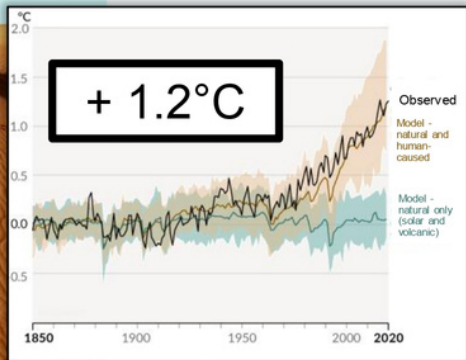
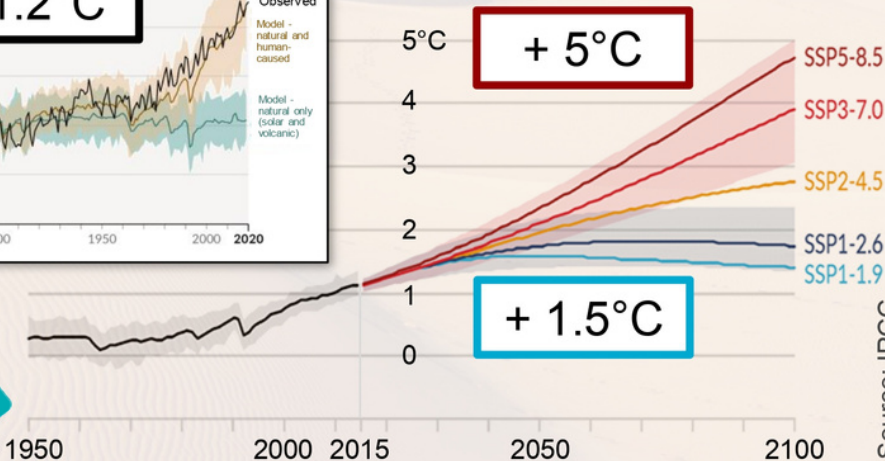


Rising Air Temperatures



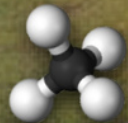
Global surface temperature change from 1850-1900



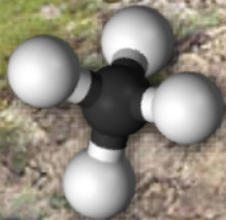
Source: IPCC

The average air temperature at the surface of the Earth has increased by 1.2°C since 1900. Future emission scenarios predict that this increase will reach between 2 and 5°C by 2100.

During the last ice age 20,000 years ago, the average air temperature was only 5°C lower than today and warming up took 10,000 years.



Permafrost

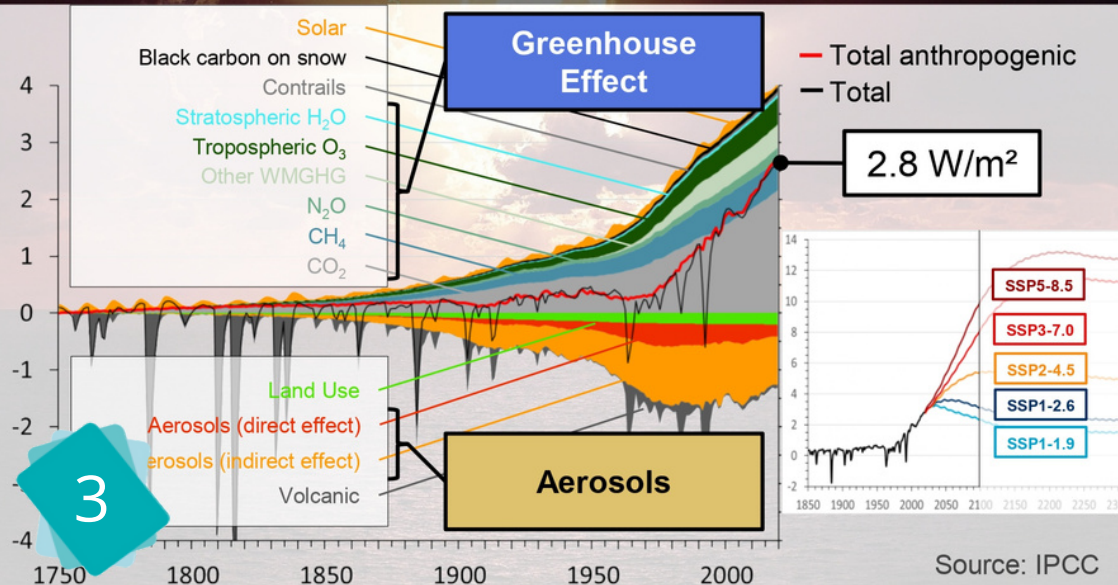


1



Permafrost is permanently frozen ground. It is starting to melt, releasing into the atmosphere previously locked-in methane and CO₂ from decomposed biomass. This creates a positive feedback loop, just like forest fires and albedo changes due to melting sea ice.

Radiative Forcing





Radiative forcing represents the difference between the energy that reaches the Earth each second and the energy that is released. It is rated at 2.8 W/m^2 (Watt per square metre), 3.8 W/m^2 from the greenhouse effect and -1 W/m^2 from aerosols.

