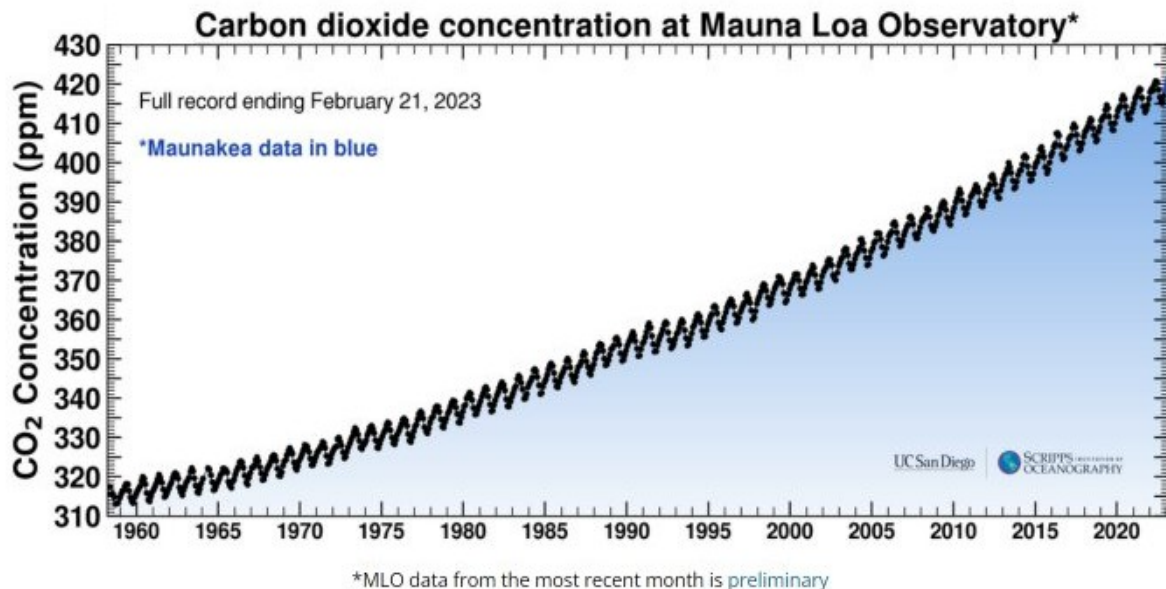


## +++ Saving the climate requires de-growth

On the evidence of the past few decades, the necessary fall in greenhouse emissions cannot be achieved, without a fall in economic activity. This is unwelcome to business interests, who influence the UK Government, which seems to care much more about business than about climate change.

### **++ The rise in CO2 emissions and atmospheric concentrations**

Climate change is being caused by emissions of greenhouse gases. The most important gas is Carbon Dioxide (CO2). Global emissions of CO2 have steadily risen over the past 50 years - occasionally slowed by economic crises. However, although emissions may have occasionally stalled, [atmospheric concentrations of CO2 have steadily increased](#). For the past two decades these concentrations are not just increasing - atmospheric concentration is accelerating despite the international agreements to cut emissions.



<https://keelingcurve.ucsd.edu>

Figure 1 - atmospheric concentrations of CO2

### **++ Emissions Intensity of Production**

The amount of CO2 emitted per unit of output has decreased steadily over these 60 years.

The measure "CO2 emitted per unit of output" is called Emissions Intensity. It is shown in the Figure 2 below. It uses an inflation proofed measure of value for output, the purchasing value of the dollar in 2010.

The emissions from a unit of production has fallen from over 600 grammes of CO2 per \$(2010 dollars) in 1971 to less than 300 grammes in 2021. If this linear fall were continued, by 2061

production would cause no emissions - as also shown in Figure 2. But, during the 1971 to 2021 period CO2 emissions have doubled because world production has increased more than four times. This means CO2 emissions have continued to rise.

The fall in Emissions Intensity sounds like good news. The bad news is the increase in consumption swamps this effect: Emissions continue to rise. Atmospheric concentrations accelerate.

