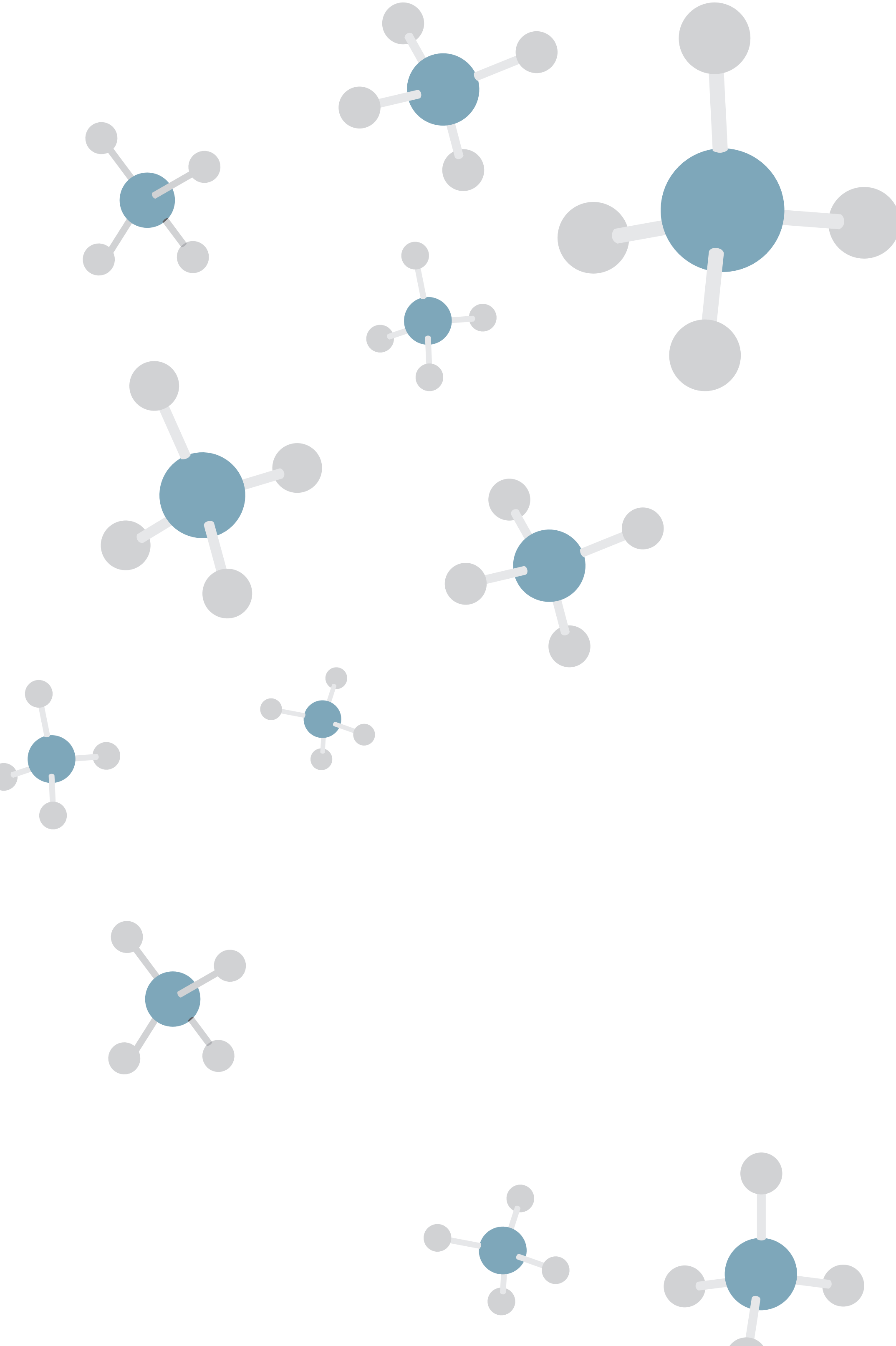
why

METHANE MATTERS



WHY METHANE MATTERS

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By the end of this century, global average temperatures are estimated to increase between 1.5°C and 4.5°C relative to the 1880s.[1]

