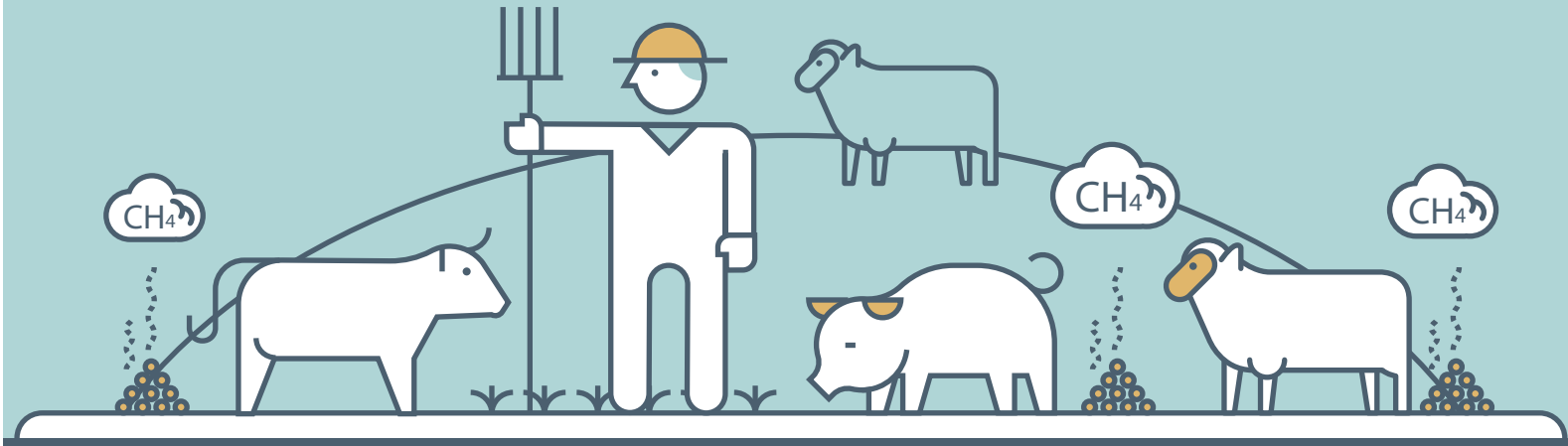
METHANE



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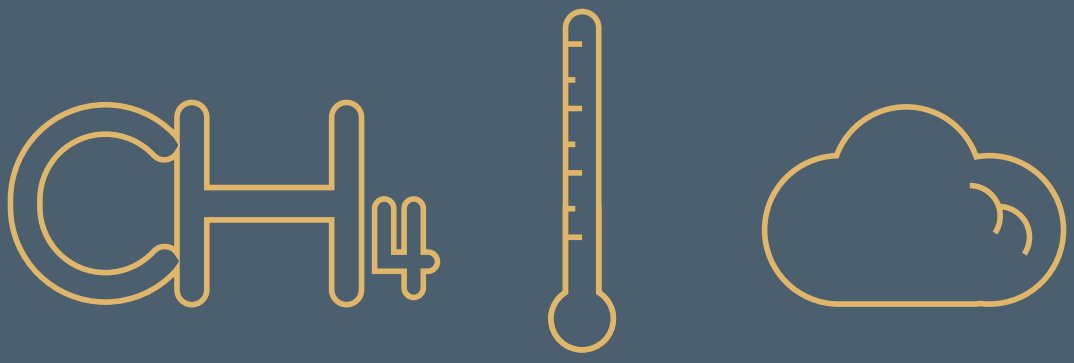
METHANE

