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IGES
Institute for Global Environmental Strategies

Importance of Addressing Methane

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METHANE (CH_4)

Methane emissions caused by human activities are one of the most significant drivers of climate change. Methane is also the main precursor of tropospheric ozone, a powerful greenhouse gas and air pollutant.

SOURCES

Methane is one of the fastest growing greenhouse gases in the atmosphere. Human activity causes ⅔ of emissions.

42% AGRICULTURE

36% FOSSIL FUEL OPERATIONS

18% WASTE

3% OTHER

% = global emissions

IMPACTS

CLIMATE

Responsible for **40% of warming** since the industrial revolution

84x times more powerful than carbon dioxide over a **20-year period**

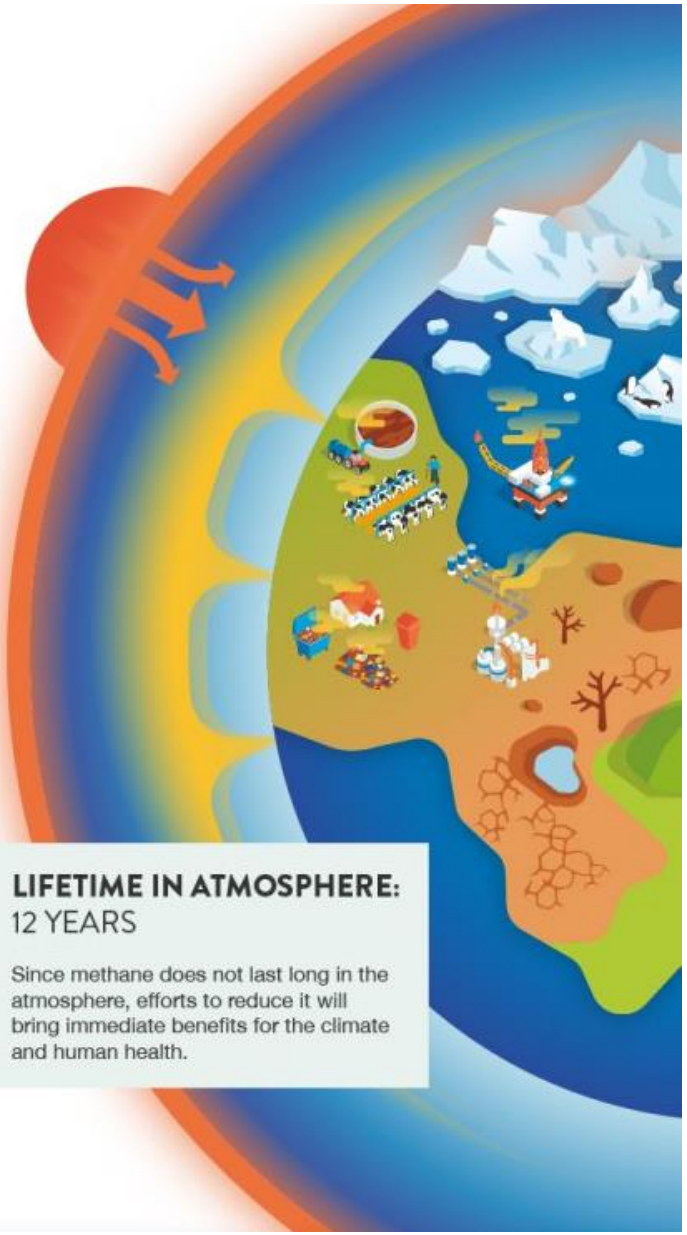
HEALTH

Increasing emissions are driving a rise in tropospheric ozone air pollution, **causing 1+ million premature deaths annually**

