Recalculations in the National GHG Inventory: Japan's Case

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Hirata Eriko
Greenhouse Gas Inventory Office of Japan (GIO)
Center for Global Environmental Research (CGER)
Earth System Division (ESD)
National Institute for Environmental Studies (NIES)

Purpose of recalculations

- Time series provides information on historical emissions trends and tracks the effects of strategies to reduce emissions at the national level.

- All emissions estimates in a time series should be estimated consistently, which means that as far as possible, the time series should be calculated using the same method and data sources **in all years**.

Reference: 2006 IPCC Guidelines(GLs), Vol1,ch5

Performing recalculations is a key element in **ensuring time series consistency**

Reporting Requirements related to recalculations

- Decision 18/CMA.1 Annex.

  Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement (**MPGs**)

- Each Party **shall** perform recalculations in accordance with the IPCC guidelines, ensuring that changes in emission trends are not introduced as a result of changes in methods or assumptions across the time series. (para.28)

- Each Party **shall** report recalculations for the starting year and all subsequent years of the inventory time series, together with explanatory information and justifications for recalculations with an indication of relevant changes and their impact on the emission trends. (para.43)

Recalculations due to methodological changes/refinements

- Available data have changed
  - ✓ The abolition of data in some statistics of Japan invoked the changes in methods.

    e.g., Some data in the national statistics used for the estimation of activity data (AD) of Land converted to Forest land (4.A.2) became aggregated, therefore a new method for the disaggregation of the AD by using an alternative survey was developed, resulting in recalculations.
- A category has become key (higher Tier method applied)
- New inventory methods become available (new models for specific categories)

See *2006 IPCC GLs, Vol1, Ch5* for more details

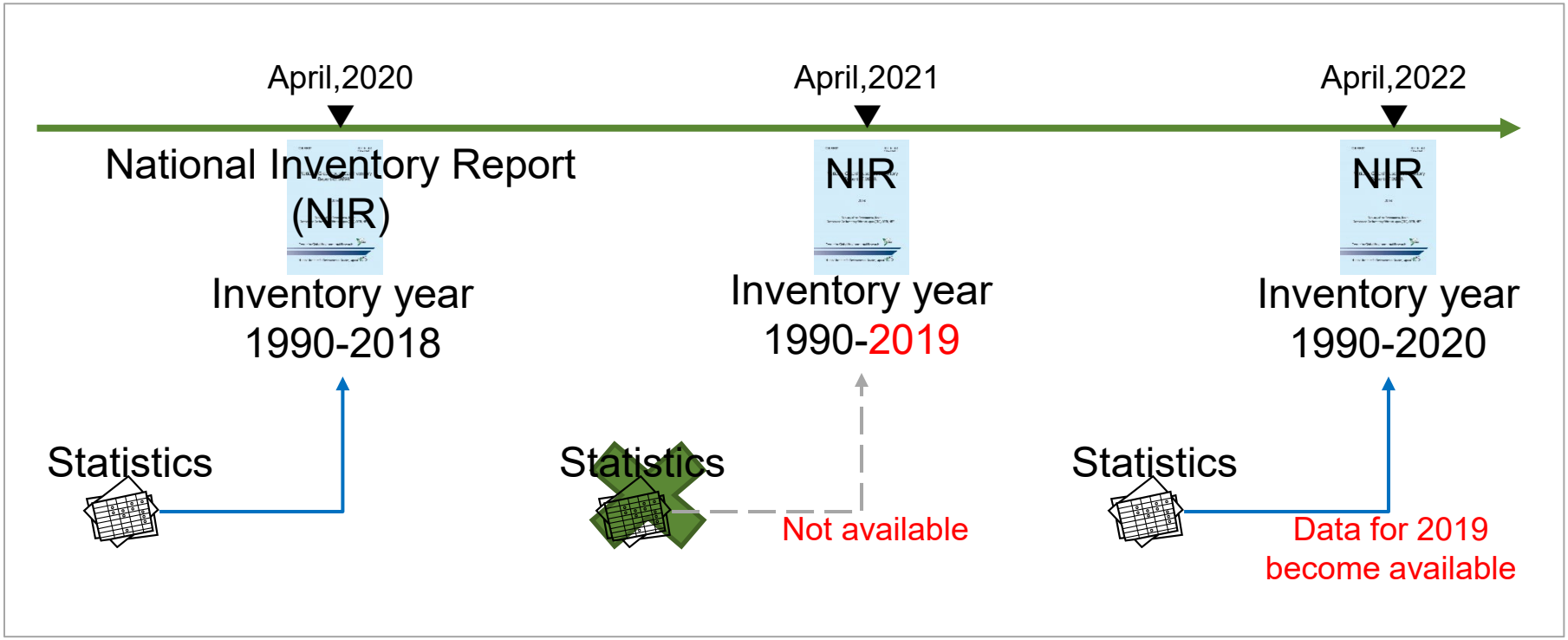
- Follow up to a recommendation from inventory reviews
- New decisions adapted by the CMA

