

# The CC quiz



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# Rules of the CC quiz

- CC stands for Climate Change (;
- You will get 10 slides with statements which can be right or wrong.
- After each slide the correct answer is given with a bit of explanation.
- Count your correct answers. You'll get a mark on 10.
- If you have any questions or comments about the content, please contact me: [werner@bikingbodyplanet.com](mailto:werner@bikingbodyplanet.com)
- Success!



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# Statement 1

Greenhouse gases partly reflect the infrared radiation from the earth's surface back to earth.



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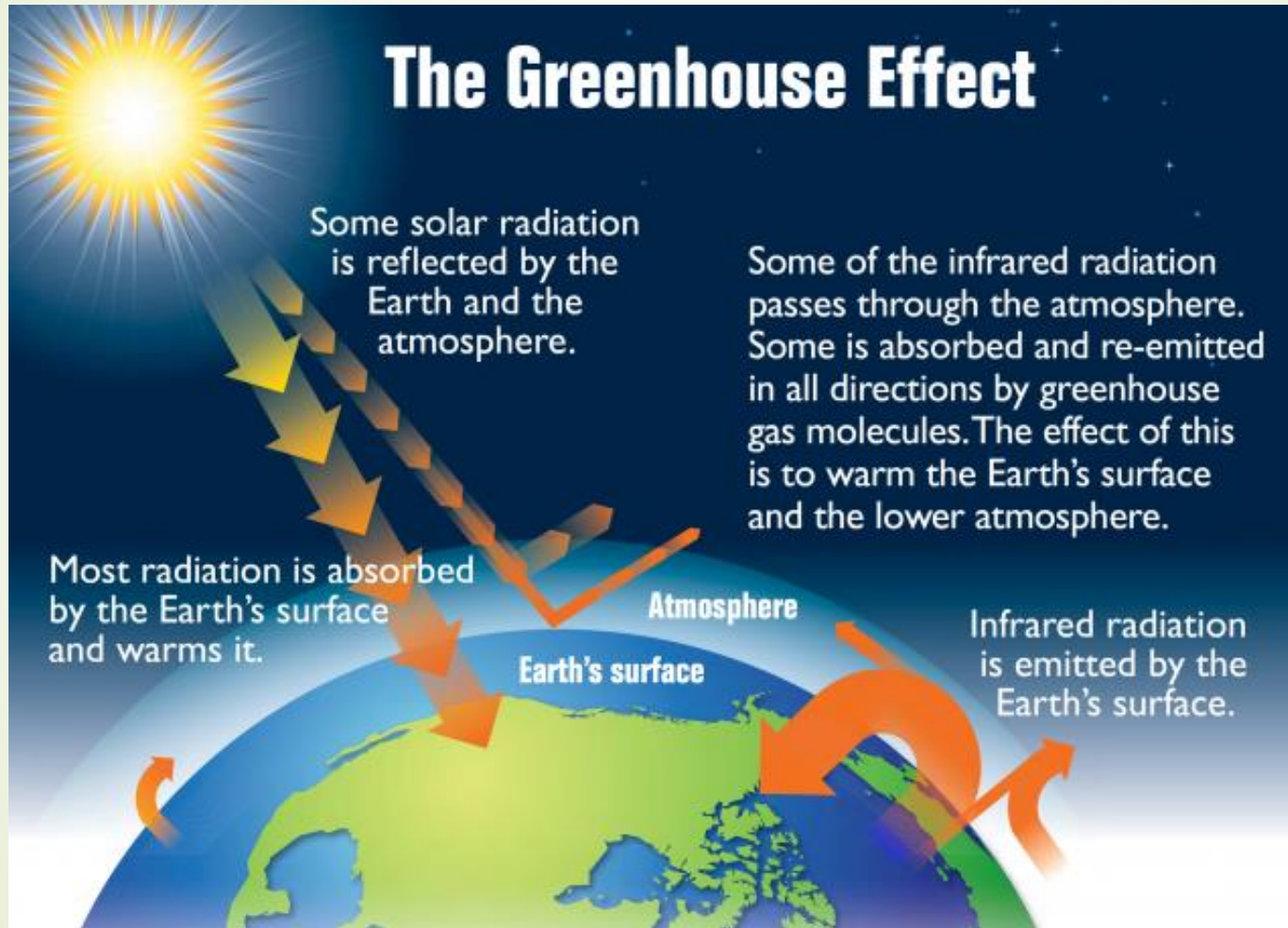


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# Right!



Source: EPA



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## Statement 2

Without greenhouse gases it would be on average 30°C colder on earth.