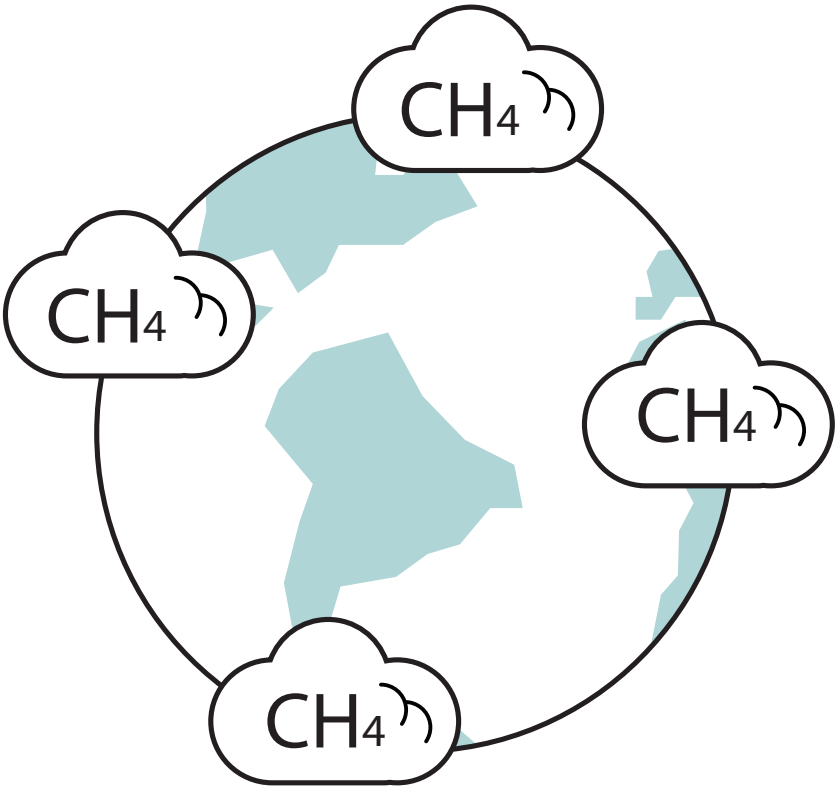


INTRODUCTIION

Methane is largely ignored by the climate science community as a distraction from the main problem: carbon dioxide. The mainstream view is that because it is removed from the atmosphere within 12 years, its warming is not a concern.

However, methane and the other short-term greenhouse gases it helps create are responsible for over 40% of global warming. More importantly, it offers a powerful means of moderating global warming in the coming decades. One comparison showed that cutting methane emissions by half, was equivalent to cutting carbon dioxide emissions by 100% by 2050.

The greatest source of human-caused methane is livestock (cattle, pigs, sheep) and therefore a change in diet away from animal consumption will greatly assist in global cooling.



ATMOSPHERIC METHANE UP 150%

"Human activity has boosted atmospheric concentrations of methane by 150% since the Industrial Revolution, mostly through agriculture"

Nature Journal, 2009

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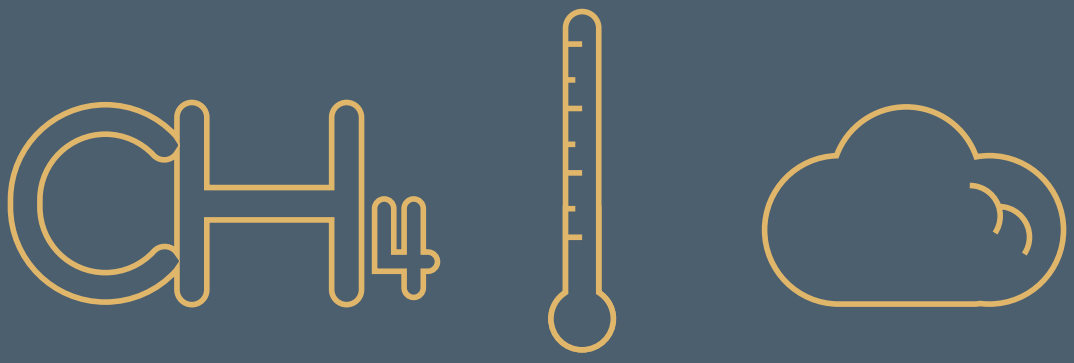
Methane

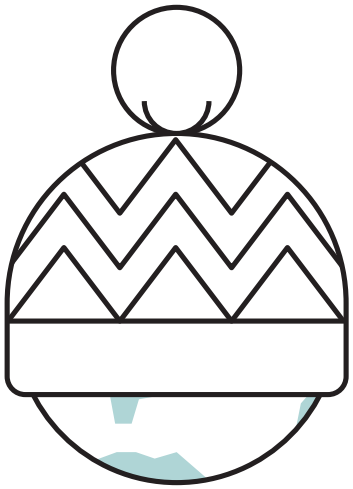
PROBLEM

Atmospheric Methane



METHANE 34X MORE WARMING THAN CO2

"Methane is 34 times stronger a heat-trapping gas than CO2 over a 100-year time scale"



