CLIMATE EMERGENCY INSTITUTE
The Health and Human Rights Approach to Climate Change

The 2018 Intergovernmental Panel on Climate Change (IPCC) Special Report on the 1.5°C Limit

Peter Carter, Main Conclusions, 11 October 2018

- **The 1.5°C limit is essential for a future livable planet – we really have no choice**
- **We are all in a dire global EMERGENCY**
- **1.5°C is globally disastrous, possibly recoverable, but 2°C is total planetary catastrophe**
- **Immediate rapid global emissions decline is the best scenario given, and the only predictably effective response**

IPCC Press Release and Headline Statements

***"Global Warming of 1.5°C* is an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty."**

Excerpts from IPCC Press Release, 8 October 2018

"Limiting global warming to 1.5ºC would require rapid, far-reaching and unprecedented changes in all aspects of society, with clear benefits to people and natural ecosystems, limiting global warming to 1.5ºC compared to 2ºC.

"We are already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes.

"Every extra bit of warming matters, especially since warming of 1.5ºC or higher increases the risk associated with long-lasting or irreversible changes, such as the loss of some ecosystems.

"The report finds that limiting global warming to 1.5°C would require 'rapid and far-reaching' transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO2) would need to fall by about 45 percent from 2010 levels by 2030, reaching 'net zero' around 2050.

"Allowing the global temperature to temporarily exceed or 'overshoot' 1.5ºC would mean a greater reliance on techniques that remove CO2 from the air to return global temperature to below 1.5ºC by 2100. The effectiveness of such techniques are unproven at large scale and some may carry significant risks for sustainable development."

Excerpts from the IPCC 2018 1.5°C Special Report, Headline Statements

A. Understanding Global Warming of 1.5°

- A1. Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.
- A.2. Warming from anthropogenic emissions from the pre-industrial period to the present will persist for centuries to millennia and will continue to cause further long term changes in the climate system, such as sea level rise, with associated impacts.
- A3. Climate-related risks for natural and human systems are higher for global warming of 1.5°C than at present, but lower than at 2°C. These risks depend on the magnitude and rate of warming….

B. Projected Climate Change, Potential Impacts and Associated Risks

- B1. Climate models project robust differences in regional climate characteristics between present-day and global warming of 1.5°C, and between 1.5°C and 2°C.

  These differences include increases in:
  - mean temperature in most land and ocean regions,
  - hot extremes in most inhabited regions,
  - heavy precipitation in several regions, and
  - the probability of drought and precipitation deficits in some region.

- B2. By 2100, global mean sea level rise is projected to be around 0.1 metre lower with global warming of 1.5°C compared to 2°C. Sea level will continue to rise well beyond 2100, and the magnitude and rate of this rise depends on future emission pathways. A slower rate of sea level rise enables greater opportunities for adaptation in the human and ecological systems of small islands, low-lying coastal areas and deltas.

- B3. On land, impacts on biodiversity and ecosystems, including species loss and extinction, are projected to be lower at 1.5°C of global warming compared to 2°C. Limiting global warming to 1.5°C compared to 2°C is projected to lower the impacts on terrestrial, freshwater, and coastal ecosystems and to retain more of their services to humans.

- B4. Limiting global warming to 1.5°C compared to 2ºC is projected to reduce increases in ocean temperature as well as associated increases in ocean acidity and decreases in ocean oxygen levels.

- B5. Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.

- B6. Most adaptation needs will be lower for global warming of 1.5°C compared to 2°C. There are limits to adaptation and adaptive capacity for some human and natural systems at global warming of 1.5°C, with associated losses

C. Emission Pathways and System Transitions Consistent with 1.5°C Global Warming

- C1. In model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO2 emissions decline by about 45% from 2010 levels by 2030 (up to 60%), reaching net zero around 2050. For limiting global warming to below 2°C, CO2 emissions are projected to decline by about 20% by 2030 in most pathways (up to 30% and reach net zero around 2075. Non-CO2 emissions in pathways that limit global warming to 1.5°C show deep reductions that are similar to those in pathways limiting warming to 2°C.

- C2. Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems.