# Right!

It is important to make a distinction between

## ➤ **Natural greenhouse effect**

- Caused by volcanos, decomposition of organic material,...
- Made life on earth possible (without these greenhouse gases earth would be an ice planet)



## ➤ **Enhanced greenhouse effect**

- Caused by man
- Responsible for current global warming





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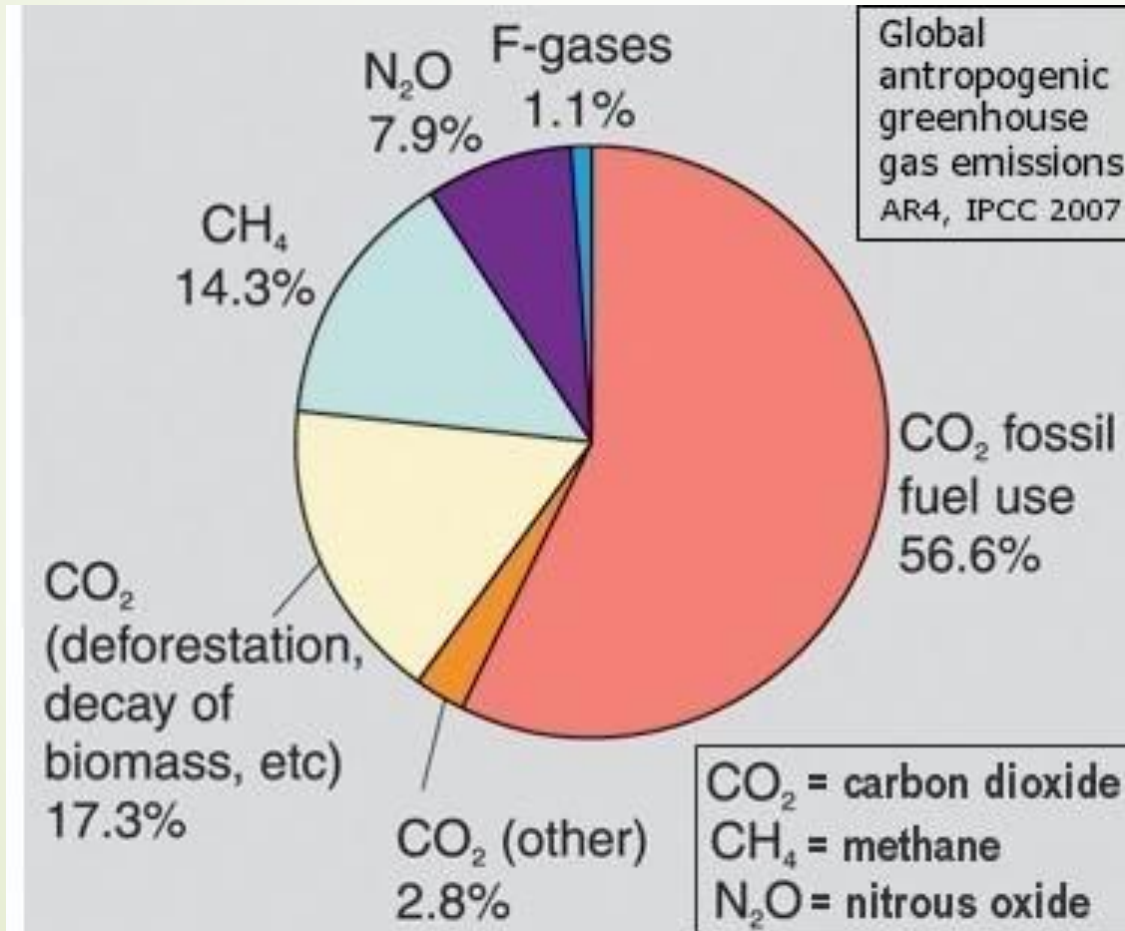
## Statement 3

CO is the main anthropogenic  
(= caused by man) greenhouse  
gas.



# Wrong!

CO is not a greenhouse gas, CO<sub>2</sub> is!







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## Statement 4

The anthropogenic CO<sub>2</sub>-emissions are responsible for the hole in the ozone layer.



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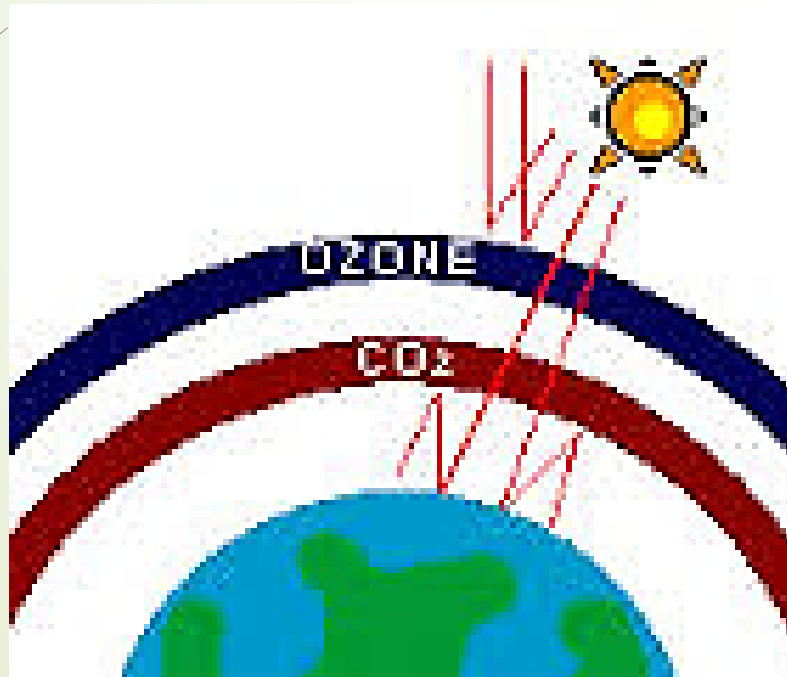
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# Wrong!

