

Special Bulletin
Government Presents Draft GHG Emission Reduction Target

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【Summary】

At the seventh joint meeting of the subcommittee on post-2020 global warming measures of the Global Environment Subcommittee, Central Environment Council, and the INDC working group of the Subcommittee for Global Environment, Environment Committee, Industrial Structure Council, on April 30, the government presented an outline of its draft “Intended Nationally Determined Contribution,” or INDC, for submission to the 21st Conference of Parties to the United Nations Framework Convention on Climate Change, including Japan's target of reducing greenhouse gas emissions in FY2030 by 26.0% from FY2013 (by 25.4% from FY2005) to about 1,042 million tons of CO₂ equivalent.

Seeing a Group of Seven summit in Germany in June as the timing for announcing the INDC, the government plans to compile the draft INDC based on the outline for public comments, decide the final INDC at the Global Warming Prevention Headquarters and submit it to the UNFCCC Secretariat. It also plans to work out a global warming action plan based on the Act on Promotion of Global Warming Countermeasures.

Particularly regarding the GHG emission reduction target, it is important to assess the reasonability of the target and share the target from the diplomatic viewpoint of leading the world by offering a GHG emission reduction target as ambitious as those of European countries and the United States and from the viewpoint of the feasibility of energy policy goals including the energy mix.

1. Draft GHG emission reduction target for INDCs

At the seventh joint meeting of the subcommittee on post-2020 global warming measures of the Global Environment Subcommittee, Central Environment Council, and the INDC working group of the Subcommittee for Global Environment, Environment Committee, Industrial Structure Council, on April 30, the government presented an outline of its draft “Intended Nationally Determined Contribution,” or INDC, for submission to the 21st Conference of Parties to the United Nations Framework Convention on Climate Change, including Japan's target of reducing greenhouse gas emissions in FY2030 by 26.0% from FY2013 (25.4% from FY2005) to about 1,042 million tons of CO₂ equivalent. The target is based on a draft target of cutting energy-related CO₂ emissions in

FY2030 by 25% from FY2013, as presented at a meeting of the Long-term Energy Supply and Demand Outlook Subcommittee of the Advisory Committee for Natural Resources and Energy on April 28 and covers measures for other GHG emission sources.

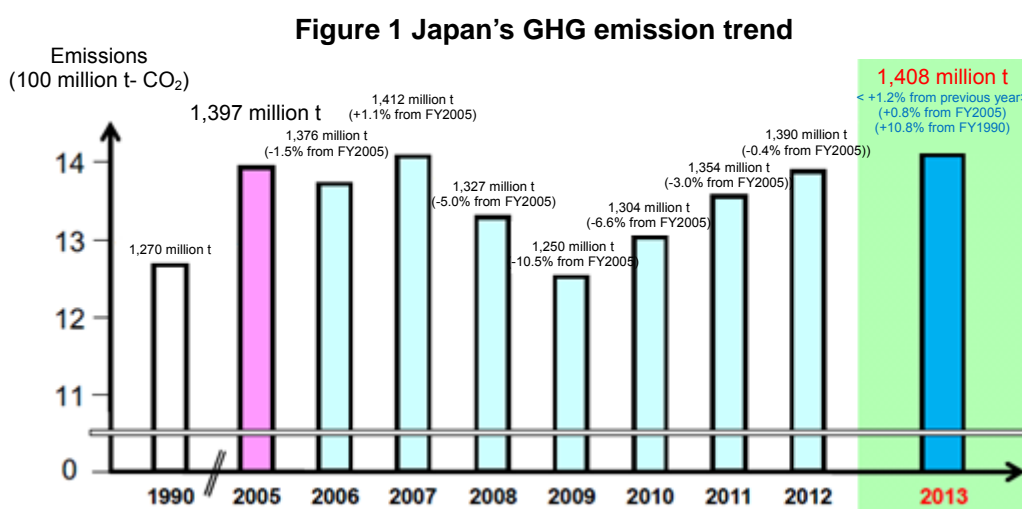
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At the joint meeting, many participants reaffirmed that Japan should aim to realize a cheap, stable system for its energy mix as a key precondition for the GHG emission reduction target. As for the GHG target, participants broadly appreciated the target year and level. But they pointed out that attention should be paid to GHG emission reduction costs' economic and social impacts and that explanations should be given on where the target is positioned in connection with long-term targets. They also gave a view that the government should take care to prevent misunderstanding at home and abroad in regard to the description of the Joint Crediting Mechanism in the INDC.

