

## Japan's National Greenhouse Gas Emissions in Fiscal Year 2019 (Final Figures<sup>1</sup>) <Executive Summary>

- Japan's total greenhouse gas (GHG) emissions<sup>2</sup> in fiscal year\* (FY) 2019 were 1,212 million tonnes of carbon dioxide equivalents (Mt CO<sub>2</sub> eq.).
  - Total emissions decreased by 2.9% (36 Mt CO<sub>2</sub> eq.) compared to FY2018 emissions (1,247 Mt CO<sub>2</sub> eq.).
  - Total emissions decreased by 14.0% (197 Mt CO<sub>2</sub> eq.) compared to FY2013 emissions (1,408 Mt CO<sub>2</sub> eq.).
  - Total emissions decreased by 12.3% (170 Mt CO<sub>2</sub> eq.) compared to FY2005 emissions (1,381 Mt CO<sub>2</sub> eq.).

\* Japan's fiscal year runs from April 1 to March 31.

### Note:

- Total GHG emissions have decreased for the sixth consecutive year since FY2014, falling to a record low following FY2018 and since FY1990, when emission estimates began. The total amount of GHG emissions per unit of real GDP has decreased for the seventh consecutive year since FY2013.
  - The two main factors for the decrease in emissions in FY2019 as compared to FY2018 are the reduced energy consumption (reduced production in manufacturing industries etc.) and the decrease in CO<sub>2</sub> emissions from electricity production due to the wider use of low-carbon electricity (wider adoption of renewable energy).
  - The two main factors for the decrease in emissions in FY2019 as compared to FY2013 are the reduced energy consumption (due to improved energy conservation etc.) and the decrease in CO<sub>2</sub> emissions from electricity production due to the wider use of low-carbon electricity (wider adoption of renewable energy, resumption of nuclear power plant operations).
  - The main factor for the decrease in emissions in FY2019 as compared to FY2005 is the reduced energy consumption (due to improved energy conservation etc.).
  - In contrast to the decrease in total emissions, hydrofluorocarbon emissions from refrigerants that substitute ozone-depleting substances are increasing every year.
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- Removals by forest and other carbon sinks from activities under the Kyoto Protocol<sup>3</sup> in FY2019 were 45.9 Mt CO<sub>2</sub> eq., consisting of 42.9 Mt CO<sub>2</sub> eq. by forest carbon sinks and 3.0 Mt CO<sub>2</sub> eq. by the promotion of activities on cropland management, grazing land management, and urban revegetation.

Footnote:

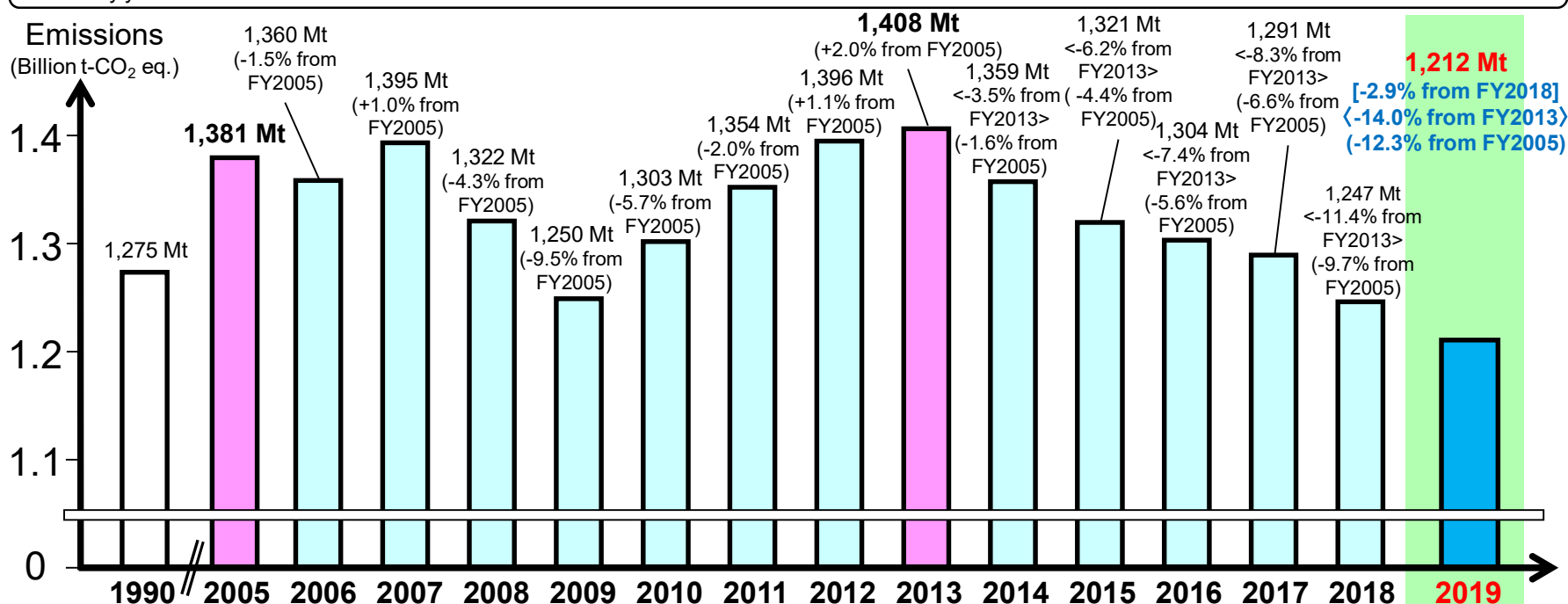
1. “Final figures” refers to the figures officially submitted to the Secretariat of the United Nations Framework Convention on Climate Change (hereinafter, Convention) as Japan’s GHG emissions and removals in the national GHG inventory. The final figures compiled this time may be recalculated when annual statistical data are updated, and/or estimation methods are revised.
2. There are some differences between the final figures compiled this time and the preliminary figures released on December 8, 2020, due to recalculations conducted based on annual statistical data made available after the preliminary estimation, and further revision of estimation methods. The preliminary figures for GHG emissions in FY2019 were 1,213 million tonnes, showing a 2.7% decrease compared to FY2018 (a 14.0% decrease and a 12.2% decrease when compared to FY2013 and FY2005, respectively).
3. The removals by forest and other carbon sinks reported this time were estimated by calculating emissions/removals from activities under the Kyoto Protocol, in accordance with the decision of the 8<sup>th</sup> session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

## Japan's total greenhouse gas emissions in fiscal year (FY) 2019 (final figures)

**Japan's total greenhouse gas (GHG) emissions in FY2019 (final figures) were 1,212 Mt CO<sub>2</sub> eq.**

(reflecting a 2.9% decrease as compared to FY2018; a 14.0% decrease from FY2013; and a 12.3% decrease from FY2005 levels)

- Total GHG emissions have decreased for the sixth consecutive year since FY2014, falling to a record low following FY2018 and since FY1990, when emission estimates began. The total amount of GHG emissions per unit of real GDP has decreased for the seventh consecutive year since FY2013.
- The two main factors for the decrease in emissions in FY2019 as compared to FY2018 are the reduced energy consumption (reduced production in manufacturing industries etc.) and the decrease in CO<sub>2</sub> emissions from electricity production due to the wider use of low-carbon electricity (wider adoption of renewable energy).
- The two main factors for the decrease in emissions in FY2019 as compared to FY2013 are the reduced energy consumption (due to improved energy conservation etc.) and the decrease in CO<sub>2</sub> emissions from electricity production due to the wider use of low-carbon electricity (wider adoption of renewable energy, resumption of nuclear power plant operations).
- The main factor for the decrease in emissions in FY2019 as compared to FY2005 is the reduced energy consumption (due to improved energy conservation etc.).
- In contrast to the decrease in total emissions, hydrofluorocarbon emissions from refrigerants that substitute ozone-depleting substances are increasing every year.



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2. There are some differences between the final figures compiled this time and the preliminary figures released on December 8, 2020, due to recalculations conducted based on annual statistical data made available after the preliminary estimation, and further revision of estimation methods.
3. Total GHG emissions in each FY and percent changes from previous years (such as changes from FY2013) do not include removals by forest and other carbon sinks from activities under the Kyoto Protocol.