The hole in the ozone layer is caused by CFCs (Chlorofluorocarbons) and other ozone-depleting substances. They have been phased out since the Montreal Protocol in 1987. Since then the hole in the ozone layer is gradually recovering.





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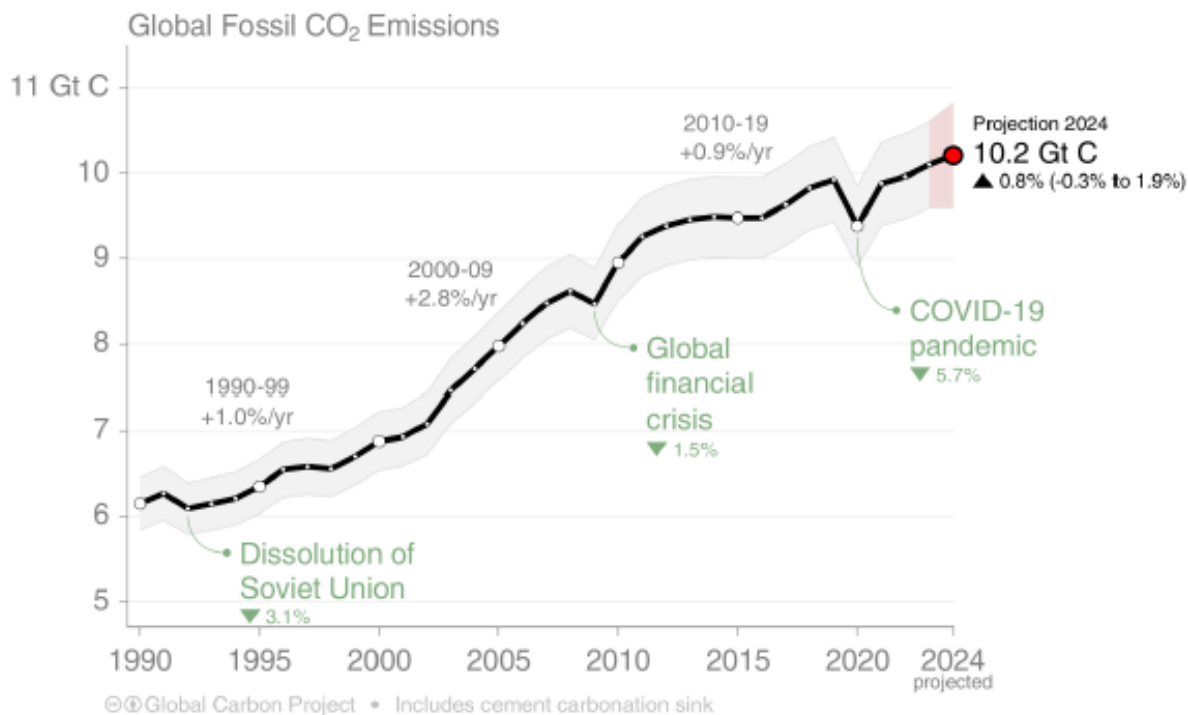
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## Statement 5

The anthropogenic global CO<sub>2</sub>-emissions are decreasing since 2020 (Covid-19 pandemic).

# Wrong!

- Global fossil CO<sub>2</sub> emissions: 10.1 ± 0.5 GtC in 2023, 66% over 1990
- Projection for 2024: 10.2 ± 0.5 Gt, 0.8% [-0.3% to +1.9%] higher than 2023



Uncertainty is ±5% for one standard deviation (IPCC "likely" range)

The 2024 projection is based on preliminary data and modelling. The global total includes a cement carbonation sink of 0.2 GtC.

Source: [Friedlingstein et al 2024](#); [Global Carbon Project 2024](#)



