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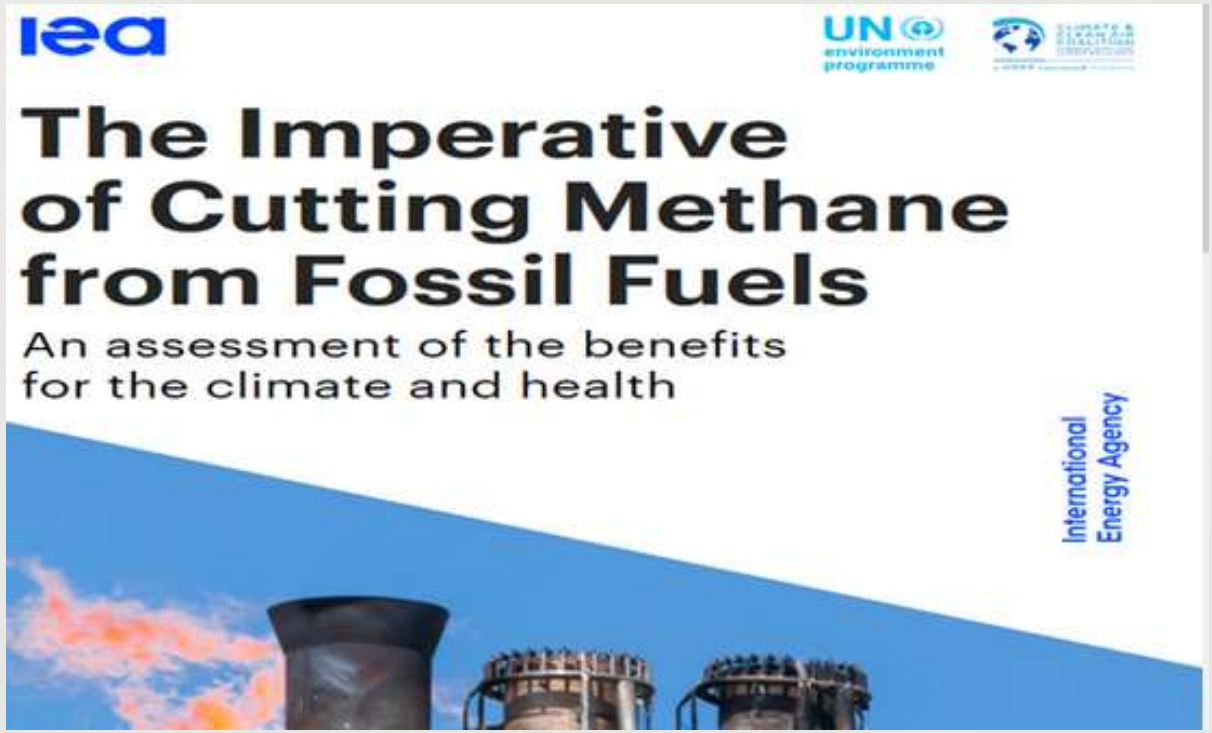
CUTTING METHANE FROM FOSSIL FUELS

- A Report titled ‘Imperative of Cutting Methane from Fossil Fuels’ was prepared by International Energy Agency (IEA)

