

## Japan's National Greenhouse Gas Emissions in Fiscal Year 2016 (Final Figures<sup>1</sup>) <Executive Summary>

- Japan's total greenhouse gas emissions<sup>2</sup> in fiscal year (FY) 2016 were 1,307 million tonnes of carbon dioxide equivalents (Mt CO<sub>2</sub> eq.).
  - Total emissions decreased by 1.2% (16 Mt CO<sub>2</sub> eq.) when compared to those of FY2015 (1,323 Mt CO<sub>2</sub> eq.).
  - Total emissions decreased by 7.3% (103 Mt CO<sub>2</sub> eq.) when compared to those of FY2013 (1,410 Mt CO<sub>2</sub> eq.).
  - Total emissions decreased by 5.2% (72 Mt CO<sub>2</sub> eq.) when compared to those of FY2005 (1,379 Mt CO<sub>2</sub> eq.).

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

### Note:

- The main factor for the lower emissions in FY2016 as compared to FY2015 and FY2013 is the decrease in energy-related CO<sub>2</sub> emissions due to the decrease in energy consumption through energy conservation, and the increase in the share of non-fossil fuels within the domestic energy supply brought by the wider adoption of solar and wind power and resumption of nuclear power plant operation, despite the increase in hydrofluorocarbon emissions from refrigerants that substitute for ozone-depleting substances.
- The main factor for the drop in emissions in FY2016 as compared to FY2005 is the decrease in energy-related CO<sub>2</sub> emissions owing to the decrease in energy consumption through energy conservation, despite the increase in hydrofluorocarbon emissions from refrigerants that substitute for ozone-depleting substances.
- Removals by forest and other carbon sinks from activities under the Kyoto Protocol<sup>3</sup> in FY 2016 were 55.4 Mt CO<sub>2</sub> eq., consisting of 47.5 Mt CO<sub>2</sub> eq. by forest carbon sinks and 7.8 Mt CO<sub>2</sub> eq. by cropland management, grazing land management, and urban revegetation.

### Footnote:

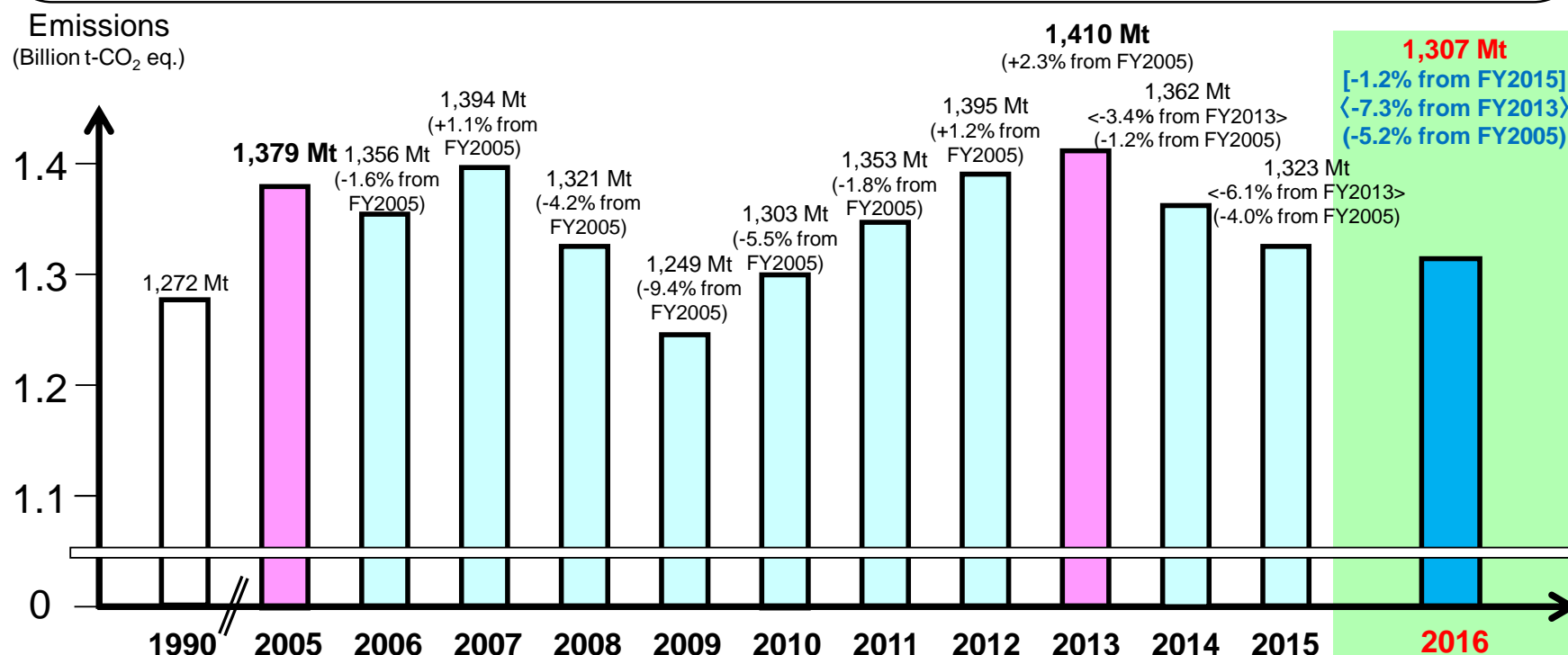
1. "Final figures" means the figures officially submitted to the Secretariat of the United Nations Framework Convention on Climate Change (hereinafter, Convention) as Japan's GHG emissions and removals in the national GHG inventory. The final figures compiled this time may be recalculated when annual values in statistical data are updated, and/or estimation methods are revised.
2. There are some differences between the final figures compiled this time and preliminary figures

