IGES Capacity Building Programme – Osaka General Meeting
7th March 2013, Osaka, JAPAN

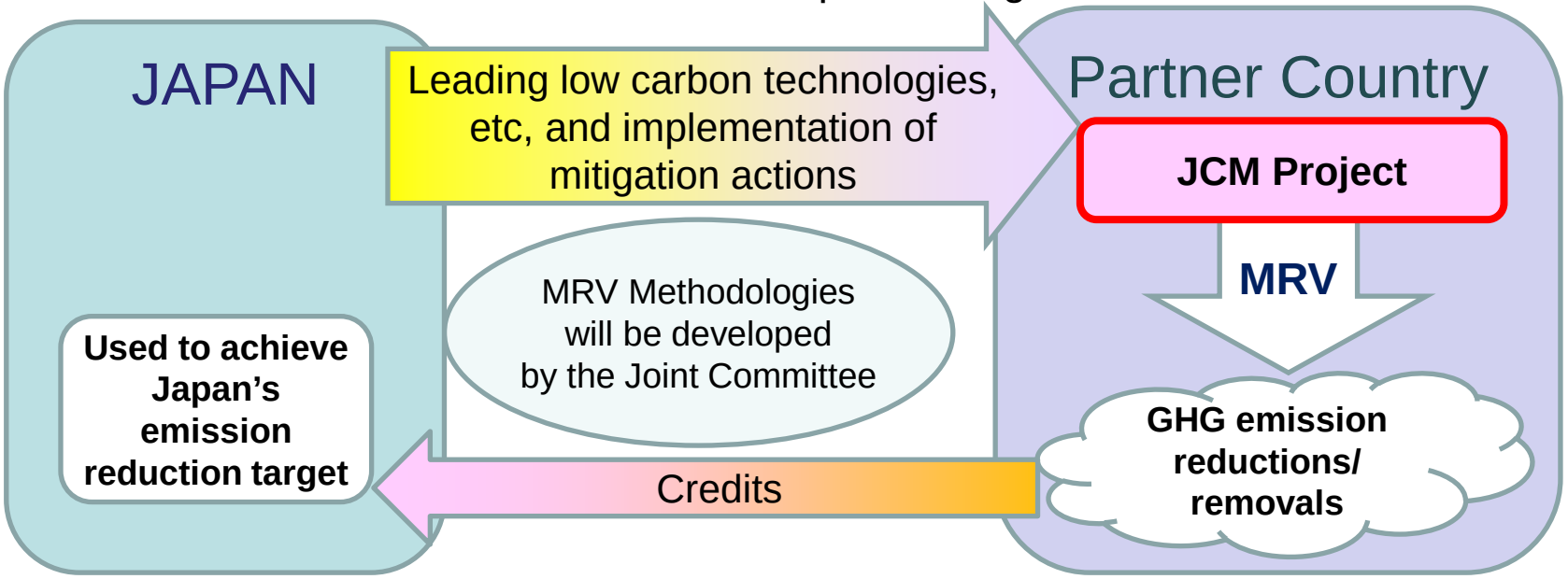
JCM/BOCM Methodology Development under Programme of MRV Demonstration Study & JCM/BOCM Feasibility Study

Tomoya MOTODA, Carbon Management Dept.,
Global Environment Centre Foundation (GEC)
as the Secretariat of the DS/FS Programme on JCM/BOCM

Joint Crediting Mechanism (JCM)/ Bilateral Offset Credit Mechanism (BOCM)

Basic Concepts:

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions to GHG emission reductions or removals from Japan in a quantitative manner, by applying measurement, reporting and verification (MRV) methodologies, and use them to achieve Japan's emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals, complementing the CDM.



Source: Slide #3, Government of Japan, "Recent Development of the Joint Crediting Mechanism (JCM)/Bilateral Offset Credit Mechanism (BOCM)" (Feb. 2013)

Initiatives for the Development of JCM/BOCM under the Ministry of the Environment, Japan (MOEJ)

(1) Feasibility Studies (FS) for MRV Methodology Development **(GEC)**

- Called for study proposals focusing on MRV Methodology Development from Japanese entities, based on concrete potential JCM/BOCM projects/activities.
- MRV Demonstration Studies (DS) using Model Projects have been undertaken, in order to acquire practical know-hows and experiences in JFY2012.

