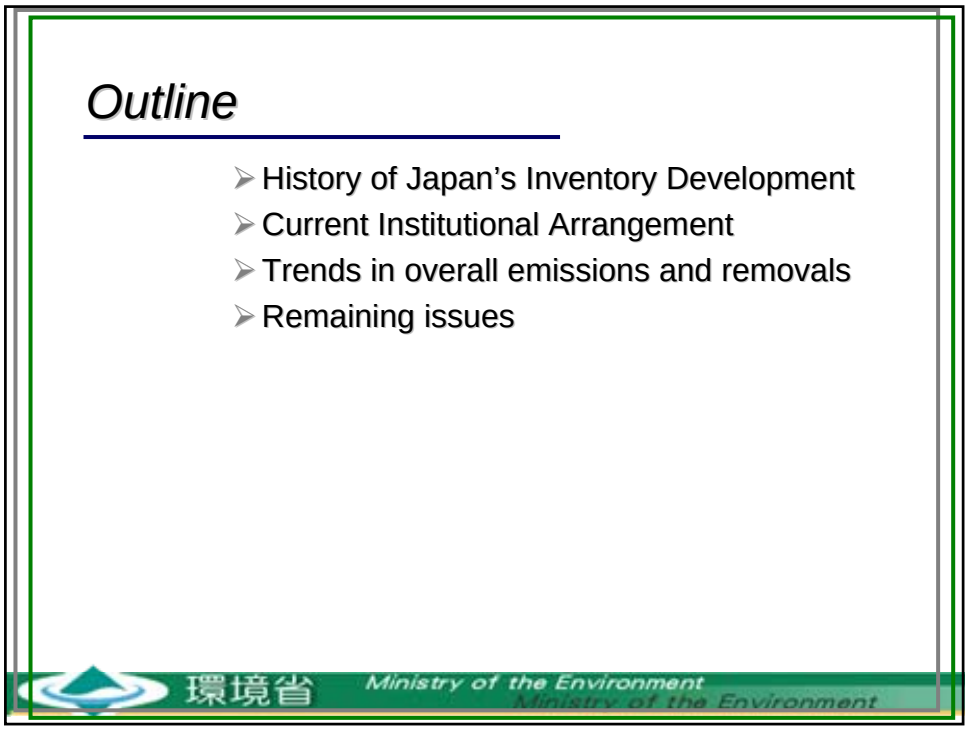
Recent problems and efforts on preparing inventory in Japan
Mr. Yoshiteru Sakaguchi



Recent problems and efforts on preparing inventory in Japan
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History of Japan's Inventory Development

1980's

Estimation of CO_2 emissions were started by researchers

1989

Development of CH_4 and N_2O emissions estimation methods was started by Environment Agency (predecessor of MOE)

1990

National CO_2 emissions were estimated according to the establishment of "Action Program to Arrest Global Warming"

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Ministry of the Environment

History of Japan's Inventory Development

1992 onward

CO_2 emissions were reported to "Council of Ministers for Global Environment Conservation under the cooperation with ministries.

1994.9

Submission of the first National Communication (NC1)

1996.7

In-depth review of NC1

Guideline for NC2 was established

1996.9

Revised 1996 IPCC Guidelines were approved

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History of Japan's Inventory Development

1996.10-12

Revision of JNGI (Japan National GHG Inventory) under ad-hoc expert committee to reflect the comment of IDR, revision of IPCC guidelines and the best available scientific information

1997.6

Submission of the second National Communication

1998.10

Annual inventory submission to UNFCCC was started

1999.10

UNFCCC reporting guidelines on annual inventory

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History of Japan's Inventory Development

1999.11-2000.9

"Committee for the GHG Emissions Estimation Methods" was set up for the revision of JNGI

2000.5

Good Practice Guidance was published

2000.7

Submission of JNGI 2000 (CRF and relevant data set)

(improvement: CRF application, Actual emissions of F-gas, Addition of new sources)

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History of Japan's Inventory Development