- C3. All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR) on the order of 100–1000 GtCO2 over the 21st century. CDR deployment of several hundreds of GtCO2 is subject to multiple feasibility and sustainability constraints. Significant near-term emissions reductions and measures to lower energy and land demand can limit CDR deployment to a few hundred GtCO2 without reliance on bioenergy with carbon capture and storage

D. Strengthening the Global Response in the Context of Sustainable Development and Efforts to Eradicate Poverty

- D1. Estimates of the global emissions outcome of current nationally stated mitigation ambitions as submitted under the Paris Agreement would lead to global greenhouse gas emissions in 2030 of 52–58 GtCO2eq yr-1 (medium confidence). Pathways reflecting these ambitions would not limit global warming to 1.5°C, even if supplemented by very challenging increases in the scale and ambition of emissions reductions after 2030. Avoiding overshoot and reliance on future largescale deployment of carbon dioxide removal (CDR) can only be achieved if global CO2 emissions start to decline well before 2030.

- D2. The avoided climate change impacts on sustainable development, eradication of poverty and reducing inequalities would be greater if global warming were limited to 1.5°C rather than 2°C.

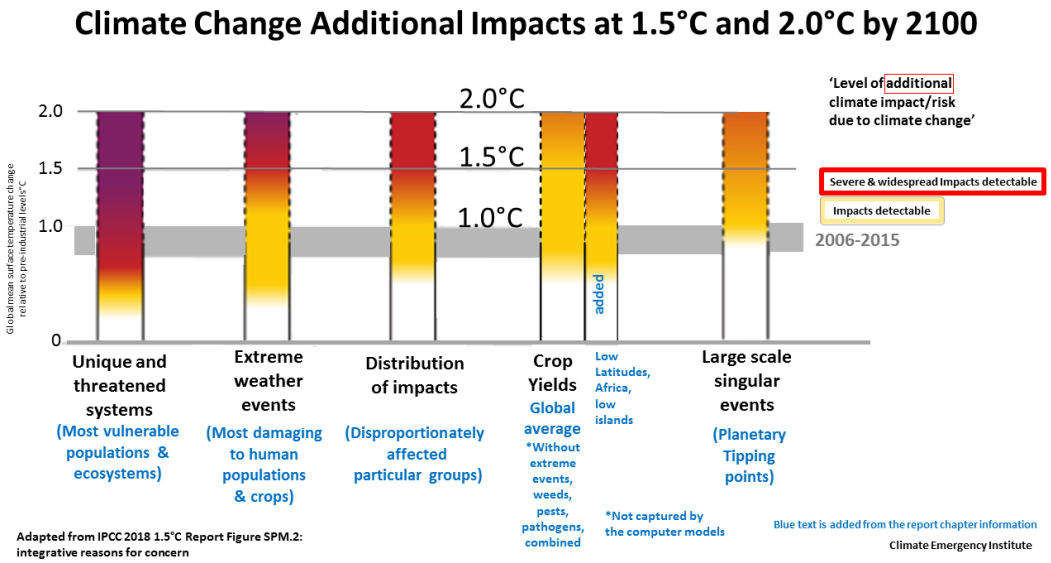
- D3. Adaptation options specific to national contexts, if carefully selected together with enabling conditions, will have benefits for sustainable development and poverty reduction with global warming of 1.5°C.

- D4. Mitigation options consistent with 1.5°C pathways are associated with multiple synergies.

From the Summary for Policy Makers on Oceans

B4.2. Global warming of 1.5°C is projected to shift the ranges of many marine species, to higher latitudes as well as increase the amount of damage to many ecosystems. It is also expected to drive the loss of coastal resources, and reduce the productivity of fisheries and aquaculture (especially at low latitudes). The risks of climate-induced impacts are projected to be higher at 2°C than those at global warming of 1.5°C. Coral reefs, for example, are projected to decline by a further 70–90% at 1.5°C with larger losses (>99%) at 2ºC (*very high confidence*). The risk of irreversible loss of many marine and coastal ecosystems increases with global warming, especially at 2°C or more.

The industrial world has already brought about the accelerating 6th mass extinction of life on Earth, which global climate change will accelerate further.



