



# Methane Mitigation to Combat Global Warming

**For Prelims:** [Methane](#), [International Energy Agency](#), [United Nations Environment Programme \(UNEP\)](#), Convened Climate and Clean Air Coalition

**For Mains:** Methane Emissions - Impact, Agriculture and Methane Emissions, Initiatives to Curb Methane Emissions

[Source: DTE](#)

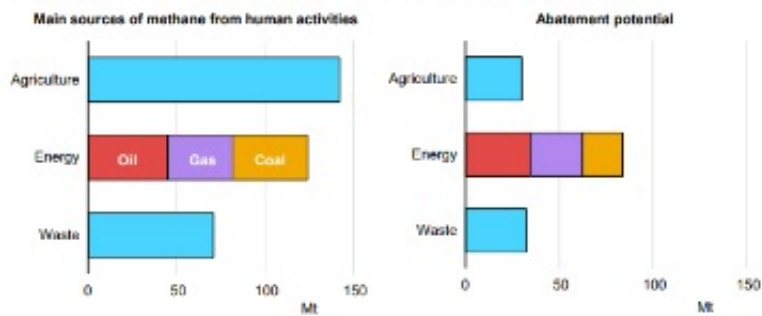
## Why in News?

Recently, a new report titled "**The Imperative of Cutting Methane from Fossil Fuels**" released jointly by the [International Energy Agency](#), the [United Nations Environment Programme \(UNEP\)](#) and the **UNEP-convened Climate and Clean Air Coalition**, emphasizes the significance of targeted [methane](#) mitigation to combat global warming.

## What are the 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 30% of global warming since the [Industrial Revolution](#).
  - These efforts could prevent approximately **0.1°C of warming by 2050**.
- **Current Methane Emission Scenario:**
  - Globally, approximately **580 million tonnes of methane** are emitted annually.
    - **Human activities contribute to 60%** of these emissions.
    - [Fossil fuel](#) operations alone were responsible for **about 120 million tonnes of methane emissions in 2022**.
  - Under current trajectories, total **anthropogenic methane emissions** could rise by up to **13% between 2020 and 2030**.

## Main sources of methane emissions and current abatement potential



Notes: Methane emissions and abatement potential for oil, gas and coal is based on the IEA's [Global Methane Tracker](#). Abatement potential for agriculture and waste it is based on the [Global Methane Assessment](#). Emissions from bioenergy and from biomass burning, each totalling [around 10 Mt](#) per year, are not shown.

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### ▪ 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**.
- Targeted methane mitigation measures are imperative and should complement **decarbonization efforts**.
  - Existing technologies can help avoid **over 80 million tonnes of annual methane emissions from fossil fuels by 2030**.
  - These solutions are estimated to be cost-effective, often at low or even negative cost.
- Around **USD 75 billion is required by 2030** for all methane reduction measures in the oil and gas sector in the [Net Zero scenario](#).
  - Actions such as eliminating **routine venting and flaring and repairing leaks** are a must to reducing methane emissions from the energy sector and for this, the organisations called for appropriate regulatory frameworks.
- Most measures can and should be financed by the **industry itself**, but a number of **low- and middle-income countries may face barriers** to accessing capital for some interventions, which may not be implemented without concessional financing.

### ▪ Economic and Health Benefits:

- Methane is the **primary reason for ground-level ozone pollution** and mitigation efforts will help prevent **“nearly one million premature deaths through 2050, which is equivalent to the current population of Amsterdam, Netherlands”**.
- Achieving methane reduction targets will result in the prevention of **95 million tonnes of crop losses** for wheat, rice, soy and maize (corn).
  - These savings are equivalent to roughly 60% of the volume of wheat, rice, soy and maize produced in Africa in 2021.
- Avoiding such losses of crops, labour and forestry will “provide direct economic benefits valued at more than USD 260 billion between 2020 and 2050”.

### ▪ Regulatory Frameworks:

- Appropriate regulatory frameworks are crucial for effective methane reduction.

## What is Methane?

### ▪ About:

- Methane is the simplest hydrocarbon, consisting of one carbon atom and four hydrogen atoms (CH<sub>4</sub>).
  - It is flammable and is used as a fuel worldwide.
- Methane is a **powerful greenhouse gas (GHG)**, which has an atmospheric lifetime of **around a decade** and affects the **climate for hundreds of years**.
- Methane has more than 80 times the warming power of carbon dioxide over the first 20 years of its lifetime in the atmosphere.

- The common sources of methane are oil and natural gas systems, agricultural activities, coal mining and wastes.
- **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.](#)
- **International Energy Agency**
  - It is an autonomous Intergovernmental Organisation established in 1974 in Paris, France.
  - It mainly focuses on its energy policies which include economic development, energy security and environmental protection.
  - **Mission:** Ensure reliable, affordable and clean energy for its member countries and beyond.
  - **Major Reports:** [World Energy Outlook Report, World, Energy Investment Report,](#) and [India Energy Outlook Report.](#)
  - India joined the IEA in 2017.
- **United Nations Environment Programme**
  - The UNEP is a leading global environmental authority established on 5th June 1972.
  - It sets the global environmental agenda, promotes sustainable development within the [United Nations](#) system, and serves as an authoritative advocate for global environment protection.
  - **Major Reports:** [Emission Gap Report, Adaptation Gap Report, Global Environment Outlook.](#) Frontiers, Invest into Healthy Planet.
  - **Major Campaigns:** Beat Pollution, UN75, World Environment Day, Wild for Life.
  - **Headquarters:** Nairobi, Kenya.
  - UNEP supports its 193 Member States to achieve the [Sustainable Development Goals](#) and live in harmony with nature.
  - India is a member of the UNEP.
- **UNEP-Convened Climate and Clean Air Coalition (CCAC)**
  - It is a voluntary global partnership of governments, intergovernmental organizations, businesses, scientific institutions, and civil society organizations working to reduce **short-lived climate pollutants (SLCPs)** that have a significant impact on climate change and public health.
  - India is a CCAC Partner since 2019.

## 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 atmosphere oxidizes 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)**

PDF Reference URL: <https://www.drishtiias.com/printpdf/methane-mitigation-to-combat-global-warming>