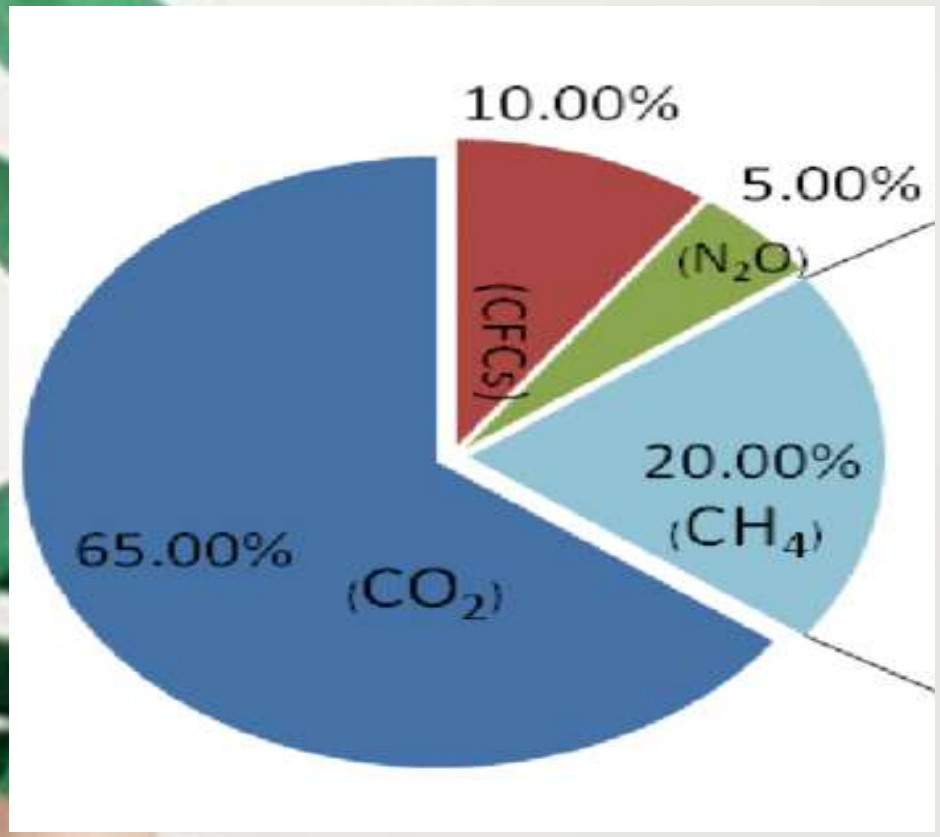
- Report emphasizes the significance of targeted methane mitigation to combat global warming.



Key Findings from the Report

Methane Emissions and Global Warming:

- **Mitigating methane emissions is essential to limit global warming to 1.5°C above pre-industrial levels.**