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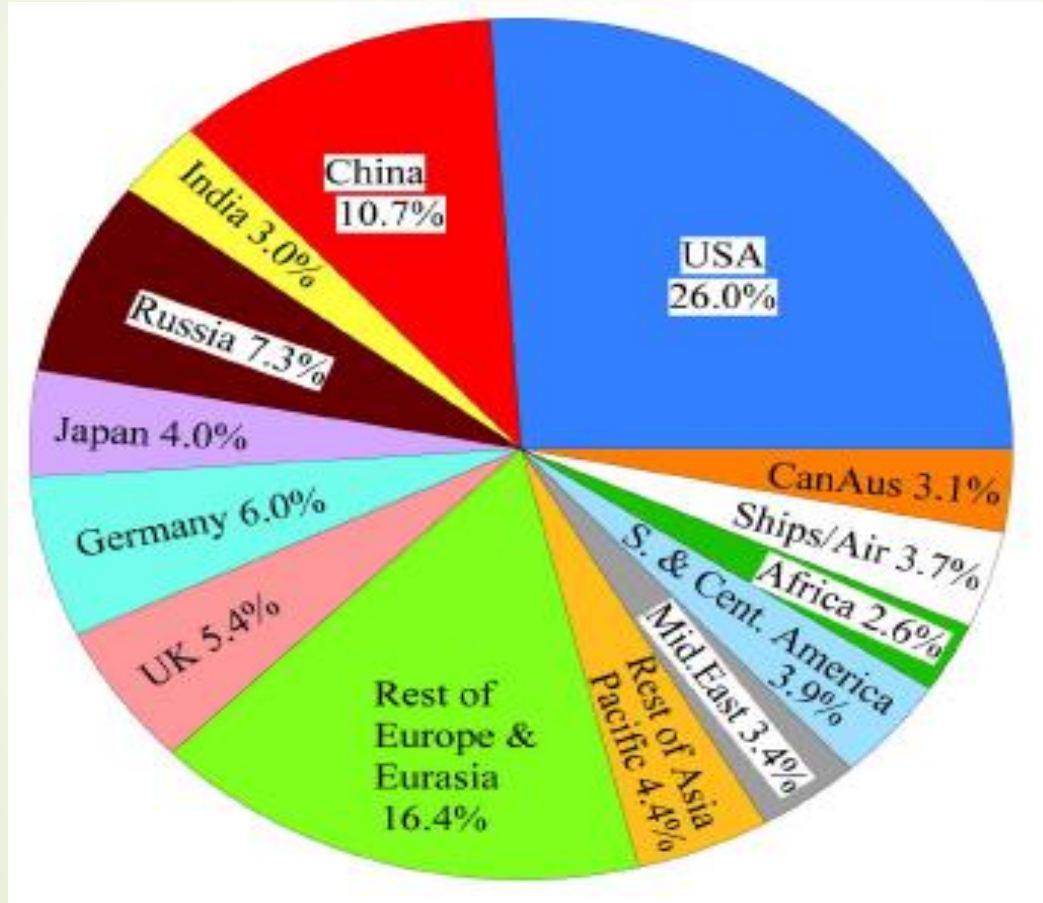
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## Statement 6

China and other emerging economies are the main culprits of current climate change.

# Wrong!

## Cumulative CO2-emissions 1750-2012



Source: Assessing dangerous climate change 2013



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## Statement 7

About half of the anthropogenic CO<sub>2</sub> emissions are recovered by forests and oceans.



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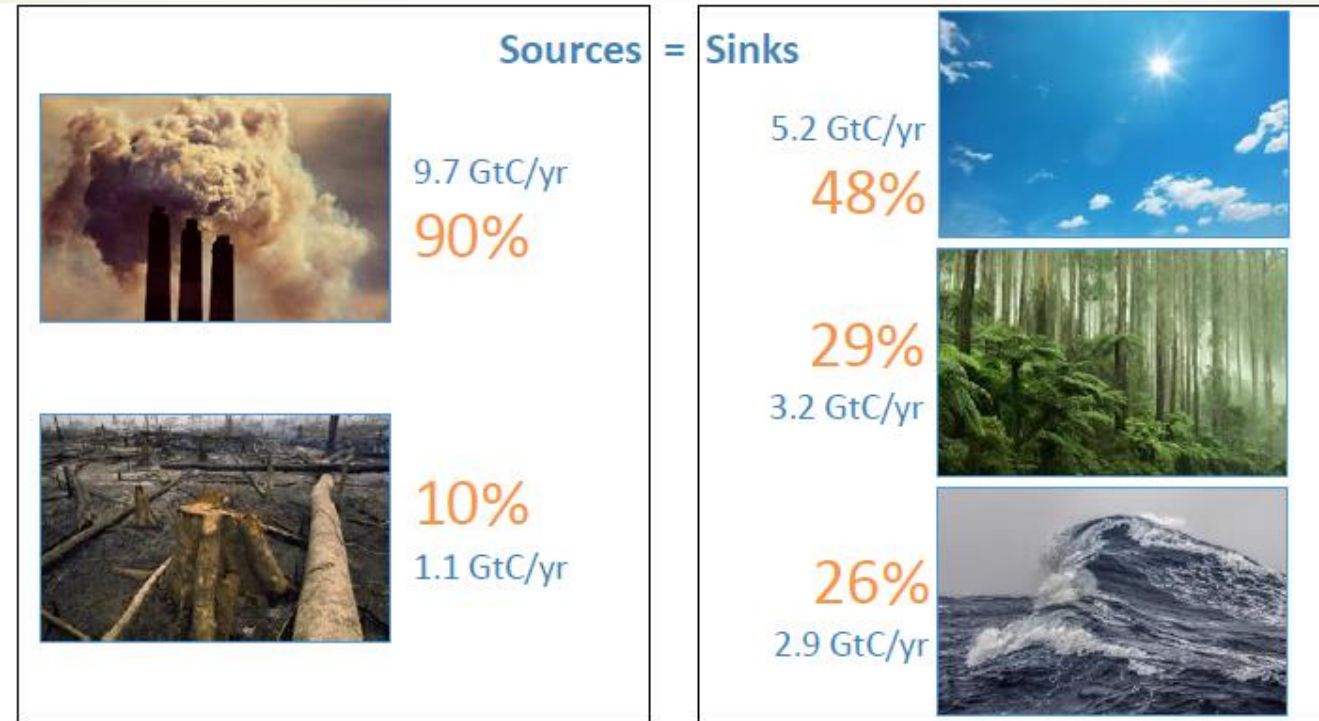
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# Right!