To establish the enabling environment for JCM/BOCM projects/activities in developing countries

(2) Information platform for the JCM/BOCM **(OECC)**

- New Mechanisms Information Platform website was established to provide the latest movements and information on the JCM.

(3) Capacity Building (CB) for the JCM/BOCM **(IGES, etc.)**

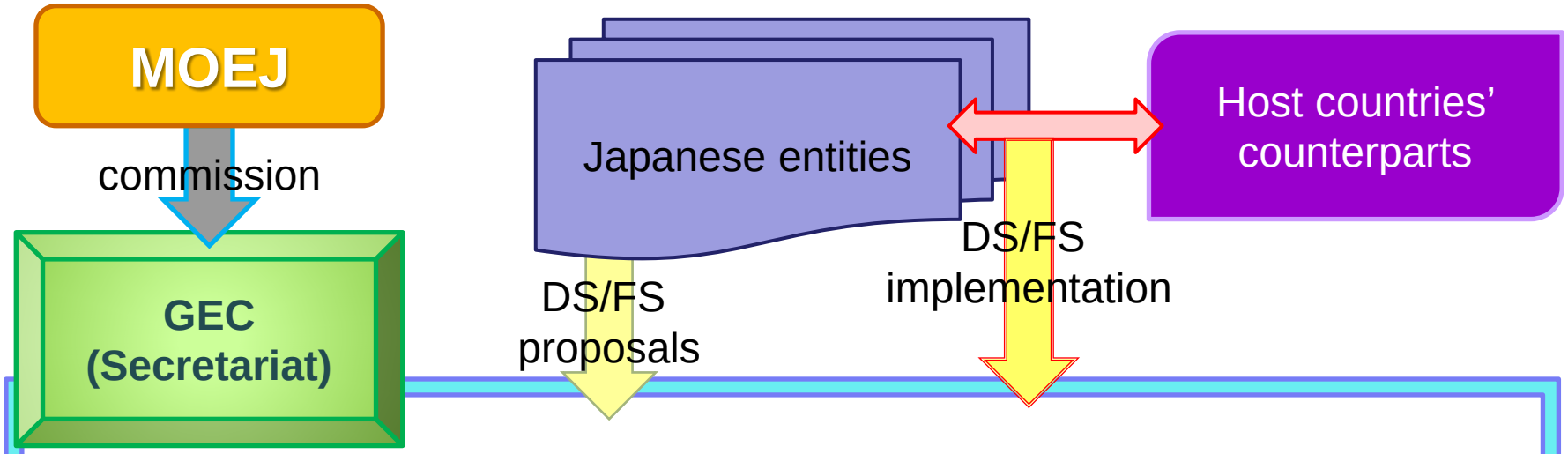
- Consultations with government officials and private firms in developing countries for capacity building for new market mechanism implementation and MRV application (incl. development of MRV methodologies)

Source: modification based on the Ministry of the Environment, Japan

MOEJ/GEC's JCM/BOCM FS Programme

2010	3 FS were implemented.
• Each FS entity made rough estimation of GHG emission reductions from a target sector/project, and proposed a concept of MRV of GHG emission reductions under New Mechanisms.	
2011	29 FS were implemented.
• Each FS entity surveyed following points; setting of reference scenario, monitoring plan, calculation protocol and quantification of GHG mitigation effects, MRV system, securing environmental integrity, etc..	
2012	**13 MRV DS** & **12 JCM FS** implemented.
• Main objective is to develop streamlined MRV methodologies applicable to JCM/BOCM projects/activities. • MRV DS aimed at practicing actual monitoring and verification on a trial basis, based on existing model projects under already operation, in order to demonstrate draft MRV methodologies are practically usable.	