corrected and released on January 9<sup>th</sup>, 2018, because some recalculation was conducted based on annual values in statistics and other data which were made available after the estimation of preliminary figures, and some estimation methods were further revised. The preliminary figures for GHG emissions in FY2016 were a 0.2% decrease compared to FY2015 (6.2% decrease and 4.6% 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 Kyoto Protocol.

## Japan's total greenhouse gas emissions in fiscal year (FY) 2016 (Final figures)

- Japan's total greenhouse gas (GHG) emissions in FY2016 (final figures) were **1,307 Mt CO<sub>2</sub> eq.** (1.2% decrease as compared to FY2015; 7.3% decrease from FY2013; and 5.2% decrease from FY2005 levels)
- The main factor for the lower emissions in FY2016 as compared to FY2015 and FY2013 is the decrease in energy-related CO<sub>2</sub> emissions due to the decrease in energy consumption through energy conservation, and the increase in the share of non-fossil fuels within the domestic energy supply brought by the wider adoption of solar and wind power and resumption of nuclear power plant operation, despite the increase in hydrofluorocarbon emissions from refrigerants that substitute for ozone-depleting substances.
- The main factor for the drop in emissions in FY2016 as compared to FY2005 is the decrease in energy-related CO<sub>2</sub> owing to the decrease in energy consumption through energy conservation, despite the increase in hydrofluorocarbon emissions from refrigerants that substitute for ozone-depleting substances.



1. "Final figures" means 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 values in statistical data are updated, and/or estimation methods are revised.
2. There are some differences between the final figures compiled this time and preliminary figures released on January 9th, 2018, because some recalculation was conducted based on annual values in statistics and other data which were made available after the estimation of preliminary figures, and some estimation methods were further revised.
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 greenhouse gas emissions in FY2016 (final figures)

Table 1 Japan's national greenhouse gas emissions by gas  
(comparison with FY2005, FY2013, and FY2015)

	FY1990 emissions [Share]	FY2005 emissions [Share]	FY2013 emissions [Share]	FY2015 emissions [Share]	FY2016			
					Emissions [Share]	(Compared to FY2005)	(Compared to FY2013)	(Compared to FY2015)
<b>Total</b>	1,272 [100%]	1,379 [100%]	1,410 [100%]	1,323 [100%]	1,307 [100%]	-5.2%	-7.3%	-1.2%
<b>Carbon Dioxide (CO<sub>2</sub>)</b>	1,161 [91.2%]	1,290 [93.6%]	1,316 [93.4%]	1,226 [92.6%]	1,206 [92.3%]	-6.5%	-8.3%	-1.6%
Energy-related Carbon Dioxide	1,065 [83.7%]	1,198 [86.9%]	1,235 [87.6%]	1,147 [86.7%]	1,128 [86.3%]	-5.9%	-8.7%	-1.7%
Non-energy-related Carbon Dioxide	95.7 [7.5%]	91.8 [6.7%]	80.9 [5.7%]	78.3 [5.9%]	78.6 [6.0%]	-14.4%	-2.9%	+0.4%
<b>Methane (CH<sub>4</sub>)</b>	44.3 [3.5%]	35.6 [2.6%]	32.5 [2.3%]	31.1 [2.4%]	30.8 [2.4%]	-13.4%	-5.3%	-1.1%
<b>Nitrous Oxide (N<sub>2</sub>O)</b>	31.7 [2.5%]	25.1 [1.8%]	21.7 [1.5%]	21.0 [1.6%]	20.7 [1.6%]	-17.5%	-4.8%	-1.4%
<b>F-gases</b>	35.4 [2.8%]	27.9 [2.0%]	39.1 [2.8%]	45.3 [3.4%]	48.8 [3.7%]	+74.7%	+24.8%	+7.7%
Hydrofluorocarbons (HFCs)	15.9 [1.3%]	12.8 [0.9%]	32.1 [2.3%]	39.2 [3.0%]	42.5 [3.3%]	+232.6%	+32.5%	+8.3%
Perfluorocarbons (PFCs)	6.5 [0.5%]	8.6 [0.6%]	3.3 [0.2%]	3.3 [0.3%]	3.4 [0.3%]	-60.9%	+2.9%	+2.0%
Sulfur Hexafluoride (SF <sub>6</sub> )	12.9 [1.0%]	5.1 [0.4%]	2.1 [0.1%]	2.2 [0.2%]	2.3 [0.2%]	-55.4%	+7.2%	+4.7%
Nitrogen Trifluoride (NF <sub>3</sub> )	0.03 [0.003%]	1.5 [0.1%]	1.6 [0.1%]	0.6 [0.04%]	0.6 [0.05%]	-56.9%	-60.8%	+11.1%

