

**Global Methane Budget 2020 Japanese Press release: Thursday 6<sup>th</sup> August 2020**

Tsukuba, Japan

**Global Methane Emissions have risen by nearly 10 per cent over the last 20 years. Major contributors are human activities in the agriculture and waste sector and in the production and consumption of fossil fuels**

On July 15<sup>th</sup>, 2020, the Global Carbon Project (GCP) publishes an updated and more comprehensive global methane (CH<sub>4</sub>) budget with all methane sources and sinks. It also provides insights into the geographical regions and economic sectors where the emission changed the most over the most recent two decades (2000-2017). The update employs the state-of-the-art bottom-up and top-down methods to improve the accuracy of the methane gas accounting in each category, which took three years to process. The estimated global methane budget for the recent decade (2008-2017) is shown in Figure 1.

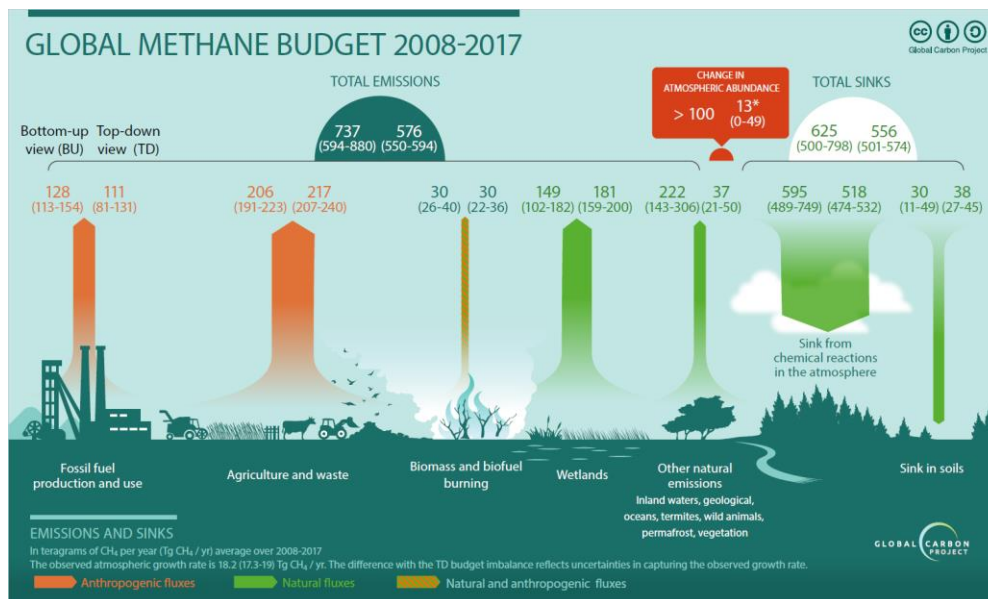


Figure 1: Global Methane Budget 2008 - 2017 (<https://www.globalcarbonproject.org/methanebudget/index.htm>)

The study also shows the emission rate has increased by 9 % (about 50 million tons of CH<sub>4</sub> per year) between the reference period (2000-2006) and the last year of the presented budget (2017). This increase in methane emissions is completely attributed to the increase in anthropogenic emissions which account for 60% of the total methane emissions. The rest comes from natural sources which have not changed over the past two decades despite their diversity: wetland, lakes, reservoirs, termites, geological sources, hydrates etc.

The sectors that primarily contributed to this increase are the fossil fuel sector (production and consumption) and activities in agriculture and waste sectors. The findings highlight the requirement for strong mitigation in these sectors.

Methane (CH<sub>4</sub>) is the second most important greenhouse gas contributing to human-induced climate change after carbon dioxide (CO<sub>2</sub>). In 2017, the level of methane in the atmosphere was over 150% higher than pre-industrial times (circa. 1750). Methane is responsible for 23% of the global warming produced by all greenhouse gases and although it has a shorter lifetime than carbon dioxide (about ten years in the atmosphere), methane has a Global Warming Potential 28 times larger than carbon dioxide over a time horizon of 100 years (GWP-100). On unit mass comparison, the global-warming potential of one tonne of atmospheric methane is similar to that of around 86 tonnes of carbon dioxide over a 20-year period.

Regionally, we find emission increases in agriculture, waste, and fossil fuel sectors from southern and southeastern Asia, including China. There are also increases in the fossil fuel sector of the United States. Conversely, Europe is the only region with a decrease in Methane emission.

