JICA Climate-FIT （Mitigation)

Climate Finance Impact Tool for Mitigation

Quantitative evaluation of

GHG emissions reduction (removals)

Guidelines for emissions reduction calculation

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I. Introduction

- At the 21st session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015, the Paris Agreement was adopted, which is an international framework after 2020 in which all countries participated. The Paris Agreement aims to hold the increase in the global average temperature to well below 2 degrees above pre-industrial levels and to pursue effort to limit the temperature increase to 1.5 degrees above pre- industrial levels.
- At the 28th Conference of the Parties (COP26) held in November 2021, the Japanese Government announced to provide support worth 60 billion USD mobilizing both public and private sector funds by 2025 (5 years total from 2021 to 2025), and up to an additional 10 billion USD for decarbonization in Asia and beyond by 2025.
- The Government of Japan announced "Japan's Assistance Package to Promote Investments for Global Actions Toward the Achievement of the Paris Agreement Goals". The Package aims to close the three gaps of "ambition gap," "adaptation gap," and "implementation gap" and bring the emission pathway on-track by establishing a foundation to promote investment in decarbonization and adaptation. The package mentions initiatives or efforts which led by JICA, such as realization of decarbonization domino-effect through city-to-city collaboration for decarbonization, human resource development for climate change, Ecosystem-based Disaster Risk Reduction, JICA Clean Cities Initiative (JCCI), and co-benefits-based climate change mitigation and adaptation measures.
- In order to provide assistance in the field of mitigation, the "Cancun Agreement" at the 16th Conference of the Parties (COP16) requires the implementation of MRVs (measurement/reporting/verification) for quantitative assessment of greenhouse gas (GHG) emissions reductions (removals).
- In light of these circumstances, JICA, as an organization to execute ODA, needs to take measures to implement MRV from the stage of considering cooperation policies for developing countries and formulation of projects in order to ensure the MRV of GHG emissions reductions (removals) for climate-change mitigation projects to be implemented in the future.
- This guideline summarizes the methodology for quantitative estimation as a reference material in order to conduct MRV of quantitative assessments of GHG emissions reductions (removals) when considering cooperation policies and project formulation on climate-change mitigation in developing countries. However, this work does not provide a methodology for estimating carbon credits represented by

the Clean Development Mechanism (CDM) and aims to grasp the business effects of projects supported by JICA. Therefore, it is not anticipated to consider additionality as in the CDM.

II. Common items for quantification

1. Projects subject to the quantitative evaluation

In the consideration of cooperation policies and project formulation in developing countries, projects that lead to climate-change mitigation are targeted to the quantification of GHG emissions reductions (removals) at the planning stage in order to grasp the project effects on climate-change mitigation.

2. Basic principles for the evaluation

Quantification of GHG emissions reductions is conducted by using a pre-established estimation methodology sheet attached to this guideline. Estimation methodology sheets refer to well-known methods for quantifying GHG emissions reductions, such as the GHG Protocol[1], the ISO 14064[2], CDM methodology[3], and other internationally recognized standards, and are based on JICA's experiences in quantifying GHG emissions reductions from projects. In the absence of a sheet of estimation methods to be applied, the adoption of a project-specific quantification method may be permitted. However, it should be in line with the "Common items for quantification" of this guideline.

3. Boundaries of the project

In principle, project boundaries should be established to include all sources of GHG emissions associated with activities, facilities, or infrastructures supported by JICA that are large and manageable. Although some projects may also affect upstream and downstream activities, these emissions (Scope 3) are, in principle, outside the scope of quantification. However, for emissions with a large impact, the quantifying methods are specified in the estimation methodology sheet.

GHG emission reductions are quantified annually (The target year shall be a representative year under average operation or an annual average of multiple years), and the six greenhouse gases subject to quantification are carbon dioxide (CO_2), methane (CH_4), dinitrogen monoxide (N_2O), hydrofluorocarbon (HFCs), perfluorocarbon (PFCs), and sulphur hexafluoride (SF_6), and are quantified on a CO_2 equivalent. Global Warming Potentials (GWPs) for CO_2 conversion are specified in

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[1] The GHG Protocol for Project Accounting (https://ghgprotocol.org/standards/project-protocol)
[2] ISO 14064-2:2019, Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements (https://www.iso.org/standard/66454.html)
[3] CDM methodologies (https://cdm.unfccc.int/methodologies/index.html)

the estimation methods sheets.

4. Quantification of GHG emissions reductions

Greenhouse gas emissions reductions are estimated by comparing project emissions with baseline emissions.

(1) Baseline Emissions

Baseline emissions are emissions of greenhouse gases that would occur in the absence of a project, and are hypothetical emissions that are reasonably demonstrated. In other words, baseline emissions are emissions of greenhouse gases in the baseline scenario which is a hypothetical scenario "without a project."

(2) Project Emissions

Project emissions are emissions of greenhouse gases associated with the implementation of project activities supported by JICA.

(3) Emission reductions

The emissions reduction (ERy) is quantified by calculating the difference between the baseline emissions (BEy) and the project emissions (PEy). According to the following formula;

$$ERy = BEy - PEy$$

Of the greenhouse gas emissions resulting from the implementation of the project, those from sources outside the boundary must be considered as leakages. However, in principle, leakages can be ignored. If the impact of leakage is likely to be non-negligible, the estimation method is specified in the individual estimation method sheet.
Baseline emissions and project emissions are, in principle, quantified by multiplying activity data by an emission factor, and the emission factors should adopt the default values shown in the Appendix.
Emission factors are based on values internationally widely referenced, including the IPCC National Greenhouse Gas Inventory Guidelines (2006[4] and 2019[5]) and IFI

[4] 2006 IPCC Guidelines for National Greenhouse Gas Inventories（https://www.ipcc-nggip.iges.or.jp/public/2006gl/）
[5] 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories（https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/）

TWG (The Technical Working Group of the International Financial Institutions)[6].

5. Reporting GHG emissions reductions

For reporting GHG emissions reductions, the calculation sheet based on the estimation methodology sheet which is provided by the JICA should be submitted. The information on which the data entered in the calculation sheet is based should also be submitted. For example, an investigation report or a project implementation plan can be considered as a basis material.

[6] https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies

III. List of the methodologies

Sector	Methodology
Forest and Natural Resources Conservation	1. Afforestation
	2. Countermeasures for Deforestation and Forest Degradation
Transport	3. Modal Shift (Passenger)
	4. Measures on road congestion
	5. Modal Shift (Freight)
	6. Railway Electrification
Energy Saving	7. Energy Efficiency of Devices and Equipment
	8. Waste Energy Use in Industrial Facilities
	9. Fuel Switch in Industrial Facilities
Energy	10. Heat and Electricity Generation Facility/Fuel Switch
	11. Thermal Power Generation/Fuel Efficiency Improvement
	12. Transmission System Efficiency Improvement
	13. Distribution System Efficiency Improvement
	14. Rural Electrification
Renewable Energy	15. Solar, Wind and Others
	16. Biomass
Water and Waste Management	17. Landfill (Methane Recovery)
	18. Anaerobic Treatment of Organic Waste
	19. Composting of Organic Waste
	20. Waste Water Treatment (Methane Recovery)
	21. Sludge Treatment (Methane Recovery or Composting)
	22. Non Revenue Water
	23. Semi-aerobic landfill