## The fate of anthropogenic CO2 emissions (2014-2023)



Budget Imbalance:  
(the difference between estimated sources & sinks)

**4%**  
-0.4 GtC/yr

Source: [Friedlingstein et al 2024](#); [Global Carbon Project 2024](#)





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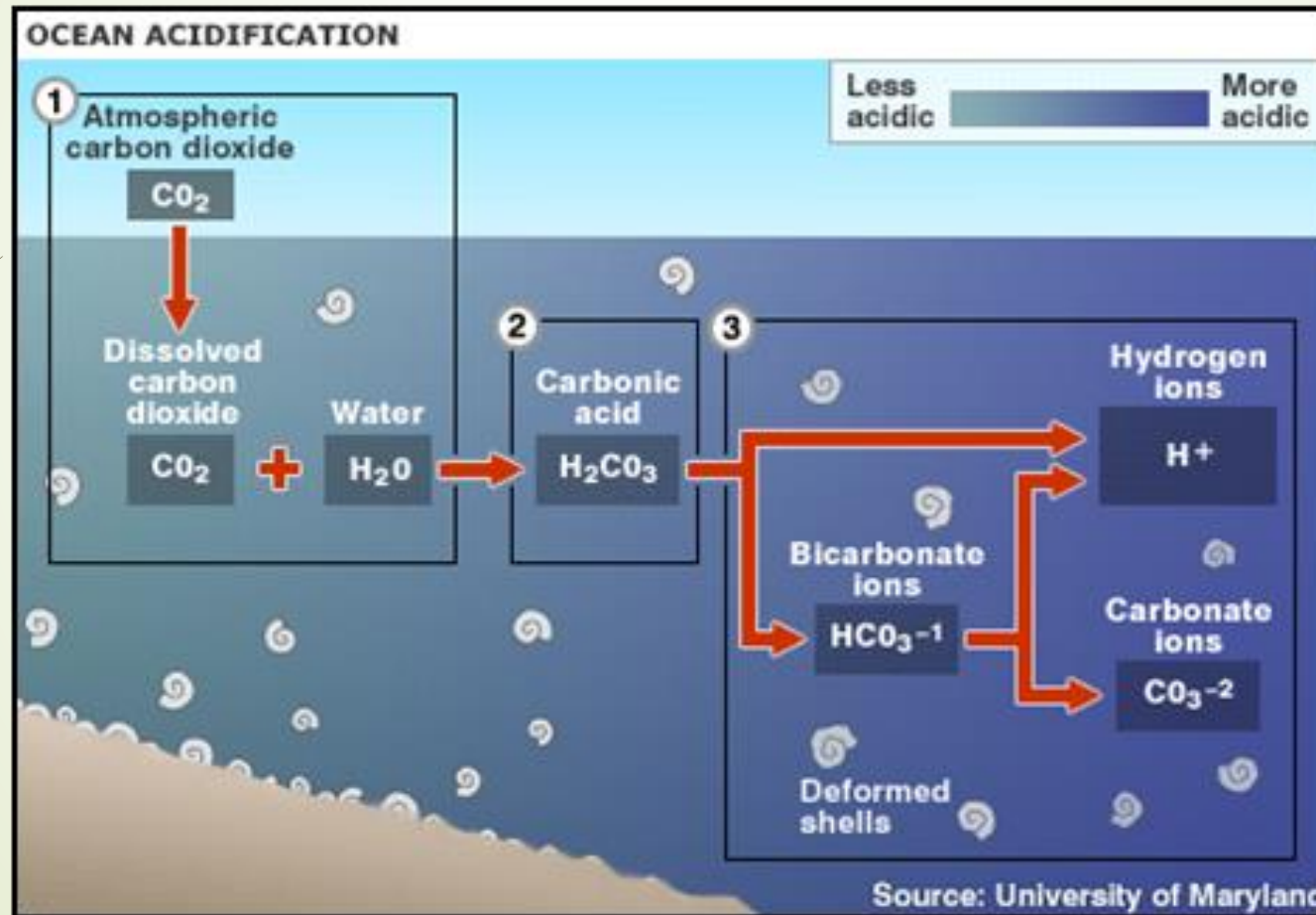
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The excess CO<sub>2</sub> uptake by the oceans causes them to become more acidic...