### **Regional differences: Rises of emission in Africa, Asia, and the USA; a drop in Europe**

Geographically, 64% of global methane emissions originate from the Tropics (<30°N), 32 % from the Northern mid-latitudes (30°N-60°N) and only 4% from the Northern high latitudes (> 60°N).

Comparing the methane emission between the period 2000-2006 and the year 2017 at the regional level, we find a significant increase in emission in the following regions: 1) Africa and the Middle East 2) China, 3) South Asia and Oceania, and 4) North America. Standing out among others, Europe is the only region where emissions have decreased. Its decrease is primarily the result of changes in practices within the agriculture and waste sectors.

There are also differences in emission sources per region; for instance, in Africa and Asia (except China), the agriculture and waste sector are the major sources followed by fossil fuel consumption. In contrast, fossil fuel consumption is the largest source of emission in China and North America.

### **Emission increase results in higher atmospheric methane concentrations**

The rise of methane emission means the need for a considerable effort to reduce methane emissions to meet the Paris Agreement target. The current anthropogenic methane emissions trajectory is within the two warmest IPCC-AR5 scenarios, i.e., RCP8.5 and RCP6.0, corresponding to temperature increases above 3°C by the end of this century. The Paris Agreement's target is at 1.5-2°C

## **International collaboration, with contributions from Japan**

The Global Methane Budget is part of the Global Carbon Project efforts to develop a complete picture of the greenhouse gases cycles by establishing complete, consistent scientific knowledge to support policy discussion and actions to mitigate greenhouse gas emissions to the atmosphere. The study was conducted by an international research team from 91 scientists & 69 research organizations from around the world. These include ten scientists from three Japanese organizations (NIES, JAMSTEC and MRI). Japanese institutions also provided atmospheric methane observations at monitoring stations and by the Greenhouse gas Observing SATellite (GOSAT) for use in the emission estimates. Two peer-reviewed articles were published on July 15th in the journals Environmental Research Letters and Earth System Science Data (see details at the end).

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**The Global Carbon Project** is an international research project within the Future Earth research initiative on global sustainability. It aims to develop a comprehensive picture of the global carbon cycle, including both its biophysical and human dimensions together with the interactions and feedbacks between them.

**NOTES: Press release: EMBARGO: Wednesday 15 July 2020, 9:01 Japan time**

### **1. Contact point**

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### **2. Social Media**

- Twitter: @gcarbonproject, #methanebudget
- Facebook: <https://www.facebook.com/globalcarbonproject>

### **3. Publications:**

This press release is part of the Global Methane Budget 2020, the periodical update by the Global Carbon Project. It is based on the analyses:

- Sauniois et al. (2020) The Global Methane Budget 2000-2017. *Earth System Science Data*. <https://doi.org/10.5194/essd-12-1561-2020>

- Jackson et al. (2020). Increasing anthropogenic methane emissions arise equally from agricultural and fossil fuel sources. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ab9ed2>

#### **Access to the data:**

Data for the global methane budget are available from the Global carbon Atlas, with budgets by regions and sectors. For the release of the global methane budget, the Global Carbon Atlas includes a new design and new applications related to the Global Carbon Project: CO<sub>2</sub> emissions for 343 cities worldwide, and carbon cycle and natural CO<sub>2</sub> emissions from rivers and lakes.

- <http://www.globalcarbonproject.org/methanebudget>
- <http://www.globalcarbonatlas.org>
- <https://www.icos-cp.eu/GCP-CH4/2019>

#### **4. Events:**

Ten scientists from Japan are involved in this international research collaboration and will present the research findings and their expertise in a one-day event on 6th August 2020. The event consists of the press and public conference in the morning and a scientific forum in the afternoon. In the press and public conference (only in Japanese), the research findings will be presented in an accessible manner, suitable for anyone who is interested in the topic. The afternoon session will be presented in English and is suitable for those who would like to learn in detailed the methodology and scientific findings of the Budget. Both events are free of charge but required pre-registration (see detail below).

**4a) Press and public conference (only in Japanese): Thursday, August 6th 2020 09:30 ~ 11:30**

**4b) Scientific forum (only in English): Thursday, August 6th 2020 13:00 ~ 15:30**

Free of charge:

**Registration for both events:** <https://bit.ly/2ZV4Wv1>

#### ***Organizing Secretariat for Global Carbon Budget Seminar 2019, Tsukuba, Japan***

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#### **5. Access to the material:**

- Data and figures: <https://www.globalcarbonproject.org/methanebudget/index.htm>