Measurement, Reporting and Verification (MRV) system introduction

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Outline

- General introduction of MRV system
- Necessary components to develop MRV system
- Japanese experience of MRV system
- Summary

General introduction of MRV system

Measurement, Reporting and Verification (MRV) system:

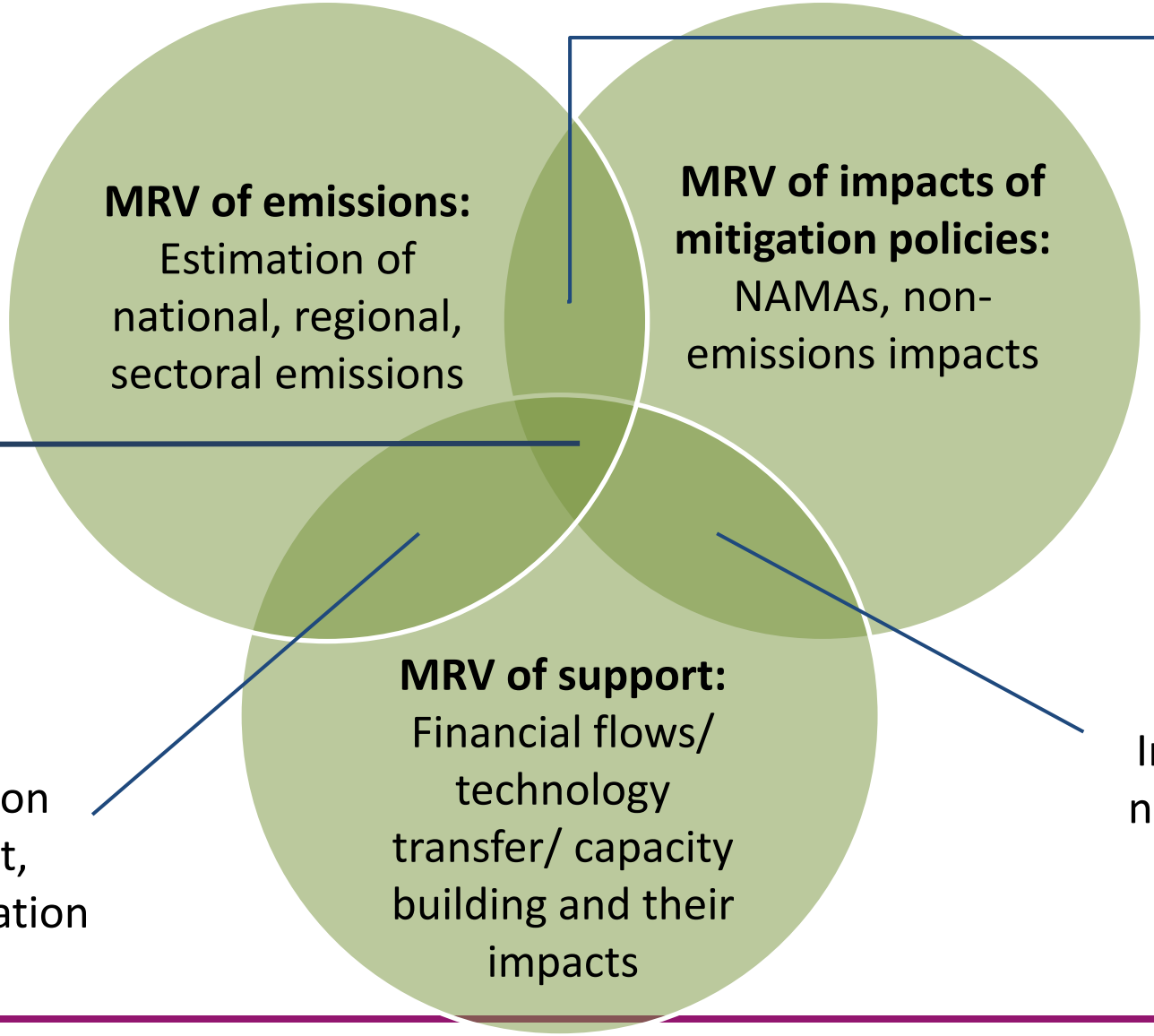
- Measurement: monitoring, tracking, collecting greenhouse gas (GHG) emissions and non-emission impacts
- Reporting: submitting measured data in a structured format to compile data
- Verification: verifying reported data and information (quality control (QC)/quality assurance (QA))

