URGENT ACTION FOR A HEALTHY CLIMATE

COP26: October 31-November 12, 2021

Dear COP26 Delegates and Stakeholders,

We are an international network of scientists, engineers, physicists, biologists, and public policy experts active in the climate change arena. We are extremely concerned about the accelerating pace of climate disruption and are calling for your leadership at the COP26 in Glasgow and thereafter to urgently mobilize an expanded global response. Immediate action must be taken to prevent further catastrophic increases in temperature, weather extremes, sea level rise, and polar ice and permafrost melt that could be leading to runaway feedbacks, making future climate stabilization almost impossible to achieve. The reduced temperature difference between the poles and tropics created by polar temperature rising three times faster than the global mean has already resulted in a deadly disruption of jet stream behaviour. This has slowed weather patterns and caused increasingly extreme weather events throughout the world. We must collectively commit to restoring a healthy climate now.

The world needs broader international cooperation to protect humanity and to restore and regenerate our ecosystems. We ask you to undertake an expanded set of effective climate interventions including immediately launching an expedited, multi-disciplinary, and inclusive program to evaluate and deploy measures designed to regenerate polar ice and reduce extreme weather. All options must be on the table and evaluated for effectiveness, feasibility, equity, safety, timeframe, and the potential for unintended consequences. This program would be accompanied by rapidly scaling up efforts to prevent dangerous global heating and to reduce Greenhouse Gas (GHG) concentrations to levels at which civilization has historically developed and can flourish.

We ask that COP26 adopt a resolution committing to develop a climate restoration plan no later than 2023 to limit global warming to well below 1° C. An effective and responsible plan will need to integrate three approaches:

1. **Cooling the planet, particularly the polar regions and the Himalayas,**
2. **Reducing GHG emissions, including methane and other short-lived warming agents, and**
3. **Removing legacy CO_2, methane, and other GHGs from the atmosphere.**

The August 2021 IPCC 6th Assessment Report confirms the need for urgent global response. The previously under-estimated pace and impacts of human-caused climate change are producing rising temperatures, deadly heat waves, extreme precipitation events, spreading deserts, declining crop yields, decimated rainforests, raging wildfires, warming oceans, dying coral reefs, diminished biodiversity, and rising sea levels. Crucial regions of the cryosphere, including glaciers, sea ice, and permafrost, are melting and accelerating feedbacks. Every region of the world is affected.

Climate change impacts are exacerbating existing regional and global inequities. The communities and groups most vulnerable to climate change impacts are often least responsible for the problem and have limited capacity for mitigation, adaptation, and recovery. Food insecurity, land loss, extreme weather events, and intolerable temperatures are forcing mass migrations of people who have no alternative but to abandon their homelands.

As climate change threatens humanity and the biosphere, it exerts destabilizing forces on national security, economic sustainability, and financial and political systems throughout the world. The challenges are unprecedented in magnitude, urgency, complexity, and risk.

Although it is critical to reduce GHG emissions and remove CO2 and methane as much and as soon as possible, GHG emissions reduction and removal alone will not rescue us from the climate emergency. Continued warming from legacy emissions and ocean heat, and the lead time required to replace infrastructure will mean the transition to climate stability will not be completed for at least several decades.

The three-pronged approach to limit global warming to well below 1°C -- direct cooling, GHG emissions reduction, and GHG removal -- will prevent catastrophic and irreversible damage to critical natural and human systems and return the Earth to an enduring state that can recreate a healthy, stable, biodiverse, and productive climate. This is the legacy we owe our children, our grandchildren, current and future generations, and all life on our planet.

We are counting on you. It would be our pleasure to confer with you, your colleagues, and your staff. Do not hesitate to contact us at healthyplanetaction@gmail.com with any questions, comments, or requests for further information.

Further discussion and references for this letter are available here.