Overview of DS/FS Programme



- Invite public proposals on DS/FS from Japanese entities (private companies and NGO/NPOs)
- Select the proposals to be officially adopted as qualified DS/FS (funded to implement studies)
- Provide advice and supervision to the qualified DS/FS
  - Through an expert committee and task force teams
- Promotion of cooperative relationships with host countries
  - Through meetings with host countries' governments and stakeholders
- Outreach the DS/FS results
  - Through GEC website, UNFCCC Side Events, etc.

MRV DS and JCM/BOCM FS 2012

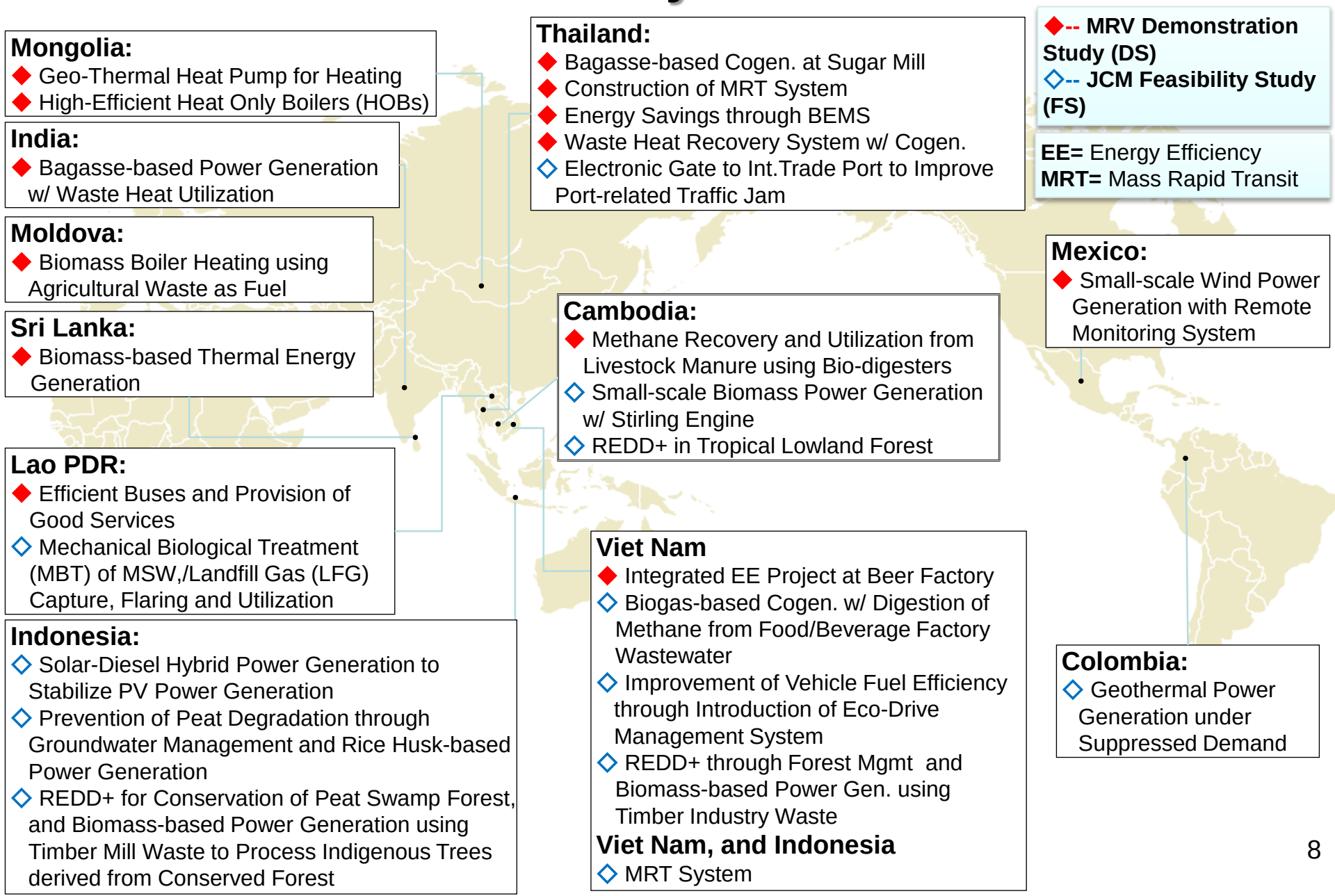
- **13 DS and 12 FS in 12 countries in JFY 2012**
  - **32 FS in JFYs 2010-2011**

