Japan's National Greenhouse Gas Emissions in Fiscal Year 2019 (Preliminary Figures) <Executive Summary>

- Japan's total greenhouse gas (GHG) emissions in fiscal year* (FY) 2019 were 1,213 million tonnes of carbon dioxide equivalents (Mt CO_2 eq.).
  - Total emissions decreased by 2.7% (34 Mt CO_2 eq.) compared to those of FY2018 (1,247 Mt CO_2 eq.).
  - Total emissions decreased by 14.0% (197 Mt CO_2 eq.) compared to those of FY2013 (1,410 Mt CO_2 eq.).
  - Total emissions decreased by 12.2% (169 Mt CO_2 eq.) compared to those of FY2005 (1,382 Mt CO_2 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_2 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 (from improved energy conservation etc.) and 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 (from 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.

** These preliminary figures for FY2019 were estimated based on annual figures in various statistics. Some annual figures from FY2018 were temporarily used in place of FY2019 figures that have yet to be released. Moreover, some estimation methodologies are currently being reconsidered in order to make more accurate estimations of emissions for the final figures. As such, the final figures to be released in April 2021 may differ from the preliminary figures in this summary. Carbon removals by forests and other carbon sinks will also be estimated and announced at the time of the release of the final figures.

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

Japan's total greenhouse gas (GHG) emissions in FY2019 (preliminary figures) were 1,213 Mt CO_2 eq.
(reflecting a 2.7% decrease as compared to FY2018; a 14.0% decrease from FY2013; and a 12.2% 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.
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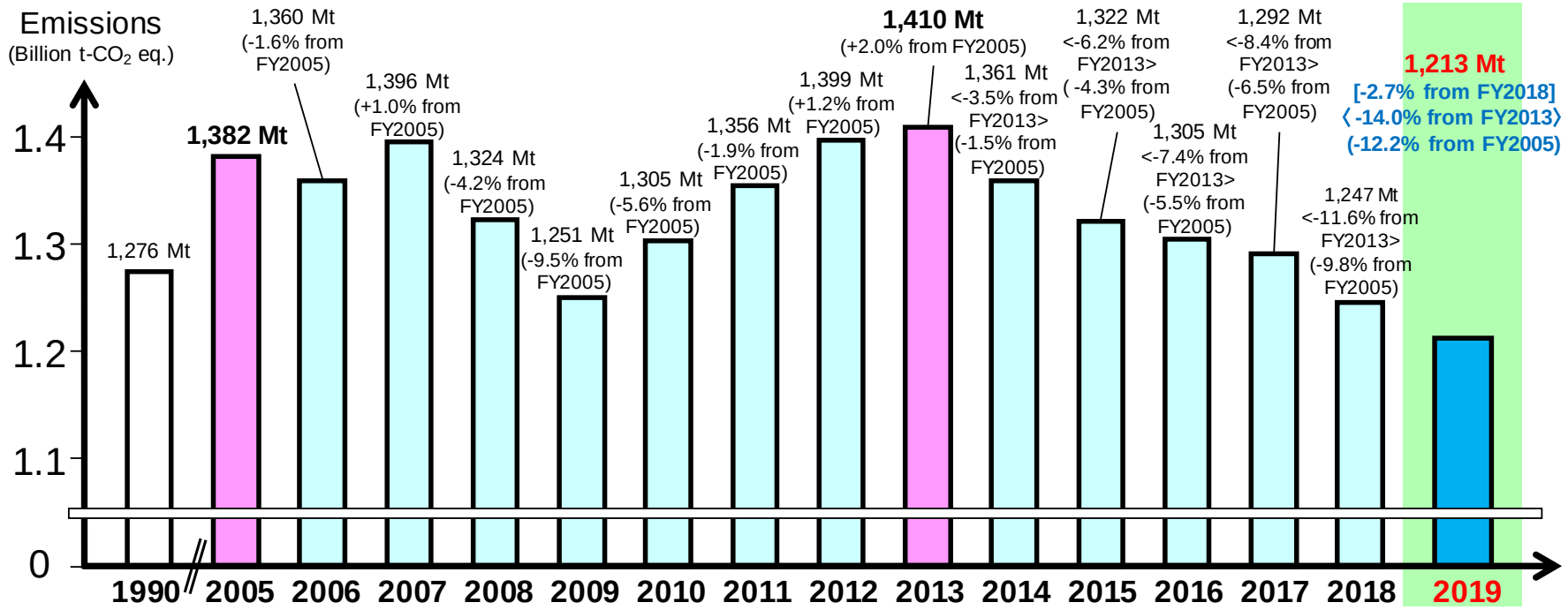

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2. Total GHG emissions in each FY and percentage changes from previous years (such as changes from FY2013) do not include removals by forests and other carbon sinks from activities under the Kyoto Protocol.