- Respiratory diseases
- Heart disease
- Damages airways and lung tissue

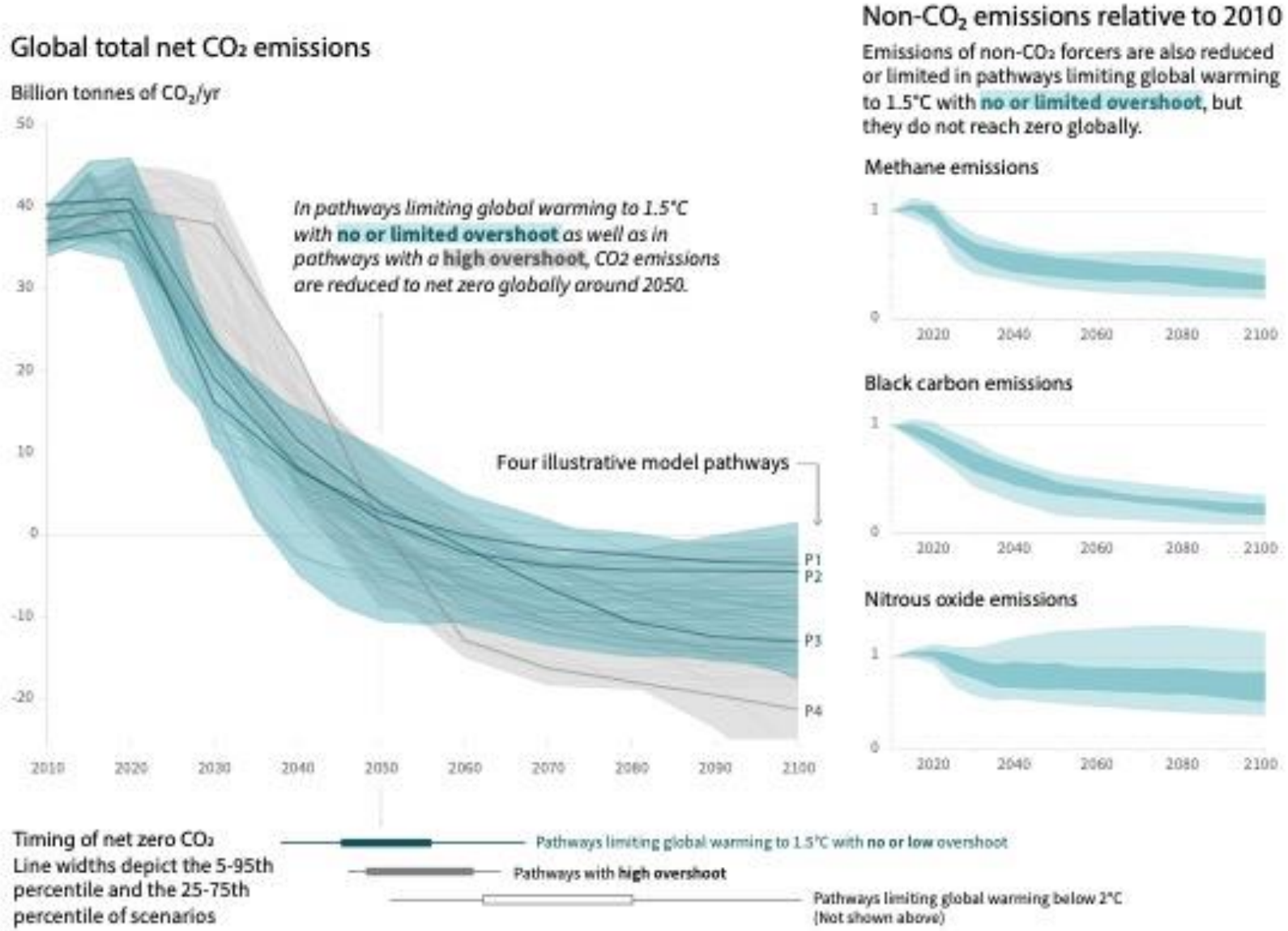
AGRICULTURE & ECOSYSTEMS

Up to **15%** **annual yield losses** of soy, wheat, rice and maize



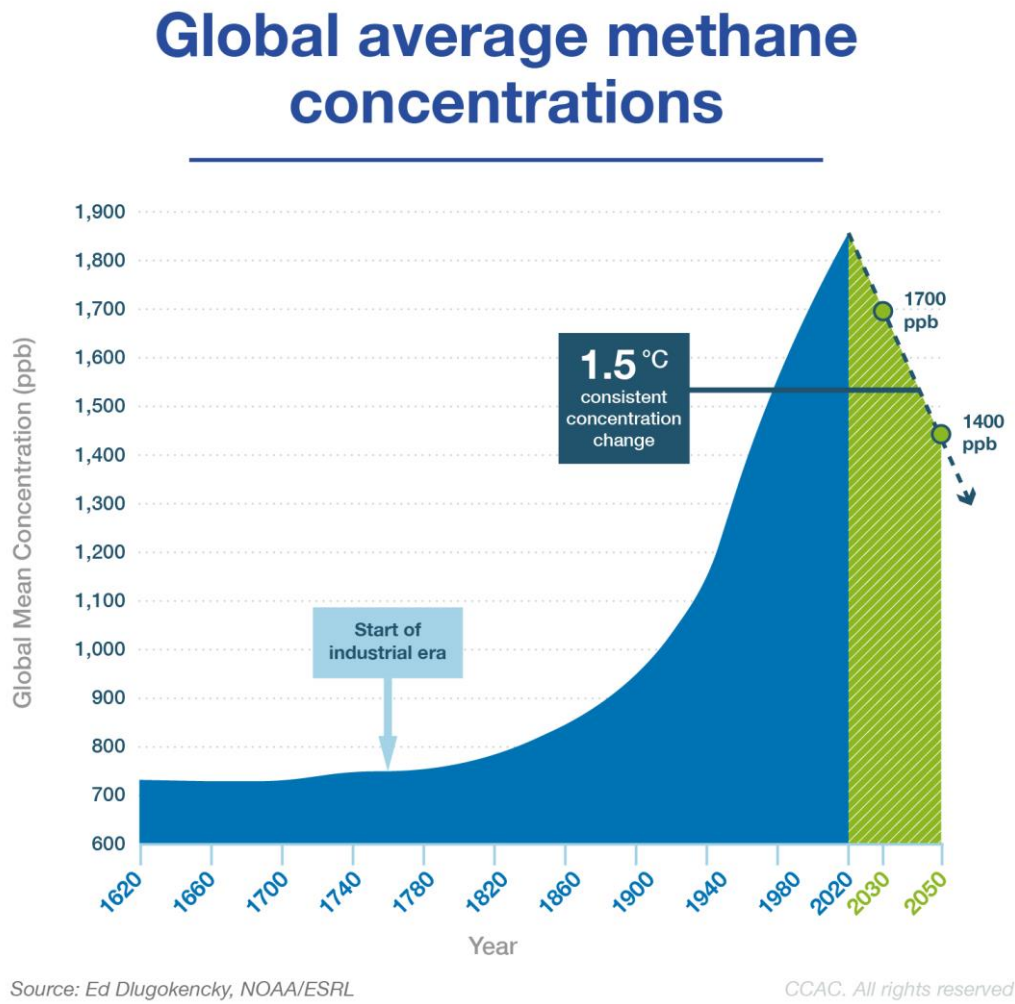
LIFETIME IN ATMOSPHERE: 12 YEARS

Since methane does not last long in the atmosphere, efforts to reduce it will bring immediate benefits for the climate and human health.


Global total net CO₂ emissions
Billion tonnes of CO₂/yr
50
40
30
20
10
0
-10
-20
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
In pathways limiting global warming to 1.5°C with no or limited overshoot as well as in pathways with a high overshoot, CO2 emissions are reduced to net zero globally around 2050.
Four illustrative model pathways
P1
P2
P3
P4
Timing of net zero CO₂
Line widths depict the 5-95th percentile and the 25-75th percentile of scenarios
Pathways limiting global warming to 1.5°C with no or low overshoot
Pathways with high overshoot
Pathways limiting global warming below 2°C (Not shown above)
Non-CO₂ emissions relative to 2010
Emissions of non-CO₂ forcers are also reduced or limited in pathways limiting global warming to 1.5°C with no or limited overshoot, but they do not reach zero globally.
Methane emissions
Black carbon emissions
Nitrous oxide emissions
1
0
2020
2040
2060
2080
2100

The atmospheric concentration of methane is increasing faster now than at any time in the observational record.

- Methane emissions are projected to continue rising through at least 2040
- Current concentrations are well above levels in the 2°C scenarios used in the IPCC's 2013 Assessment
- The Paris Agreement's 1.5°C target cannot be achieved at a reasonable cost without reducing methane emissions by 40–45 per cent by 2030.