United Nations Framework Convention on Climate Change, 2014

METHANE 86X MORE WARMING THAN CO2 OVER 20 YEARS AND 34X OVER 100 YEARS

"Policymakers typically ignore methane's warming potential over 20 years (GWP20) when assembling a nation's emissions inventory. Instead, they stretch out methane's warming impacts over a century, which makes the gas appear more benign than it is, experts said. The 100-year warming potential (GWP100) of methane is 34, according to the IPCC. There is no scientific reason to prefer a 100-year time horizon over a 20-year time horizon; the choice of GWP100 is simply a matter of convention. The 100-year GWP value underestimates the gas's negative impacts by almost five times, said Ilissa Ocko, a climate scientist at the nonprofit Environmental Defense Fund"

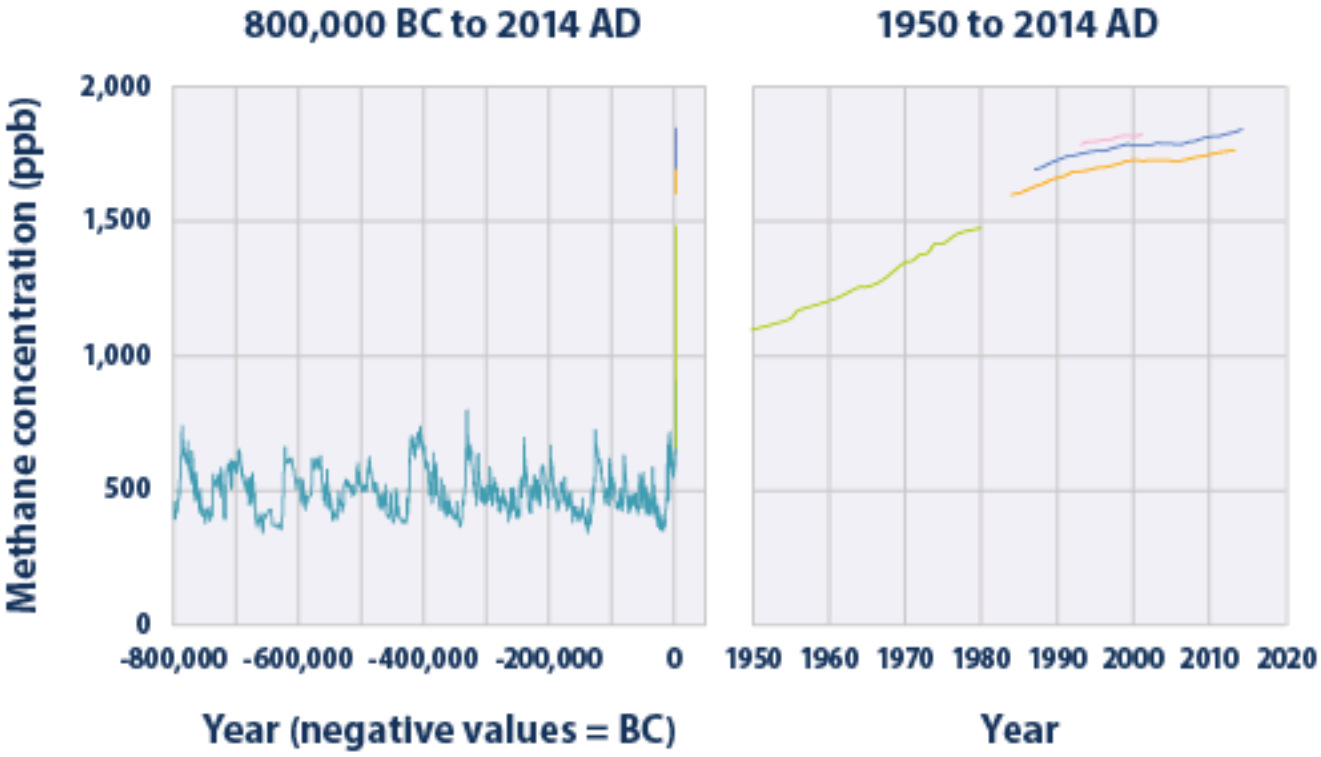
Scientific American, 2015

METHANE CONCENTRATIONS AT 650,000 YEAR HIGH

"Atmospheric concentrations of methane (1774 ppb) in 2005 exceed by far the natural range over the last 650,000 years"