Typical example of recalculations in Japan

Recalculations due to data refinement

- Updates of statistics/surveys
  - ✓ Some data can only be updated at longer intervals than a year, resulting in recalculations when finally updated.

    e.g., The statistics used for the AD of Liming (3.G.) are published only every two years.

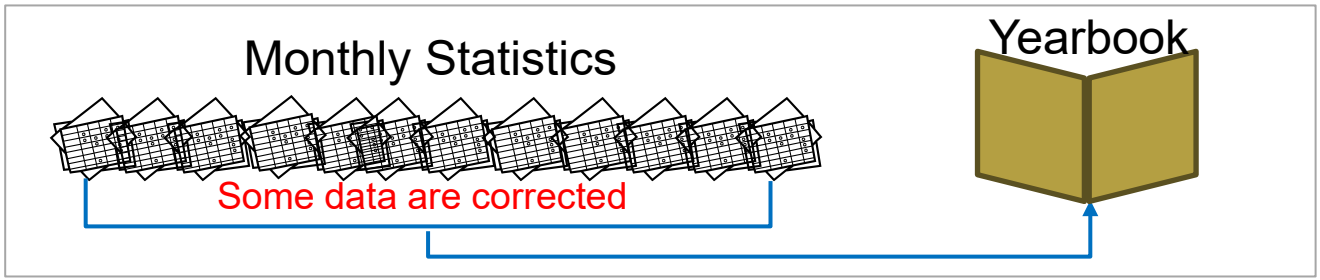


Typical example of recalculations in Japan(cont.)

Recalculations due to data refinement (cont.)

- Updates of statistics/surveys (cont.)
  - ✓ Some monthly statistics of Japan are later compiled and published as yearbooks, resulting in recalculations due to the correction of errors in the data when compiling the final yearbook.

    e.g., "*Yearbook of Current Production Statistics – Chemical Industry*".



- Data used in previous submissions are revised
  - ✓ Some statistics of Japan are revised to improve the accuracy of the data.

    e.g., The gross calorific values for some fuel types in the *"General Energy Statistics"* are annually revised.

We need to check for updated/revised data and perform recalculations when necessary.

REPORTING AND DOCUMENTATION OF RECALCULATIONS WITH JAPAN'S EXAMPLE

Reporting and Documentation

- The documentation should explain the reason for the recalculation and the effect of the recalculation on the time series.

Reference: 2006 IPCC GLs Vol1,ch5

- Recalculations chapter of the National Inventory Document(NID) outlines
  - Chapter on each CRT* sector : Category-specific recalculations, if applicable, including explanatory information and justifications for recalculations, changes made in response to the review process and impacts on emission trends
  - Chapter 10 (Recalculations and improvements) : Explanations and justifications for recalculations, including in response to the review process

Reference: Decision 5/CMA.3, Annex V
**CRT: common reporting table*

Japan's reporting example (NIR in the sectoral chapter)

The recalculation chapter of the NID outlines is similar to that of the NIR of Annex I Parties to the Convention, therefore it can be helpful as a reference.

e.g.Manufacturing Industries and Construction (1.A.2.: CH_4,N_2O)

- Category-specific Recalculations

  Since the activity data for FY1990-2019 in the General Energy Statistics were revised, the CH_4 and N_2O emissions in those years were recalculated.