2001.5

Individual review (centralized review) of JNGI 2000

2001.9 – 2002.7

"Committee for the GHG Emissions Estimation Methods" was set up for the Quantitative uncertainty assessment and the development of method

2002.5

Submission of the third National Communication

History of Japan's Inventory Development

2002.8

Submission of JNGI 2002 (CRF and relevant data set)
(improvement: Sectoral approach for CO_2 emissions ,etc)

2003.8

Submission of JNGI 2003 (CRF)

2003.9

The first NIR (National Inventory Report) submission

2003.10

Individual review (In-country visit) of JNGI 2003

Recent problems and efforts on preparing inventory in Japan
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Current Institutional Arrangement

- MOE compiles Japan's inventory including following information
  - ✧ estimation of GHG emissions and removals
  - ✧ identification of key source categories
  - ✧ uncertainty assessment, etc.
- Relevant ministries, agencies, and organizations provide data for EF and activity data
- Actual task is conducted in Greenhouse Gas Inventory Office (GIO) in National Institute for Environmental Studies, with assistance of consultants

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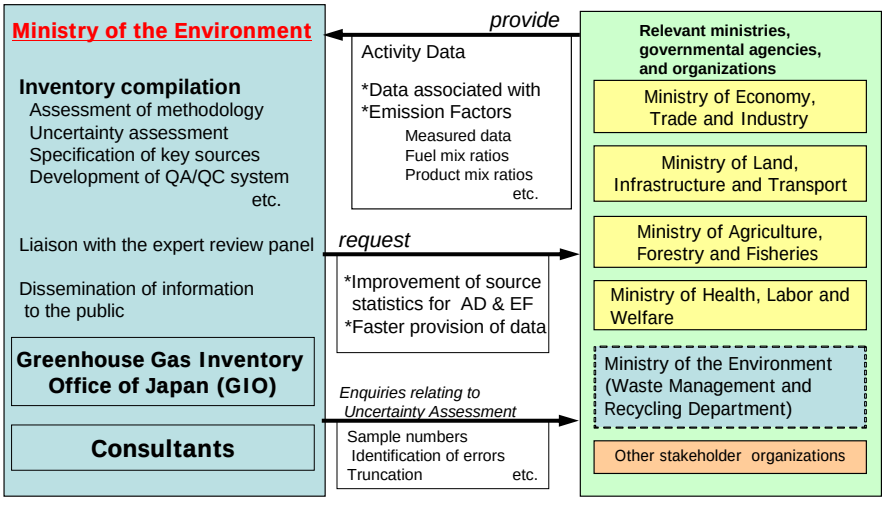
Current Institutional Arrangement



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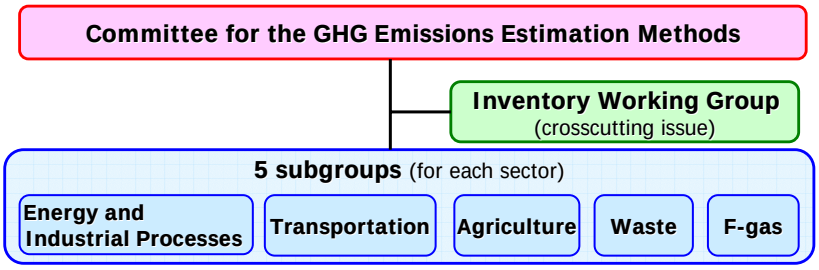
Current Institutional Arrangement

- MOE set up the Committee for the GHGs Emissions Estimation Methods, since 2000
- The committee was in charge of methodological development of the inventory
- Approximately 60 experts participated.