Intergovernmental Panel on Climate Change, 2007

GLOBAL ATMOSPHERIC CONCENTRATION OF METHANE OVER TIME



United States Environmental Protection Agency, 2015

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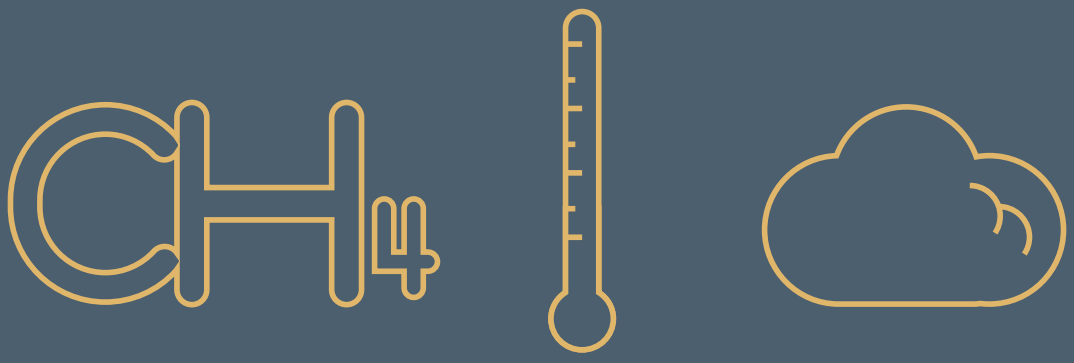
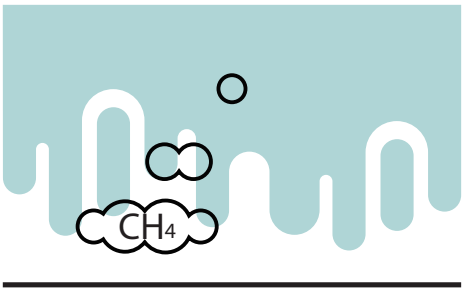
Methane

PROBLEM

Frozen Methane Stores Releasing

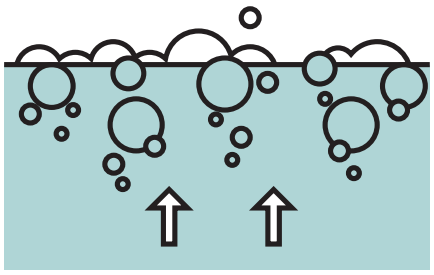




FROZEN METHANE RELEASING

"As the planet warms, vast stores of methane, a potent greenhouse gas, could be released from frozen deposits on land and under the ocean"

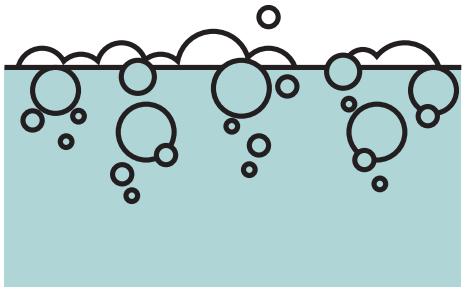
Nature Journal, 2009



METHANE EMISSIONS ACCELERATING

"Between 1974 and 2000, methane emissions increased by 58% in northern Siberia"

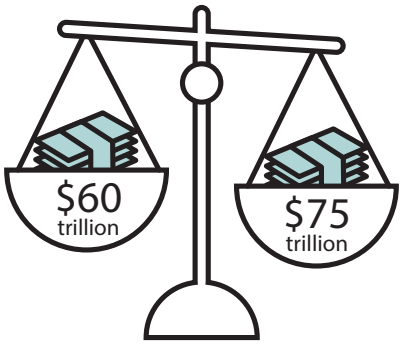
Nature Journal, 2009



THE SIBERIAN SHELF CONTAINS MORE CARBON THAN ALL THE EARTH'S VEGETATION

"The Siberian Shelf alone harbours an estimated 1,400 billion tonnes of methane in gas hydrates, about twice as much carbon as is contained in all the trees, grasses and flowers on the planet. If just 1% of this escaped into the atmosphere within a few decades, it would be enough to cause abrupt climate change"

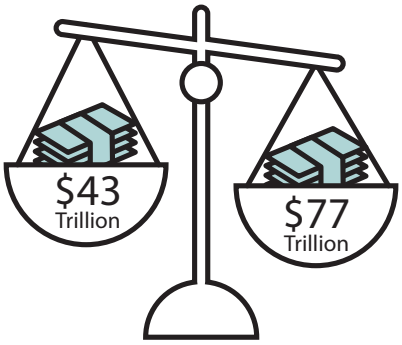
Nature Journal, 2009



IF THE SIBERIAN METHANE THAWED IT WOULD COST THE GLOBAL ECONOMY $60 TRILLION

"A major release of methane trapped in the frozen seabed off Russia could accelerate global warming and cause $60 trillion in damage, almost the size of world GDP [$75 Trillion]"