2. Overview of GHG emission reduction target

2.1 Outline of Japan's GHG emissions

According to the Ministry of the Environment, GHG emissions in Japan in FY2013 totaled 1,408 million t-CO₂ on a final report basis, the second highest ever level after the peak in FY2007 (Figure 1). This may be particularly because fossil fuel consumption for power generation after the Great East Japan Earthquake made great contributions to GHG emissions. Another factor behind the GHG emission growth may be increasing emissions of hydrofluorocarbons (HFCs) as replacements for ozone-depleting substances for cooling.



Note 1: The final report basis means the emission data reported officially as Japan's GHG emissions and absorptions to

the UNFCCC Secretariat. The final report value could be revised depending on revisions to various annual statistical data and calculation methods.

Note 2: The finally compiled emission value is different from the preliminary FY2013 value due to calculation method revisions for improving the calculation accuracy in line with the UNFCCC guidelines for GHG emission and absorption reports, and recalculation based on various annual statistical data made available after the calculation of the preliminary FY2013 value (published on December 4, 2014).

Note 3: Annual emissions and percentage changes from earlier years (e.g., changes from FY2005) do not cover absorptions based on the Kyoto Protocol.

(Source) Ministry of the Environment

The FY2013 emissions represent a 10.8% rise from FY1990 as the base year for the Kyoto Protocol among UNFCCC-related base years (but the Kyoto Protocol target covers domestic GHG absorptions and the Kyoto Mechanism) and a 0.8% increase from FY2005 as the base year for the target for 2020 (the interim emission reduction target at 3.8%) as announced by Japan at the COP19 meeting in line with the Cancun agreement.

A sector-by-sector breakdown of energy-related CO₂ emissions (Table 1: sector-by-sector breakdown of emissions after distribution of electricity and heat generation to sectors) accounting for some 90% of total GHG emissions indicates that emissions declined by 15% from FY1990 in the industry sector while increasing by 9% in the transport sector, by 53% in the residential sector and by 108% in the commercial sector. Particularly, emissions in the residential and commercial sectors posted remarkable increases. This suggests that carbon reduction in power generation and promotion of energy conservation in the residential, commercial and transport sectors are growing even more important.

Table 1 Trends of energy-related CO₂ emissions by sector (after distribution of electricity and heat generation)

	FY1999 [share]	FY 2005 [share]	FY 2012 [share]	Change from previous year	FY2013 (from FY2005) [share]
Total	1,067 [100%]	1,219 [100%]	1,221 [100%]	→ <+1.1%> →	1,235 (+1.3%) (100%)
Industry sector (plants, etc.)	503 [47.2%]	457 [37.5%]	432 [35.4%]	→ <-0.7%> →	429 (-0.6%) (34.8%)
Transport sector (vehicles, etc.)	206 [19.3%]	240 [19.7%]	226 [18.5%]	→ <-0.7%> →	225 (-6.3%) (18.2%)
Commercial sector (commerce, services, business offices, etc.)	134 [12.5%]	239 [19.6%]	254 [20.8%]	→ <+9.9%> →	279 (+16.7%) (22.6%)
Residential sector	131 [12.3%]	180 [14.8%]	204 [16.7%]	→ <-1.3%> →	201 (+11.9%) (16.3%)
Energy conversion sector (power plants, etc.)	92.4 [8.7%]	104 [8.5%]	105 [8.6%]	→ <-3.8%> →	101 (-2.9%) (8.2%)

(Unit: million t-CO₂)

(Source) Ministry of the Environment

2.2 List of information for INDC

The INDC for submission to the UNFCCC Secretariat is designed to provide the following information featuring multiple reference points or base years:

- (1) Reference point (a base year)

Descriptions should center on changes from FY2013. Both FY2013 and 2005 should be registered as base years.