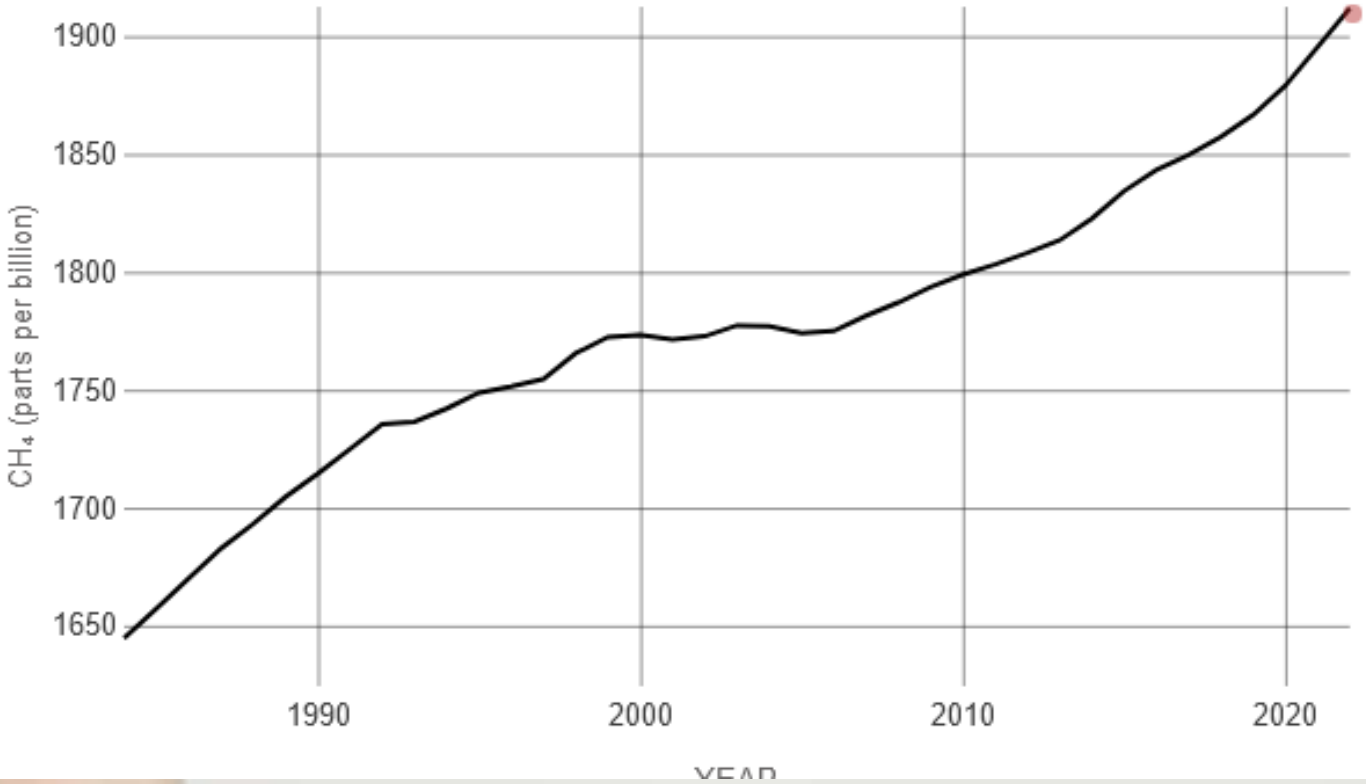


- **Methane is a highly potent greenhouse gas responsible for about 20% of global warming since the Industrial Revolution.**

- **These efforts could prevent approximately 0.1°C of warming by 2050.**

ATMOSPHERIC METHANE CONCENTRATIONS SINCE 1984

Data source: Data from NOAA, measured from a global network of air sampling sites



