Annual Partnership Retreat

"Enhanced transparency -Learning from implementation, facilitating negotiations"

Japan's experience in improving GHG inventories over time

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Overview of history of Japan's inventory preparation

- ✓ Japan submitted its **1st NC** including GHG inventories **in 1994**.
- ✓ Began to submit its **annual GHG inventories since 1996**, and have continued to **submit every year** since then.
- ✓ Established "Act on Promotion of Global Warming Countermeasures" including the **request for the Government to estimate national GHG emissions and removals every year** in 1998.
- ✓ Established "**Greenhouse gas Inventory Office (GIO)**" which performs the actual work of inventory compilation in 2002 to respond to the requirements related to the national system under the Kyoto Protocol (Art. 5.1).
- ✓ **Recalculated national GHG emissions and removals every year** through domestic consideration and 14 UNFCCC inventory reviews (Desk: 2, Centralized: 9, in-country: 3)

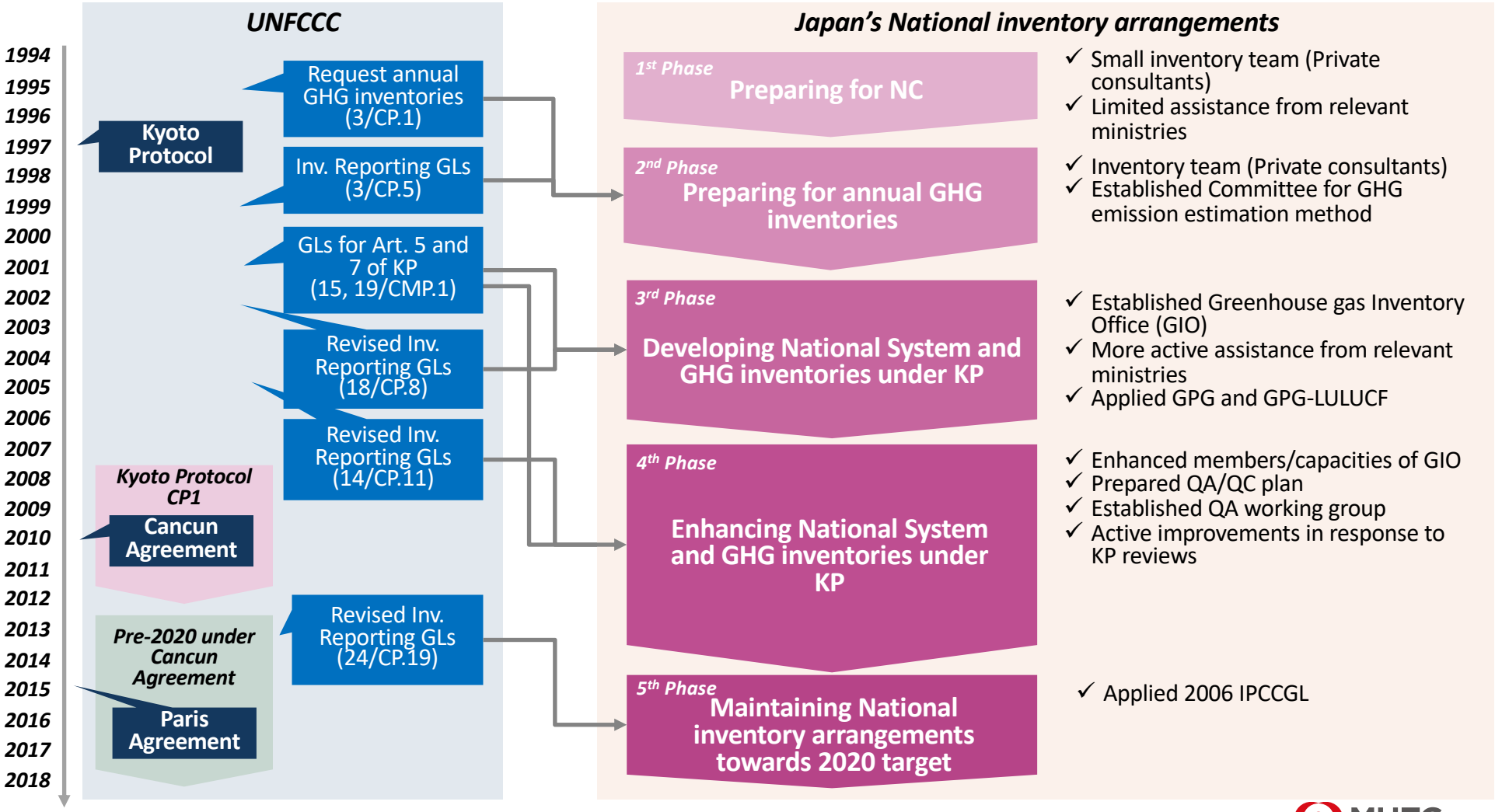
Japan has implemented continuous improvements of GHG inventories over 20 years.

