

Under a Greenhouse Atmosphere. Analyzing Global Carbon Emissions

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Theme: [Environment](#)

In-depth Report: [Climate Change](#)

As carbon emissions have been growing at an accelerated rate (Figure 1) and new power plants are under construction (Figure 2) the race to destroy species and civilization is heading toward its critical conclusion (Figure 3), already with fatal consequences (Figure 4).

According to the UNHCR, since [2008](#) an estimated 22.5 million people have been displaced by climate or weather-related events. According to researchers from the World Health Organization (WHO) and the University of Wisconsin global warming is already responsible for some 150,000 deaths each year around the [world](#). In 2014, the [World Health Organization \(WHO\) estimated](#) that climate change would lead to about [250,000](#) additional deaths each year between 2030 and 2050, from factors such as malnutrition, heat stress and malaria.

The climate crisis constitutes the greatest existential threat humanity has ever faced and nature has suffered since [66 million years ago](#). From 1870 to 2014, cumulative carbon emissions totaled about [545 GtC](#) (Billion ton/year). Emissions are partitioned among the atmosphere (approx. 230 GtC or 42%), ocean (approx. 155 GtC or 28%) and land (approx. 160 GtC or 29%).

The transfer of additional part of the known fossil fuel reserve of [>3000 GtC](#) to the atmosphere is threatening to render large parts of the Earth [uninhabitable](#). Yet, bar lip service and non-binding agreements, world governments are now presiding over the demise of much of the global biosphere and of civilization. As the planet keeps warming and the powers to be are spending \$trillions on so-called “defense” and murderous wars, tragically people and nature suffer.

Global carbon emissions in 2018 are set to hit an all-time high of 37.1bn tonnes

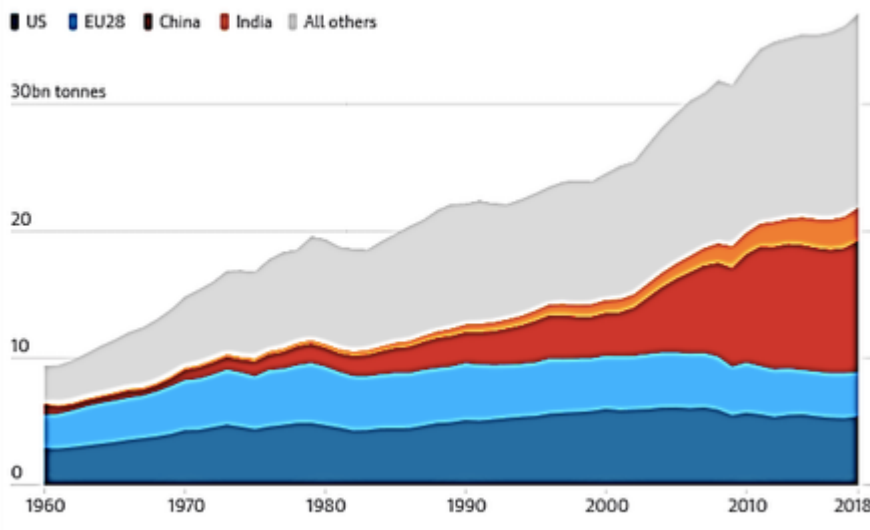
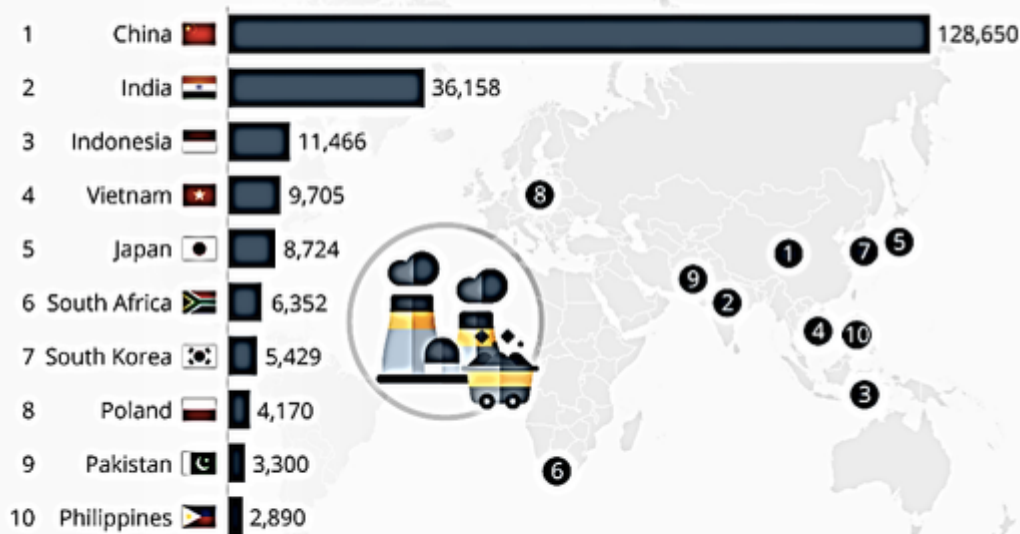