**“The evil twin of CC”**

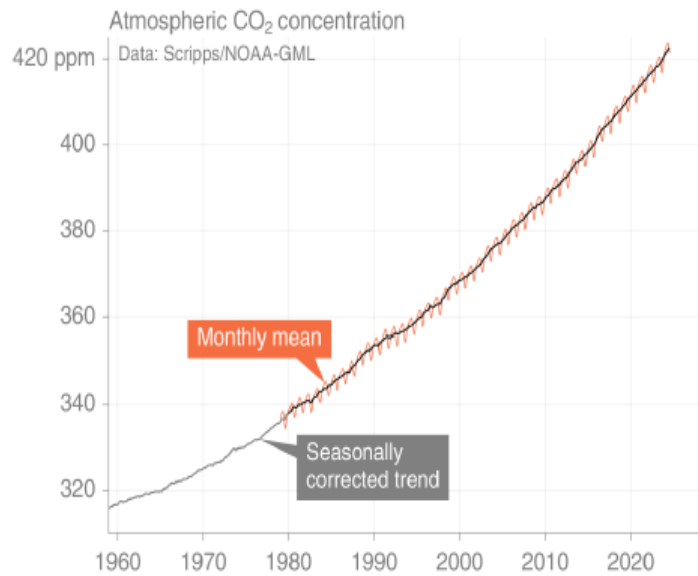




Going back to the atmosphere we see that CO<sub>2</sub>-concentrations are rising..

...in a short time span

The global CO<sub>2</sub> concentration increased from ~277 ppm in 1750 to 422.5 ppm in 2024 (up 52%)

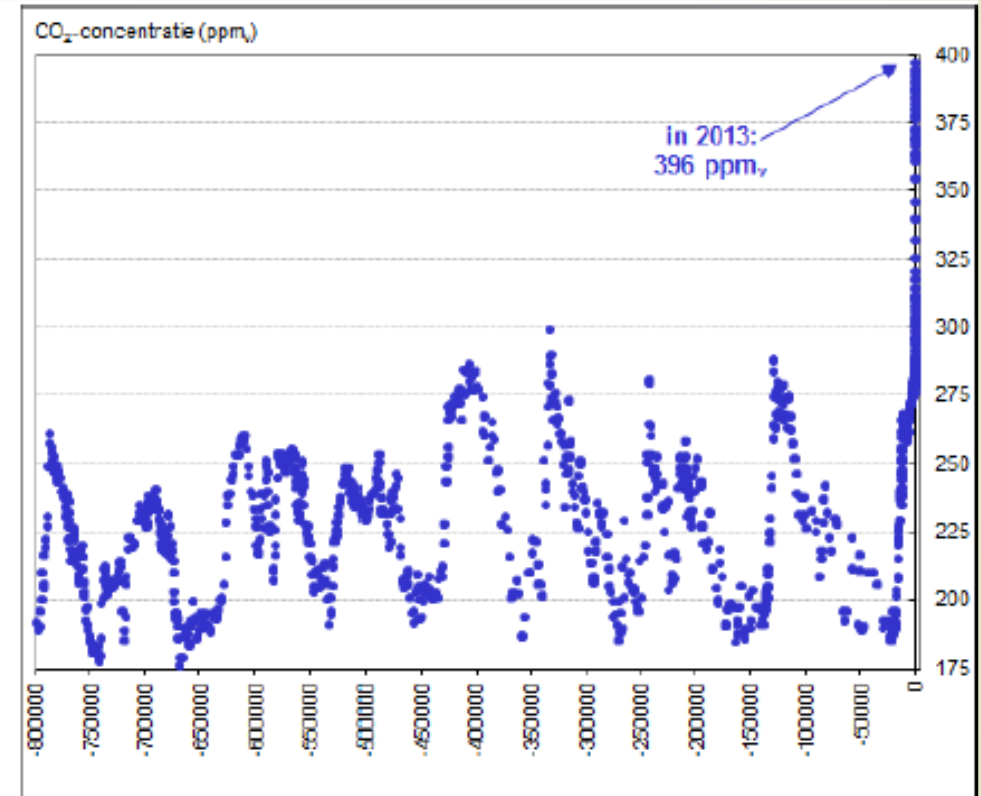


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Globally averaged surface atmospheric CO<sub>2</sub> concentration. Data from: NOAA-GML after 1980; the Scripps Institution of Oceanography before 1980

Source: [NOAA-GML](#); [Scripps Institution of Oceanography](#); [Friedlingstein et al 2024](#); [Global Carbon Project 2024](#)

...in a longer time perspective



Source: [www.milieurapport.be](http://www.milieurapport.be) (MIRA/VMM)