- **Developing streamlined MRV methodologies for JCM/BOCM projects/activities in each study, that should**:
  - Be simplified, objective and practical, while lowering uncertainty and ensuring environmental integrity
    - One preset reference scenario, which should be conservative compared to BaU
    - Objective “Eligibility Criteria”, which should include positive list(s) and benchmarks
    - Reduced monitoring items and burdens, with default value(s) and/or preset project-specific value(s)
    - “Conservativeness” – quantification of emission reductions should be conservative
  - Simple but conservative methodology application contributes to the **global net reductions**, as well as the **reduction of transaction costs**.
  - Accelerate the deployment of low-carbon technologies, products and services, taking into account the national circumstances in host countries
  - Facilitate the NAMAs in host countries

DS/FS Agenda: in developing MRV methodologies

- Setting objective “Eligibility Criteria”: as a check list
  - Positive list(s): automatically eligible if the technology adopted for the project/activity ➔ Surveyed what kind of technology is acceptable as positive list.
  - Benchmark(s): e.g. higher efficiency with concrete number ➔ Surveyed what number is applicable as benchmark.
- Setting one objective **reference scenario**, which should be conservative than BaU
- Identification of parameters to calculate GHG emission reductions
  - Default value(s) / Preset project-specific value(s) / Monitored value(s)
- Setting **default value(s)**:
  - Based on IPCC inventory guidelines
  - Based on CDM methodologies
  - Surveyed the current situation in host country
- Identification of monitoring parameter(s): how to reduce the parameters and the monitoring frequencies
  - Hopefully at most 3 parameters to be monitored
- Creation of **“GHG reduction Calculation Spreadsheet(s)”**
  - Through the Calculation Spreadsheet(s), quantified GHG reductions will be popped up when the number of monitored parameters fill in.
  - The Calculation Spreadsheet(s), equipped with calculation protocols (functions of Excel), should be created by the DS/FS, as a part of developed draft MRV methodologies.

MRV Demonstration Studies using Model Projects & JCM/BOCM Feasibility Studies in JFY2012



Mongolia:
- ◆ Geo-Thermal Heat Pump for Heating
- ◆ High-Efficient Heat Only Boilers (HOBs)

India:
- ◆ Bagasse-based Power Generation w/ Waste Heat Utilization

Moldova:
- ◆ Biomass Boiler Heating using Agricultural Waste as Fuel

Sri Lanka:
- ◆ Biomass-based Thermal Energy Generation

Lao PDR:
- ◆ Efficient Buses and Provision of Good Services
- ◇ Mechanical Biological Treatment (MBT) of MSW,/Landfill Gas (LFG) Capture, Flaring and Utilization

Indonesia:
- ◇ Solar-Diesel Hybrid Power Generation to Stabilize PV Power Generation
- ◇ Prevention of Peat Degradation through Groundwater Management and Rice Husk-based Power Generation
- ◇ REDD+ for Conservation of Peat Swamp Forest, and Biomass-based Power Generation using Timber Mill Waste to Process Indigenous Trees derived from Conserved Forest

Thailand:
- ◆ Bagasse-based Cogen. at Sugar Mill
- ◆ Construction of MRT System
- ◆ Energy Savings through BEMS
- ◆ Waste Heat Recovery System w/ Cogen.
- ◇ Electronic Gate to Int.Trade Port to Improve Port-related Traffic Jam

Cambodia:
- ◆ Methane Recovery and Utilization from Livestock Manure using Bio-digesters
- ◇ Small-scale Biomass Power Generation w/ Stirling Engine
- ◇ REDD+ in Tropical Lowland Forest

Viet Nam
- ◆ Integrated EE Project at Beer Factory
- ◇ Biogas-based Cogen. w/ Digestion of Methane from Food/Beverage Factory Wastewater
- ◇ Improvement of Vehicle Fuel Efficiency through Introduction of Eco-Drive Management System
- ◇ REDD+ through Forest Mgmt and Biomass-based Power Gen. using Timber Industry Waste