**According to historic trend, by 2061 there will be no carbon emissions generated by economic output because the carbon intensity of carbon emissions becomes zero**

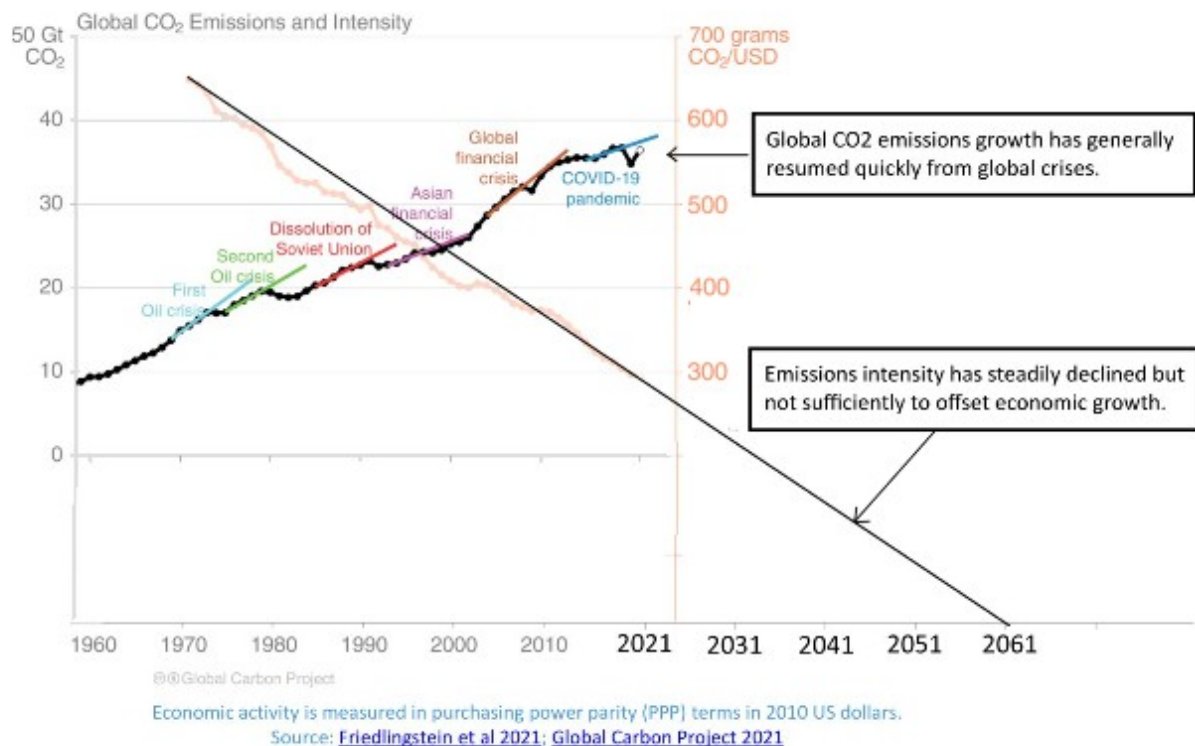


Figure 2: The intensity of carbon emissions for economic activity has fallen slowly but steadily, trending to zero in 2061 - but as GDP has grown faster, emissions are still growing. (Based on a figure in the [GCP Global Carbon Budget 2021](#).)

## ++ Exhausting the Remaining Carbon Budget

As noted above, the Remaining Carbon Budget is the amount of CO<sub>2</sub> humanity can emit before triggering a given rise in Earth's Surface Temperature. The [IPCC estimated the Remaining Carbon Budget](#) for a rise of 1.5°C as 48 tonnes CO<sub>2</sub> per person, starting in 2020. (See *Appendix. Climate is worse than they say*.)

This budget means that, if there were no global economic growth, and the Emissions Intensity continued to fall at its historic rate, this budget would be exhausted by 2036 as shown in Figure 3.