Figure 1. the rise in global carbon emissions to 37.1 GtC per year between [1960-2018](#)

Where The Most Coal Power Plants Are Under Construction

Megawatts of coal power capacity under construction in 2018



Sources: Global Energy Monitor, Greenpeace India, and the Sierra Club



Figure 2. Coal power plants [under construction](#)

Every week the internet reports newly discovered and exploited [coal, oil and gas](#) fields. Just as often it reports cyclones, floods and fires. The two are intrinsically linked. Whereas any single extreme weather event may not be related to global warming, the [tripling](#) of the incidence of [extreme weather events](#) heralds the rising warming/energy of the planetary system away from conditions that allowed humans to flourish in the Neolithic, as contrasted with conditions in which stone age people had to struggle to survive.

By 2018 the carbon concentration of the atmosphere exceeded 750 billion [tons](#) (GtC) as

compared to pre-industrial atmospheric composition of ~620 GtC, representing the largest transfer of carbon from the Earth to the atmosphere since 56 million years ago. Over the last quarter century carbon emissions have risen by almost 63 percent (1990 - 22.6 MtCO₂/year; 2005 - 30MtCO₂/year; 2017 - 37MtCO₂/year; 2017/1990 - +163.5%). [Coal production in Australia](#) increased 13.6% between 2005 and 2010 and 5.3% between 2009 and 2010. In 2016 Australia was the fourth-highest producer with 6.9% of global production (503 MtC out of 7,269 MtC total) and was the biggest net exporter of coal, with 32% of global exports (389 MtC out of 1213 MtC total).

As a consequence of global carbon emissions by 2018 mean temperatures reached +0.98C over pre-industrial conditions and rose further by more than +0.5C over the continents. For example in [Mongolia](#) reaching +2.2C. The temporary masking effect by human-emitted aerosols potentially accounts for latent additional temperature rise of between 0.5 and 1.0C (as was manifested for example when jet [flights](#) contrails were discontinued on 9/11).

In coastal regions and islands the rise in temperature is driving increasingly intense cyclones and flood events, such as hit the Caribbean islands, southeastern Texas, Florida, Mississippi, southwest Pacific islands, the Philippines, Kerala, Mozambique, Zimbabwe, Japan, Queensland, and [other regions](#).

