



Climate Change

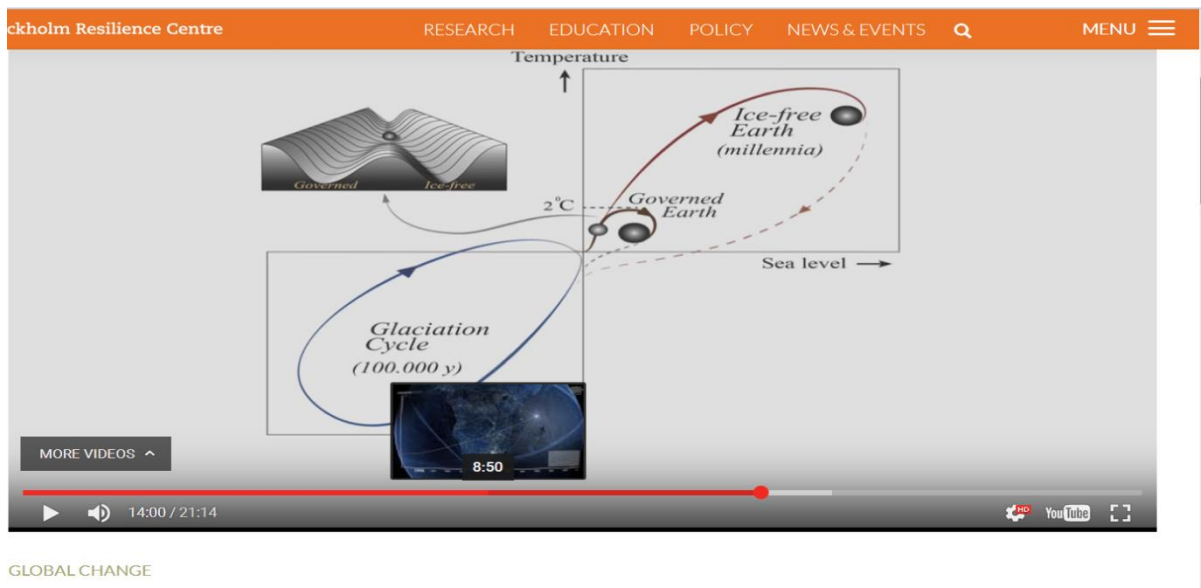
By
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Dear Friends,

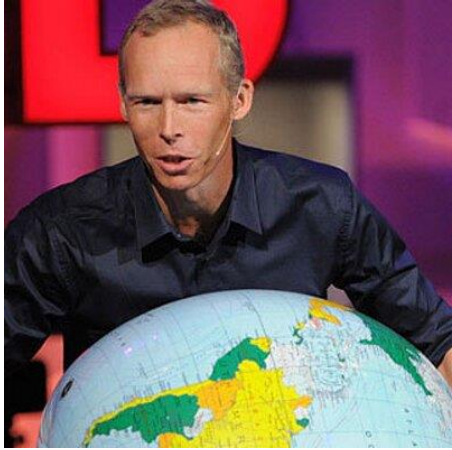
This month, we shall talk about Climate Change. This is another Planetary Boundary that we have already crossed. We shall try to understand the consequences as well as the causes behind this phenomenon, and see what can be done by each one of us. The best representation of the effects of climate change has been shown by our favorite author Prof. Johan Rockstrom in the picture below:



GLOBAL CHANGE

Fig.1 - Possibility of entering into an ice-free state (Source: WEF 2017: Beyond the Anthropocene - Stockholm Resilience Centre)

The quadrant marked 'Glaciation Cycle' at the bottom left represents the pre-Holocene period, with the sea level going down by as much as 30 to 50 meters below current level, as more and more sea water formed into ice. The sea levels became higher in the warm inter-glacial periods. Now we are in the Holocene period indicated by the small loop in the top right box marked 'Governed Earth', with very stable temperatures, but with a very alarming trend over the past 100 years, with the average surface temperature having already risen by 0.8 degree Celsius, accompanied by rising sea levels. The Paris Agreement of 2015 aims at keeping the global warming within 1.5 to 2 degree Celsius. The larger loop at the top right box points out the highly risky potential of our Mother Earth entering into a completely unknown 'Ice-free Earth' if we fail to take appropriate climate action.



Prof. Johan Rockstrom is executive director of the Stockholm Resilience Centre

Emission of different Green House Gases (GHGs) is the root cause for this change in our climate, also known as global warming. The single largest GHG is CO₂ (Carbon Dioxide) followed by CH₄ (Methane). The primary sources of CO₂ are fossil fuels burnt by us to get energy and cement production, as we may see from Fig. 2 below.

Our dependence on fossil fuel based energy is primarily behind this phenomenon. Therefore, as individuals, we must try to minimize our use of energy in any form, and try to switch over to renewable energy sources in future. We use energy directly for lighting, heating and cooling and in transportation. We can try to use natural lights and ventilations, plant trees around our habitats to provide us cooling effects, use energy efficient appliances, and use mass

surface transport systems instead of air transportation where possible, and avoid using private cars / powered two-wheelers wherever possible.