  Updating the statistical data in the waste sector, CH_4 and N_2O emissions for FY2019 were recalculated.

  See section 7.4.3 for details.

Reference: NIR2022 section 3.2.7

Japan's reporting example (NIR in chapter 10)

Chapter 10. Recalculation and Improvements

- Comparison of emissions and removals in the inventories submitted in 2021 and 2022.

[Mt-CO_2 eq.]

		1990		2018	2019
CO_2	JNGI 2021	1,092.3		1,087.3	1,055.5
with LULUCF	JNGI 2022	1,092.5		1,087.4	1,054.8
(excl. Indirect CO_2)	*difference*	*0.01%*		*0.01%*	*-0.07%*
CO_2	JNGI 2021	1,158.0		1,143.5	1,105.9
without LULUCF	JNGI 2022	1,158.1		1,143.4	1,106.0
(excl. Indirect CO_2)	*difference*	*0.01%*		*0.00%*	*0.01%*
CH_4	JNGI 2021	43.9		28.6	28.5
with LULUCF	JNGI 2022	44.2		28.7	28.5
	difference	*0.52%*		*0.32%*	*0.21%*
CH_4	JNGI 2021	43.8		28.6	28.4
without LULUCF	JNGI 2022	44.1		28.7	28.5
	difference	*0.53%*		*0.31%*	*0.20%*
N_2O	JNGI 2021	32.0		20.3	20.0
with LULUCF	JNGI 2022	32.6		20.8	20.5

1. Energy [Mt-CO_2 eq.]

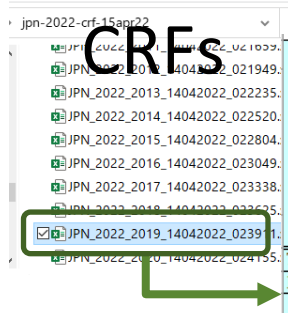
Category	Gas		1990		2018	2019
A. Fuel Combustion	CO_2	JNGI 2021	368.5		471.4	447.9
1. Energy Industries		JNGI 2022	368.5		471.3	449.0
		difference	*0.00%*		*-0.03%*	*0.24%*
	CH_4	JNGI 2021	0.5		0.4	0.4
		JNGI 2022	0.5		0.4	0.4
		difference	*0.00%*		*-0.57%*	*-0.53%*
	N_2O	JNGI 2021	0.9		2.3	1.9
		JNGI 2022	0.9		2.3	1.9
		difference	*0.00%*		*-0.06%*	*0.04%*
A. Fuel Combustion	CO_2	JNGI 2021	349.8		267.1	260.3
2. Manufacturing Industries		JNGI 2022	349.8		267.4	260.0
and Construction		*difference*	*0.00%*		*0.15%*	*-0.14%*
	CH_4	JNGI 2021	0.4		0.6	0.6
		JNGI 2022	0.4		0.6	0.6

- See NIR 2022, Ch.10 for more other information.

Japan's reporting example (CRF)

- CRF Reporter automatically generates recalculations for an inventory year as table 8. It shows the differences in emissions/removals by category and by gas between current and previous submissions.

Example of CRF table 8



CRFs

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2						
	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF[2]	Impact of recalculation on total emissions including LULUCF[3]	Previ submis
	CO_2 equivalent (kt)			(%)			
Total national emissions and removals	1055484.64	1054778.52	-706.1				.06
1. Energy	1048150.30	1048518.91	368.6				.03
A. Fuel combustion activities	1047757.06	1048149.93	392.8				.03
1. Energy Industries	447922.13	449002.10	1079.9				.09
2. Manufacturing industries and construction	260341.45	259988.10	-353.3				.03
3. Transport	198811.01	198579.09	-231.9				.02
4. Other sectors	140682.47	140580.65	-101.8				.01
5. Other	NO	NO					
ive emissions from fuels	393.24	368.98	-24.26	-6.17	0.00	0.00	
els	0.42	0.43	0.01	2.29	0.00	0.00	
natural gas	392.81	368.55	-24.27	-6.18	0.00	0.00	
d storage	NO,NE,NA	NO,NE,NA					
nd product use	45173.64	45121.47	-52.17	-0.12	0.00	0.00	
	32606.28	32481.03	-125.25	-0.38	-0.01	-0.01	

Recalculations for 2019 inventory year

Difference between 2019 and 2018 submissions

- Table 8 in the CRTs is similar to that of CRFs.

