

Illustration 4.1 - Methane the super-powered greenhouse gas

ILLUSTRATION 4.3

METHANE: FAST IMPACT, SHORT LIFETIME

Methane warms the planet quickly, but breaks down in the atmosphere.
Carbon dioxide warms more slowly, but lasts for a very long time.

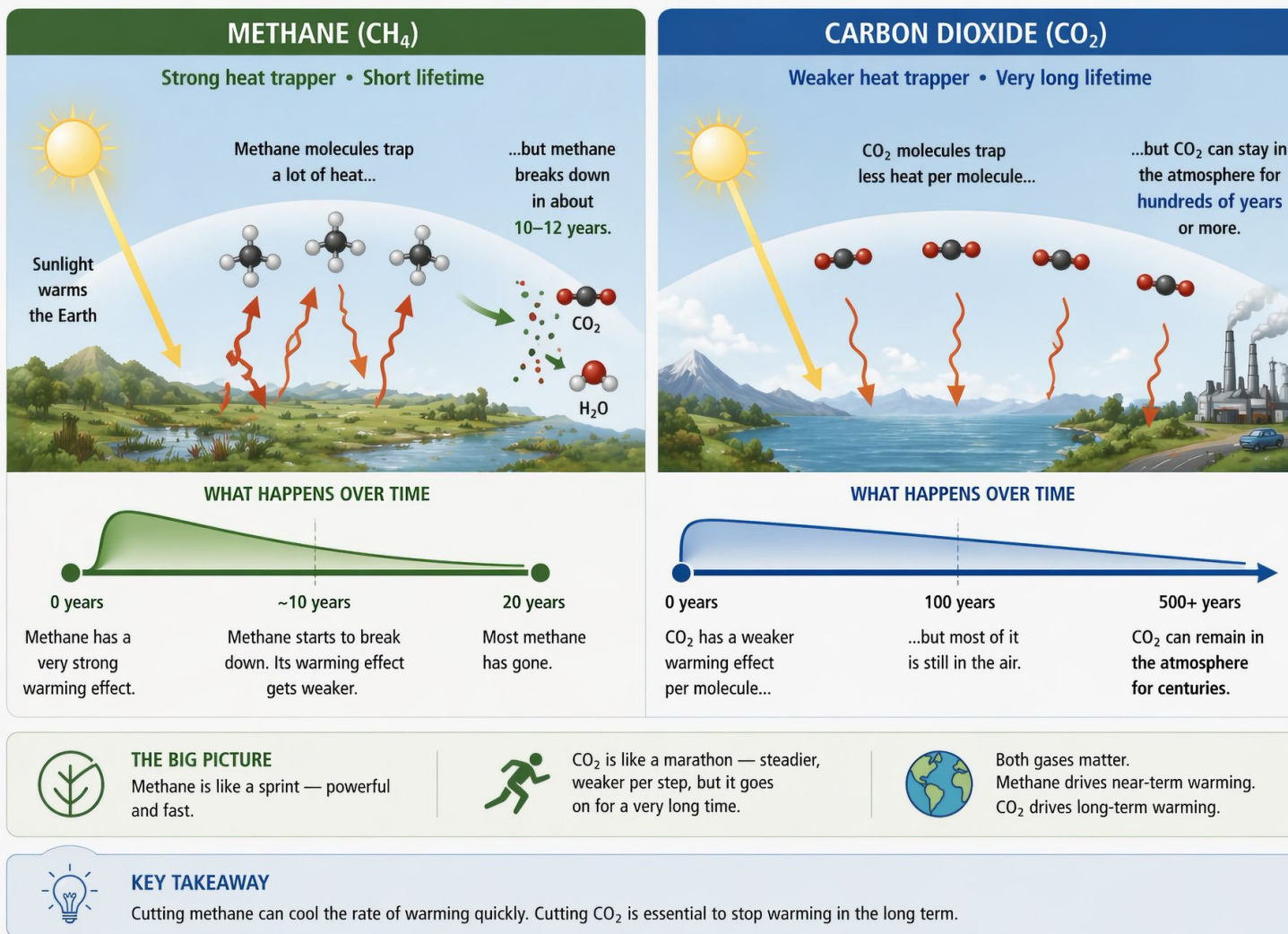
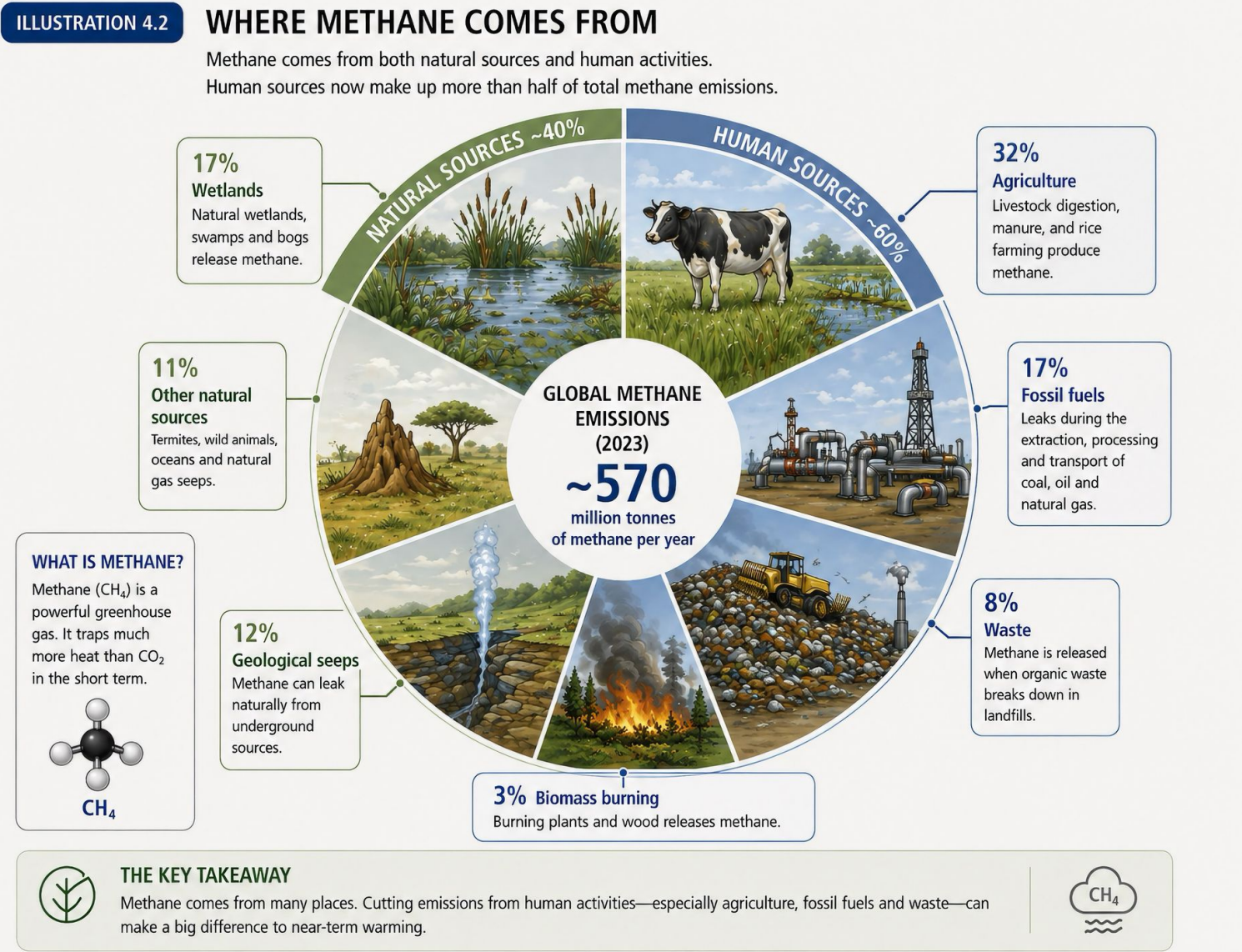


Illustration 4.2 - Origins of methane



Note: Percentages may not add to 100% due to rounding.