Figure 1 Japan's national GHG emissions in FY2019 (final figures)

Table 1 Japan's national GHG emissions by gas  
(compared to FY2005, FY2013, and FY2018)

	FY1990 emissions [Share]	FY2005 emissions [Share]	FY2013 emissions [Share]	FY2018 emissions [Share]	FY2019			
					Emissions [Share]	(Compared to FY2005)	(Compared to FY2013)	(Compared to FY2018)
Total	1,275 [100%]	1,381 [100%]	1,408 [100%]	1,247 [100%]	1,212 [100%]	-169.6 «-12.3%»	-196.6 «-14.0%»	-35.6 «-2.9%»
Carbon dioxide (CO <sub>2</sub> )	1,164 [91.3%]	1,294 [93.7%]	1,318 [93.6%]	1,146 [91.9%]	1,108 [91.4%]	-185.7 «-14.4%»	-209.7 «-15.9%»	-37.6 «-3.3%»
Energy-related carbon dioxide	1,068 [83.8%]	1,201 [86.9%]	1,235 [87.7%]	1,065 [85.4%]	1,029 [84.9%]	-171.7 «-14.3%»	-206.6 «-16.7%»	-36.6 «-3.4%»
Carbon dioxide not related to energy	96.0 [7.5%]	93.1 [6.7%]	82.3 [5.8%]	80.2 [6.4%]	79.2 [6.5%]	-13.9 «-15.0%»	-3.1 «-3.8%»	-1.1 «-1.3%»
Methane (CH <sub>4</sub> )	43.8 [3.4%]	34.7 [2.5%]	30.0 [2.1%]	28.6 [2.3%]	28.4 [2.3%]	-6.2 «-18.0%»	-1.6 «-5.4%»	-0.15 «-0.5%»
Nitrous oxide (N <sub>2</sub> O)	31.8 [2.5%]	25.0 [1.8%]	21.4 [1.5%]	20.1 [1.6%]	19.8 [1.6%]	-5.2 «-20.7%»	-1.6 «-7.5%»	-0.33 «-1.7%»
F-gases	35.4 [2.8%]	27.9 [2.0%]	39.1 [2.8%]	52.9 [4.2%]	55.4 [4.6%]	+27.5 «+98.4%»	+16.3 «+41.7%»	+2.5 «+4.8%»
Hydrofluorocarbons (HFCs)	15.9 [1.3%]	12.8 [0.9%]	32.1 [2.3%]	47.0 [3.8%]	49.7 [4.1%]	+36.9 «+288.9%»	+17.6 «+54.8%»	+2.7 «+5.7%»
Perfluorocarbons (PFCs)	6.5 [0.5%]	8.6 [0.6%]	3.3 [0.2%]	3.5 [0.3%]	3.4 [0.3%]	-5.2 «-60.4%»	+0.14 «+4.1%»	-0.06 «-1.9%»
Sulfur hexafluoride (SF <sub>6</sub> )	12.9 [1.0%]	5.0 [0.4%]	2.1 [0.1%]	2.1 [0.2%]	2.0 [0.2%]	-3.0 «-60.2%»	-0.07 «-3.6%»	-0.05 «-2.6%»
Nitrogen trifluoride (NF <sub>3</sub> )	0.03 [0.003%]	1.5 [0.1%]	1.6 [0.1%]	0.28 [0.02%]	0.26 [0.02%]	-1.2 «-82.2%»	-1.4 «-83.8%»	-0.02 «-7.4%»

(Unit: Mt-CO<sub>2</sub> eq.)

Table 2 Energy-related CO<sub>2</sub> emissions from each sector  
(after allocation of power and heat)