Scientific American, 2014

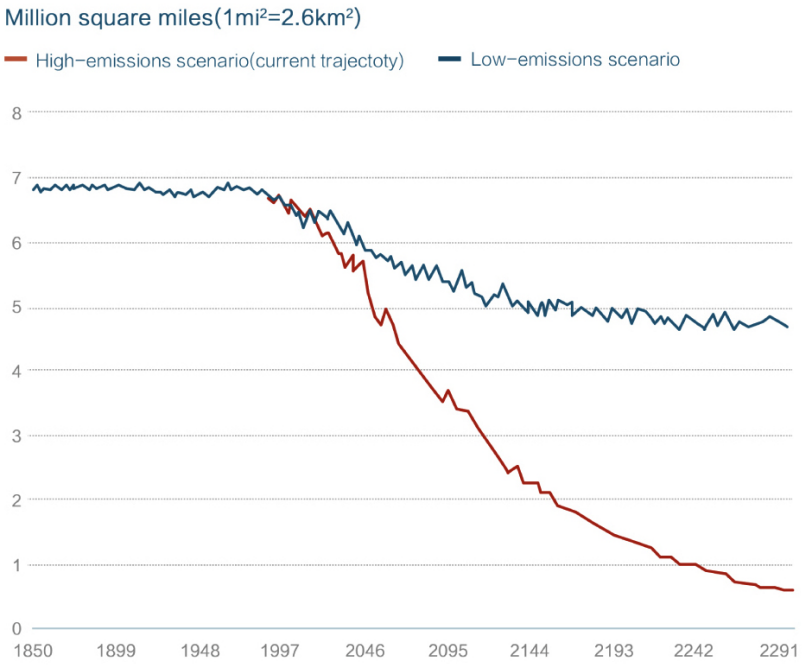


ALASKA'S PERMAFROST THAW OUT WILL COST $43 TRILLION, GLOBAL GDP IS $77 TRILLION

"Last week, scientists revealed that Alaska alone could lose 24% of its permafrost by 2100. In fact scientists suspect that in the worst-case scenario 70% of Arctic permafrost could thaw. That act alone could release 20 to 100 times more CO2 than the United States burns in a year, causing another $43 trillion in damages globally, Global Gross Domestic Profit for 2014 was $77 Trillion"

National Geographic, 2015
Statista, 2015

PERMAFROST EXTENT



NG STAFF
SOURCES: COMMUNITY LAND MODEL;CHARLES KOVEN, LAWRENCE BERKELEY NATIONAL LABORATORY

National Geographic, 2015

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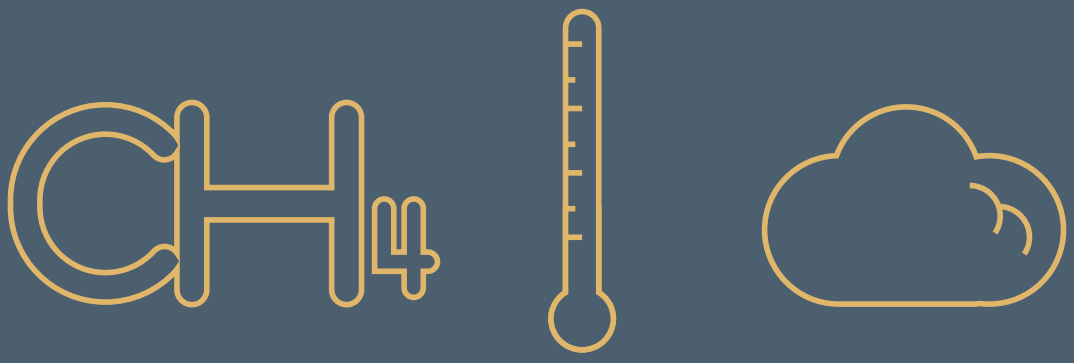
Methane

PROBLEM

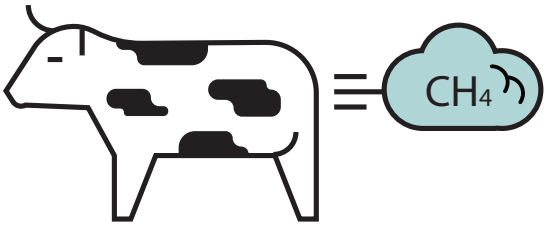
Livestock Related Methane



60% OF METHANE FROM HUMAN ACTIVITIES

"Globally over 60% of total methane emissions come from human activities"