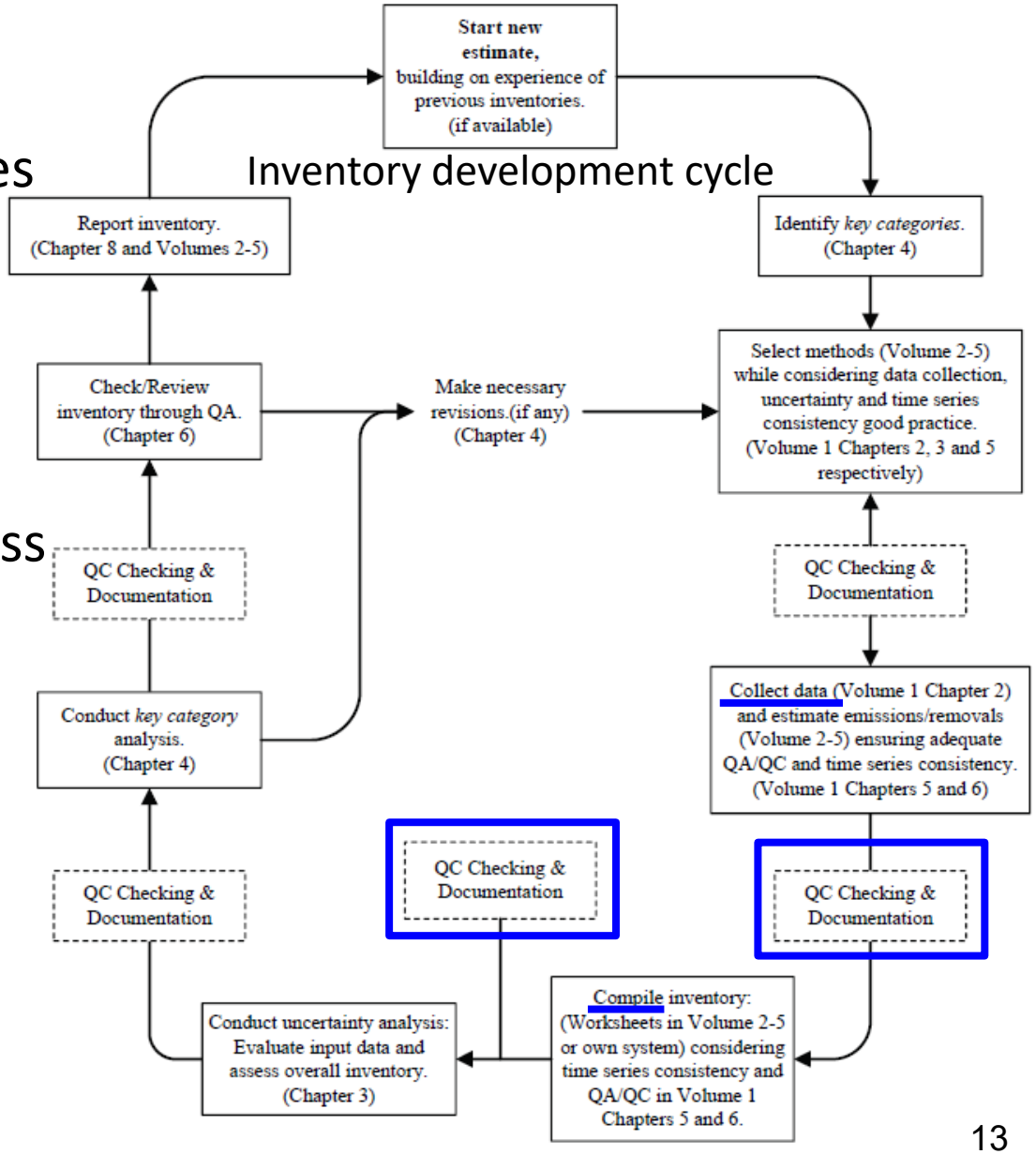
JAPAN'S EXPERIENCES OF QUALITY CHECKS BY CONFIRMING RECALCULATIONS

Background information

- Japan's inventory quality is controlled by performing Quality Control(QC) activities at each step, in accordance with 2006 IPCC GLs.
- Trend checks on data collection/estimation process are conducted.