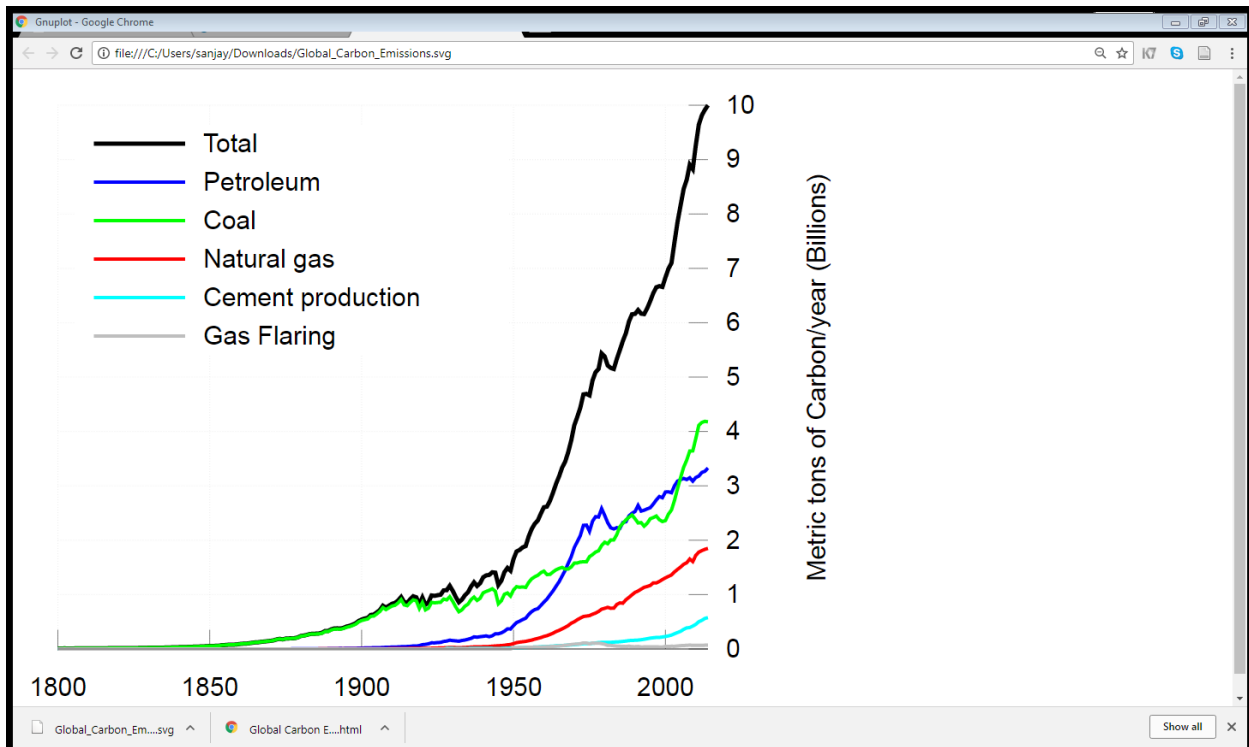


Fig. 2 Source: https://en.wikipedia.org/wiki/File:Global_Carbon_Emissions.svg

It is interesting to note that Prof. Rockstrom has suggested a Carbon Law (Fig. 3 - Halve the CO₂ emission every decade) to arrest this global warming. Each one of us may consciously try to implement this law in our own lives.

Year	Total CO ₂ Emissions Gt
2020	40
2030	20
2040	10
2050	5

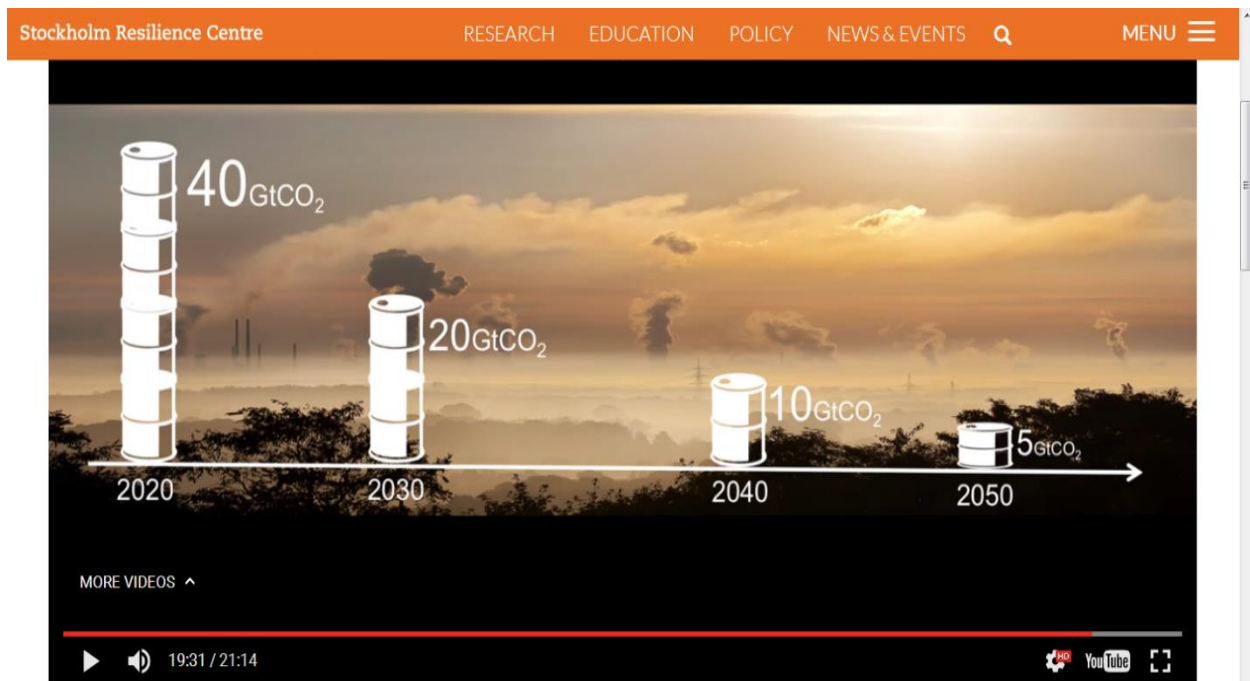


Fig. 3 Source: WEF 2017: (Beyond the Anthropocene - Stockholm Resilience Centre.)