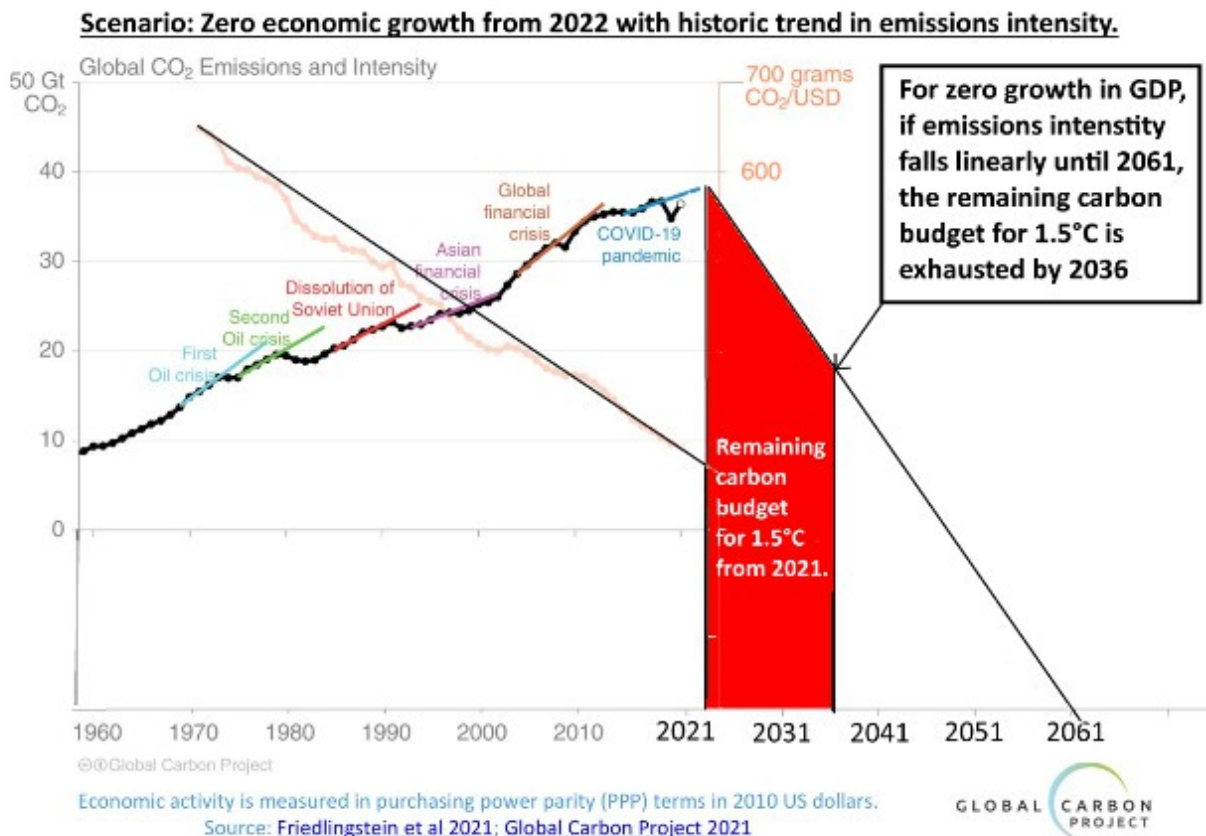


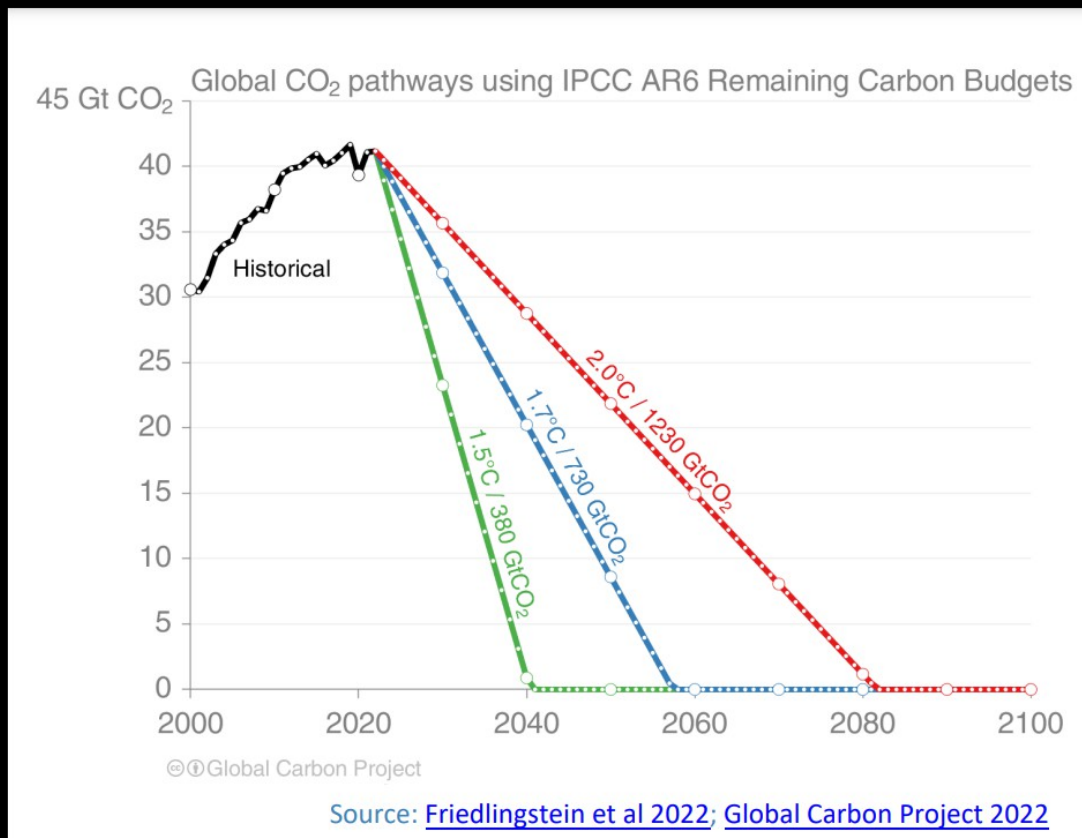
Figure 3: For zero economic growth, emissions intensity trends still exhaust the 1.5°C remaining carbon budget by 2036. The red area represents the amount of CO<sub>2</sub> that can be emitted before a rise in Earth's surface temperature of 1.5°C is caused. This (the remaining carbon budget for 1.5°C) will be exhausted in 2036 - if there is zero global economic growth. It is possible to keep within a 1.5°C target by greatly reducing economic activity to cut emissions. This is de-growth.

Saving the climate and having a growing world economy is only possible if emissions intensity can be made to fall at a much, much faster rate. If it cannot be fall fast enough, economic activity must be cut to keep within carbon budgets. This is de-growth.

## ++ Estimates of Carbon Emissions

[The Global Carbon Project 2022](#) has estimated that global CO<sub>2</sub> emissions must fall to zero by 2040 to stay within the Remaining Carbon Budget for 1.5°C (i.e. giving a 50% chance of the rise in Earth's average surface temperature staying under 1.5°C). A continued fall in emissions intensity at its historic value would exceed the budget unless production were to fall as well. This means that the fall in Emissions Intensity must be accelerated or the economy must shrink.

# Global Carbon Budget 2022



## Remaining Carbon Budget

[https://www.globalcarbonproject.org/carbonbudget/22/files/GCP\\_CarbonBudget\\_2022.pdf](https://www.globalcarbonproject.org/carbonbudget/22/files/GCP_CarbonBudget_2022.pdf)

Figure 4. To stay within the 1.5°C budget, Emissions Intensity must fall at twice the rate of the past 50 years (15.6 gm CO<sub>2</sub>/2010\_\$ against the historical fall of 7.4) - and that is assuming zero economic growth. Worryingly global economic growth has been positive for nearly all of the past 50 years, mostly in the range 2% to 4%. This growth has driven the rise in emissions and atmospheric concentrations of greenhouse gases despite a fall in Emissions Intensity.

See also *Appendix. Net zero not good enough*