Objectives of MRV system:

- Ensuring Transparency, Comparability, Accuracy of data and information
- Identifying good practices and lesson learned
- Analyzing effectiveness of mitigation actions
- Utilizing quantified impacts to climate policy development
- Evaluating the progress in national and international levels
- Identifying gaps/needs and increasing international supports (financially/technically)

Source: UNFCCC, Handbook on institutional arrangement to support MRV/Transparency
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

General introduction of MRV system



GHG emission effects of mitigation actions on overall emissions

Impact of support on overall emissions and mitigation actions

Impacts of support on GHG measurement, reporting, and verification

Impacts of support on non-emissions impacts (co-benefits)

Source: GIZ, MRV tool

General introduction of MRV system

Different types of MRV system:

MRV type	Purpose	Characteristic	Example
MRV of GHG emissions at organization level	Determination of GHG emissions from covered entities	Required level of MRV: High Need well-established MRV system Sufficient knowledge and experiences is needed	EU ETS Tokyo Cap-and-Trade Program
MRV of GHG emission reduction at project level	Crediting of GHG emission reduction achieved by individual projects	Required level of MRV: High Need well-established MRV system (Need to carefully determine some technical issues such as baseline setting/additionality)	CDM JCM Gold Standard
MRV of GHG emissions at national level	Determination of GHG emissions at national level (compliance assessment for Kyoto Protocol/ Paris Agreement)	Required level of MRV: Medium International rule: IPCC guideline Well established MRV system in some countries, but some still working	National GHG inventory
MRV of GHG emission reduction by policies and measures	Evaluation of GHG emission reduction achieved by policy/ measure	Required level of MRV: probably Medium Needs to reflect domestic context No international guideline	Country-basis MRV system

Source: IGES, MRV for NAMAs

Necessary components to develop MRV system

1. Key component: National legal framework

- National overarching **legal framework enhances to govern the fulfilment of responsibilities** in delivering requirements under transparency related work (including MRV)

- The **establishment of a new system (data flow, compiling, reporting, tracking, verifying activities)** creates new requirements to be managed by well-supported team. This system/process requires **legally binding frameworks and mandates** to provide adequate resources (human and financial)

- **Without a legal mandate, it can be challenging to ensure** that the individuals carrying out transparency related activities to **receive necessary resources and supports**

- **National climate change law** can provide organizations or individuals **with the authority** required to incentivize data flows when a lack of cooperation and date flows (see Annex)

Source: UNFCCC, Handbook on institutional arrangement to support MRV/Transparency
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

Necessary components to develop MRV system

2. Key component: Institutional arrangements

- **Structuring institutional arrangements** defines **roles and responsibilities** among the involved organizations. Ex: Describing the structure of the institutional arrangements in an organization chart offers a visual summary of the organizational linkages

- Clearly defined roles and responsibilities will **ensure the smooth flow of data and information** to all stakeholders producing, reporting and verifying the GHG emission estimation

- The structure reflects **the cross-cutting system** which manages data gathering, analyzing, compiling, reporting and utilizing data for different purposes

- **Clarifying the organizational structure** and defining the roles and responsibilities can **help to communicate effectively and efficiently** with the right organizations (see Annex)

Source: UNFCCC, Handbook on institutional arrangement to support MRV/Transparency
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

Necessary components to develop MRV system

3. Key component: MRV guideline

Clearly define what gets measured, reported and measured by whom in the guideline

Measurement:

- Establishing the baseline scenario on historical data
- Methodology of GHG emission reductions according to emission baseline scenario

Reporting:

- Data on emission reductions and methodologies
- Information on sustainability objectives, coverage, institutional arrangements
- Define how to report, when to report and who should report

Verification:

- All quantitative and qualitative information reported
- Implement quality assurance (QA) and quality control (QC) procedures (align with IPCC Guideline)
- Apply Transparency, Completeness, Consistency, Comparability, Accuracy criteria when to verify (see Annex)