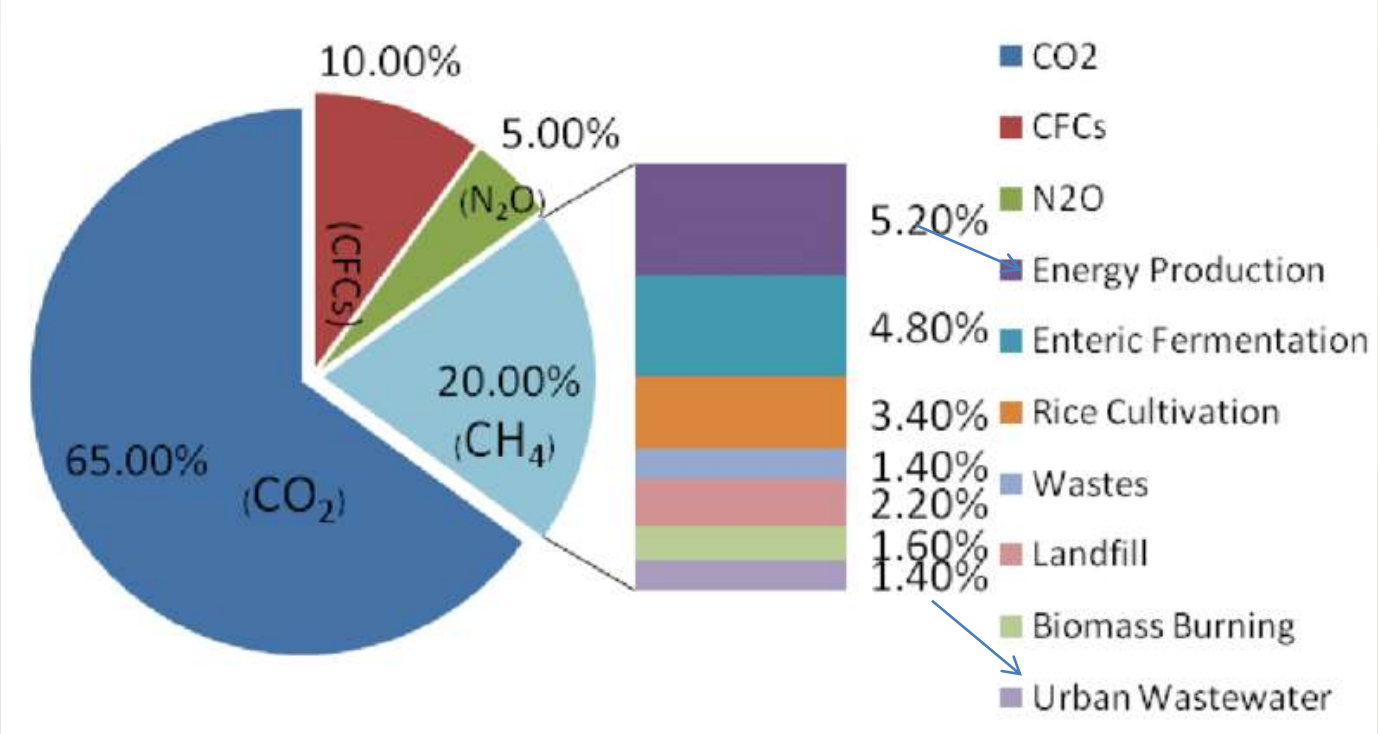
Methane (CH4) Concentration

Before 1800s- ~750ppb

21st Century - 1912 ppb

Current Methane Emission Scenario:

- **Globally, approximately 580 million tonnes of methane are emitted annually.**
  - **Human activities contribute to 60% of these emissions.**
- **Under current trajectories, total anthropogenic methane emissions could rise by up to 13% between 2020 and 2030.**