Source: Global Carbon Project (2024) – Global Methane Budget 2000—2023

Illustration 4.3 - Methane vs CO₂ over time

HOW TO READ THIS GRAPH

The graph shows the warming effect over time after an equal one-off release of each gas (same mass).

The height of each line shows how strong the warming effect is at that time. The area under each line shows the total warming effect over a period (for example 20 or 100 years).

Methane has a much stronger effect at first, but it breaks down faster. Carbon dioxide has a weaker effect per kilogram, but it lasts much longer.

Methane (CH₄)



One carbon atom and four hydrogen atoms.

Carbon dioxide (CO₂)



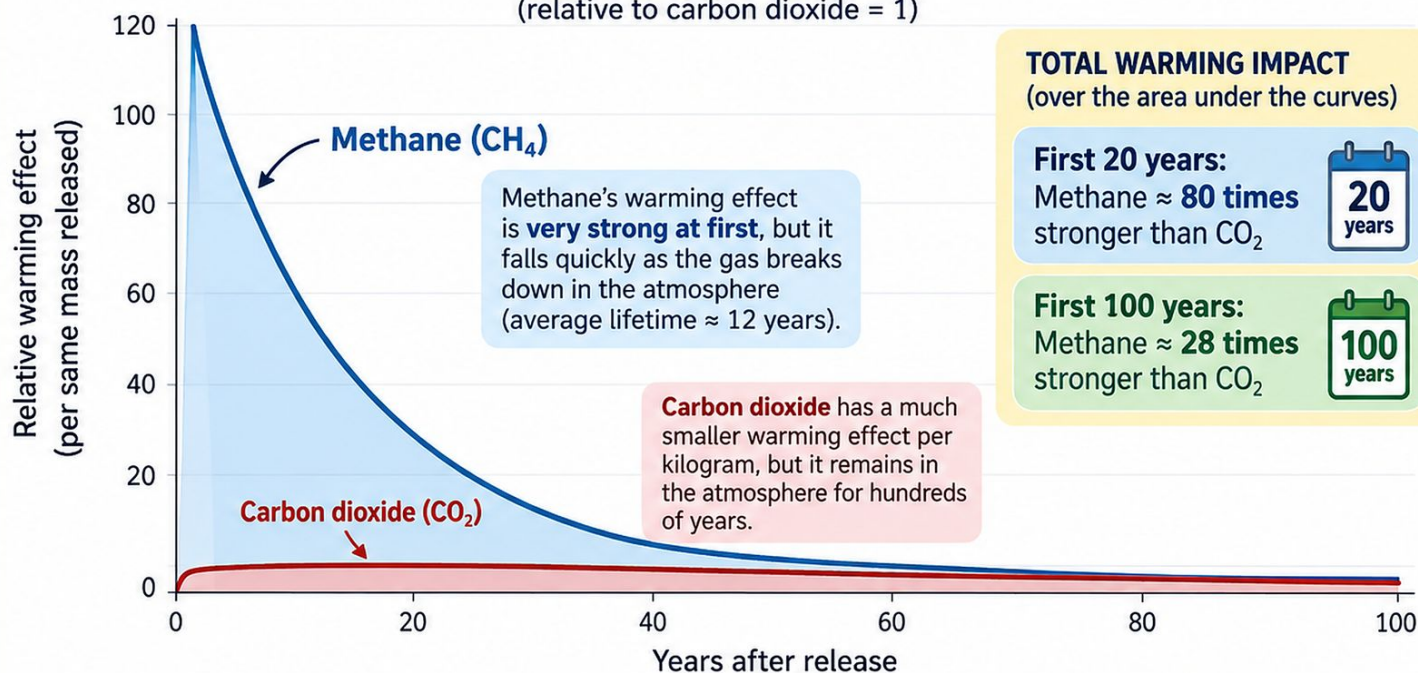
One carbon atom and two oxygen atoms.

METHANE vs CO₂ – WARMING EFFECT OVER TIME

Methane is much more powerful than carbon dioxide at trapping heat, but it does not stay in the atmosphere as long.