Source: GIZ, MRV tool

Japanese experience in MRV system

1. MRV of GHG emissions at organization level:

- Tokyo Cape-and-Trade Program (ETS)
- Mandatory GHG emission reporting and accounting

2. MRV of GHG emission reduction by policies and measures:

- Evaluation of GHG emission reduction achieved by policy and measure

Tokyo Cape-and-Trade Program (ETS)

Launched in April 2010, the Tokyo Emission Trading Scheme (ETS) of the Tokyo Metropolitan Government is Japan's first mandatory ETS

- **Sector coverage:** Large buildings, factories, heat suppliers, and other commercial buildings that consume large quantities of fossil fuels are required to reduce emissions (Buildings account for 70% of emissions)
- **Gas coverage:** CO2, CH4, N2O, PFCs, HFCs, SF6, and NF3
- **Threshold:** Annual energy consumption of 1,500 kL or more crude oil (2,000～3,000 t-CO_2 eq.)
- **Compliance period and GHG emission reduction target:**

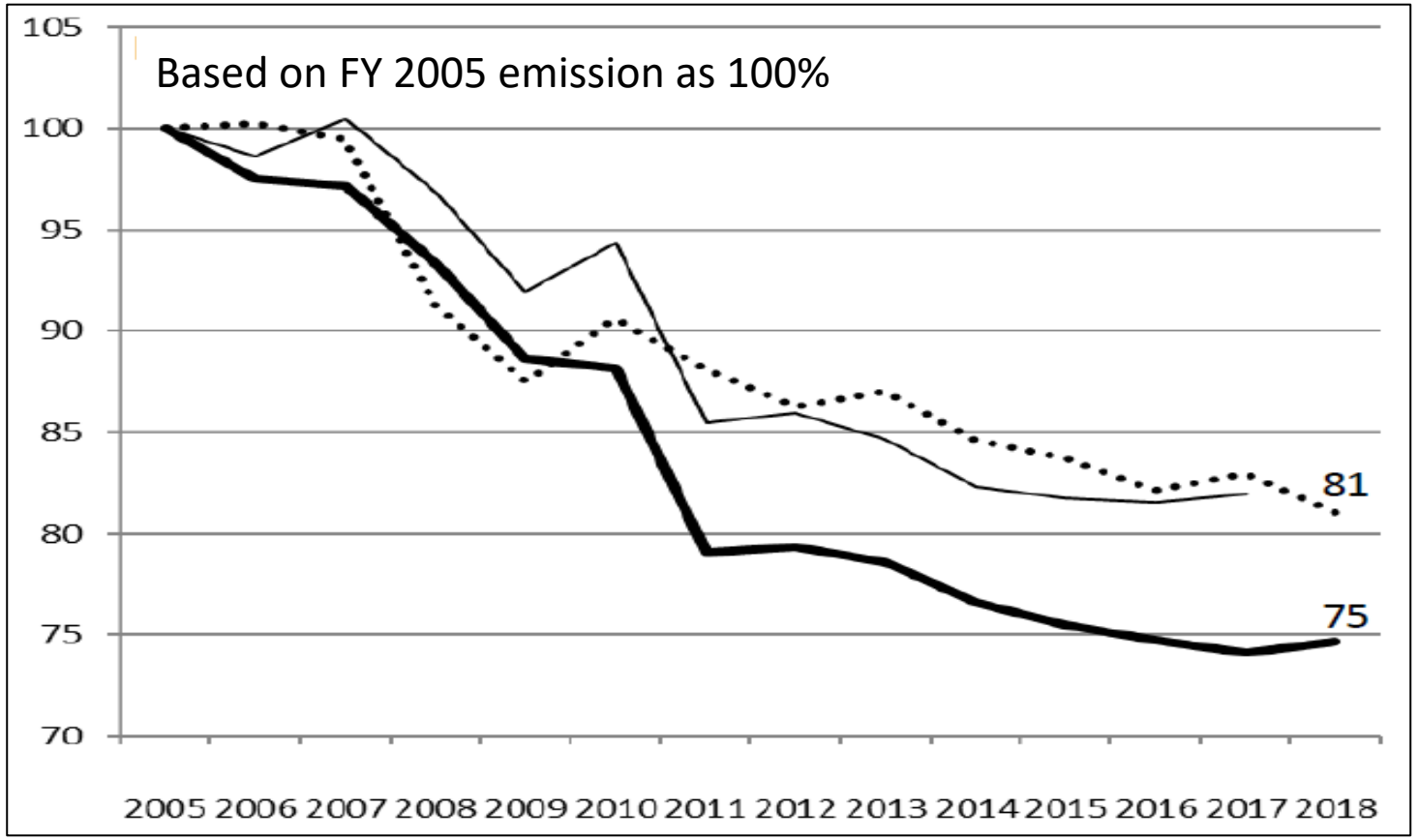
Compliance period	Office buildings	Factories
1. FY 2010 - FY 2014	8%	6%
2. FY 2015 – FY 2019	17%	15%
3. FY 2020 – FY 2024	27%	25%