Questions

1. ***What were the main drivers of continuous improvements for Japan?***
2. ***What was the impact of the continuous improvements (recalculations) on the GHG emissions?***
3. ***Why does Japan believe that continuous improvements of GHG inventories are extremely important and necessary?***

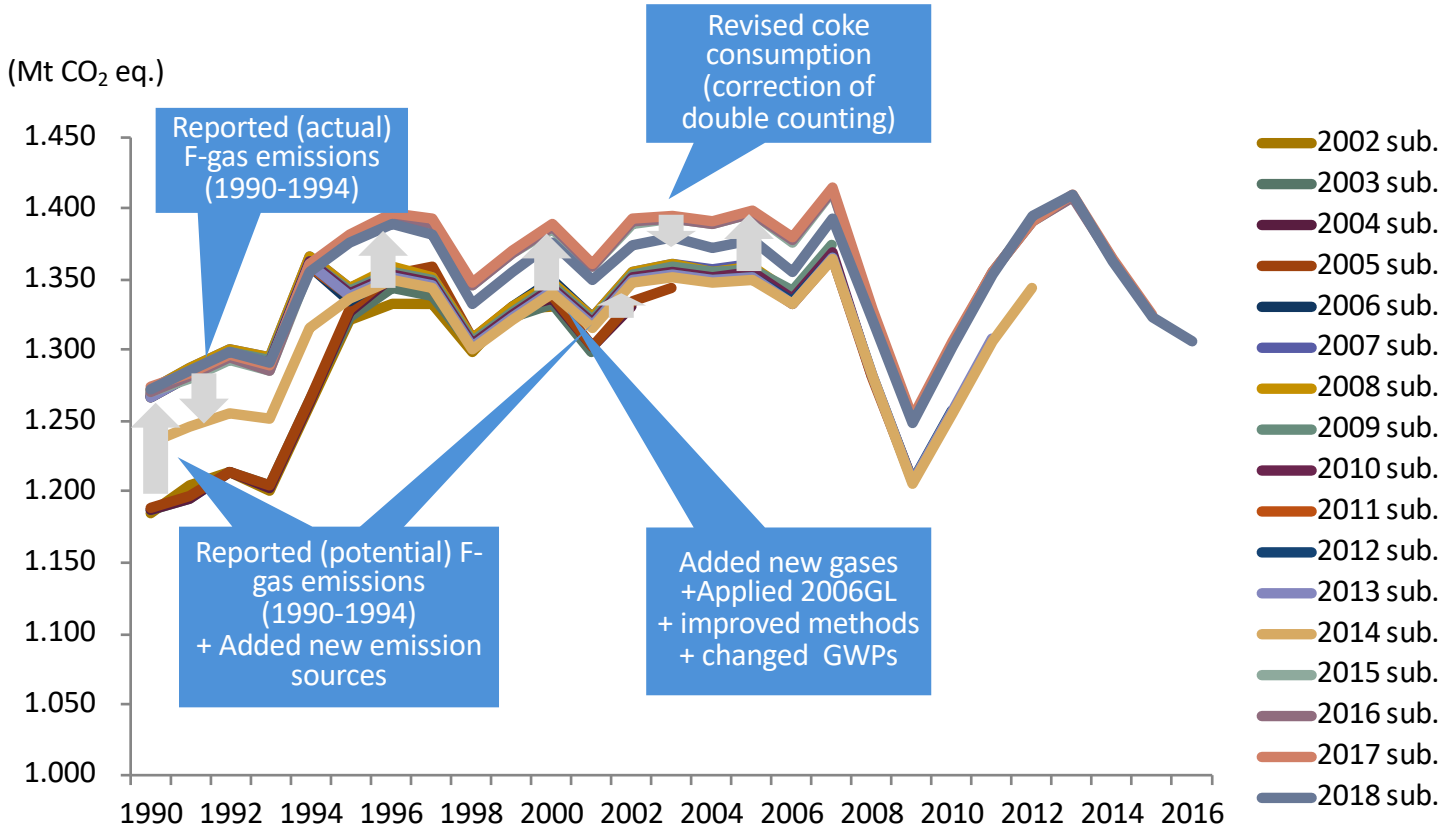
History of Japan's inventory arrangements

✓ **Reporting requirements have become good opportunities** to enhance national inventory arrangements.