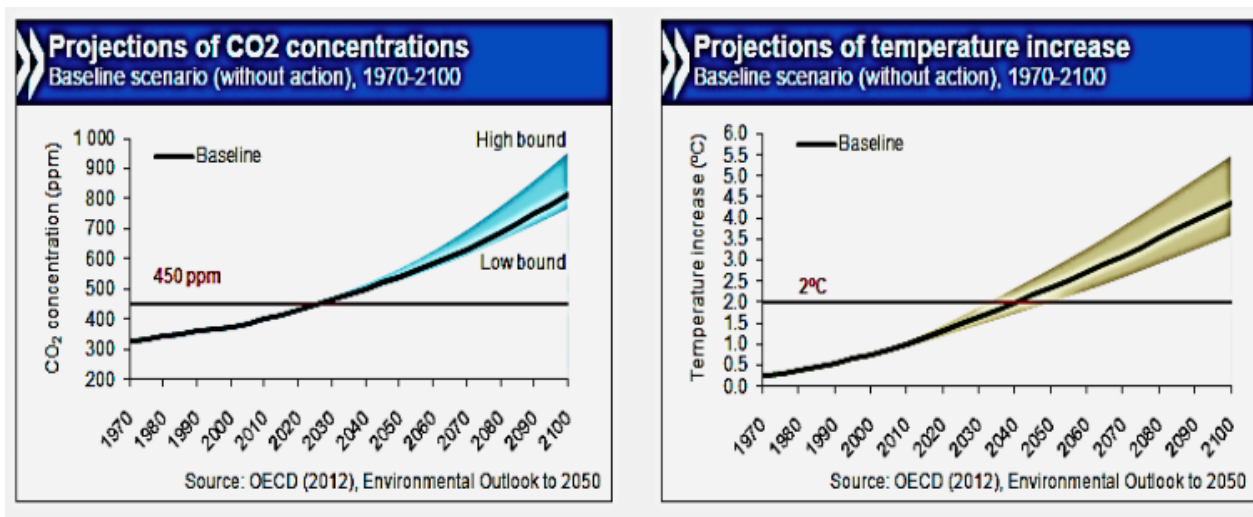


Figure 3. (a) CO₂ concentration rise 1970-2100 and (b) mean temperature rise to 2100 to levels well above the stability limit of the large ice sheets

In terms of the effects of global warming on human life ([OECD "Climate change: Consequences of inaction"](#)), a quantitative risk assessment by the World Health Organization (WHO) suggests additional climate change-related deaths for the year 2030 would total [241000 people](#) (38000 due to heat exposure in elderly people, 48000 due to diarrhea, 60000 due to malaria, and 95000 due to childhood under-nutrition). A review of the effects of extreme weather events in 2018 is given in "Deadly weather: the human cost of 2018's climate disasters - [visual guide](#)" by Daniel Levitt et al (2018).

A changing climate not only affects agriculture but also leads to greater food spoilage from heat, leading to diarrheal illnesses and hunger that caused around 310,000 deaths in [2010](#). Heat and cold illnesses, malarial and vector-borne diseases, meningitis and environmental disasters account for the rest of the almost 700,000 deaths attributable to these direct climate impacts. Pollution, indoor smoke, and occupational hazards related to the carbon economy cause the rest of those [5 million deaths](#) (Figure 4) through ailments like skin and

lung cancer.

NUMBER OF DEATHS		2010	2030
Climate	Diarrheal Infections	85,000	150,000
	Heat & Cold Illnesses	35,000	35,000
	Hunger	225,000	380,000
	Malaria & Vector Borne Diseases	20,000	20,000
	Meningitis	30,000	40,000
	Environmental Disasters	5,000	7,000
Carbon	Air Pollution	1,400,000	2,100,000
	Indoor Smoke	3,100,000	3,100,000
	Occupational Hazards	55,000	80,000
	Skin Cancer	20,000	45,000
World	4,975,000	5,957,000	

Figure 4. Numbers of climate related deaths in [2011 and 2030](#).

The melting of the polar ice sheets, where warming takes place at twice the rate as over the rest of the Earth, heralds a fundamental climate shift. Development of temperature contrasts between cold ocean regions and warming tropical regions (Figure 5) would lead to storminess, costing the lives of [millions](#).