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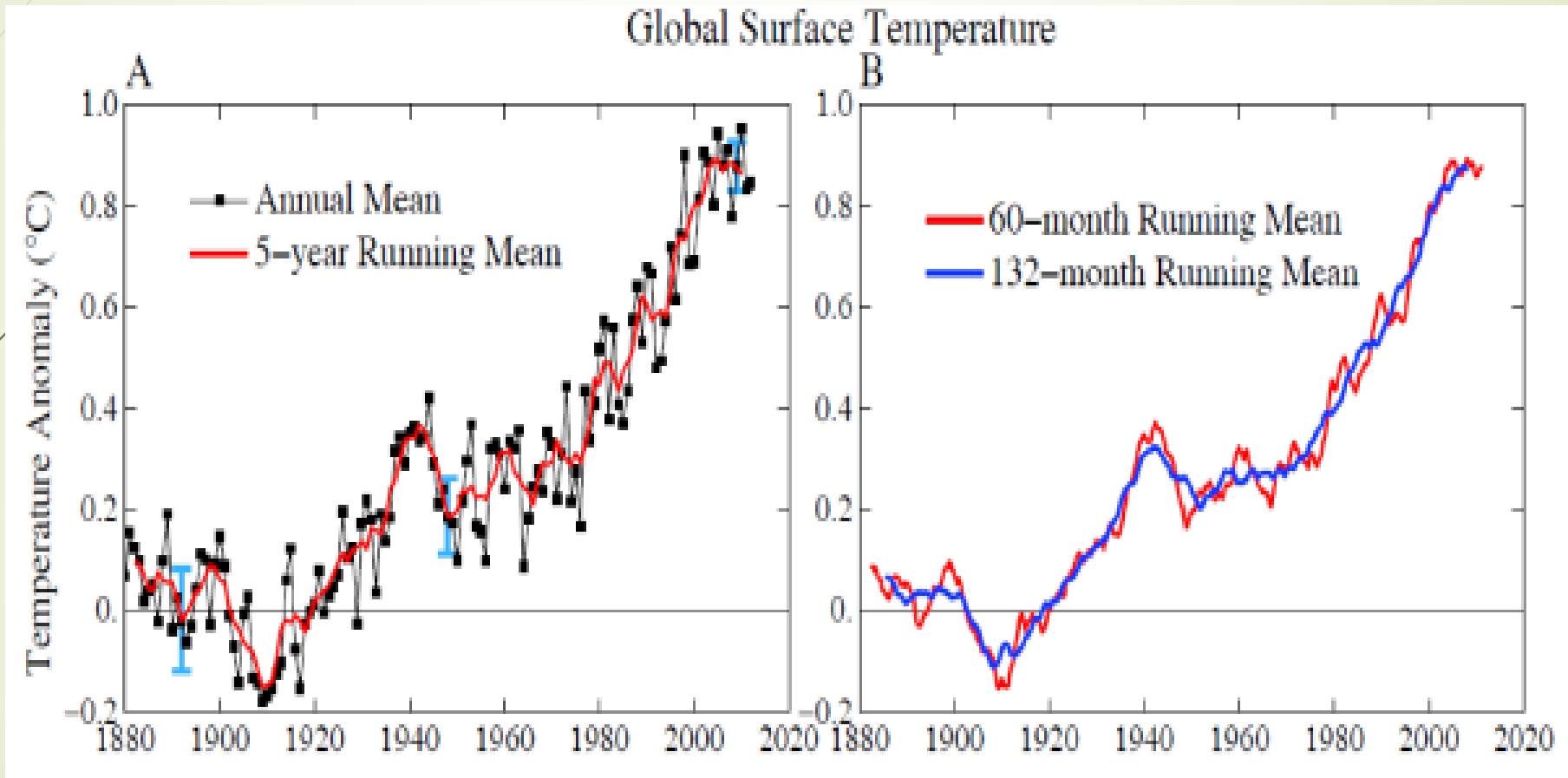
## Statement 8

In the period 2005-2015 global average temperature was  $\pm 0,8^{\circ}\text{C}$  higher than in the beginning of the industrial period (1850-1899).



# Right!

We are currently (2020) already above 1°C global warming above pre-industrial levels.





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## Statement 9

Anthropogenic emissions of greenhouse gases are the main cause of current global warming.



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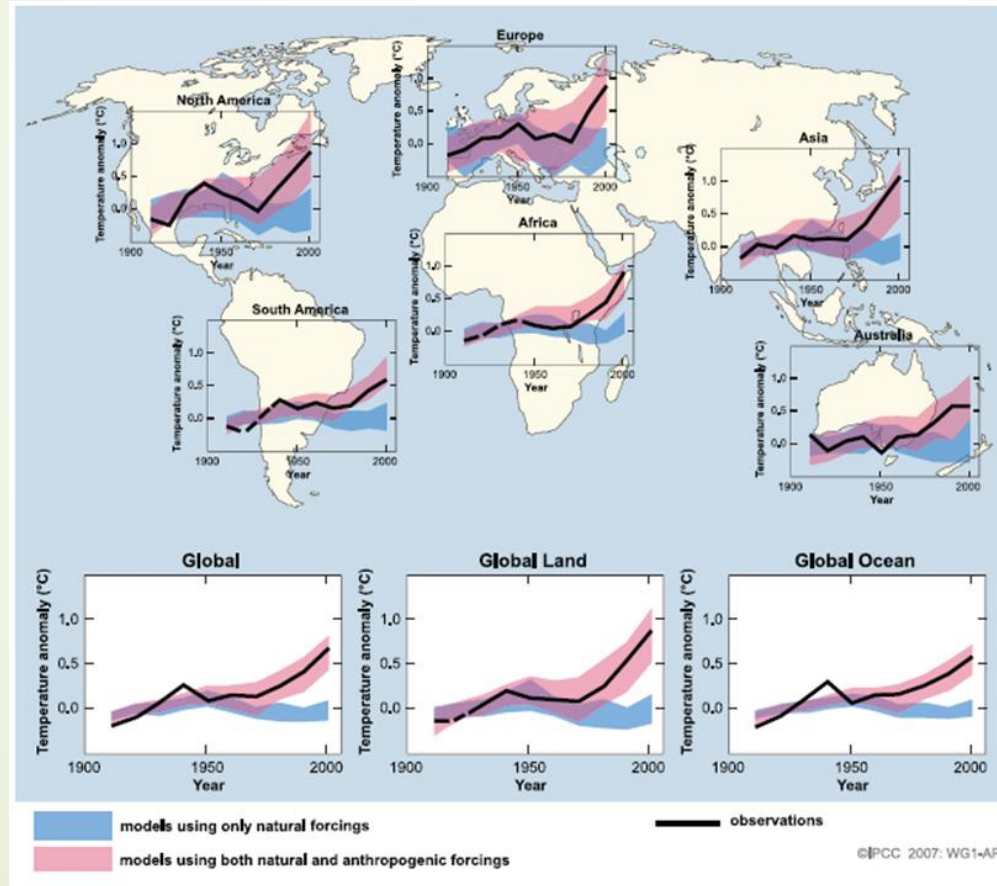
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# Right!