Changes in national total GHG emissions from Japan

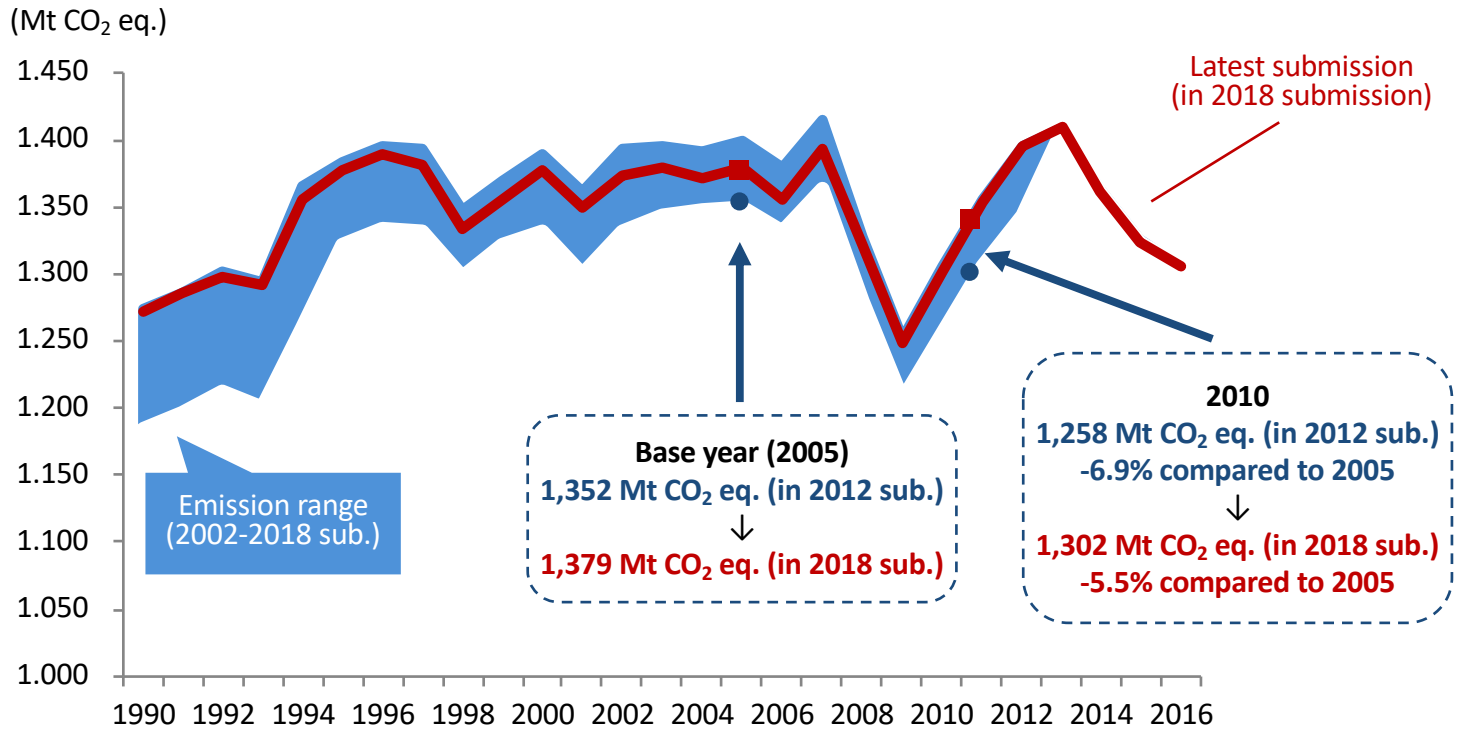
- ✓ **National total GHG emissions of Japan have changed over time** through the recalculations in each submission.
- ✓ These repeated recalculations have contributed to improving the quality of GHG inventories.