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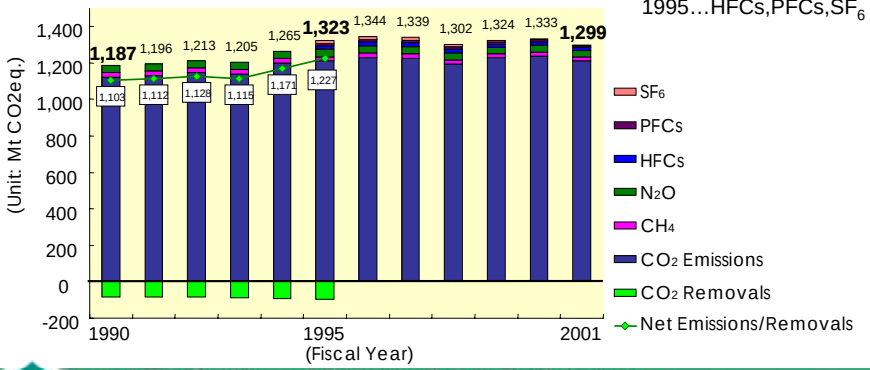
Trends in overall emissions and removals

- Overall emission of GHGs:
  - 1,187 [Mt CO_2 eq.] in 1990 (CO_2, CH_4, N_2O)
  - 1,299 [Mt CO_2 eq.] in 2001 (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6)
- Increased by 5.2% since KP's Base Year : 1990…CO_2, CH_4, N_2O 1995…HFCs,PFCs,SF_6



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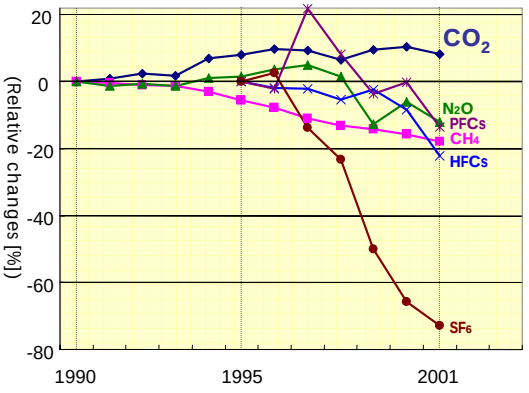
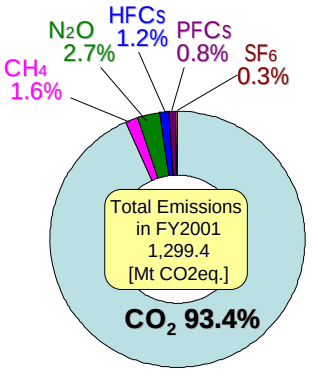
Trends in overall emissions and removals

- CO_2 +8.2%, CH_4 -18.0%, N_2O -12.0% (since 1990)
- HFCs -22.1%, PFCs -13.7%, SF_6 -72.9% (since 1995)
- Share of CO_2 amounts to be 93.4%





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Remaining Issues

- Delay of submission

  According to Dec.11/CP4, Annex I parties are requested to submit annual inventory by 15th April.

  -- Japanese Inventories were submitted on July ~ August these years

- Reporting on a calendar year basis

  1996 IPCC Guidelines: "Inventories are prepared on a calendar year basis." (Jan. ~Dec)

  -- Japanese Inventories are prepared on a fiscal year basis (Apr. ~Mar.).

  (Most of Japanese statistics are prepared on a fiscal year basis)