P1 scenario: The only 1.5°C (or 2°C) response with proven technologies for the foreseeable future

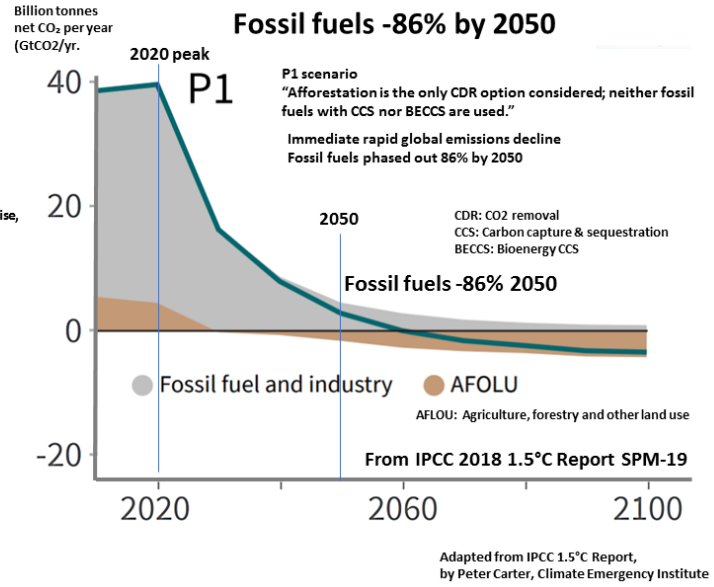
"Allowing the global temperature to temporarily exceed or 'overshoot' 1.5ºC would mean a greater reliance on techniques that remove CO2 from the air to return global temperature to below 1.5ºC by 2100. The effectiveness of such techniques are unproven at large scale and some may carry significant risks for sustainable development." (IPCC media release)

IPCC 2018 1.5°C Report SPM-19

P1 "A (1.5°C by 2100) scenario in which social, business, and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A down-sized energy system enables rapid decarbonisation of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used."

Rapid decarbonization

Primary energy from coal		
↳ in 2050 (% rel to 2010)	-97	-97 Coal
from oil		
↳ in 2050 (% rel to 2010)	-87	-87 Oil
from gas		
↳ in 2050 (% rel to 2010)	-74	-74 Gas
		-258
		-86% Fossil fuels



Adapted from IPCC 1.5°C Report, by Peter Carter, Climate Emergency Institute

Comments

The above has been approved by all IPCC 1.5°C Report scientists and approved by all world governments through the IPCC policy maker process. This is a commendably great achievement.

By frequent, the impression is given that carbon capture and sequestration (CCS) is an available option in the near future, but as the report does acknowledge, there is no good evidence for this. Only the P1 best-case scenario avoids CCS. Despite may years of interest and research CCS is unfeasible today and we can assume in the foreseeable future.

The projections in the 1.5°C Report are only to 2100, while global climate change and impacts will continue for centuries to millennia after 2100. The Report acknowledges this in Chapter 3 referring to "… long-term equilibrium stabilization responses (i.e. once climate equilibrium at 1.5° C or 2° C is reached off to several millennia). Hence a comprehensive assessment of climate risks associated with 1.5° C or 2° C climate scenarios' need to include consideration of higher levels of warming (e.g. up to 2.5°C-3°C)". This makes the climate change emergency today even more dire.

The report does not include the greatest risk which is triggering irreversible multiple amplifying feedback 'runaway carbon dynamic' (IPCC 2001 TAR). It acknowledges that "potential additional carbon release from future permafrost thawing and methane release from wetlands would reduce budgets by up to 100 GtCO2 over the course of this century and more thereafter," but this is not included in the global warming projections. The effect on permafrost emissions by loss of Arctic sea ice albedo cooling is not considered. The report does not include the extra global surface warming caused by "terrestrial" feedback emissions, like warming soils, forest fires and forest dieback (these are treated ase separate from permafrost and wetlands), which is substantial by 2100 at and above 2°C. Including these makes benefits from 1.5°C compared to 2°C much greater, hopefully avoiding runaway.

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