(2) Target year

FY2030 (period for implementation: April 1, 2021, through March 31, 2031)

(3) Scope and coverage

[Sectors covered] all sectors (energy (fuel combustion (energy, manufacturing, construction, transport, commercial, residential, agriculture/forestry/fishery and other sectors), leaks from fuels, CO₂ transportation and storage), industrial processes and use of manufactured products, agriculture, LULUCF (land use, land-use change and forestry), and wastes)

[Gases covered] CO₂, CH₄, N₂O, HFC_s, PFC_s, SF₆ and NF₃

[Coverage] 100%

(4) Planning processes

Domestic planning and decision-making processes for preparation of the INDC (details omitted)

(5) Assumptions and methodological approaches

Methods for calculating GHG emissions (details omitted)

(6) Other information as decided at UNFCCC COP meetings

2.3 Draft GHG emission reduction target

The GHG emission reduction target in the draft INDC calls for cutting total GHG emissions in FY2030 by 26% from FY2013. The target reduction features full dependence on domestic measures such as reduction of energy-related CO₂ and other GHG emissions and their absorptions into sinks, excluding overseas GHG emission reduction credits that had been taken into account for achieving the GHG emission reduction target under the Kyoto Protocol. The target's details are as follows:

(1) Energy-related CO₂ emissions

The draft INDC adopts a draft energy-related CO₂ emission reduction target given at a meeting of the Long-term Energy Supply and Demand Outlook Subcommittee of the Advisory Committee for Natural Resources and Energy on April 28. Specifically, the draft energy-related CO₂ emission reduction target seeks to cut energy-related CO₂ emissions in FY2030 by 25% from FY2013. Given that energy-related CO₂ emissions account for about 90% of Japan's total GHG emissions, this target means a total GHG emission cut of 21.9%.

(2) Other GHG emissions

1) Non-energy-related CO₂ emissions

The draft INDC seeks to cut non-energy-related CO₂ emissions in FY2030 by 6.7% from FY2013 (by 17.0% from FY2005) to about 70.8 million t-CO₂.

2) Methane

The draft INDC seeks to cut methane emissions in FY2030 by 12.3% from FY2013 (by 18.8% from FY2005) to about 31.6 million t-CO₂.

3) N₂O

The draft INDC seeks to cut dinitrogen monoxide (N₂O) emissions in FY2030 by 6.1% from FY2013 (by 17.4% from FY2005) to about 21.1 million t-CO₂.

4) Four gases including HFCs

The draft INDC seeks to cut the emissions of HFCs (hydrofluorocarbons), PFCs (perfluorinated chemicals), SF₆ (sulfur hexafluoride) and NF₃ (nitrogen trifluoride) in FY2030 by 25.1% from 2013 to about 28.9 million t-CO₂ (up 4.5% from 2005).

(3) Domestic sinks

The draft INDC aims to have 37 million t-CO₂ (equivalent to 2.6% of total GHG emissions in FY2013 or 2.6% of those in FY2005) absorbed through sink activities. The total absorptions include 27.8 million t-CO₂ (equivalent to 2.0% of total GHG emissions in FY2013 or FY2005) for forest sink activities and 9.1 million t-CO₂ (equivalent to 0.6% of total GHG emissions in FY2013 or 0.7% of those in FY2005) for the promotion of farmland sink activities and urban greening.

GHG absorptions through forest and other sink activities are calculated with the same approach as for the Kyoto Protocol. The approach sets a ceiling on absorptions through sink activities in each country. The estimated absorptions in the draft INDC are judged as meeting the approach. But we must take note of the possibility of the absorption calculation approach being modified through international negotiations.

(4) JCM and other international contributions

The draft INDC, while refraining from depending on the Joint Crediting Mechanism for achieving the GHG emission reduction target, calls for appropriately counting Japan's overseas GHG emission reductions and absorptions as its reductions.

The JCM is planned to be built and implemented to quantify Japan's contributions to GHG emission reductions and absorptions through the diffusion of GHG emission reduction technologies, products, systems, services and infrastructure and the implementation of emission reduction measures in developing countries and to help Japan achieve its emission reduction target. Apart from the private sector's contributions, the Japanese government's projects under its annual budgets are estimated to achieve 50-100 million t-CO₂ in cumulative overseas GHG emission reductions and absorptions through FY2030. Furthermore, the draft INDC projects emission reduction potentials for international contributions through initiatives by government agencies and the industrial world in addition to the JCM. It also seeks to proactively make international contributions including the promotion of GHG emission reduction technology development, the diffusion of such technologies and human resources development in developing countries.