- **Base year emission:** Calculated based on the average emission of selected 3 consecutive fiscal years between 2002 and 2007
- **Reporting:** Annual emissions reporting, including emission reduction plans
- **Verification:** Mandate verification by a third party

Source: Tokyo Metropolitan Government, https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.html

Tokyo Cape-and-Trade Program (ETS)

CO_2 emissions from ETS covered facilities



Final energy consumption in the business sector across Japan

Final energy consumption in the industrial and commercial sectors of Tokyo

CO_2 emissions from facilities covered by Tokyo Cap-and-Trade Program (emission factor fixed)

Source: Tokyo Metropolitan Government, https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/9thYearResult.pdf

Mandatory GHG emission reporting and accounting

Entities that emit large amounts of GHG (more than 3,000 t-CO2 eq.) are required to calculate their emissions and report it to the **Government** by the Act (Promotion of Global Warming Countermeasure)

- **Purpose:** Enhancing voluntary efforts by self-assessment on emission throughout of calculating process, Promoting public and business awareness by visualizing and disclosing information
- **Gas coverage:** CO_2 (energy and non-energy origins), CH_4, N_2O, fluorinated 4 gases (HFC, PFC, SF_6, NF_3)
- **Calculation method:** The method specified by national law
- **Reporting:** Format is designated by the Government. Reporting entity should fill in the required information and submit it to relevant ministries. Electronic reporting is allowed.
- **Verification:** The Government conducts the completeness check for aggregating data and ask entities their modification if necessary.
- **Penalties:** Fine (200,000 JPY or less) is applied for violations of reporting obligations and false reports

Source: Ministry of Environment Japan https://ghg-santeikohyo.env.go.jp/files/manual/chpt1_4-6.pdf

Mandatory GHG emission reporting and accounting

Basic calculation method for GHG emissions:

- Emission is calculated based on the activity data by multiplying emissions factor set under the system
- Direct measurement, material flow and modelling can be used as other calculation methods

Step1: Identify emission sources in business activities

(Manual of GHG accounting and reporting should be referred to identify emissions sources.)

Step2: Calculate GHG emission of each identified activity by using calculation method and emission factor designated by Act on Promotion of Global Warming Countermeasure

GHG emissions = Activity Data × Emission Factor (EF)

(EF list in the website can be used as the reference when selecting calculation method and EF of each emission activity.)

Step3: Summation of emissions (by GHG) calculated in the step2

Step4: Conversion of GHG emissions summed in the step3 to CO_2 emissions

GHG emissions (t-CO_2) = GHG (t-Gas) × Global Warming Potential (GWP)

(GWP should be used from the list which is published at the website of GHG mandatory accounting and reporting system.)

Source: Ministry of Environment Japan https://ghg-santeikohyo.env.go.jp/files/manual/chpt1_4-6.pdf

Evaluation of GHG emission reduction achieved by policy and measure

Global Warming Countermeasures Plan (GWCP) covers GHG emissions targets by sector and by gas, as well as policies and actions that the government, businesses, and citizens should implement to achieve the target.