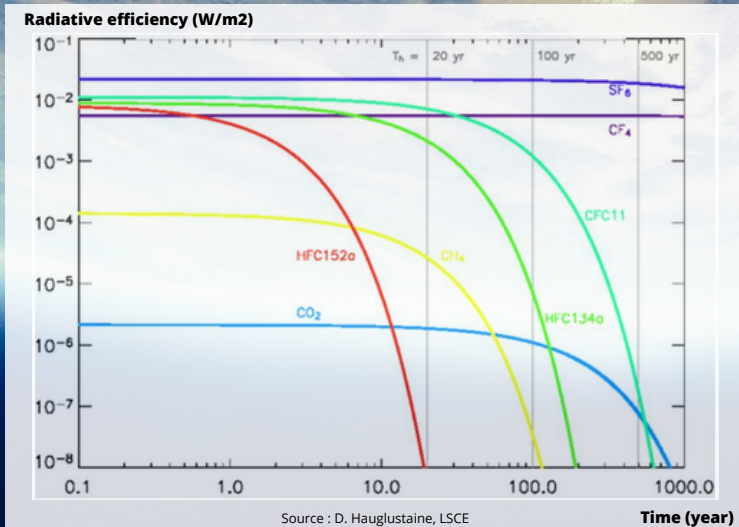
Global Warming Potential (GWP)

	GWP		
	20 years	100 years	500 years
Carbon dioxide (CO₂)	1	1	1
Methane (CH₄)	81,2	27,9	7,95
Protoxyde d'azote (N₂O)	273	273	130

Source : IPCC Sixth Assessment Report, 2021

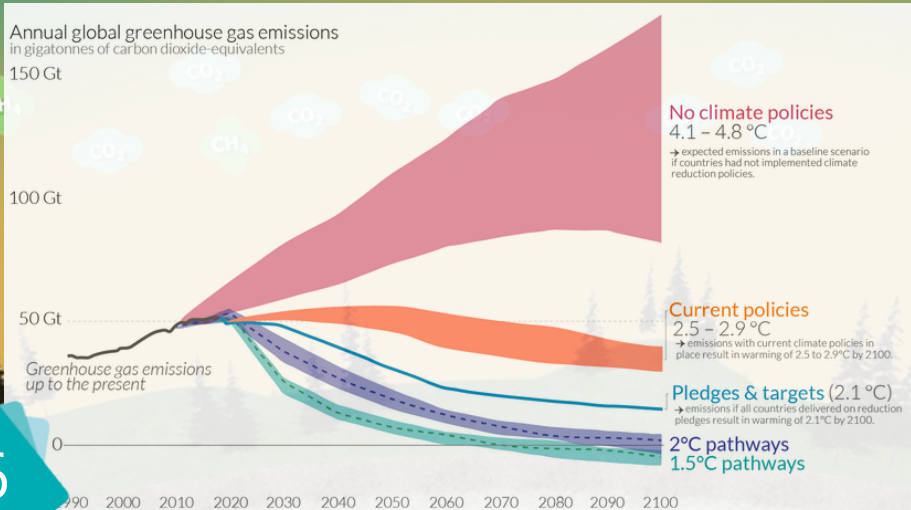
The Global Warming Potential or GWP is an indicator that compares how much energy the emissions of 1 ton of a gas will absorb over a given period of time relative to the emissions of 1 ton of carbon dioxide (CO₂).

Residence Time



Residence time is the atmosphere lifetime of a gas. Methane has a residence time of 10 years whereas carbon dioxide residence time is around 100 years!

Greenhouse Gases Emissions



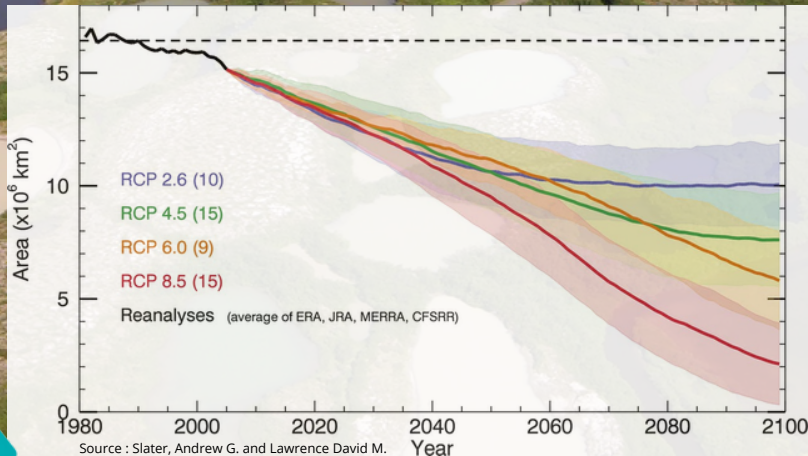
Source: Climate Action Tracker (based on national policies and pledges as of November 2021).

WorldinData.org – Research and data to make progress against the world's largest problems.

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When the permafrost melts, the carbon of decomposed plant and animal remains is released as methane and carbon dioxide. This phenomenon creates a feedback loop with the rising air temperatures.

Reduction of permafrost area



Compared to the pre-industrial level, the permafrost area could decrease by 25-50% in 2050. By 2100, this reduction could reach 40-90%.

Release of old Diseases

Some bacteria such as the *Bacillus anthracis* can survive in permafrost and be released when it melts. It could be a possible threat for the local population.

Collapsing Ground



As the permafrost melts, the ground sinks creating holes. This can lead to damage to buildings, ruptured pipelines, aqueducts or sewers.

New exploitable areas

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The collapse of the ground due to the melting of the permafrost opens up new potential exploitation areas such as methane or oil sinks.