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

Table 2 Energy-related CO<sub>2</sub> emissions from each sector  
(CO<sub>2</sub> emissions from power and heat allocated to each final demand sector)

	FY1990 emissions [Share]	FY2005 emissions [Share]	FY2013 emissions [Share]	FY2015 emissions [Share]	FY2016			
					Emissions [Share]	(Compared to FY2005)	(Compared to FY2013)	(Compared to FY2015)
<b>Total</b>	1,065 [100%]	1,198 [100%]	1,235 [100%]	1,147 [100%]	1,128 [100%]	-5.9%	-8.7%	-1.7%
Industries (factories, etc.)	502 [47.1%]	466 [38.9%]	467 [37.8%]	433 [37.7%]	418 [37.0%]	-10.4%	-10.5%	-3.5%
Transport (cars, etc.)	207 [19.5%]	244 [20.4%]	224 [18.1%]	217 [19.0%]	215 [19.1%]	-11.9%	-3.8%	-0.9%
Commercial and other (commerce, service, office, etc.)	129 [12.1%]	217 [18.1%]	239 [19.4%]	218 [19.0%]	214 [19.0%]	-1.2%	-10.4%	-1.7%
Residential	130 [12.2%]	174 [14.5%]	205 [16.6%]	187 [16.3%]	188 [16.7%]	+8.2%	-8.3%	+0.6%
Energy industries	96.6 [9.1%]	97.1 [8.1%]	100.2 [8.1%]	92.6 [8.1%]	92.6 [8.2%]	—	—	—
Oil refineries, power plants, etc.	96.5 [8.3%]	102.7 [8.0%]	104.9 [8.0%]	96.5 [7.9%]	97.7 [8.1%]	-4.9%	-6.9%	+1.2%
Statistical discrepancy from power and heat allocation	0.1 [0.01%]	-5.6 [-0.4%]	-4.8 [-0.4%]	-3.9 [-0.3%]	-5.1 [-0.4%]	—	—	—

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

**【Details of main increases/decreases in energy-related CO<sub>2</sub> emissions (after allocation of power and heat), as compared to FY2015】**

- Industries sector (factories, etc.): 14.9 million tonnes (3.5%) decrease
  - Energy consumption decreased due to energy conservation.
- Transport sector (cars, etc.): 2.0 million tonnes (0.9%) decrease
  - Emissions from freight lorries/trucks and household-owned cars decreased.
- Commercial and other sector (commerce, services, office, etc.): 3.7 million tonnes (1.7%) decrease
  - Energy consumption decreased due to energy conservation.
- Residential sector: 1.0 million tonnes (0.6%) increase
  - Energy consumption such as electricity and kerosene increased.
- Energy Industries sector (oil refineries, power plants, etc.) (excluding statistical discrepancy from power and heat allocation): 1.2 million tonnes (1.2%) increase
  - Emissions from utility power producers increased. (This is affected by the change in the definition of utility power producers, due to the amendment of the Electricity Business Act.)

**【Details of main increases/decreases in emissions other than energy-related CO<sub>2</sub> emissions, as compared to FY2015 (CO<sub>2</sub> eq.)】**

- Non-energy related CO<sub>2</sub> emissions: 0.3 million tonnes (0.4%) increase
  - Emissions from the Waste sector increased.
- Methane (CH<sub>4</sub>) emissions: 0.3 million tonnes (1.1%) decrease
  - Emissions from the Waste and Agriculture sectors decreased.
- Nitrous Oxide (N<sub>2</sub>O) emissions: 0.3 million tonnes (1.4%) decrease
  - Emissions from the Fuel Combustion and Fugitive Emissions sector and the Industrial Processes and Product Use sector decreased.
- Hydrofluorocarbon (HFC) emissions: 3.3 million tonnes (8.3%) increase
  - Emissions from refrigerants increased.
- Perfluorocarbon (PFC) emissions: 0.07 million tonnes (2.0%) increase
  - Emissions from semiconductor and liquid crystal display (LCD) manufacturing increased.
- Sulfur Hexafluoride (SF<sub>6</sub>) emissions: 0.1 million tonnes (4.7%) increase
  - Emissions from metal production increased.
- Nitrogen Trifluoride (NF<sub>3</sub>) emissions: 0.06 million tonnes (11.1%) increase
  - Emissions from semiconductor and LCD manufacturing increased.