Source: National GHG inventories of Japan (CRF) (2002-2018 submission) (UNFCCC)

Impact on changes in national total GHG emissions from Japan

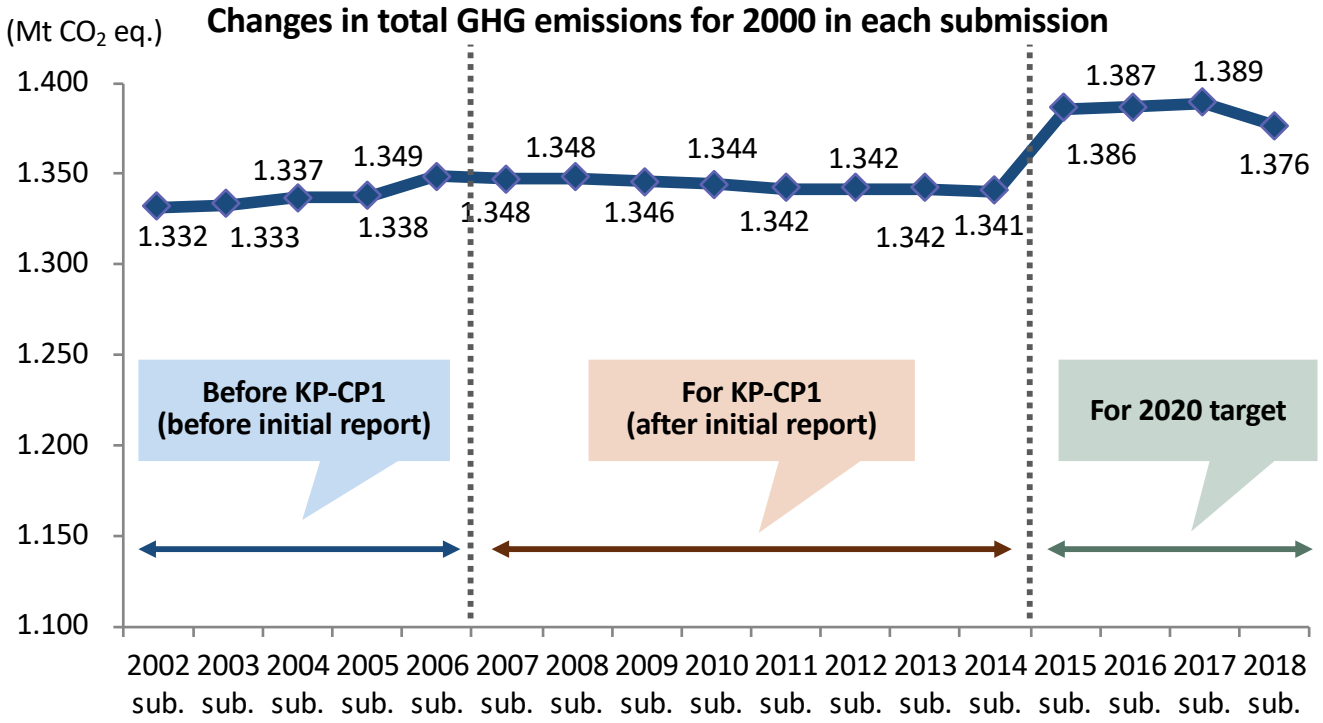
- ✓ National total GHG emissions of Japan between 1990-2016 in each submission (2002 sub. – 2018 sub.) have **a range of -6.9% - +1.8%** compared to the GHG emissions in the latest submission.
- ✓ **Recalculations could have a large impact on the achievement of the target**.



Source: National GHG inventories of Japan (CRF) (2002-2018 submission) (UNFCCC)

Changes in national total GHG emissions for 2000

- ✓ National total GHG emissions for the year 2000 has changed from 1,332 Mt CO_2 in 2002 submission to 1,376 Mt CO_2 in 2018 submission **(+45 Mt CO_2 (+3.4%))** by the recalculations.



Source: National GHG inventories of Japan (CRF) (2002-2018 submission) (UNFCCC)

Transition to 2006GL from 1996GL+GPG

- ✓ **Began to consider the application of 2006GL from 2012 internally** in parallel with the consideration for the improvement of GHG inventories based on 1996GL+GPG for KP-CP1.
- ✓ Submitted the first GHG inventories based on 2006GL **in 2015**.
- ✓ Major impacts on the total GHG emissions by applying 2006GL were by the **addition of new emission sources** like listed below. **The impact of methodological change by applying 2006GL was not so large**.