Respectfully submitted on behalf of the signatories listed below,

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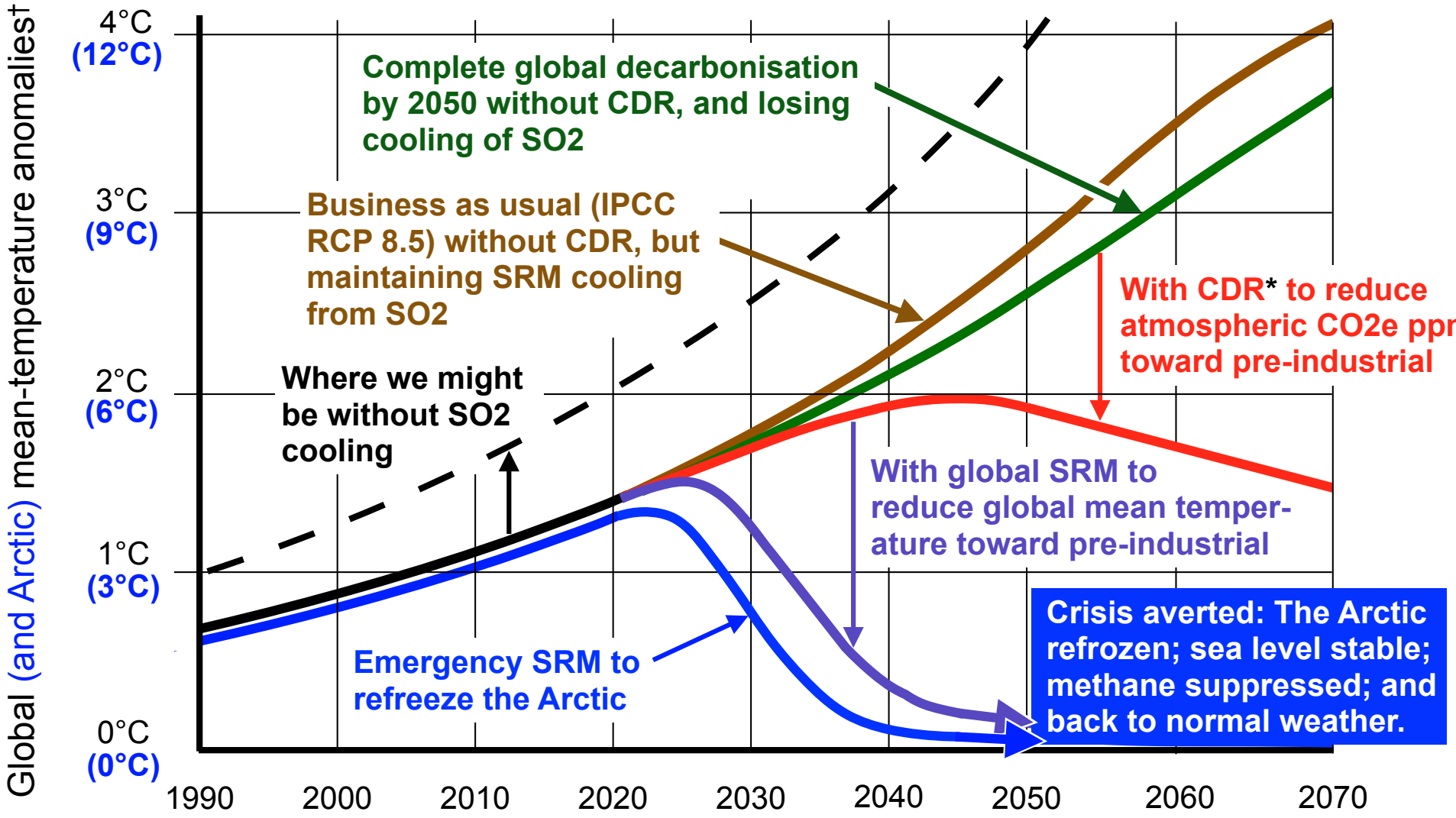
Global-mean and Arctic temperature trajectories for various scenarios, with and without CO2 removal (CDR*) and Solar Radiation Management (SRM)



† Global temperatures (and Arctic temperatures in blue) are relative to pre-industrial norms.

* CO2 removal at x2 current emissions plus suppression of methane and black carbon.

12 Feb 2021 Temperature trajectories diagram

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Global-mean and Arctic temperature trajectories for various scenarios, with and without CO2 removal (CDR) and Solar Radiation Management (SRM)

Arctic temperature

The blue line is the trajectory of Arctic temperature, with scale shown in blue on the y-axis. We consider this independently of global temperature, whose scale is shown in black. The blue line is curved downward to show how cooling the Arctic might avoid catastrophes arising from continued warming and melting:

- multi-metre sea level rise from glacier and ice sheet meltwater;
- potentially irreversible loss of sea ice with associated disruption of ocean circulation (the AMOC);
- a multi-gigaton outburst of methane from permafrost potentially boosting global temperature by over 1°C.
- a reducing temperature gradient between Arctic and tropics, accelerated by albedo loss from retreating snow and sea ice, causing increasing disruption to jet stream behaviour (see below).

From 1970 to 2021 the Arctic temperature (shown in blue) has been rising 3 times faster than the global mean (shown in black). This has resulted in an ever decreasing temperature gradient between the Arctic and the tropics. This has disrupted jet stream behaviour causing the increase in extreme weather events which is now considered a climate emergency. If the Arctic temperature rise can be halted and reversed (as shown by the blue line bending downwards) the increase in extreme weather events can be halted and reversed. **This is the emergency Arctic cooling we urge G20 leaders to get done, using the most powerful cooling technology available: SRM at surface, cloud and stratospheric levels**.

Global temperature

The current strategy, espoused by IPCC and most environment activists, is to go for near 100% decarbonisation by 2050. The cooling effect of the SO2 emitted from coal and oil burning would be lost. The result, without any CDR or SRM intervention, would be catastrophic global warming (see green curve). Even business as usual would be better assuming it maintained the SO2 cooling (see brown curve). To avoid dangerous sea level rise from ocean expansion, the global mean temperature needs to be reduced to near the pre-industrial norm within two or three decades, using a combination of CDR and SRM. The diagram shows a lag of 5 years of global cooling behind Arctic cooling (see purple curve to right of blue curve). Note that CDR alone would be too slow to reduce the global temperature (see red curve). SRM without CDR would be unsustainable in the longer term; the SRM intervention could be phased out completely as CO2e ppm approaches the pre-industrial 280 ppm. By this time, planetary restoration could be complete.

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