6. Historical emissions

In addition to mitigating residual CO_2 emissions from materials inputs and sectors that are difficult to decarbonise rapidly, it is essential that the far greater level of historical greenhouse gas emissions accumulated over decades are urgently ameliorated with reliable carbon negative processes to keep global heating under the vital 1.5°C threshold.

Historical carbon dioxide emissions have not only raised the atmospheric CO_2 concentration to a dangerous level, much of that CO_2 is now stored in the oceans. The resulting ocean acidification increasingly damages marine ecosystems and slows further CO_2 uptake, with the huge warming oceanic store of CO_2 perilously capable of re-release.

Global heating will also accelerate the release of dangerously more powerful methane from thawing permafrost and methane hydrates on the sea floor, as well as from drying peat bogs, mangroves and forests.

Avoidance of the alarming impacts forecast by the IPCC for the more dangerous 2°C temperature rise can only be secured if national and local governments, as well as businesses and individuals, urgently invest in historical CO_2 emissions remediation in addition to the carbon negative mitigation required for residual emissions.

Beyond that critical 2°C threshold it is predicted that we risk triggering self-reinforcing (positive) climate feedback mechanisms leading to a catastrophic runaway “Hothouse Earth”.

To prevent disaster, the countries with the highest historical responsibility for greenhouse gas emissions, as well as the highest historical emissions per capita, need immediately to start rapidly expanding programmes of reliable carbon negative historical mitigation.

If each year, in addition to current carbon neutrality/net-zero mitigation, just one further previous year’s CO_2 emissions were mitigated, the past emissions of 30 years could be remediated by 2050. Doubling or trebling the historical mitigation rate would enable 20 or 30 years’ emissions to be remediated by 2030, and 60 or 90 years’ emissions by 2050.