.4 percent) and Venezuela (5.1 percent) were the next most climate vulnerable nations identified in the analysis. North America is projected to lose only 1.1 percent of GDP and the European Union. 1.7 percent.[\[143\]](#)

Yet the cost of wildfires and weather events in the U.S. is astounding and growing annually. California's 2018 wildfires cost the US economy \$148.5 billion—0.7 percent of U.S. annual GDP.[\[144\]](#) There were 28 weather and climate disasters in the U.S. in 2018 and 2019 with losses exceeding \$1 billion.[\[145\]](#) The total approximate cost of damages from weather and climate disasters in the U.S. from 1980 to 2019 was \$1.75 trillion dollars. The average annual number of weather and climate disasters from 2015 to 2019. Even after adjusting for inflation, the U.S. experienced more than twice the number of billion-dollar disasters during the 2010s (119) when compared to the 2000s (59).[\[146\]](#)

IF WE STUMBLE

“If the global mean temperatures warm by more than 2°C, risks to ecosystems and livelihoods will surpass tolerable levels. It is likely that humans will no longer be able to inhabit many previously hospitable regions. We will suffer from increasingly variable and extreme weather conditions with disastrous consequences that are already occurring in stark preview. With present warming exceeding 1°C, we are hurtling towards an irreversible climate crisis.”[\[147\]](#)

While the situation is grave and big effects are unavoidable, it is not too late to turn the tide to avoid the worst effects of climate change. The sooner we can take needed action, the less harm will result and the sooner we and our planet will recover.

What We in RC Can Do

Most of us are numb, scared, and detached about climate change. A starting point is to connect with and discharge the early hurts underlying our distresses (the heartbreak, fears, and defeats). It is important to do this if we are to take on climate change as part of our lives. We can go back to and discharge these early hurts as we challenge their hold on us in the present. We can learn from what worked to change society in the past, and we can find new solutions. We can come together to discharge and think freshly about a new course for our society, using the 2017 Goal on COE and the 2019 Initiative to guide us. We can create the conditions for the changes to occur. We can organize and take action in ways that we haven't before.

We will need to put forth the best ideas we can and work for their implementation. This will require our willingness to be in public opposition to others. While we wish everyone could see the factual necessity of taking new large steps to save the environment, some people's confusion and self-interest may persuade them that these steps do not need to be made. This does not change the necessity of these steps being taken soon. Achieving the widest possible agreement that these changes must occur is a task we face now. It has always been difficult for people wedded to a particular policy to face its unworkability, but on the issue of climate this must be faced soon. We must

go forward working on the best proposals we can find while working to help people change their mind.

We have developed a clear enough draft policy and program that we think is in everyone's interest. We can organize enough people that we can effectively say "no" to the present course. We will try things and learn from all of our efforts as we work to develop our program. Our Draft Policy for Care of the Environment is now on the RC website at: <https://www.rc.org/draftpolicycoe>.

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