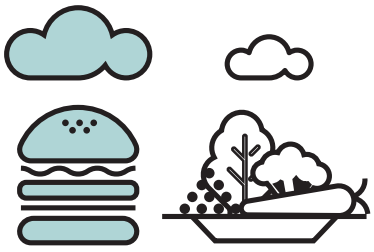
United States Environmental Protection Agency



37% OF METHANE FROM LIVESTOCK

"37% of human induced methane comes from livestock"

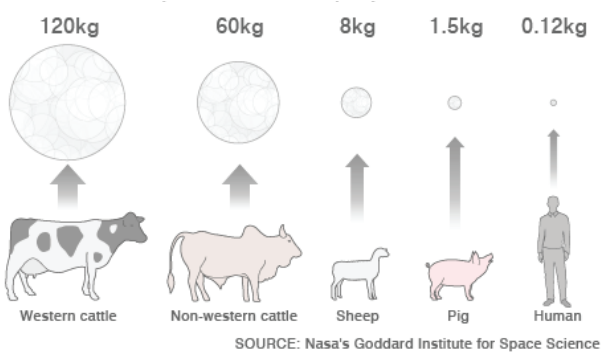
Worldwatch Institute, 2009



CATTLE AND SHEEP CREATE 19X TO 48X MORE GHG EMISSIONS THAN PLANT PROTEIN

"The global production of cattle and sheep is responsible for 19 to 48 times more greenhouse-gas emissions, based on pounds of food produced, than the global production of protein-rich plant foods like beans or soy products"

International Business Times, 2014



METHANE BY HUMAN/COW /OTHER ANIMAL COMPARISON

BBC, 2009

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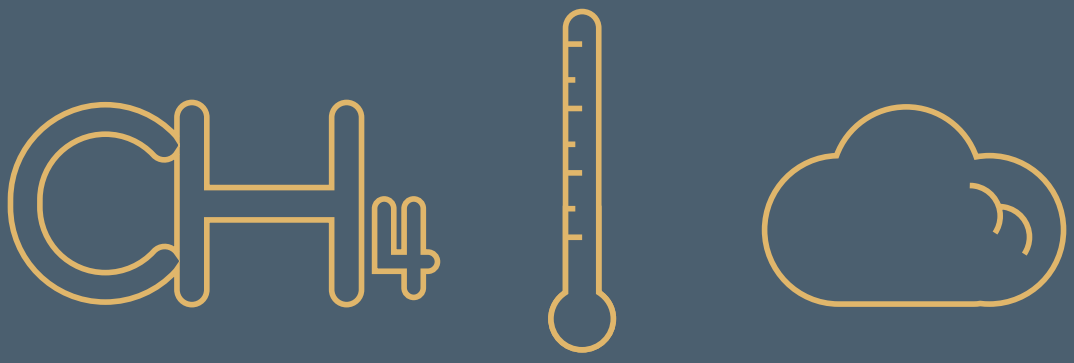
Methane

TIMELINE



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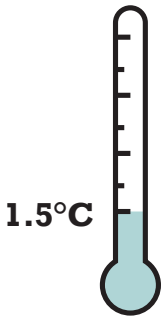
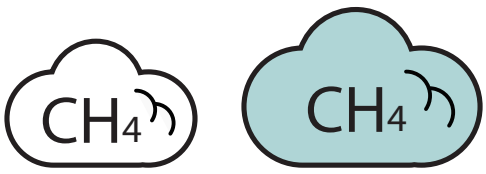


THE EARTH WILL WARM BY 1.5°C BY 2030

"Researchers from Cornell University in the US have predicted that unless emissions of methane (and black carbon) are reduced immediately, the Earth will warm by 1.5°C by 2030 and by 2.0°C by between 2045 and 2050, whether or not carbon dioxide emissions are reduced"

United Nations Framework Convention on Climate Change, 2014

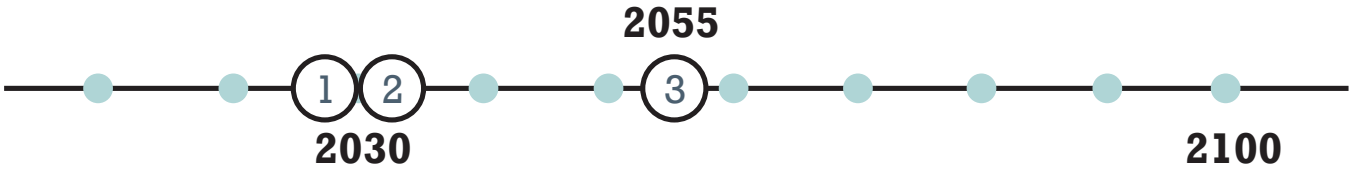
2



BY 2030 METHANE TO INCREASE 20%

"Global anthropogenic methane emissions are projected to increase 20% by 2030"