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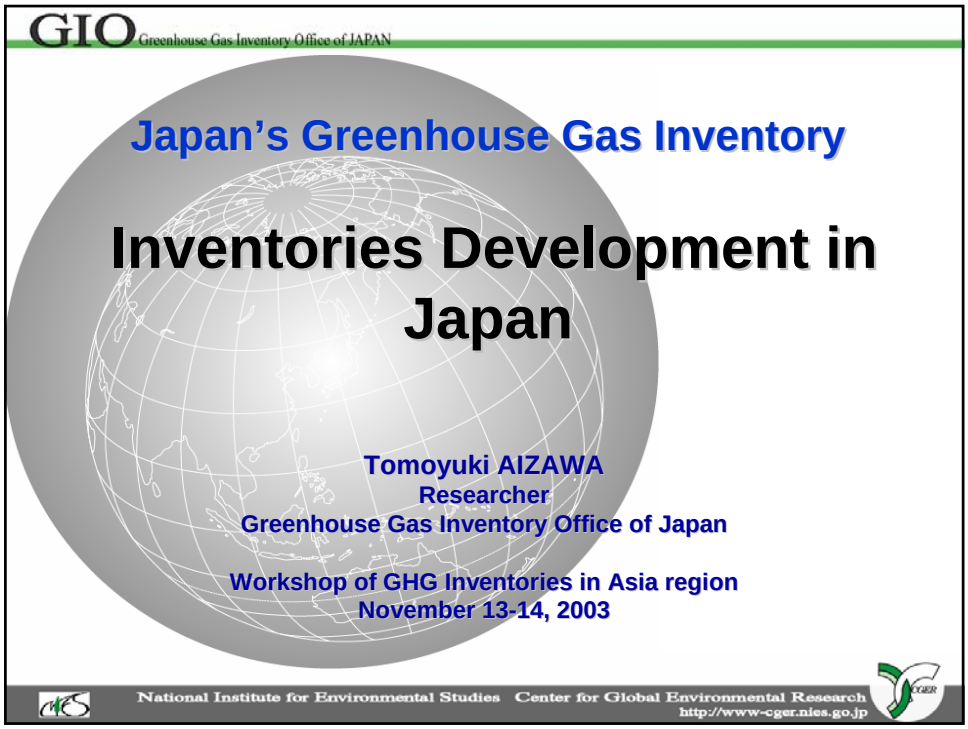
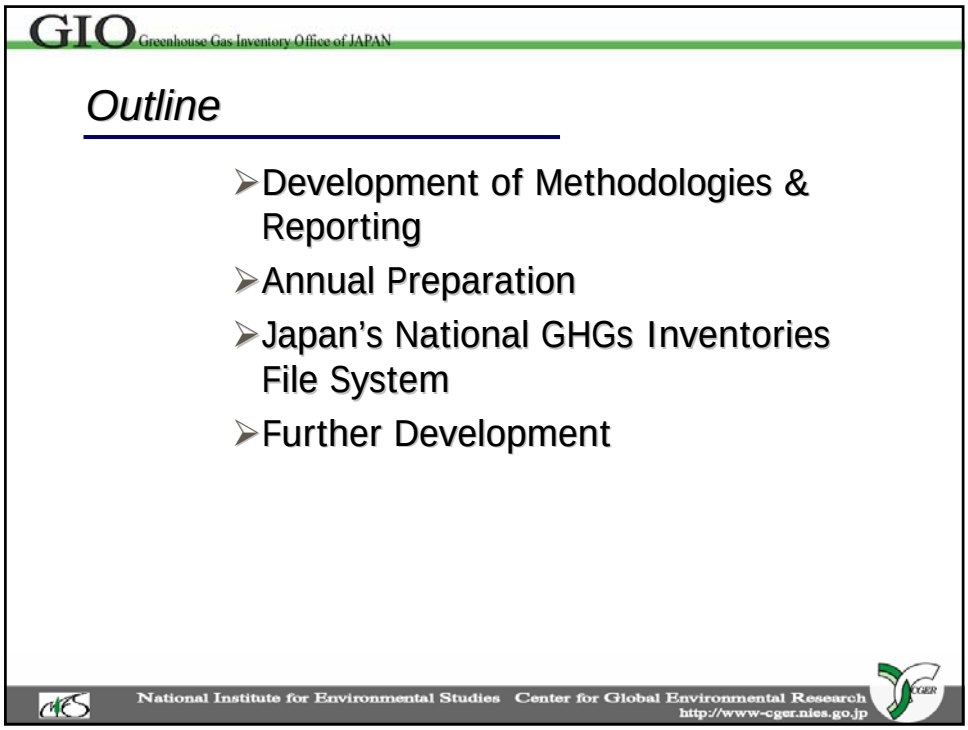
Recent problems and efforts on preparing inventory in Japan
Mr. Yoshiteru Sakaguchi