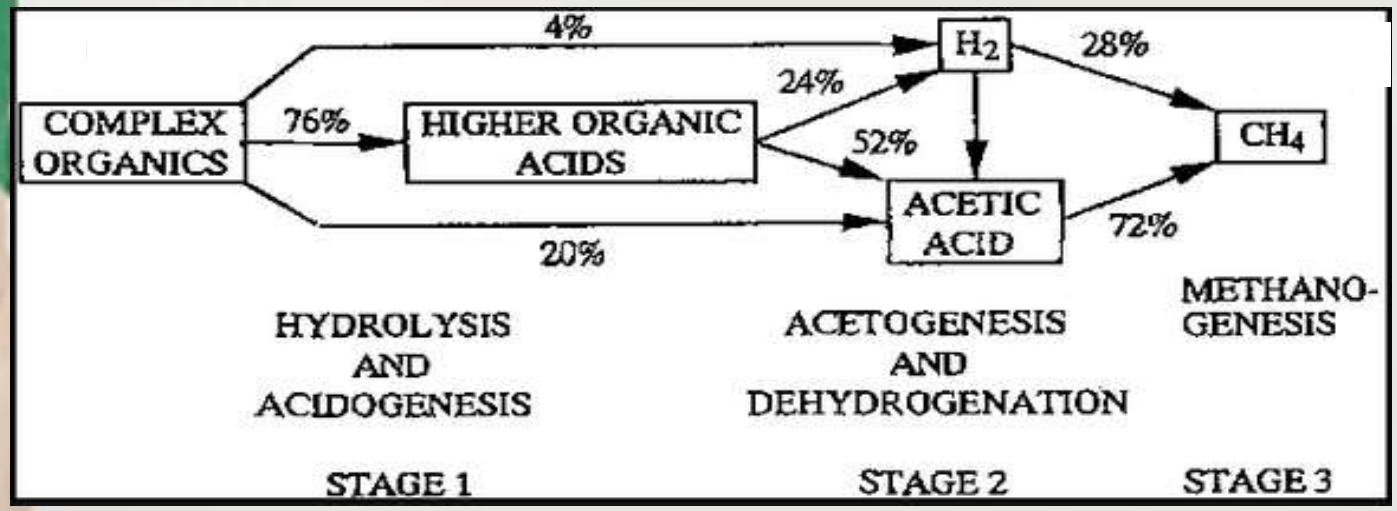
Sources of methane

A. wetlands

glucose + oxygen → carbon dioxide + water + energy

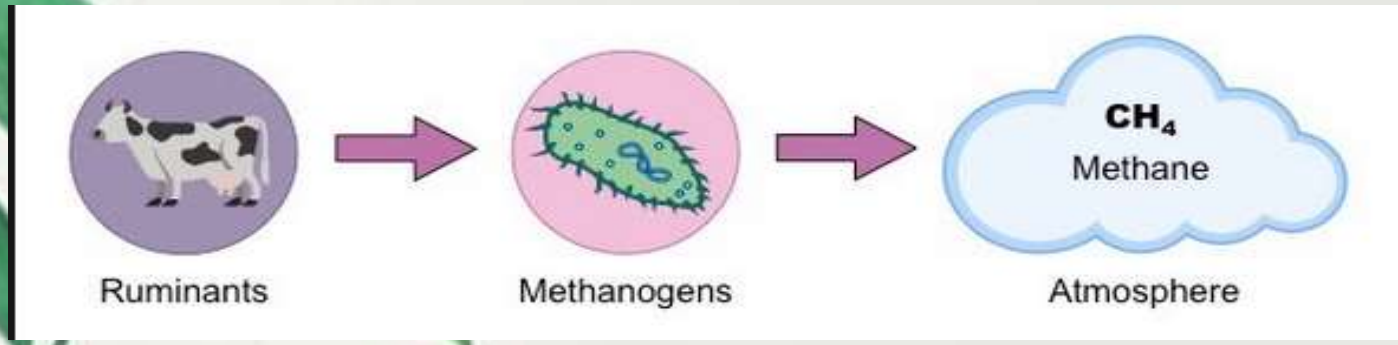
$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$

Aerobic respiration



Anerobic repiration

B. animal husbandry



D. Waste treatment- Landfills

C. Industry – processing of crude oil and natural gas

Methane and Global Warming

- rapid and sustained reductions in methane emissions are key to limit near-term warming and improve air quality.

- Two key characteristics determine the impact of different greenhouse gases on the climate:

  1. their ability to absorb energy and

  2. the length of time they remain in the atmosphere

  Methane has a much shorter atmospheric lifetime

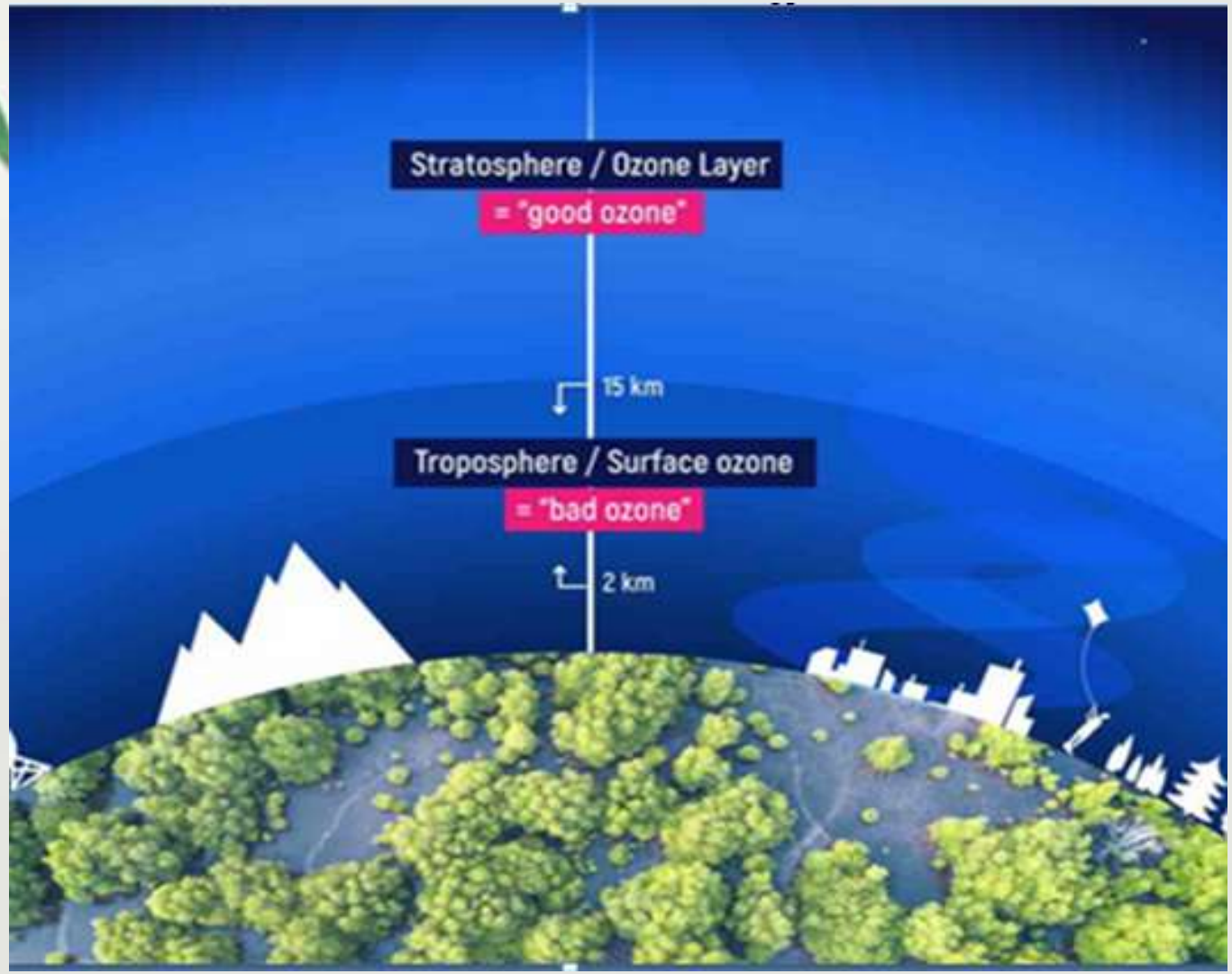
Global warming potential (GWP) of GHGs

CO2 GWP =1

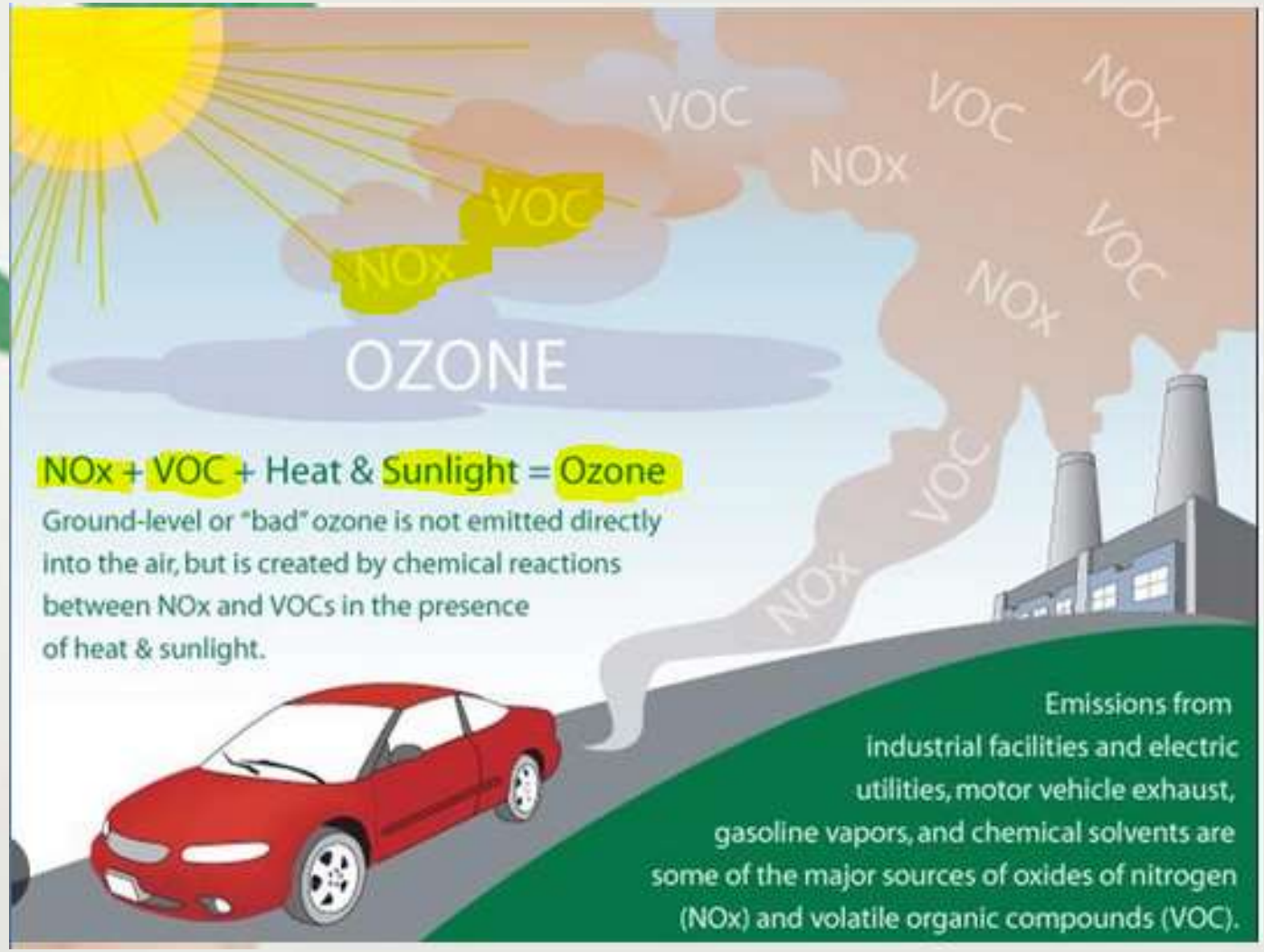
	Gas	lifetime(year)	GWP (100 YEAR)
1.	CO2	100	1
2.	**CH4**	**15**	25 (**80 on 20year scale**)
3.	N2O	120	290
4.	CFCs	100	6000
5.	HFCs	1-250	10,000
6.	HCFC	15	1000
7.	PFC	1000-50,000	5000
8.	SF6	3000	24000

Methane increases ground level ozone

- **Methane also affects air quality because it can lead to ground level (tropospheric) ozone, a dangerous air pollutant.**



Ozone formation



VOCs include such compounds as methane, benzene, xylene, propane and butane.

- Need for Targeted Methane Mitigation:
- Even with deep cuts in fossil fuel use, not addressing methane could lead to global temperatures exceeding 1.6°C by 2050.

- India is 3rd largest emitter of CH4

- ~20% of its anthropogenic CH4 emissions come from agriculture (manure management), coal mines, municipal solid waste, etc.

Efforts to curb methane emissions
Global
Global Methane Pledge – Both the US and the EU have planned to cut methane emissions by 30% (by 2030) compared with the 2020 levels.
UNEP's International Methane Emissions Observatory (IMEO) strategy – To get policy-relevant data into the right hands for emissions mitigation.
Methane Alert and Response System (MARS) – Launched at the COP27 to the UNFCCC in Sharm El-Sheikh, Egypt

Way ahead

- The policies should focus on super emitters, which are facilities, equipment, and other infrastructure, typically in the fossil-fuel, waste, or agriculture sectors, that emit methane at high rates.

- While reducing livestock or rice-production-related emissions is challenging for India,

- India can contribute by reducing emissions associated with coal production.

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