WARMING EFFECT AFTER AN EQUAL ONE-OFF RELEASE

(relative to carbon dioxide = 1)



THE BIG PICTURE



Methane is a short-lived but super-powered greenhouse gas. Carbon dioxide is less powerful per kilogram, but it stays in the climate system for a very long time.

KEY NUMBERS



Over the first 20 years methane traps about **80×** more heat than CO₂.
Over 100 years it traps about **28×** more.



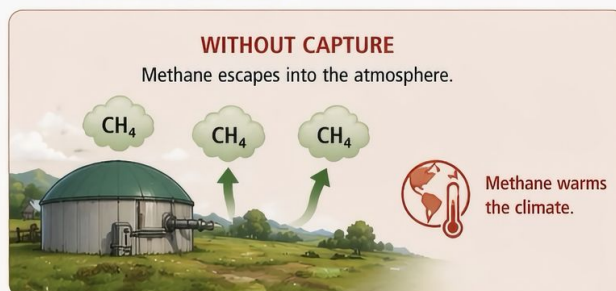
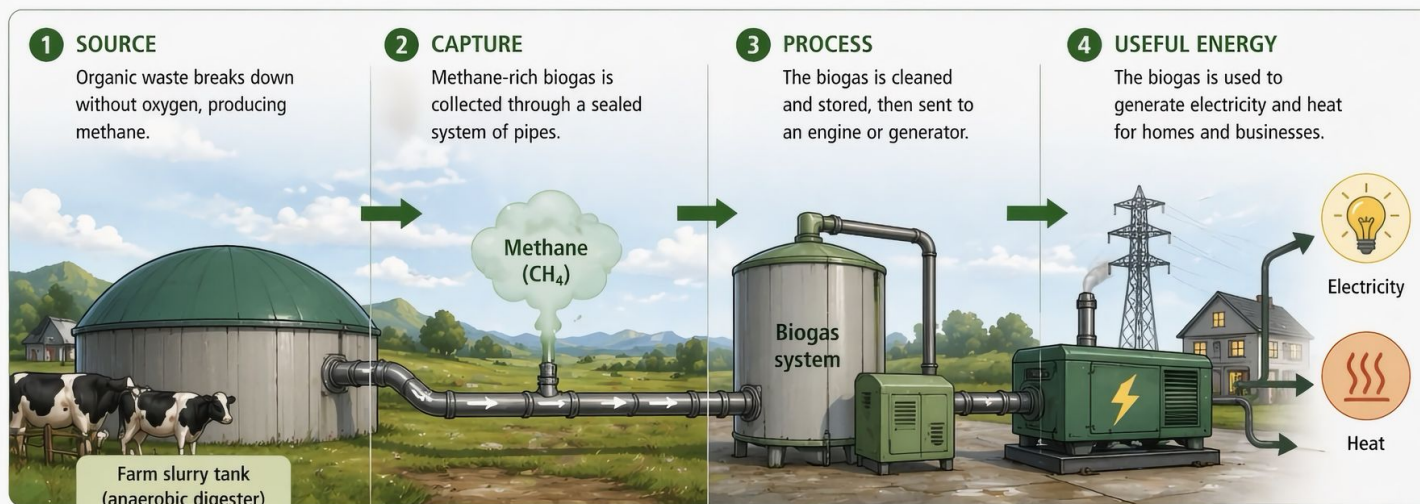
WHY THIS MATTERS

Methane is a key driver of near-term warming. Reducing methane emissions can make a real difference, even though there is less of it in the air than carbon dioxide.

Illustration 4.4 - Methane capture

CAPTURING METHANE AND TURNING IT INTO ENERGY

Instead of escaping into the air and warming the planet, methane can be captured and used as a powerful source of energy.



THE BIG IDEA

Capturing methane is a win-win. It reduces emissions and provides clean energy.



Powerful methane is kept out of the atmosphere.



Useful energy is created from a waste product.



Lower emissions, lower costs, and stronger communities.



Smart systems today can turn a powerful greenhouse gas into part of the solution.