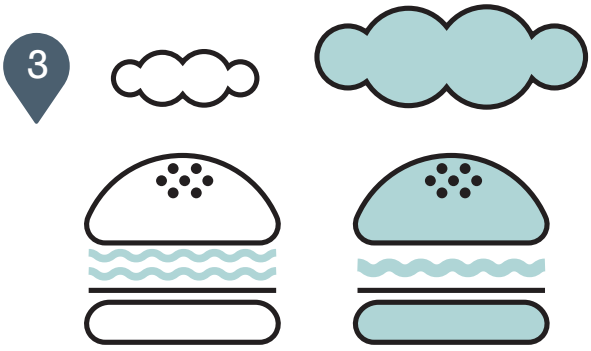
Global Methane Initiative



IF CURRENT DIETARY TRENDS CONTINUE METHANE AND NITROUS OXIDE EMISSIONS WILL MORE THAN DOUBLE BY 2055

"If current dietary trends (increasing global consumption of animal products) were to continue, emissions of CH4 and N2O would more than double by 2055 from 1995 levels"

3

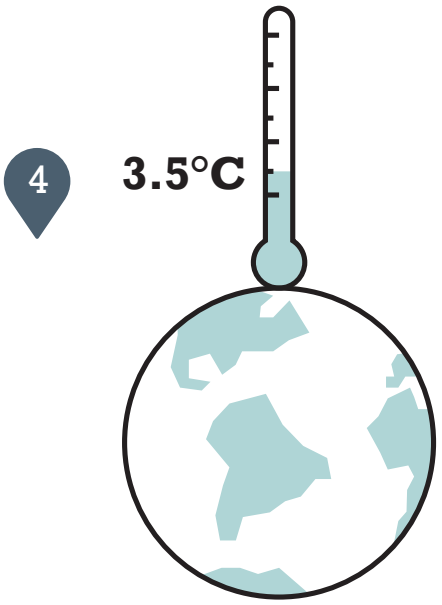


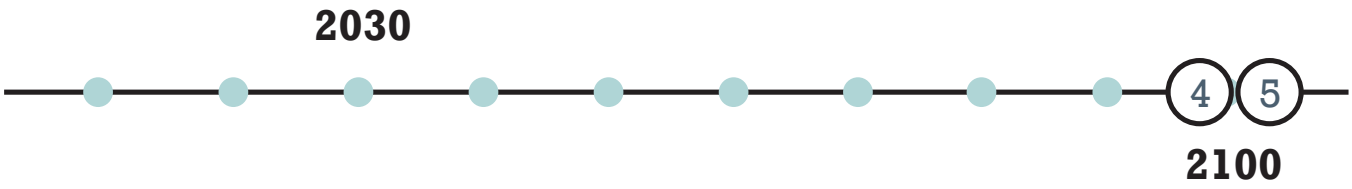
Chatham House, The Royal Institute Of International Affairs, 2014

THE EARTH WILL WARM BY 3.5° BY 2100

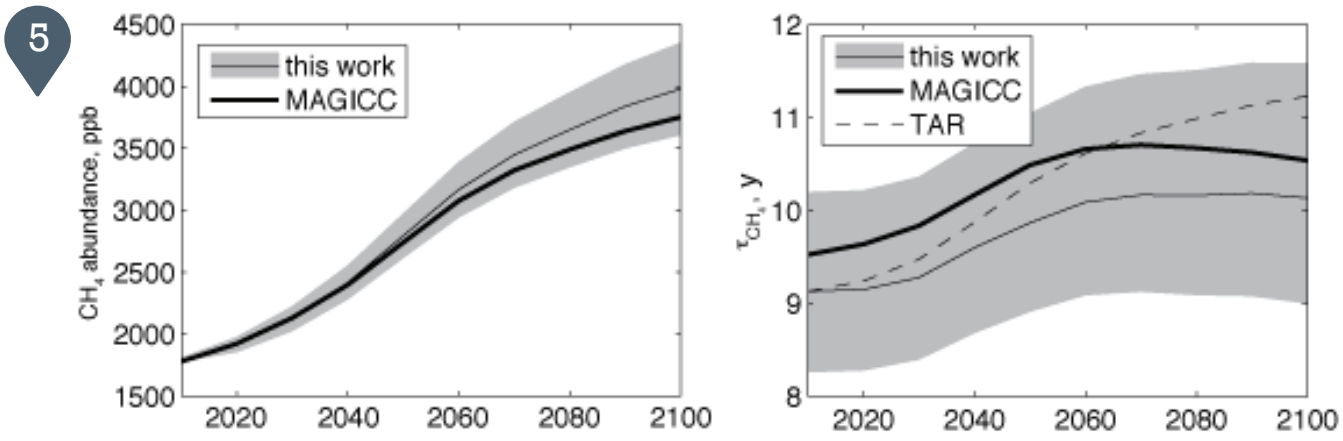
"Our analysis shows that the national contributions to date, with no further progress post-pledge period, result in expected warming in 2100 of 3.5°C"

