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# Climate Change is a very Moderate Problem

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Since 1980, the world economy – the combined GDP of all countries – has roughly quadrupled.[1] It is particularly the poorest countries that have experienced remarkable progress in living conditions. This progress is evident in a number of areas:

- Poverty has fallen. The proportion of humanity living in extreme poverty – defined as consumption below 3 dollars per day – has dropped from 47 to 10 percent.[2]
- Health conditions have improved dramatically. Average life expectancy has increased from 63 to 72 years.[3] The proportion of children dying before the age of five has fallen from 12 to 4 percent.[4] Today, 80 percent of the world's children are vaccinated, compared to 20 percent in 1980.[5]
- Food production has increased more than population growth.[6] A global distribution system has also helped ensure that fewer and fewer people are affected by famines.[7]
- Security against disasters. Even though there is more extreme weather, the number of people dying in natural disasters is probably lower than ever. The wealthier we become, the better we are at protecting ourselves from nature.[8]

There are many contributors to this growth. One important factor is stable access to affordable and reliable energy. The Chinese factories need electricity. The Indian farmers need petrol for his moped to transport goods to the market. The African health clinics need light. School buildings require steel and cement.

All this energy use entails increasing emissions. In 1980, the world emitted about 20 billion tonnes of greenhouse gases, $CO_2$ equivalents. This year, it will be around 40 billion

[1] https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD

[2] https://data.worldbank.org/indicator/SI.POV.DDAY

[3] https://data.worldbank.org/indicator/sp.dyn.le00.in

[4] https://ourworldindata.org/grapher/global-child-mortality-timeseries

[5] https://ourworldindata.org/grapher/share-of-vaccinated-one-year-olds-globally?time=1980..2015

[6] https://ourworldindata.org/grapher/food-supply-by-region-kilocalories?time=1961..2013

[7] https://ourworldindata.org/uploads/2018/03/Famine-death-rate-since-1860s-revised.png

[8] https://ourworldindata.org/natural-disasters

tonnes. In this period, emissions in the West have decreased somewhat. At the same time, emissions have increased sharply in the poorest parts of the world, especially in China. With 10 billion tonnes per year, China now emits more greenhouse gases than the USA and EU combined. But emissions are also rising in Africa, India, and Latin America.[9]

This also means that the planet's temperature is rising. In parallel with the increase in prosperity, it has become around 0.7 degrees warmer since 1980, or close to 1.5 degree since "pre-industrial times". The IPCC estimates that if no further climate measures are implemented, the Earth's temperature will rise by an additional 2.5 degrees over the next 80 years.[10]

In the longer term, this warming is harmful to humanity. At the same time, the sources of emissions – transport, power generation, production of materials – are of great value. We face a trade-off. In order to make a good trade-off, we need knowledge about the consequences of energy usage – both the benefits and the drawbacks.

One issue which will be affected both by climate and climate change, as well as access to cheap energy, is agriculture. The trade-off is well illustrated in the latest IPCC report, which says that the policies needed to prevent global heating to cross the 1.5-degree mark, will entail more hungry people than today's climate policies.

William Nordhaus won the so-called Nobel Prize in Economics for his analysis of the impact of climate change on GDP development. Based on the climate forecasts from natural scientists and Nordhaus's tools, it has been calculated that climate change will harm global welfare as much as a 2–5 % fall in GDP would do, if the global temperature rises by an additional 2 degrees.[11] This magnitude is quite standard, and the IPCC refers to similar results in its reports.[12]

At the same time, prosperity is expected to increase significantly over the next 80 years. Especially in today's poorest countries, the UN's prognosis is that living conditions will improve dramatically.[13]

If humanity manages to limit fossil fuel use with little or no harm to living standards and living conditions, it seems reasonable to do so. But the "cure", of cutting fossil fuels, could very well prove to be much, much worse than the "disease" of climate change.

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[9] https://ourworldindata.org/co2-and-greenhouse-gas-emissions

[10] https://www.ipcc.ch/sr15/chapter/chapter-3/

[11] https://www.dallasfed.org/~/media/documents/institute/wpapers/2019/0365.pdf

[12] https://www.ipcc.ch/report/ar6/wg2/figures/chapter-16/figure-16-cross-working-group-box-economic-1

[13] https://www.sciencedirect.com/science/article/abs/pii/S0959378015000837