As the climate changes, there is a greater likelihood of extreme weather events, crop shortages, and sea level rise as a result of the collapse of the Antarctic ice sheet.[2]

While most people have heard about the ability of carbon dioxide to trap heat in the atmosphere, the role of methane as a significant contributor to climate change is less well known. Major sources of human caused methane emissions include the decomposition of waste in landfills, livestock production, and fossil fuels.[3] How we interpret methane's impact on climate change depends on whether we consider climatic impacts in the short or long term.

SHORT TERM

OUR CRISIS NOW

The United Nations recognizes the importance of making significant reductions in global greenhouse gas emissions. Secretary-General Ban Ki-moon warned that inaction from the international community over the next decade could cause a global temperature rise of at least 2°C.[4]

Our actions in upcoming years are critical to ensuring that global average temperatures do not exceed a 2°C increase above pre-industrial levels. Unlike carbon dioxide that can remain in the atmosphere for hundreds or thousands of years, methane has a much shorter atmospheric lifetime.[5] In a 20-year time frame, a single molecule of methane has the global warming potential of 86 molecules of carbon dioxide.[6] Methane therefore constitutes a highly concentrated and severe threat to immediate global temperatures, particularly in comparison to carbon dioxide, the most common greenhouse gas.

LONG TERM
THE 100 YEAR TIME SCALE

Based on a 100-year timeframe, the impact of methane – according to the latest IPCC report – is worse than had previously been estimated. Most countries that report their greenhouse gas emissions utilize United Nations models that assume methane to have 21 times the warming potential as carbon dioxide.[7] The 2007 IPCC report updated this to 25 and as of the 2013 Fifth Assessment Report, the IPCC increased methane's global warming potential to 34 times that of carbon dioxide.[8,9]*

As more methane and other greenhouse gases are added into the atmosphere and global temperatures continue to rise, we approach troubling tipping points. Tipping points are thresholds at which slight changes result in dramatic systemic impacts. In the context of climate change, tipping points prompt major shifts in both biological and geophysical systems. A cause for concern is that analyses of tipping point calculations reveal significant uncertainties.[10] **We may not know when we have reached a tipping point until it is too late.**

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*This change to a global warming potential of 34 happened for two reasons:

1) First, corrections to methane's lifetime and radiative efficiency, combined with new measurements of ozone and stratospheric water vapor concentrations, changed measurements of methane's warming in comparison to carbon dioxide from 25 to 28.[11] Radiative efficiency is the amount of radiative forcing that arises due to a single molecule of greenhouse gas.[12]
2) The second change, from a global warming potential of 28 to 34, stems from accounting for the climate-carbon feedback in the IPCC's Fifth Assessment Report, which was not considered in the Fourth Assessment Report.[13] This resulted in the earlier, and lower, values of global warming potential. Essentially, when greenhouse gas emissions warm the planet, the rising temperature change increases future greenhouse gas generation and concentrations through positive feedback cycles.[1]

What this science means is that whether we look at methane in the short-term period of the next two decades or the long-term period of the next century, mitigating methane emissions, including through efforts to reduce the landfilling of food scraps and other organic material, is a key strategy in fighting climate change.

About Global Green USA

Global Green USA is dedicated to helping the people, the places, and the planet in need through catalytic projects, transformative policy, and cutting-edge research. Global Green USA's signature programs include greening affordable housing, schools, neighborhoods, and cities.

A key part of Global Green's work in urban sustainability is with pilot programs, research and events that promote recovery of food scraps from being buried in landfills. The reason for this focus is not only to keep valuable nutrients in our food system, but also to prevent the release of methane - a powerful greenhouse gas that forms when food scraps decompose in a landfill environment.

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