Table 2 Projected energy-related CO₂ emissions by sector (after distribution of electricity and heat generation)

	Projected emissions in FY2030	FY2013 (FY2005)
Energy-related CO ₂ emissions	927	1,235 (1,219)
Industry sector	401	429 (457)
Commercial and other sectors	168	279 (239)
Residential sector	122	201 (180)
Transport sector	163	225 (240)
Energy conversion sector	73	101 (104)

(Unit: million t-CO₂)

(Source) Document for the seventh joint meeting of the subcommittee on post-2020 global warming measures, Global Environment Subcommittee, Central Environment Council, and the INDC working group, Subcommittee for Global Environment, Environment Committee, Industrial Structure Council (April 30, 2015)

Table 3 Non-energy-related CO₂, methane and N₂O emission targets

	FY2030 emission target	FY2013 (FY2005)
Non-energy-related CO ₂	70.8	75.9 (85.4)
Methane (CH ₄)	31.6	36.0 (39.0)
Dinitrogen monoxide (N ₂ O)	21.1	22.5 (25.5)

(Unit: million t-CO₂)

(Source) Same as for Table 2

Table 4 Emission targets for HFCs and three other gases

	FY2030 emission target	FY2013 (FY2005)
HFCs and three other gases	28.9	38.6 (27.7)
HFC _s	21.6	31.8 (12.7)
PFC _s	4.2	3.3 (8.6)
SF ₆	2.7	2.2 (5.1)
NF ₃	0.5	1.4 (1.2)

(Unit: million t-CO₂)

(Source) Same as for Table 2

3. Assessment of GHG emission reduction target (interim)

The GHG emission reduction target in the draft INDC calls for cutting energy-related CO₂ emissions accounting for 90% of Japan's total GHG emissions by 25% from FY2013 (or by 21.9% from total GHG emissions in FY2013), indicating the significance of harmony between energy and global warming policies. The following two points may be important for assessing specific initiatives:

(1) Feasibility of power generation targets for nuclear and renewables emitting no CO₂

The draft long-term energy supply and demand outlook provides an attention-attracting electricity mix including renewable energy accounting for 22-24% of 1,065 billion kWh in total

power generation and nuclear for 20-22%. Range shares have thus been given for renewables and nuclear.

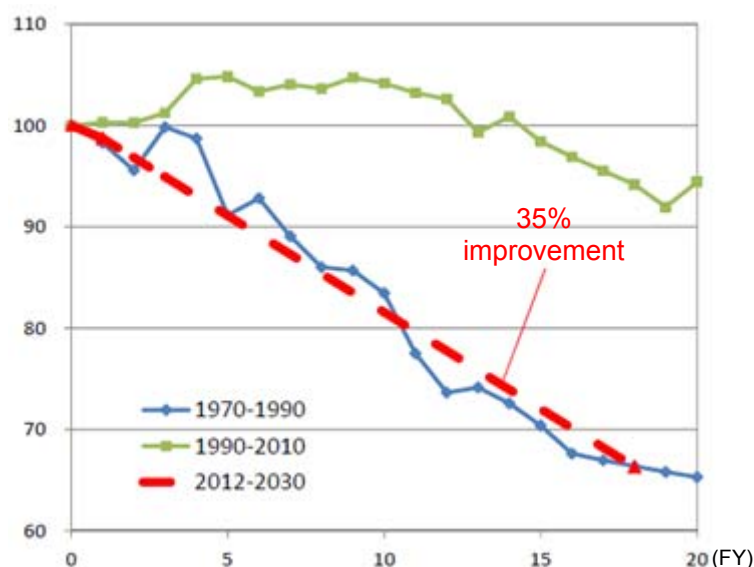
As for the expansion of renewable energy use, there is a problem of how to reduce the feed-in-tariff system's burden on the people for solar photovoltaics and other volatile electricity sources. Depending on revisions to the FIT system, expected investment growth could be lowered. Given that the outlook seeks to expand non-volatile renewable energy electricity sources such as geothermal heat, hydro and biomass to the physical maximum, proactive policies will be required to be implemented for achieving the renewable energy diffusion target. Meanwhile, the early restart of nuclear power plants and the extension of very old nuclear plants' operation are indispensable for achieving nuclear energy's share of the electricity mix. Japan will have to proceed with initiatives to achieve the target share while securing nuclear plant operation in harmony with safety standards of the Nuclear Regulation Authority in order to contribute to achieving the CO₂ emission reduction target.

(2) Energy conservation as great as efforts just after oil crises

Promotion of energy conservation to increase the overall efficiency of the entire society is indispensable for preventing global warming as it contributes to achieving energy security and supply targets for renewable and nuclear energy. The draft target indicates that thorough energy conservation measures could cut final energy consumption by 13% from a case without such measures to 326 million kiloliters in terms of crude oil. It thus projects an energy efficiency improvement as substantial as that just after the oil crises.