Viet Nam, and Indonesia
- ◇ MRT System

Mexico:
- ◆ Small-scale Wind Power Generation with Remote Monitoring System

Colombia:
- ◇ Geothermal Power Generation under Suppressed Demand

◆-- **MRV Demonstration Study (DS)**
◇-- **JCM Feasibility Study (FS)**

EE= Energy Efficiency
MRT= Mass Rapid Transit

MRV DS 2012: Sectoral Overview

Sector		# by country	Remarks
Waste Management		1: Cambodia	• Animal Manure to Bio-Digesters
Biomass Utilisation	Co-generation	1: India 1: Thailand	• Bagasse
	Heat	1: Moldova 1: Sri Lanka	• Agricultural waste or other biomass
Renewable Energy		1: Mexico 1: Mongolia	• Wind power generation • Geothermal heat-pump
Energy Efficiency		1: Mongolia 1: Thailand 1: Viet Nam	• Improved efficiency of Heat-only Boiler • Building Energy Management Systems (BEMS) • Comprehensive energy efficiency at beer factory
	Waste heat recovery	1: Thailand	• Through absorption chillers
Transport		1: Lao PDF 1: Thailand	• Public bus update and improved service • Mass Rapid Transit (MRT) system

JCM/BOCM FS 2012: Sectoral Overview

Sector		# by country	Remarks
Waste Management		1: Lao PDR	• Composting, and LFG destroy
	Waste water treatment	1: Viet Nam	• Beer factory waste water treatment with high efficiency (UASB)
Biomass Utilisation	Power generation	1: Cambodia	• Rice husk based (with Stirling engine)
Renewable Energy		1: Colombia 1: Indonesia	• Geothermal power generation • Solar-Diesel hybrid power generation
Transport		1: Thailand 1: Viet Nam 1: Viet Nam & Indonesia	• Port gate electrification • Eco-driving by software • MRT System
Land Use Change	REDD+	1: Cambodia 1: Indonesia 1: Viet Nam	
	Peatland Management	1: Indonesia	• Rewetting agricultural peatland (for rice paddy)

Summary of DS/FS Results (1)

- **Basic Concept of MRV Methodology:**
  - Emission Reductions (ER)
    = Reference Emissions (RE) – Project Emissions (PE) (– Leakage Emissions (LE))
  - Emissions = Activity Quantity x Emission Factor (EF)
  - EF is supposed to be set as default value

  → Then, 'Activity Quantity' is supposed to be monitored.
- **Challenges for Methodology Development in DS/FS:**
  - Although innovative methodologies are expected, many DS/FS entities' starting point is based on ***approved CDM methodologies*** applicable to similar projects.
  - Clear official guidance for the new MRV methodology development could not be provided at the beginning stage of DS/FS.
  - Neither guidelines for the monitoring plan development nor for the verification could be provided at the beginning stage of DS/FS.
  - Reduced burdens for monitoring activities might lead to the introduction of expensive and high-quality measuring equipment (such as continuous measuring meters and data logger) → Increase of initial cost.

Summary of DS/FS Results (2)

- **Eligibility Criteria:**
  - "High-efficiency" something – not a criterion (not a benchmark), not objective
  - Ex. 1: **Specification of installed boiler in the project shall be more than 45kg/cm^2** (*MRV DS- Bagasse-based Power Generation including Waste Heat Utilisation (India)*, Eligibility Criteria #5)
    - ← The DS entity surveyed host country's status through interviews of the target sector (sugar mills), which indicated that Indian bagasse boilers tend to improved efficiency, but '45kg/cm^2' of produced steam pressure is not widespread in Indian sugar sector. Compared to similar CDM projects, the highest specification in CDM is 42kg/cm^2.
    - → The number '45kg/cm^2' can be a criteria as a benchmark, according to the DS.
  - Ex. 2: The project activity replaces electricity from grid or fossil fuel-based generator through introducing facilities such as high-efficient biomass boilers, …
    ➔ For a case where **fluidized bed boiler** is introduced, this case can be met. (*MRV DS- Bagasse-based Cogeneration at Sugar Mill (Thailand)*, Eligibility Criteria #1)
    - ← The DS entity surveyed host country's general biomass boilers already installed, and they found that most are stoker boilers. Therefore, the introduction of fluidized bed boiler – more efficient combustion can be achieved and more expandability for fuel application can be observed – is considered to lead to additional emission reduction.
    - →'Fluidized bed boiler' can be a criteria as a positive list, according to the DS.

