



# Global Methane Tracker 2024

**For Prelims:** [International Energy Agency](#), [Global Methane Tracker 2024](#), [Bioenergy](#), [Global warming](#), [Greenhouse gas Emission](#), [Wetlands](#), [Harit Dhara](#), [BS VI Emission Norms](#), [National Action Plan on Climate Change](#), [Global Methane Pledge](#).

**For Mains:** Major Highlights of Global Methane Tracker 2024, Major Sources of Methane Emission

**Source:** [DTE](#)

## Why in News?

The [International Energy Agency's Global Methane Tracker 2024](#) indicates that [methane](#) emissions from fuel usage in 2023 were nearly at their **highest level** on record, representing a slight increase compared to 2022.

## What are the Major Highlights of Global Methane Tracker 2024?

- **Methane Emissions Overview:** In 2023, methane emissions from fossil fuels totaled close to **120 million tonnes (Mt)**.
  - [Bioenergy](#) (largely from biomass use) contributed a further 10 Mt methane emissions. This level has stayed constant since 2019.
- **Rise of Major Methane Emissions Events:** Major methane emissions events increased by over 50% in 2023 compared to 2022.
  - These events included more than 5 million metric tons of methane emissions from significant fossil fuel leaks globally.
  - One prominent incident was a major **well blowout in Kazakhstan** that lasted **over 200 days**.
- **Top Emitting Countries:** Nearly **70% of methane emissions from fossil fuels come from the top 10 emitting countries**.
  - The **United States** is the largest emitter of methane from oil and gas operations, closely followed by **Russia**.
  - China is the highest emitter of methane in the coal sector.
- **Importance of Cutting Methane Emissions:** Cutting methane emissions from fossil fuels by **75% by 2030 is crucial for limiting [global warming](#) to 1.5 °C**.
  - The IEA estimated that this goal would require about **USD 170 billion in spending**. This is less than 5% of the income generated by the fossil fuel industry in 2023.
  - Around 40% of emissions from fossil fuels in 2023 could have been avoided at no net cost.

## What is Methane?

- **About:** Methane is the simplest hydrocarbon, consisting of one carbon atom and four hydrogen atoms (CH<sub>4</sub>).
  - It is the primary component of natural gas, possessing key characteristics:
    - **Odourless, colourless, and tasteless gas.**

- Lighter than air.
- Burns with a **blue flame in complete combustion**, yielding carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) in the presence of oxygen.
- **Contribution to Global Warming:** Methane ranks as the **second** most important **greenhouse gas (GHG)** after carbon dioxide (CO<sub>2</sub>).
  - Its 20-year global warming potential (GWP) is **84**, indicating that it traps 84 times more heat per mass unit than CO<sub>2</sub> over a 20-year period, making it a potent GHG.
    - Despite its potency, methane has a shorter atmospheric lifetime compared to CO<sub>2</sub>, **classifying it as a short-lived GHG.**
  - It is a significant contributor to global warming, accounting for about **30% of the rise in global temperatures since the preindustrial era.**
  - Methane also contributes to the formation of ground-level ozone.
- **Major Sources of Methane Emission:**
  - **Natural Sources:**
    - **Wetlands**, both natural and human-made, are significant sources of methane emissions due to anaerobic decomposition of organic matter.
  - **Agricultural Activities:**
    - Growing **paddy** fields release methane due to **anaerobic conditions in flooded rice paddies.**
    - **Excreta from cattle** and other livestock undergo enteric fermentation, producing methane as a byproduct.
  - **Combustion and Industrial Processes:**
    - Burning of **fossil fuels**, including oil and natural gas, releases methane emissions.
    - **Biomass burning**, such as wood and agricultural residues, also contributes to methane levels.
    - Industrial activities like **landfills and wastewater treatment plants** generate methane during organic waste decomposition in anaerobic environments.
    - **Fertiliser factories** and other industrial processes can also release methane during production and transportation.
- **Initiatives to Tackle Methane Emissions:**
  - **India:**
    - [Harit Dhara \(HD\)](#)
    - [BS VI Emission Norms.](#)
    - [National Action Plan on Climate Change \(NAPCC\)](#)
  - **Global:**
    - [Methane Alert and Response System \(MARS\).](#)
    - [Global Methane Pledge](#)
    - [Global Methane Initiative \(GMI\)](#)
    - [MethaneSAT](#)

## What is the Global Methane Pledge?

- **About:** The Global Methane Pledge was launched at **UNFCCC COP26 in November 2021** to catalyse action to reduce methane emissions. Led by the US and the EU, the Pledge now has 111 country participants who together are responsible for **45% of global human-caused methane emissions.**
  - It aims for a 30% reduction in global methane emissions from 2020 levels by 2030.
  - India has **opted not to sign** the Global Methane Pledge.
- **Key Reasons for this Decision Include:**
  - India contends that the primary contributor to climate change remains CO<sub>2</sub>, with a long lifespan of **100-1000 years.**
    - The Pledge shifts focus to methane reduction, which has a shorter lifespan of just **12 years**, thus altering the burden of CO<sub>2</sub> reduction.
  - Methane emissions in India primarily stem from **agricultural activities like enteric fermentation and paddy cultivation**, affecting small, marginal, and medium farmers whose livelihoods would be jeopardised by the Pledge.
    - This contrasts with industrial agriculture prevalent in developed countries.
    - Also, given India's significant role as a rice producer and exporter, signing the Pledge could affect trade and economic prospects.

- India hosts the **world's largest cattle population**, supporting the livelihoods of many.
  - However, Indian livestock's contribution to global enteric methane is minimal due to their diet rich in agricultural by-products and unconventional feed materials.

## What is the International Energy Agency?

- IEA is an independent intergovernmental organisation founded in **1974** in **Paris, France**.
- Its primary publications are the [World Energy Outlook Report](#), [World Energy Investment Report](#), and [India Energy Outlook Report](#).
  - India became a member of the IEA in 2017.

## Way Forward

- **Improved Agricultural Practices:** Encouraging and adopting sustainable agricultural practices such as **precision farming, conservation tillage, and integrated crop-livestock systems** can help reduce methane emissions from agricultural activities.
- **Methane-Capturing Technologies:** Implementing methane capture technologies in livestock operations and landfills can capture methane before it is released into the atmosphere, converting it into **usable energy or other products**.
- **Rice Cultivation Techniques:** Promoting practices like **System of Rice Intensification (SRI)** and [Direct Seeded Rice \(DSR\)](#) mentioned earlier can significantly reduce methane emissions from rice paddies.
- **Biogas Production:** Encouraging the production and use of biogas from organic waste can provide a renewable energy source while mitigating methane emissions from waste decomposition.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### Prelims:

**Q1. Which of the following statements is/are correct about the deposits of 'methane hydrate'? (2019)**

1. Global warming might trigger the release of methane gas from these deposits.
2. Large deposits of 'methane hydrate' are found in Arctic Tundra and under the sea floor.
3. Methane in the atmosphere oxidises to carbon dioxide after a decade or two.

**Select the correct answer using the code given below.**

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (d)**

### Mains:

**Q.** "Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)". Comment on the progress made in India in this regard. **(2018)**