Recent problems and efforts on preparing inventory in Japan
Mr. Tomoyuki Aizawa





Recent problems and efforts on preparing inventory in Japan
Mr. Tomoyuki Aizawa

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Development of Methodologies & Reporting

- What did drive development and improvement of Japan's inventories?
  - *The international requirement*
    - In-depth review of Japan's NC
    - Publication of Revised 1996 IPCC Guidelines
    - Publication of Good Practice Guidance (2000)
    - Revision of UNFCCC reporting guideline (application of CRF)
    - Annual Inventory Review under FCCC
  - *The domestic requirement*
    - The best available scientific knowledge in Japan
    - Actual measurement of coefficients such as EF by the industrial group, which is substituted for the IPCC default values
    - Revision of statistics used in the inventory preparation

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Development of Methodologies & Reporting

- Japan had developed initial inventory before 1995 IPCC GL, which was not yet transparent, comparable and complete.

- Improvement after the In-depth review of Japan's NC & the Publication of Revised 1996 IPCC Guidelines
  - Before NC1 and 1996 IPCC GL, CO_2 emissions allocated to each sector by the electricity consumption along the method developed by Japanese researchers. In the IDR of NC1 **ERT** pointed out that these methods were not follow the IPCC methods, therefore we revised our inventory for UNFCCC without allocation of CO_2 from electricity consumption.
  - We revised the estimation methods of LUCF according to the **ERT's recommendation**.
  - Other small improvement with IDR and IPCC GL

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Recent problems and efforts on preparing inventory in Japan
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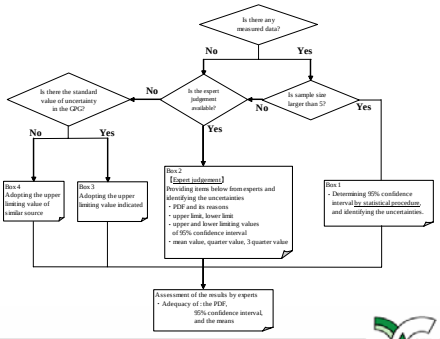
Development of Methodologies & Reporting

- Improvement after the Publication of Good Practice Guidance (2000)
  - Before GPG(2000), only the qualitative uncertainty assessment by expert judgement was submitted. The **quantitative uncertainty** assessment was done along the GPG.



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Development of Methodologies & Reporting

- Improvement after the Publication of Good Practice Guidance (2000) *(cont.)*
  - **Key source category analysis** provided the priority of development cost-effectively.
  - **QA/QC** procedure will make our inventories more accurate and will reduce editorial mistakes. QA/QC was done by inventory agency but it is not still formal implementation.
  - Some revised **default EF** were provided by GPG. So, new sources could be added to Japan's inventories.

⇒GPG made our inventory more accurate and facilitate the inventory development.

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Development of Methodologies & Reporting

- Improvement after the Revision of UNFCCC reporting guideline
  - **National Inventory Report** (NIR) was required to prepare in the UNFCCC GL. In this year, Japan's first NIR was prepared and submitted to UNFCCC.
  - The UNFCCC GL required the fulfillment of the all cells of the CRF with the Notation Keys such as "NE", "NO", etc. This requirement relating to the **Common Reporting Format** (CRF) facilitated checking the completeness. The sources "NE" were tried to estimate in the Committee for GHGs Emissions Estimation Methods.

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Development of Methodologies & Reporting

- Improvement according to the Annual Inventory Review under FCCC
  - Japan's inventories have been reviewed twice in the individual review. The first one was centralized review in 2001. However, NIR was not prepared. So, it was difficult to review without NIR and we could have little point to addressed.
  - In this year, In-country visit review was conducted with 1st NIR. The **ERT** has indicated many **potential point to improve**, which was quite helpful for our inventory development.

    For example
    - ✓ In the category of agriculture, possible improvement of technical aspects in N2O emissions measurement from soils.
    - ✓ In the category of energy, our misunderstandings in establishment of EF of CH_4 and N_2O from fuel combustion, which was considered intake air. Intake air was not considered in the IPCC GL. , etc.