- Two approaches to assess the progress towards the 2030 target:

1. Factor Analysis

- About 90% of Japan's GHG emissions are CO_2 from fuel combustion (energy-related CO_2)
- To conduct a factor analysis of the trend of energy-related CO_2 and utilizes it for analysing mitigation policies and measures using the national GHG inventory data
- The Ministry of the Environment conducts this factor analysis for the emission trend every year when the new emissions data are published

2. Progress evaluation of each policy and action

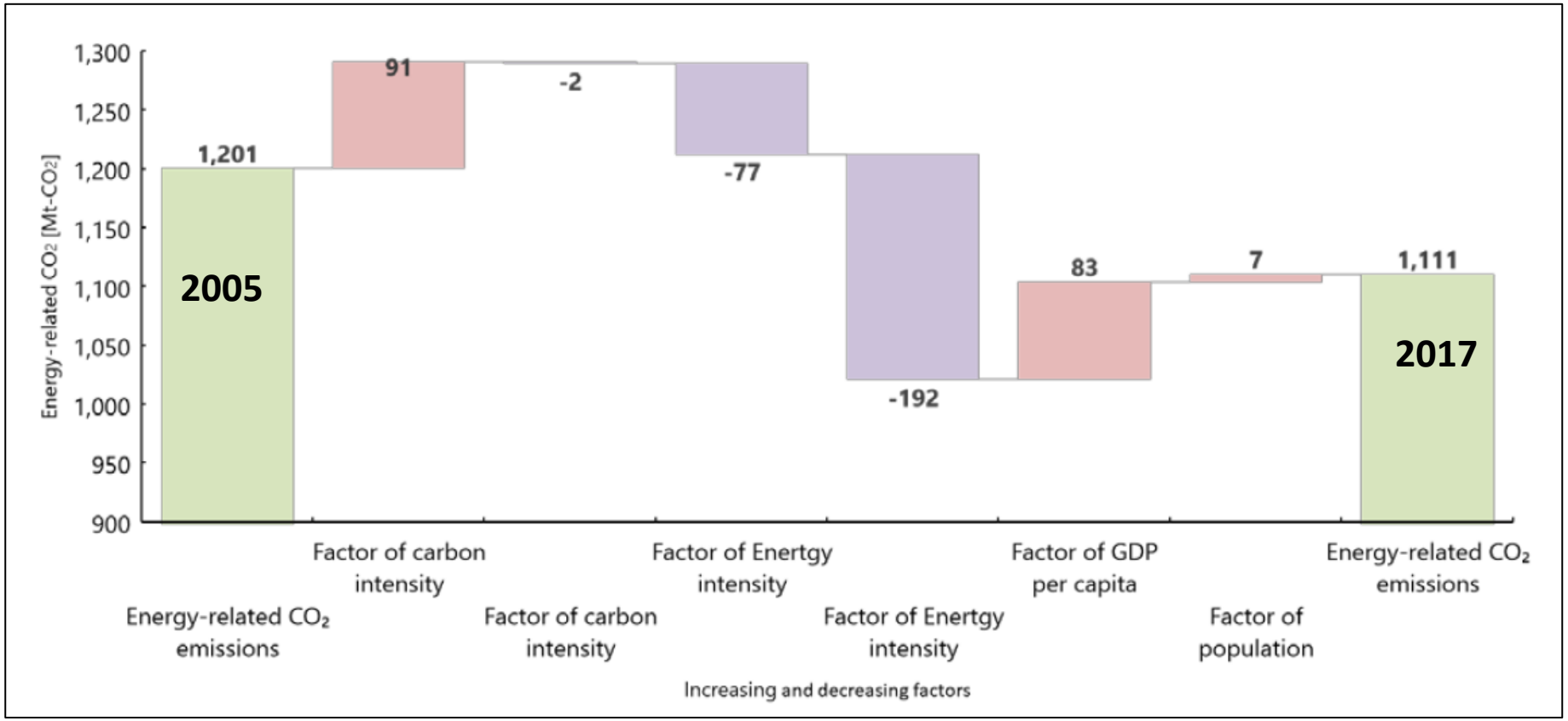
- The relevant ministries collect the latest data of **evaluation indicators** for each policy and action
- These **Indicators** are identified in the GWCP. The actual values of the indicators are assessed their progress in the annual follow-up report.
- Progress in reducing emissions is evaluated on the five-point scale of A to E based on the estimates of evaluation indicators. (see Annex)

Source: Japan's Fourth Biennial Report, https://www.env.go.jp/earth/ondanka/ghg-mrv/unfccc/BR4-JPN-E.pdf