Examples of new emission sources included in the 2015 submission

Sector	Category
Energy	Abandoned underground mines, Geothermal power, etc.
IPPU	Caprolactam, glyoxal and glyoxylic acid, Titanium dioxide, Ethylene oxide, Acrylonitrile, Phthalic anhydride, Maleic anhydride, Semiconductor(NF_3), Liquid Crystals(NF_3), etc
Agriculture	Liming, Urea application, etc.
LULUCF	HWP, etc.
Waste	Anaerobic digestion at biogas facilities

Challenges of transition to 2006GL

- ✓ **2006GL is more structured, elaborated, and detailed** than 1996GL & GPG, so **much easier to use for inventory compilers**.
- ✓ Basic principles of methodology for most sources are not changed from 1996GL & GPG.
- ✓ Challenges that we faced are:
  - ◆ **Collect old data back to 1990 for new emission sources;**

    → Used extrapolation, surrogate, overlap method, etc.
  - ◆ **Gain understanding of the relevant ministries and other stakeholders for the application of 2006GL;**

    → Tried to let them understand the reporting requirements, advantage of 2006GL, and potential negative impacts of not-applying 2006GL.
  - ◆ **Consider the impacts on national target, national mitigation plan, and domestic GHG reporting system.**

    → Clearly explained possible impacts on the related systems and the revision schedule of GHG inventories to the relevant ministries/departments in advance.

Reasons for recalculation

- ✓ **Many issues were raised by the UNFCCC inventory reviews, relevant ministries, and experts**. Thanks to these suggestions, TACCC of Japan's GHG inventories has been improved by revising these issues.
- ✓ Main types for the recalculation are:
  - ✓ **Update the past activity data (AD)** (ex. Fuel consumption in Energy statistics);
  - ✓ **Add new emission sources** (ex. New sources included in 2006GL);
  - ✓ **Correct errors** (ex. Input errors, calculation errors, unintentional double counting);
  - ✓ **Revise methodologies** (ex. Apply higher tier or country-specific method);
  - ✓ **Revise parameters (EFs, AD)** (ex. Apply new default/country-specific data);
- ✓ Japan prioritizes the issues related to **improvement of methodologies reflecting the emission reductions associated with policies and measures (PaMs) to achieve the emission reduction targets.**

Examples of improvements to reflect reductions

Ex.1 Diffusion of biomass plastics (CO_2 from plastic waste incineration)

(-2010 sub.) $\boldsymbol{Emissions = A_{pla} * C}$

(2011-2015 sub.) $\boldsymbol{Emissions = (A_{pla} - A_{pla\text{-}bio}) * C}$

(2016 sub.-) $\boldsymbol{Emissions = A_{pla} * FPF * C}$

A_{pla}: amount of total plastic waste incinerated

$A_{pla\text{-}bio}$: amount of biomass plastic waste incinerated

FPF: fraction of plastics derived from fossil fuel in total plastics

(= 1- faction of biomass plastics)

C : carbon content of plastics

Ex.2: Use of nitrification inhibitor (N_2O from synthetic fertilizer)

(-2015 sub.) $\boldsymbol{Emissions = F_{SN} * EF}$

(2016 sub.-) $\boldsymbol{Emissions = F_{SNi} * EF_i + F_{SNj} * EF_j}$

F_{SN}: Nitrogen amount of synthetic fertilizer applied to agricultural soil

EF: Emission factor of synthetic fertilizer

i : without nitrification inhibitor

j : with nitrification inhibitor

The emission reductions associated with PaMs do not appear in GHG emissions in some cases if simple methods are used in the calculation of GHG emissions even if the PaMs are being implemented nationwide.

Summary

1. ***What were the main drivers of continuous improvements for Japan?***
   → The enhancement of reporting requirements, many suggestions from inventory reviews and domestic stakeholders, and needs to reflect emission reductions associated with PaMs.

2. ***What was the impact of the continuous improvements (recalculations) on the GHG emissions?***
   → The impact of recalculations was relatively large, which could influence the achievement of emission reduction target in some cases.

3. ***Why does Japan believe that continuous improvements of GHG inventories are extremely important and necessary?***
   → Because the emission reductions associated with PaMs being implemented could not be reflected in actual values of GHG emissions if methodological improvements were not done.

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