Recent problems and efforts on preparing inventory in Japan
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Development of Methodologies & Reporting

- The best available scientific knowledge in Japan
  - There are many researches on the global warming issue under the research project such as the Global Environment Research Fund of Ministry of the Environment of Japan.
    - ✓ **Category 4. Agriculture**: Enteric Fermentation, Manure Management, Field burning of agricultural residues
    - ✓ **Category 6. Waste**: Wastewater Handling

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Development of Methodologies & Reporting

- Actual measurement of coefficients such as EF by the industrial group, which is substituted for the IPCC default values
  - In the 1st Committee for GHGs Estimation Method, EF of some sources were adopted IPCC default values. In the process and after the process, some related stakeholders such as industrial groups, who thought IPCC default values were not adequate for circumstances of Japan, provide the data of coefficients based on actual measurement and/or estimation.
    - ✓ **Category 1. Energy**: Fugitive emissions (Coal Mining, Town gas production, Oil production, Oil refinery, Natural Gas Production, Natural Gas Processing), etc.
    - ✓ **Category 2. Industrial Processes**: Production of Cement, Lime, Carbon Black, Ethylene, 1,2-Dichloroethane, Styrene, Coke, etc.

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Development of Methodologies & Reporting

These factors below drove the inventories development in Japan.

- The international requirement
  - The international requirement was often the primary motivation of inventories development.
- The domestic requirement
  - The disclosure of process and method of inventories preparation sometimes could be stakeholders' motivation to obtain the actual coefficients such as EF. We think that these data might improve the IPCC's default values as substitute.

⇒The Committee for GHGs Estimation Methods considered issues from these factors above.

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Annual Preparation of GHGs Inventory

- Japan's inventories are prepared in every year according to the Cop decision.
- Approximate timeline of inventories preparation is shown below (case of last year 2002-2003);

Dec. – Jan.	Kick off of the next inventory preparation	
Feb.	Data submission request to related stakeholders	NIR preparation
Feb.-Apr.	Data Input to the file system (JNGI 200X)	
15 Apr.		
Apr.-May	Calculation and updating the link between JNGI files	
June-Aug.	Review and consultation with government agencies	
Aug.	Inventory submission (CRF)	
Sep.	Inventory submission (NIR)	

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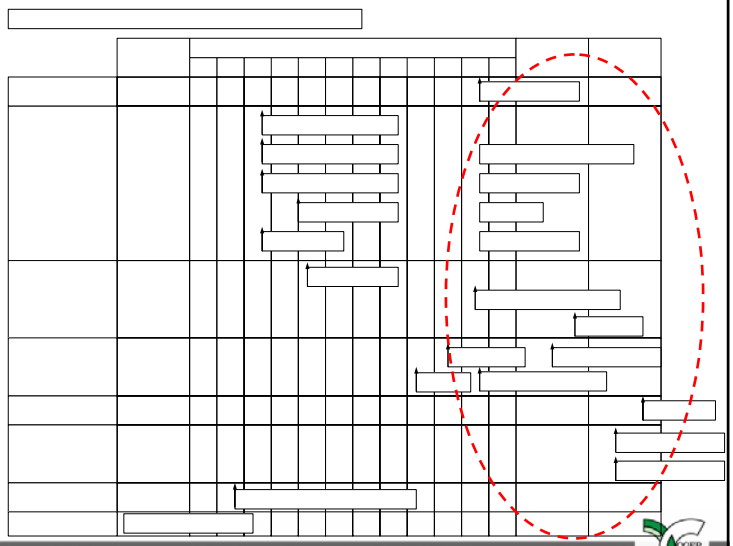
Annual Preparation of GHGs Inventory

- Late submission of Japan's inventories are caused by activity data.