As is widely known, imported energy prices since 2000 had been higher than in the 1990s. The real yen-denominated import CIF price for crude oil in 2010 more than doubled from 1990. Such price for liquefied natural gas nearly doubled. During the two decades, the energy consumption efficiency improved by more than 10% (Figure 2). The draft outlook provides the energy conservation target for a case where electricity costs would be lowered through supply-side initiatives. Given the price effect, it may be very challenging to achieve an energy efficiency improvement as substantial as the 35% improvement just after the oil crises over a period between 2012 and 2030.

Figure 2 Energy conservation's effect in draft long-term energy supply and demand outlook



Energy efficiency = final energy consumption/real GDP

(Source) Document for 8th meeting (April 28, 2015) of the Long-term Energy Supply and Demand Outlook Subcommittee, Strategic Policy Committee, Advisory Committee for Natural Resources and Energy

As mentioned above, the maximum efforts conceivable at present are assumed for supply- and demand-side measures. Policy measures to achieve the emission reduction target will have to be continuously verified with their feasibility (the possibility of the GHG emission reduction target being achieved) and their cost-effectiveness taken into account.

4. Future prospects and challenges

The GHG emission reduction target in the draft INDC is based on discussions giving priority to the objectives (three Es plus S -- economic efficiency, energy security and environmental protection plus safety) of the revised Basic Energy Plan that was developed after the Great East Japan Earthquake and decided on by the Cabinet in April 2014. The GHG emission reduction target apparently implies an attempt to demonstrate Japan's positive attitude in consideration of future international negotiations. Representing the attempt is the basic policy for the preparation of the long-term energy supply and demand outlook that calls for leading the world by offering a GHG emission reduction target as ambitious as those of European countries and the United States.

In fact, GHG emission reduction targets submitted to the UNFCCC Secretariat by the European Union and the United States by March look high. But base and target years for their targets are different, with no objective assessment given to their feasibility and costs. For example, a U.S. clean power plan to regulate the power generation sector is attracting attention in regard to the U.S.

target for 2025. But some observers have pointed out that the plan alone is expected to fail to attain the GHG emission reduction target of 26-28%, with effects of other policy measures left unspecified. The EU countries have agreed on the GHG emission reduction target of 40% while remaining apart over renewable energy diffusion and energy conservation targets, leaving specific target-attaining measures for future consideration. Japan's latest GHG emission reduction target is based on the implementation of maximum efforts. At a time when other countries' efforts have not necessarily been objectively compared or assessed, it is important for the government to provide a persuasive analysis in Japan and other countries.

Table 5 Comparison of GHG emission reduction targets in U.S. and EU INDCs

	From 2013	From 1990	From 2005
U.S.	▲ 18-21% (2025)	▲ 14-16% (2025)	<u>▲ 26-28%</u> (2025)
EU	▲ 24% (2030)	<u>▲ 40%</u> (2030)	▲ 35% (2025)

◆ The United States and the EU have specified the base year as 2005 and 1990, respectively, for their submitted GHG emission reduction targets

(Source) Document for 8th meeting (April 28, 2015) of the Long-term Energy Supply and Demand Outlook Subcommittee, Strategic Policy Committee, Advisory Committee for Natural Resources and Energy

A new platform to be pursued at the COP21 meeting is expected to provide targets based on UNFCCC countries' maximum feasible efforts and specific emission reduction measures and improve their effectiveness through a continuous review process, instead of allocating targets to UNFCCC members under the Kyoto Protocol approach. Given the direction of the international negotiations, the base and target years for the GHG emission reduction target in the draft INDC can be viewed as reasonable as indicating a year when Japan should begin to build a new energy supply and demand system. The EU and U.S. targets are based on domestic conditions. The future assessment of GHG emission reduction targets in INDCs should focus not only on numerical targets but also on relevant national and regional conditions and backgrounds including the fairness and feasibility of the targets. For example, it may be effective for Japan to consider and domestically and internationally propose objective assessment indicators and approaches including comparison of sector-by-sector efficiency and costs for emission reduction measures. Among objective indicators, energy intensity and GHG emission intensity, or analyses giving consideration to costs for emission reduction measures, may help promote understanding. As for the GHG emission reduction target in the draft INDC, the assessment of national and regional conditions and future policy measures based on these viewpoints will have to be conducted continuously, with efforts being made to have

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stakeholders in Japan and other countries understand and share assessment results and details of the Japanese target.

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