Figure 1 Japan's national GHG emissions in FY2019 (preliminary 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 (preliminary figures)			
					Emissions [Share]	(Compared to FY2005)	(Compared to FY2013)	(Compared to FY2018)
Total	1,276 [100%]	1,382 [100%]	1,410 [100%]	1,247 [100%]	1,213 [100%]	-169.2 《-12.2%》	-197.3 《-14.0%》	-34.0 《-2.7%》
Carbon dioxide (CO_2)	1,164 [91.2%]	1,293 [93.6%]	1,317 [93.4%]	1,144 [91.7%]	1,106 [91.2%]	-186.8 《-14.4%》	-210.6 《-16.0%》	-37.2 《-3.3%》
Energy-related carbon dioxide	1,068 [83.7%]	1,201 [86.9%]	1,235 [87.6%]	1,065 [85.4%]	1,029 [84.9%]	-171.0 《-14.2%》	-205.8 《-16.7%》	-35.8 《-3.4%》
Carbon dioxide not related to energy	96.3 [7.6%]	92.7 [6.7%]	81.7 [5.8%]	78.4 [6.3%]	77.0 [6.3%]	-15.8 《-17.0%》	-4.8 《-5.8%》	-1.4 《-1.8%》
Methane (CH_4)	44.4 [3.5%]	35.8 [2.6%]	32.5 [2.3%]	30.1 [2.4%]	30.0 [2.5%]	-5.8 《-16.3%》	-2.5 《-7.8%》	-0.11 《-0.4%》
Nitrous oxide (N_2O)	31.9 [2.5%]	25.0 [1.8%]	21.5 [1.5%]	20.2 [1.6%]	20.2 [1.7%]	-4.7 《-19.0%》	-1.3 《-6.0%》	+0.01 《+0.1%》
F-gases	35.4 [2.8%]	27.9 [2.0%]	39.1 [2.8%]	52.9 [4.2%]	56.1 [4.6%]	+28.2 《+101.1%》	+17.0 《+43.6%》	+3.3 《+6.2%》
Hydrofluorocarbons (HFCs)	15.9 [1.2%]	12.8 [0.9%]	32.1 [2.3%]	47.0 [3.8%]	50.4 [4.2%]	+37.6 《+294.4%》	+18.3 《+57.1%》	+3.4 《+7.2%》
Perfluorocarbons (PFCs)	6.5 [0.5%]	8.6 [0.6%]	3.3 [0.2%]	3.5 [0.3%]	3.4 [0.3%]	-5.2 《-60.3%》	+0.14 《+4.3%》	-0.06 《-1.9%》
Sulfur hexafluoride (SF_6)	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_3)	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_2 eq.)

Table 2　Energy-related CO_2 emissions from each sector (after allocation of power and heat)

	FY1990 emissions [Share]	FY2005 emissions [Share]	FY2013 emissions [Share]	FY2018 emissions [Share]	FY2019 (preliminary figures)			
					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%]	-171.0 《-14.2%》	-205.8 《-16.7%》	-35.8 《-3.4%》
Industry (factories, etc.)	503 [47.2%]	467 [38.9%]	463 [37.5%]	398 [37.4%]	386 [37.5%]	-81.1 《-17.3%》	-76.6 《-16.5%》	-12.1 《-3.0%》
Transport (cars, etc.)	207 [19.4%]	244 [20.3%]	224 [18.2%]	211 [19.8%]	207 [20.1%]	-37.2 《-15.3%》	-17.3 《-7.7%》	-3.9 《-1.8%》
Commercial and other (commerce, service, office, etc.)	130 [12.2%]	220 [18.4%]	238 [19.2%]	201 [18.9%]	192 [18.6%]	-28.4 《-12.9%》	-45.6 《-19.2%》	-9.5 《-4.7%》
Residential	131 [12.2%]	170 [14.2%]	208 [16.8%]	166 [15.6%]	159 [15.4%]	-11.9 《-7.0%》	-49.2 《-23.7%》	-7.1 《-4.3%》
Energy transformation	96.2 [9.0%]	98.0 [8.2%]	103 [8.3%]	88.8 [8.3%]	85.6 [8.3%]	-	-	-
Oil refineries, power plants, etc.	96.2 [9.0%]	102 [8.5%]	106 [8.6%]	93.8 [8.8%]	89.9 [8.7%]	-12.6 《-12.3%》	-16.3 《-15.4%》	-3.9 《-4.2%》
Statistical discrepancy from power and heat allocation	-0.007 [-0.0006%]	-4.4 [-0.4%]	-3.5 [-0.3%]	-5.0 [-0.5%]	-4.2 [-0.4%]	-	-	-

(Unit: Mt)

Note: "After allocation of power and heat" refers to the allocation of energy-related CO_2 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_2 emissions (after allocation of power and heat), as compared to FY2018]

- Industry sector (factories, etc.): 12.1 million tonnes (3.0%) decrease
  - The production in manufacturing industries decreased.
- Transport sector (cars, etc.): 3.9 million tonnes (1.8%) decrease
  - The fuel efficiency improved and the amount of traffic decreased.
- Commercial and other sector (commerce, services, office, etc.): 9.5 million tonnes (4.7%) decrease
  - The CO_2 emission intensity of electricity (CO_2 emission per electricity consumption) and energy consumption intensity (energy consumption per Tertiary Industry Activity Index) improved.
- Residential sector: 7.1 million tonnes (4.3%) decrease
  - The CO_2 emission intensity of electricity improved, and energy consumption decreased due to reasons including a warmer winter.
- Energy transformation sector (oil refineries, power plants, etc.) (excluding statistical discrepancy from power and heat allocation): 3.9 million tonnes (4.2%) decrease
  - Emissions from utility power producers (mainly due to distribution losses) decreased.

[Details of main increases/decreases in emissions other than energy-related CO_2 emissions, as compared to FY2018 (CO_2 eq.)]

- CO_2 emissions not related to energy: 1.4 million tonnes (1.8%) decrease
  - Emissions from the Industrial Processes and Product Use sector decreased.
- Methane (CH_4) emissions: 0.11 million tonnes (0.4%) decrease
  - Emissions from the Waste sector decreased.
- Nitrous oxide (N_2O) emissions: near-constant (0.01 million tonnes (0.1%) slight increase)
- Hydrofluorocarbon (HFC) emissions: 3.4 million tonnes (7.2%) 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_6) emissions: 0.05 million tonnes (2.6%) decrease
  - Emissions from semiconductor and liquid crystal display (LCD) manufacturing decreased.
- Nitrogen trifluoride (NF_3) emissions: 0.02 million tonnes (7.4%) decrease
  - Fugitive emissions from NF_3 production decreased.