Computer models using both natural and anthropogenic forcings perfectly simulate real temperature observations, models using only natural forcings don't. This is clear evidence that current climate change is man-made.



Source: AR4, IPCC 2007



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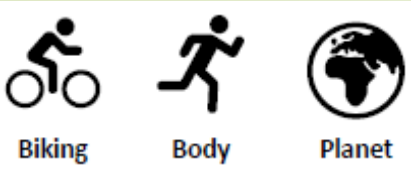
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## Statement 10

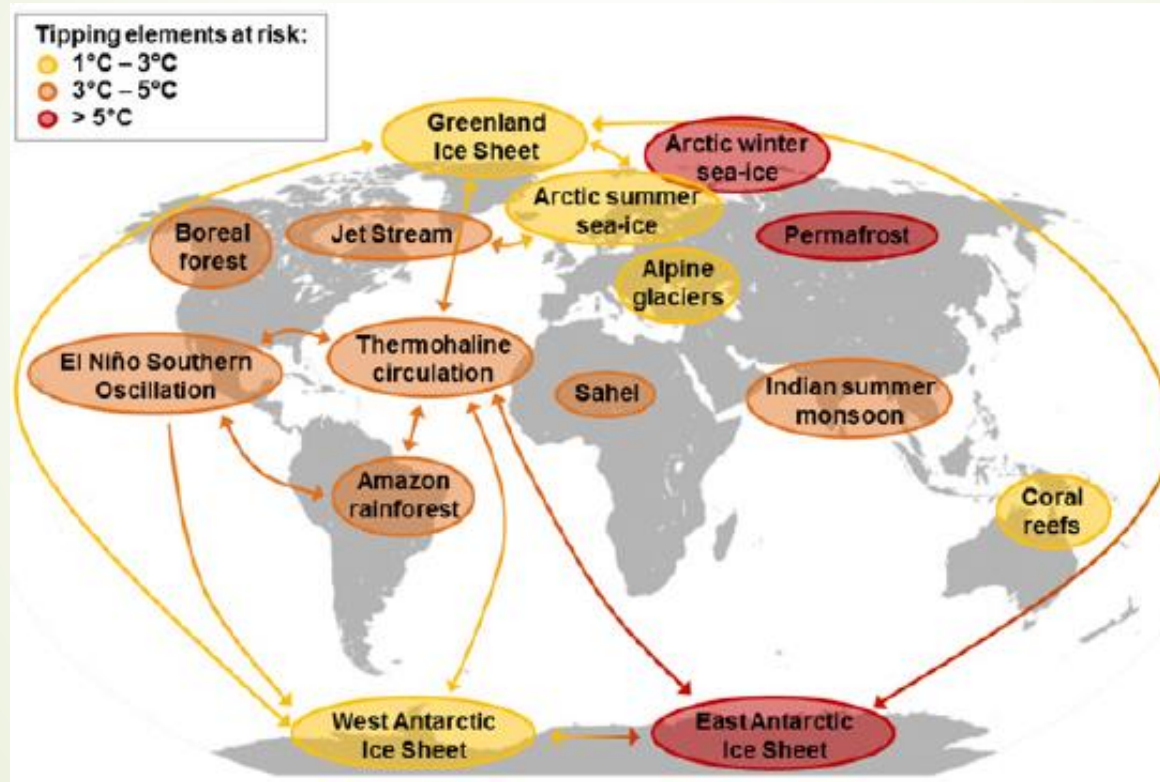
In the convention of Paris (2015) the COP agreed upon a limitation of global warming to max. 3° C in comparison with pre-industrial levels.



# Wrong!

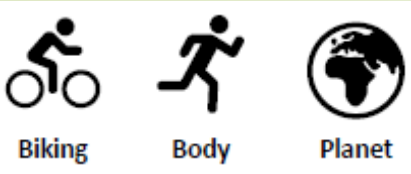
It is max. 2°C. Above that limit chances are high that certain tipping points will fall..

In fact some of them are already falling by now (Greenland ice sheet, Arctic summer sea ice,...).



Source: Trajectories of the Earth System in the Anthropocene, Steffen et al, 2018





# Remaining carbon budget

