

## How much climate change can we bear?

The stated goal of the United Nations Framework Convention on Climate Change (1992) is to avoid 'dangerous climate change'. We are committed to 1.2-1.3°C of global average temperature rise above pre-industrial levels from the greenhouse gases (ghgs) that we have pumped into the atmosphere. Keeping global average temperature rise **below** 2°C should be the goal of climate change policy.<sup>1</sup> While this is certainly dangerous to the millions of people who will be affected, it is probably the best we can do.

### Two degrees Centigrade global average warming:

- Threatens many tens of millions of people with increased risk of hunger, hundreds of millions with increased malaria risk, millions with increased flooding and billions with increased risk of water shortage.<sup>2,3</sup>
  - Damages fall largely on the poorest and developing countries, particularly in sub-Saharan Africa, South Asia, and parts of SE Asia and Latin America
- Risks melting of major ice sheets with commitments to many metres of sea level rise over several centuries, particularly the Greenland ice sheet (seven metres), and the West Antarctic Ice Sheet (WAIS) (5-7 metres). Greenland melting is accelerating and rapid melting acceleration of the glaciers from a large sector of the WAIS is now observed to be occurring and may presage the dynamic collapse of this component of the ice sheet.
  - Ensuing sea level rise threatens large populations everywhere and particularly low lying areas in developing countries such as Bangladesh, South China, and low-lying island states everywhere, not to mention 'the low countries' (Belgium, the Netherlands, NW Germany), and southeast UK.
- Threatens damage to major ecosystems from the Arctic and Antarctic to the tropics.
  - Loss of forests and species will affect the lives of all with economic costs falling disproportionately on the poor and developing countries

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<sup>1</sup> <http://www.climatenetwork.org/docs/CAN-adequacy30102002.pdf>

<sup>2</sup> Hare, B (2003) *Assessment of Knowledge on Impacts of Climate Change – Contribution to the Specification of Art. 2 of the UNFCCC: Impacts on Ecosystems, Food Production, Water and Socio-economic System*. [http://www.wbgu.de/wbgu\\_sn2003\\_ex01.pdf](http://www.wbgu.de/wbgu_sn2003_ex01.pdf)

<sup>3</sup> See M Parry, N Arnell, T McMichael, R Nicholls, P Martens, S Kovats, M Livermore, C Rosenzweig, A Iglesias and G Fischer, Millions at Risk: Defining Critical Climate Change Threats and Targets, *Global Environmental Change* 11.3 (2001): 1-3.

## Keep warming below 2 deg C – What CAN be avoided?

- Limit damages to coral reefs
- Limit risk of major ecological damages globally
- Limiting both rate and extent of sea level rise over many centuries
- Limit risk of Greenland ice sheet collapse
- Limit West Antarctic Ice Sheet instability risk
- Hunger, water scarcity and disease risk seem to accelerate with higher temperature, taking into account future economic growth and increased wealth

## How to Get There?

- It is still technologically, economically and scientifically possible to limit global temperature rise to less than 2°C above pre-industrial levels, but time is not on our side. We are within a decade or two of closing off those options with known technological means.
- Estimates of the ‘sensitivity’ of the climate to increases in ghgs are expressed in terms of the temperature response of the climate system to a doubling of pre-industrial levels of greenhouse gases in the atmosphere, expressed in carbon-dioxide equivalence in parts-per-million (ppm). Pre-industrial levels of carbon dioxide were about 270 million ppm. Today we are at about 379 ppm. The mid-line estimate of the response to the climate of a doubling of ghg concentrations to 550 ppm has been 2.5°C increase. So, we have said that our best guess is that “the climate sensitivity is 2.5°C.
- However, recent studies have revealed that the new best guess is that the climate sensitivity is in fact closer to 3.2°C, **which means that the response from the climate to the anticipated rise in ghgs will be even more dramatic than previously thought. We have to act even faster and take more dramatic action if we are to avoid the damage associated with a 2°C global average temperature rise.** This means that for now we have to aim for stabilizing ghgs in the atmosphere at a level below 400 ppm and then seek to bring them down as rapidly as possible if we are to have a reasonable chance of keeping global temperature rise below 2°C.
- To meet these goals dramatic reductions in greenhouse gas emissions are needed, and they are needed soon. From a moral, legal and practical perspective, the initial burden of emissions reductions has to fall on industrialized countries. Reductions of at least 30% on 1990 levels (the ‘baseline’ year for the Kyoto Protocol) by 2020 from industrialized countries are required, with a target of at least 75% reductions by mid-century.
- Globally, we need to bring total emissions back to 1990 levels by about 2020 and then reduce them by 50% by mid-century. This means that rapidly industrializing

economies like China, India, Mexico, Brazil, South Africa, Indonesia, Malaysia and others need to start reducing their emissions soon.

- The consequences of delay in the process of reducing emissions means that we will face a dire global emergency in the 2020s which will require rates of emissions reductions which in the past have only been associated with massive economic collapse, i.e., with the collapse of the Soviet Union. We must not be forced to choose between economic catastrophe and climate catastrophe...the most likely outcome in that case would be both, and we have a good chance of avoiding this if we ACT NOW.
- The USA MUST be brought into the system sooner rather than later. If the US carries on with business-as-usual, the rest of the industrialized world 'runs out' of emissions some time around 2025.