GLOBAL METHANE ASSESSMENT

Benefits and Costs of Mitigating Methane Emissions

Limiting warming to 1.5°C

By **2030**

methane emissions need to be reduced in each of the three main emitting sectors:

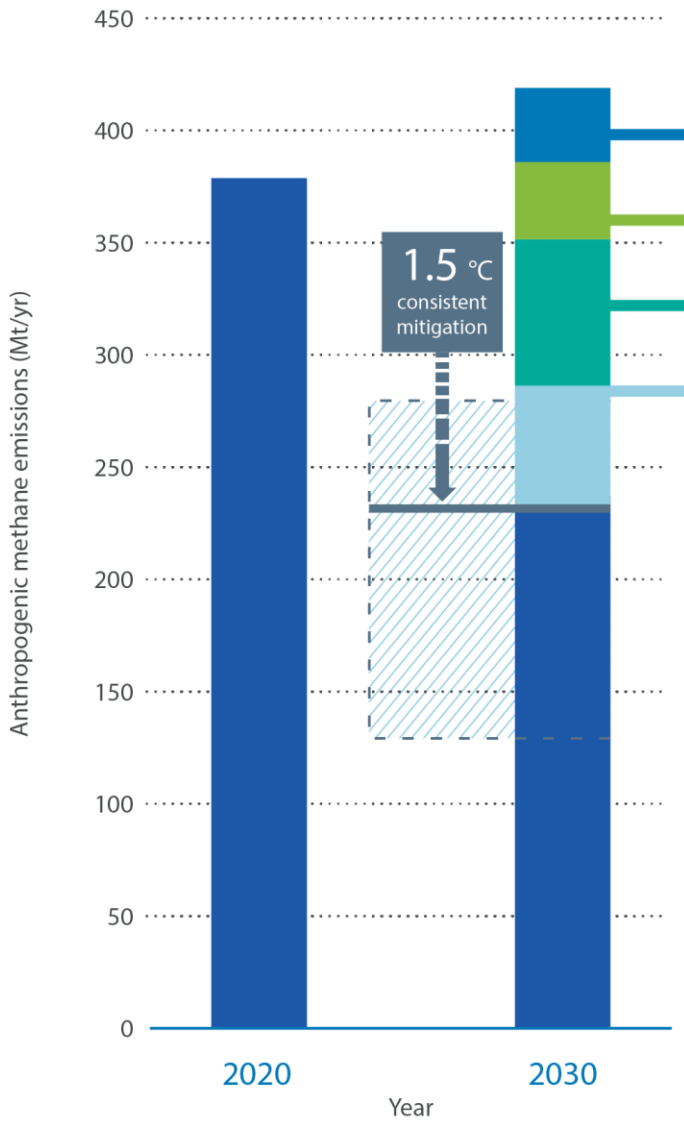
Fossil Fuels	Waste	Agriculture
60%	30% - 35%	20% - 25%

WASTE SECTOR MITIGATION MEASURES

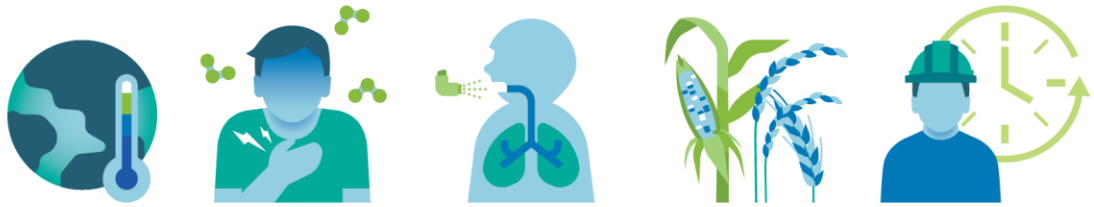
- **Solid waste management**: (residential) source separation with recycling/reuse; no landfill of organic waste; treatment with energy recovery or collection and flaring of landfill gas; (industrial) recycling or treatment with energy recovery; no landfill of organic waste.

- **Wastewater treatment**: (residential) upgrade to secondary/tertiary anaerobic treatment with biogas recovery and utilization; wastewater treatment plants instead of latrines and disposal; (industrial) upgrade to two-stage treatment, i.e., anaerobic treatment with biogas recovery followed by aerobic treatment.

- **Reduced consumer waste** and improved waste separation and recycling, improved sustainable consumption