Evaluation of GHG emission reduction achieved by policy and measure

1. Factor Analysis

Changes in energy related CO_2 emissions and factors between 2005 and 2017

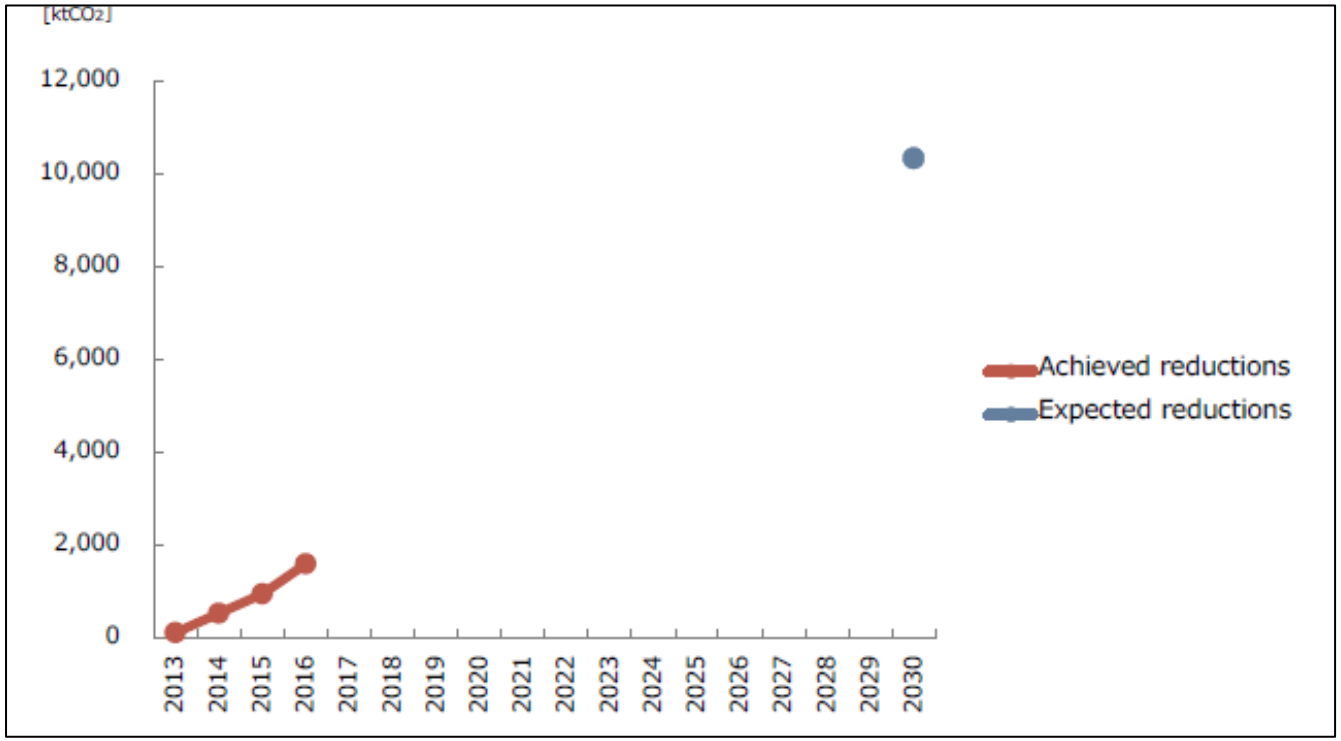


Source: Japan's Fourth Biennial Report, https://www.env.go.jp/earth/ondanka/ghg-mrv/unfccc/BR4-JPN-E.pdf

Evaluation of GHG emission reduction achieved by policy and measure

2. Progress evaluation of each policy and action:

Example: Promotion of Mandatory Compliance with Energy Conservation Standards Targeting New Construction



Progress in the emission reductions: C
(Expected to be at the same levels as the target levels for FY 2030)

Source: Japan's Fourth Biennial Report, https://www.env.go.jp/earth/ondanka/ghg-mrv/unfccc/BR4-JPN-E.pdf