Current inventory estimates should be compared to previous estimates. Significant changes in emissions or removals from previous years may indicate possible input or calculation errors.

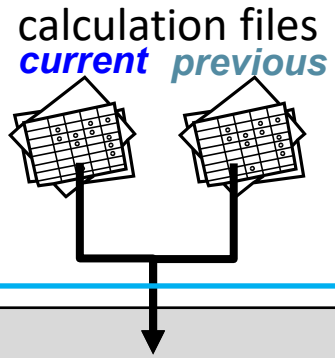
Reference: 2006 IPCC GLs, Table6.1



Reference: 2006 IPCC GLs, Figure 1.1

Example of QC by confirming recalculations

- Perform general quality checks by confirming recalculations of emissions/removals by gas/category using a summarizing file.



Recalculations are automatically detected by subtracting between the two submissions

CO2					
CRF Category	Difference in emission / removal (kt-CO2)			Date of check	Reason for recalculations
	1990	…	2019		
1.A.			0.03		
1.A.1			0.02	14-Mar-22	Update of the “General Energy Statistics” for 2019

Example of QC by confirming recalculations(cont.)

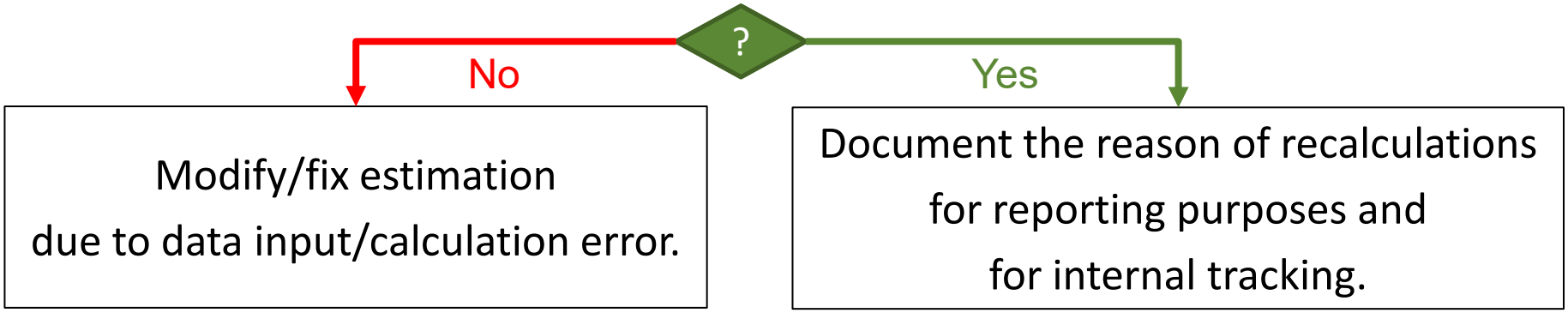
- Check if there are significant changes or departures from expected trends and re-check estimate as needed.

CH4					
CRF Category	Difference in emission / removal (kt-CH4)			Date of check	Reason for recalculations
	1990	…	2019		
3.A.			0.01		
3.A.1	-0.08		-0.08	15-Mar-22	Revised of the population in "*Record of Dairy Herd Performance Test*" for 2019

The departure from expected trend!!!

<<<Re-check estimations>>>

e.g., Statistics are updated and its change is consistent with the difference in emissions.



Summary of presentation

- Recalculations is an important element to improve the quality of national GHG inventory.
- Reporting of recalculations is a mandatory reporting requirement under the ETF of PA.
- Recalculations chapter in the NIR and the CRF of Annex-I parties to the Convention could be useful references/examples.
- Confirmation of the recalculations can be a useful check of the quality of data/estimation.

Thank you for your attention

https://www.nies.go.jp/gio/en/index.html

www-gio@nies.go.jp