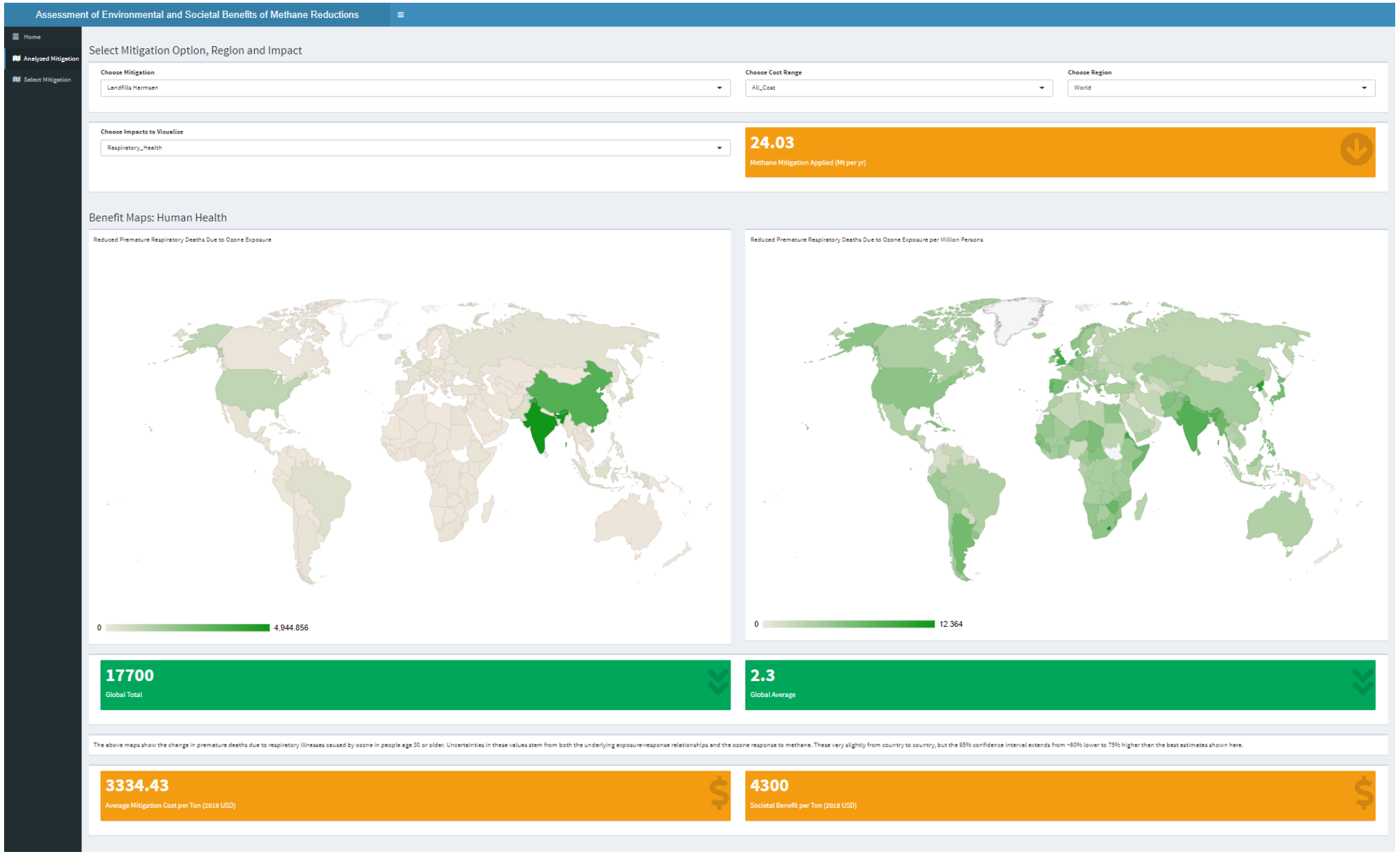


	Avoided warming (C) 2040-2070	Avoided deaths ozone (per year)	Avoided asthma-related ER visits (per year)	Avoided crop losses (Mt/yr)	Lost work hours avoided (billion hrs/yr)
AGRICULTURE	0.04	40 000	120 000	4	11
WASTE	0.05	45 000	135 000	5	13
FOSSIL FUELS	0.09	80 000	250 000	8	24
ADDITIONAL	0.10	90 000	270 000	9	25
TOTAL	0.28	255 000	775 000	26	73



Remaining global anthropogenic methane emissions

Range of methane mitigation consistent with the IPCC 1.5°C pathways



http://shindellgroup.rc.duke.edu/apps/methane/

CCAC – Engagement Strategy for the Waste Sector

CH4 + BC reductions

- Preventing organic waste, as well as diverting it
- Collecting and using/flaring of gas from existing landfills
- Developing economic uses and facilities for organics
- Increasing waste collection coverage and quality of service
- Monitoring and incentive schemes to stop open burning
- Awareness raising

+ Vertical integration between National, Cities and Local Government

ご清聴ありがとうございました。

Thank you very much for your attention.

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