Climate Interactive, 2015





METHANE PROJECTIONS FOR THE 21ST CENTURY



University of California Irvine, 2014

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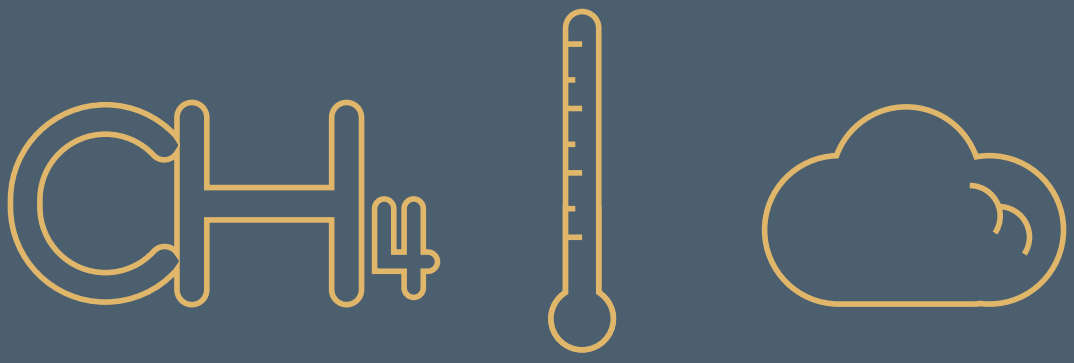
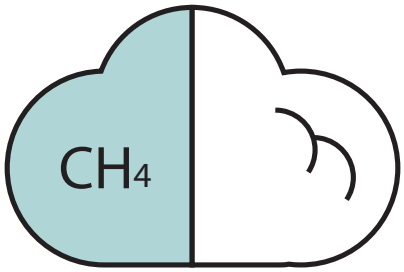
Methane

SOLUTION

Change in Diet

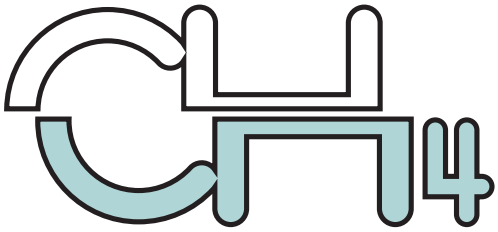




CUT METHANE EMISSIONS IN HALF TO EQUAL THE IMPACT OF STOPPING CO2 ENTIRELY

"Based on 2005 emissions, the same impact [by] 2050... could be achieved by decreasing CH4 emissions by 46% as stopping CO2 emissions entirely"

PNAS journal, 2013



HALVE METHANE TO REDUCE WARMING BY 0.55°C

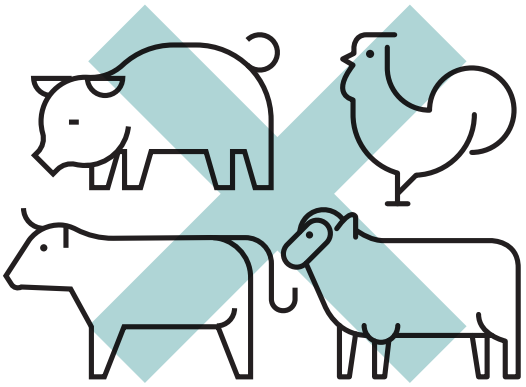
"A 50% reduction in methane emissions by 2050 maintained until 2100 could help reduce global temperature by about 0.55°C or 1°F"

Global Methane Initiative

ELIMINATE LIVESTOCK TO STOP WARMING

"Reductions in global ruminant numbers could make a substantial contribution to climate change mitigation goals and yield important social and environmental co-benefits"

International Business Times, 2014
Nature Journal, 2013



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