	FY1990 emissions [Share]	FY2005 emissions [Share]	FY2013 emissions [Share]	FY2018 emissions [Share]	FY2019			
					Emissions [Share]	(Compared to FY2005)	(Compared to FY2013)	(Compared to FY2018)
Total	1,068 [100%]	1,201 [100%]	1,235 [100%]	1,065 [100%]	1,029 [100%]	-171.7 «-14.3%»	-206.6 «-16.7%»	-36.6 «-3.4%»
Industry (factories, etc.)	503 [47.2%]	467 [38.9%]	463 [37.5%]	400 [37.5%]	384 [37.4%]	-82.9 «-17.7%»	-78.7 «-17.0%»	-15.2 «-3.8%»
Transport (cars, etc.)	208 [19.5%]	244 [20.4%]	224 [18.2%]	210 [19.8%]	206 [20.0%]	-38.5 «-15.7%»	-18.3 «-8.2%»	-4.5 «-2.1%»
Commercial and other (commerce, service, office, etc.)	131 [12.3%]	220 [18.4%]	238 [19.3%]	200 [18.8%]	193 [18.8%]	-27.2 «-12.4%»	-44.7 «-18.8%»	-7.1 «-3.6%»
Residential	129 [12.1%]	171 [14.2%]	208 [16.8%]	166 [15.6%]	159 [15.5%]	-11.3 «-6.6%»	-48.4 «-23.3%»	-6.9 «-4.2%»
Energy transformation	96.2 [9.0%]	98.0 [8.2%]	103 [8.3%]	89.0 [8.4%]	86.2 [8.4%]	-	-	-
Power plants, oil refineries, etc.	96.2 [9.0%]	102 [8.5%]	106 [8.6%]	93.8 [8.8%]	89.3 [8.7%]	-13.1 «-12.8%»	-16.8 «-15.9%»	-4.5 «-4.8%»
Statistical discrepancy from power and heat allocation	-0.007 [-0.0006%]	-4.4 [-0.4%]	-3.5 [-0.3%]	-4.8 [-0.5%]	-3.2 [-0.3%]	-	-	-

(Unit: Mt)

Note: “After allocation of power and heat” refers to the allocation of energy-related CO<sub>2</sub> emissions from power and heat generation to each sector based on the consumption of power and heat.

[Details of main increases/decreases in energy-related CO<sub>2</sub> emissions (after allocation of power and heat), as compared to FY2018]

- Industry sector (factories, etc.): 15.2 million tonnes (3.8%) decrease
  - The production in manufacturing industries decreased.
- Transport sector (cars, etc.): 4.5 million tonnes (2.1%) decrease
  - The fuel efficiency improved (especially in passenger road transport) and the amount of traffic decreased.
- Commercial and other sector (commerce, services, office, etc.): 7.1 million tonnes (3.6%) decrease
  - The CO<sub>2</sub> emission intensity of electricity (CO<sub>2</sub> emission per electricity consumption) and energy consumption intensity (energy consumption per Tertiary Industry Activity Index) improved.
- Residential sector: 6.9 million tonnes (4.2%) decrease
  - The CO<sub>2</sub> emission intensity of electricity improved, and energy consumption decreased due to reasons including a warmer winter.
- Energy transformation sector (power plants, oil refineries, etc.) (excluding statistical discrepancy from power and heat allocation): 4.5 million tonnes (4.8%) decrease
  - Emissions from utility power producers decreased.

[Details of main increases/decreases in emissions other than energy-related CO<sub>2</sub> emissions, as compared to FY2018 (CO<sub>2</sub> eq.)]

- CO<sub>2</sub> emissions not related to energy: 1.1 million tonnes (1.3%) decrease
  - Emissions from the Industrial Processes and Product Use sector decreased.
- Methane (CH<sub>4</sub>) emissions: 0.15 million tonnes (0.5%) decrease
  - Emissions from the Waste sector decreased.
- Nitrous oxide (N<sub>2</sub>O) emissions: 0.33 million tonnes (1.7%) decrease
  - Emissions from fuel combustion/ fugitives decreased.
- Hydrofluorocarbon (HFC) emissions: 2.7 million tonnes (5.7%) increase
  - Emissions from refrigerants increased.
- Perfluorocarbon (PFC) emissions: 0.06 million tonnes (1.9%) decrease
  - Emissions from semiconductor and liquid crystal display (LCD) manufacturing decreased.
- Sulfur hexafluoride (SF<sub>6</sub>) emissions: 0.05 million tonnes (2.6%) decrease
  - Emissions from semiconductor and liquid crystal display (LCD) manufacturing decreased.
- Nitrogen trifluoride (NF<sub>3</sub>) emissions: 0.02 million tonnes (7.4%) decrease
  - Fugitive emissions from NF<sub>3</sub> production decreased.