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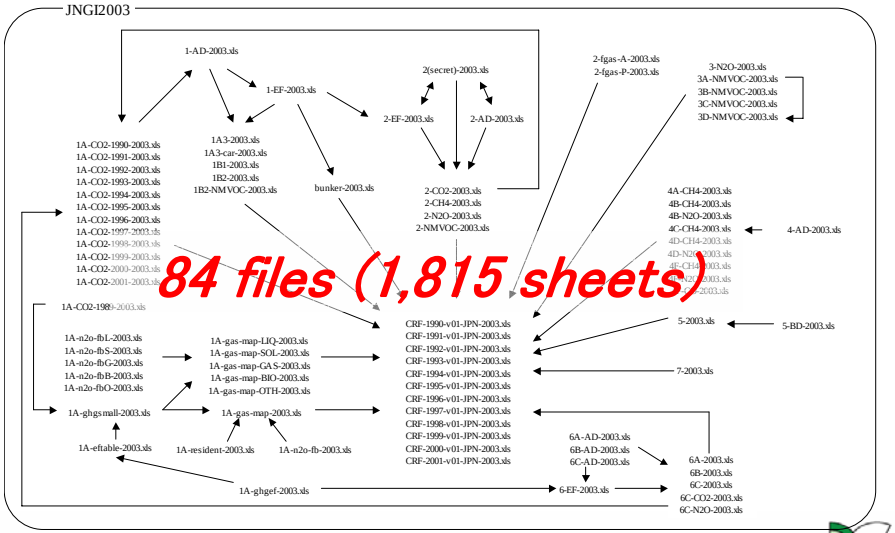
Japan's National GHGs Inventories File System



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Japan's National GHGs Inventories File System

2.A.1. Cement Production

Equation

E= EF× A
A = Aw × (1 - Rw)

Time Series

Estimation

		[Unit]	1990	1991	1992	1993	1994	1995	1996
Aw	Consumption of Limestone (wet)	[t]	92,511,000	96,345,000	99,392,000	98,441,000	100,898,000	100,632,000	101,524,000
Rw	Moisture content	[%]	3.4%	3.3%	3.2%	3.3%	3.2%	3.3%	3.2%
A	Consumption of Limestone (dry)	[t]	89,365,626	93,165,615	96,211,456	95,192,447	97,669,264	97,311,144	98,275,232
MW_lime	Molecular weight of CaCO3	[g]	100.09	100.09	100.09	100.09	100.09	100.09	100.09
MW_co2	Molecular weight of CO2	[g]	44.01	44.01	44.01	44.01	44.01	44.01	44.01
R_co2		—	0.440	0.440	0.440	0.440	0.440	0.440	0.440
P_lime	Purity of limestone	[%]	94.2%	94.2%	94.3%	94.4%	94.4%	94.5%	94.6%
EF	Emission Factor	[t CO2/ t limestone]	0.414	0.414	0.415	0.415	0.415	0.415	0.416
E	Emissions	[t CO2]	37,006,413	38,605,596	39,894,161	39,497,789	40,552,325	40,430,377	40,857,940
		[Gg CO2]	37,006	38,606	39,894	39,498	40,552	40,430	40,858

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Japan's National GHGs Inventories File System

- Feature of JNGI File system
  - **Transparency**: disclosure of all files other than confidential data. If you see these files, you could trace all the estimation process. These files facilitate the review by the third party.
  - **Updating automatically**: Structure of JNGI covers from data input to reporting with CRF.
  - **Same Structure**: Most files have same structure to facilitate making new files such as additional sources, revision of methods.
  - **All time series**: Most files include estimation of all time series. Therefore, it is easy to recalculate and assess the time series consistency.

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Further Development

- Following the reporting requirement completely.
  - **Transparency**: improvement of the NIR with more explanation
  - **Completeness**: establishment of methods in sources reported as "NE"
  - **Comparability**: improvement of the CRF reporting, which includes inadequate data provision
  - **Consistency**: reporting the data through the all time series
  - **Accuracy**: when the latest scientific knowledge become available, method would be improved. (e.g. carbon balance in the refinery sector, etc.)
  - Formal **QA/QC** procedure
  - **Comparison** with other method (e.g. IPCC default methods)

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Thank you!

ありがとうございました。