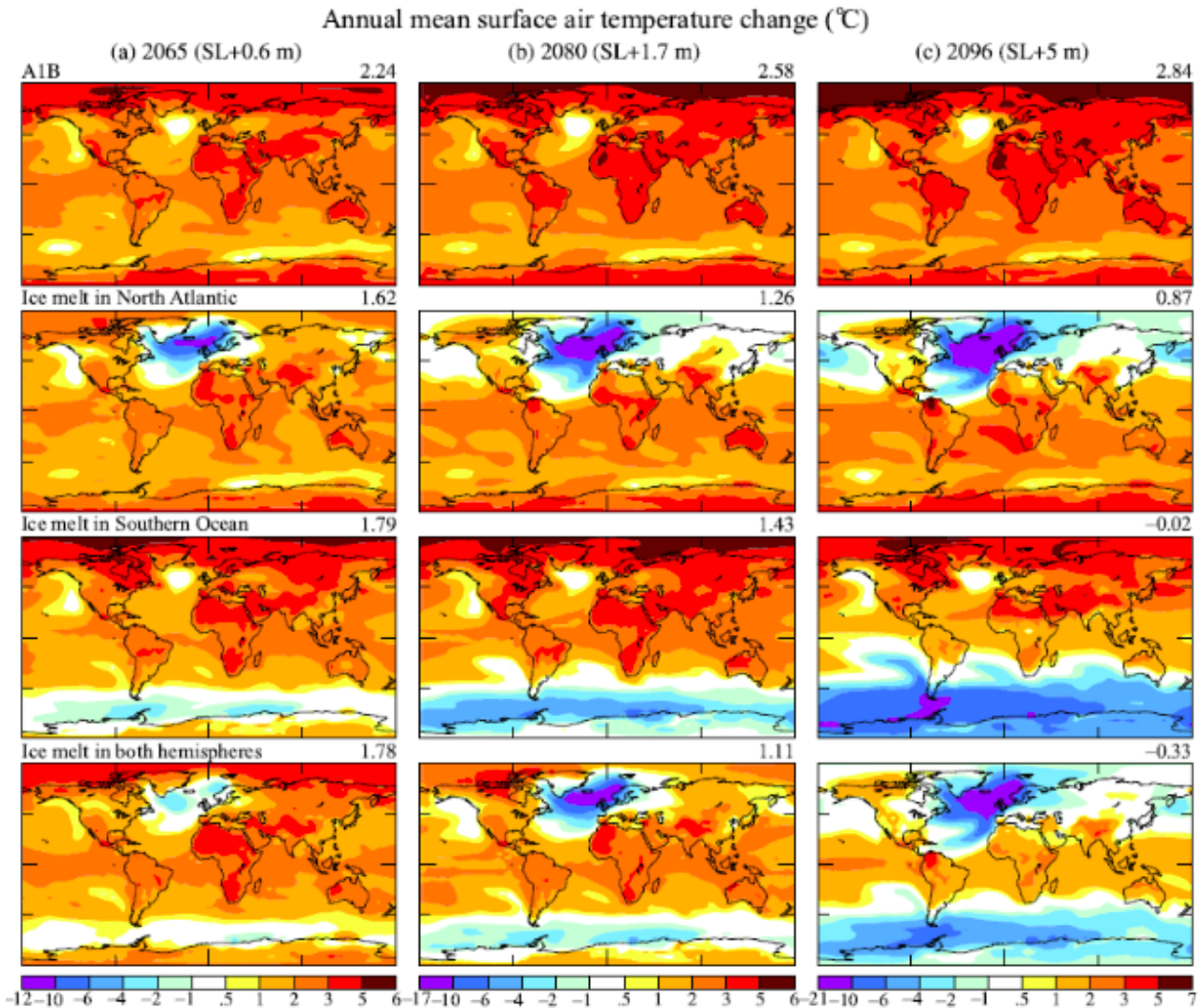


Figure 5. [Hansen et al.'s 2016](#) model of global land and sea climate changes in 2065, 2080 and 2096, according to the IPCC emission scenario A1B. As melting of the Greenland and Antarctica ice sheets progress large volumes of cold ice melt water flow into the North Atlantic Ocean and the southern ocean, leading to meters-scale sea level rise and to transient cooling of the oceans. Until near-complete melting of polar ice allows resumed rise of global temperature rise, tropical zones and deep sea continue to warm. Near-complete melting of the large ice sheet would allow the Earth to return to climate conditions such as existed in the Early Eocene.

Life on Earth is controlled by presence of water, insolation, the composition of the atmosphere and oceans, asteroid impacts and large volcanic eruptions. Cyclic and abrupt changes in these factors have affected the climate over billions of years. Sharp rises in atmospheric greenhouse gas concentrations, such as about 66 and 56 million years ago and at present have and are leading to major crises in nature. The current rise in atmospheric greenhouse gas concentration, combining the effects of CO₂, methane and nitric oxide, is now tracking toward 500 ppm CO₂ equivalent, the stability threshold of the large ice sheets. The consequent rise in mean global temperature by of 3 to 4 degrees Celsius over a period as short as a century or so represents [one of the largest catastrophes recorded in geological history](#), posing an existential threat for most species and for civilization. Current manifestations include a growing spate of extreme cyclones, floods, droughts and fires killing large number of people. Inexplicably [business as usual](#) persists among the political classes, chief executives and the media, expressing a plethora of half-truths and lies, defying the original definition of the species as “*sapiens*”.

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