Thank you for your attention

Annex

MRV in the sub-national context

	Measurement	Reporting	Verification
Why?	•Understand development circumstances •Identify reduction opportunities •Facilitate capacity building •Track policy impacts and mitigation results	Development information disclosure for public and higher level government	Enhance the credibility of government policy and GHG inventory
What?	•Local development circumstances and priority •Institutional structure and responsibility distribution •Local GHG inventory •Mitigation measures and its results •Constrains and gaps, and related financial, technical and capacity needs		•Local GHG inventory (emissions source-based) •Mitigation measures and their results
How?	•Local government coordinating responsible entities to conduct assessment, collect information and enforce policy		Currently no international standard for verification
Who?	•Local government coordinating responsible entities		Certified third party

Source: GIZ, MRV tool

Necessary components to develop MRV system

Elements need to be considered to design National Climate Change Law:

- **Focus**: Climate change alone (or climate change in wider sustainable development)
- **Scope:** Mandate for climate policy could be set within an international context considering interlinkages of national efforts with international targets and requirements
- **Design:** Focus on implementation, whether through government planning and voluntary market mechanisms
- **Devolution:** The level of devolution of responsibility should be determined which is how sub-national actors play and national government takes over (the level of centralization)
- **Long-term mitigation targets:** should be on evidence based and consistent with the NDC, and provide a strategic guidance for policymakers.
- **Short-term mitigation targets**: focus on a cost-effective way towards the long-term strategy
- **Duties and responsibilities**: Main roles and responsibilities should be clearly defined to support the transparency framework and its implementation, including establishing an steering committee
- **Monitoring and reporting requirements:** Incorporating national reporting requirements with international requirements to keep climate policy relevant and promote accountability

Source: UNFCCC, Handbook on institutional arrangement to support MRV/Transparency

Necessary components to develop MRV system

Elements needed to be considered to structure institutional arrangements:

Organizational mandates:

- **To identify the main focal point** for gathering data and information from relevant ministries and agencies, the private sector, and subnational governments
- **Integrating and building on the existing** institutional arrangements
- **The coordination of data collection and analysis** between the relevant ministries and agencies is needed to be designed carefully to avoid any duplications

Expertise:

- **To point out the key experts** (in which agencies) needed for the transparency system
- **Non-government experts** contribute to the transparency system (on regular basis or contract basis)
- **To retain in-house experts**; and to manage existing knowledge and **provide trainings** for archiving information and documenting processes

Data supply:

- **To identify key stakeholders to supply data** and how they can be integrated into the institutional arrangements
- **Utilize legislative and policy instruments** to facilitate data flows between government agencies and from the private sector (if not, need to consider)

Source: UNFCCC, Handbook on institutional arrangement to support MRV/Transparency
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

Transparency, Completeness, Consistency, Comparability, Accuracy

These principles can also be applied to estimation of emissions at national, sectoral and installation levels.

1.Transparency means that the assumptions and methodologies used for an inventory should be clearly explained to facilitate replication and assessment of the inventory by users of the reported information.

2.Consistency means that an inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the initial and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks. Under certain circumstances an inventory using different methodologies for different years can be considered to be consistent if methodologies provided by the IPCC for such situations have been applied.

3.Comparability means that estimates of emissions and removals reported by Non-Annex I Parties in inventories should be comparable among Non-Annex I Parties. For this purpose, Non-Annex I Parties should use the methodologies and formats agreed by the COP for estimating and reporting inventories.

4.Completeness means that an inventory covers all relevant sources and sinks, as well as all gases, included in the IPCC Guidelines. Completeness also means full geographic coverage of sources and sinks of a Non-Annex I Party.

5.Accuracy is a relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable.

Source: GIZ, MRV tool

Progress evaluation of each policy and action: The five-point scale of A to E

A: are expected to exceed the target levels by FY 2030, and the actual performance value for FY 2017 has already exceeded the target levels for FY 2030.

B: If current efforts continue, the measure evaluation indicators are expected to exceed the target levels by FY 2030

C: If current efforts continue, the measure evaluation indicators are expected to reach the same levels as the target levels in FY 2030.

D: If current efforts continue, the measure evaluation indicators are expected to fall below the target levels for FY 2030.

E: Other (efforts for which quantitative data cannot be obtained)

Source: Japan's Fourth Biennial Report, https://www.env.go.jp/earth/ondanka/ghg-mrv/unfccc/BR4-JPN-E.pdf