Summary of DS/FS Results (3)

- **Reference Scenario:**
  - DS/FS entities were requested to set a 'conservative' scenario compared to BaU as the reference scenario, to ensure the JCM/BOCM contributes to **global net reduction**.
  - However, many entities could not set such 'conservative' reference scenarios, because they thought such concept was not fit to project-based mechanism.
  - Some examples of 'conservative' reference scenarios are:
    - The latest version of the Long Term Expansion Plan produced by Ceylon Electricity Board shall be the reference scenario. However, if biomass or other renewable energy must be used for the duration of the project due to some sort of regulation(s), the regulation values that are provided shall be the reference scenario for both thermal energy and electricity generation. (*MRV DS- Biomass-based Thermal Energy Generation to Displace Fossil Fuels (Sri Lanka)*)
    - Unlike BaU, the reference scenario should have the following composition of transport modes:
      - Travel distance by MRT: Less than 1km → Motorcycle 100%
      - 1km – 5km → Motorcycle 100%
      - 5km – 10km → Motorcycle 87%, Bus 13%
      - 10km – 15km → Motorcycle 60%, Bus 40%
      - BaU transport modes include motorcycle, bus, automobile, and others.

      (*JCM/BOCM FS- Promotion of Modal Shift from Road-based Transport to Mass Rapid Transit (MRT) System (Viet Nam and Indonesia)*)
  - DS/FS entities, future project participant candidates, would like to earn more credits, so that there is no incentive to set 'conservative' reference scenario leading to less emission reductions.
  - Here we have to note that "Reference scenario" and "Reference emissions" are different concepts, so some discount or application of conservative value for the calculation of "Reference emissions" can be acceptable options.

Summary of DS/FS Results (4)

- **Parameters to Calculate GHG emissions:**
  - Default Value(s):
    - Many data is collected to set default values through DS/FS. However, vast workloads are necessary to set credible “default values”.
      The “default values” set by DS/FS should be reviewed in the process of methodology approval by the Joint Committee, referring to datasets collected.
    - On the other hand, the Default Values set in the IPCC Inventory Guidelines are adopted in draft MRV methodologies.
  - Preset Project Specific Value(s):
    - Monitoring by project proponent is necessary at least once to set the preset project specific value(s).
      ➔ When the value(s) is/are set for the proposed project, the parameter(s) with the value(s) can be applied for the GHG calculation without any additional monitoring.
    - Such value(s) can contribute to the reduction of monitoring burdens of the project proponents.
  - Monitoring item(s):
    - Under the JCM/BOCM, the number of monitoring items should be reduced.
    - Another idea is the reduction of monitoring frequencies, which can lead to lightened burden for the project proponents.

Summary of DS/FS Results (5)

- **Monitoring Method:**
  - It is important that the project participant (= project operator) in a host country can undertake the monitoring activity in a effective manner, based on the monitoring method described in the MRV methodology.
    ➔ Utilisation of as many default values as possible, in order to avoid the complexity of actual monitoring activity practice.
  - However, the use of high-spec measuring equipment (such as a calorimeter with automatic logger function and internet clouding function) could help reduce the burdens of monitoring activity, although the initial costs would increase.

- **Quantification of GHG Emission Reductions:**
  - MRV DS output the actual results of GHG emission reductions, according to Calculation Options identified in their draft MRV methodologies.
    → Many studies demonstrated that the draft MRV methodologies can be workable.
    → Some studies used the abovementioned high-spec measuring equipment.
  - Most model projects resulted in quite small amount of GHG reductions.
    ← The reason is probably the demonstration studies completed within less than one year should be targeted to the small model projects.

Summary of DS/FS Results (6)

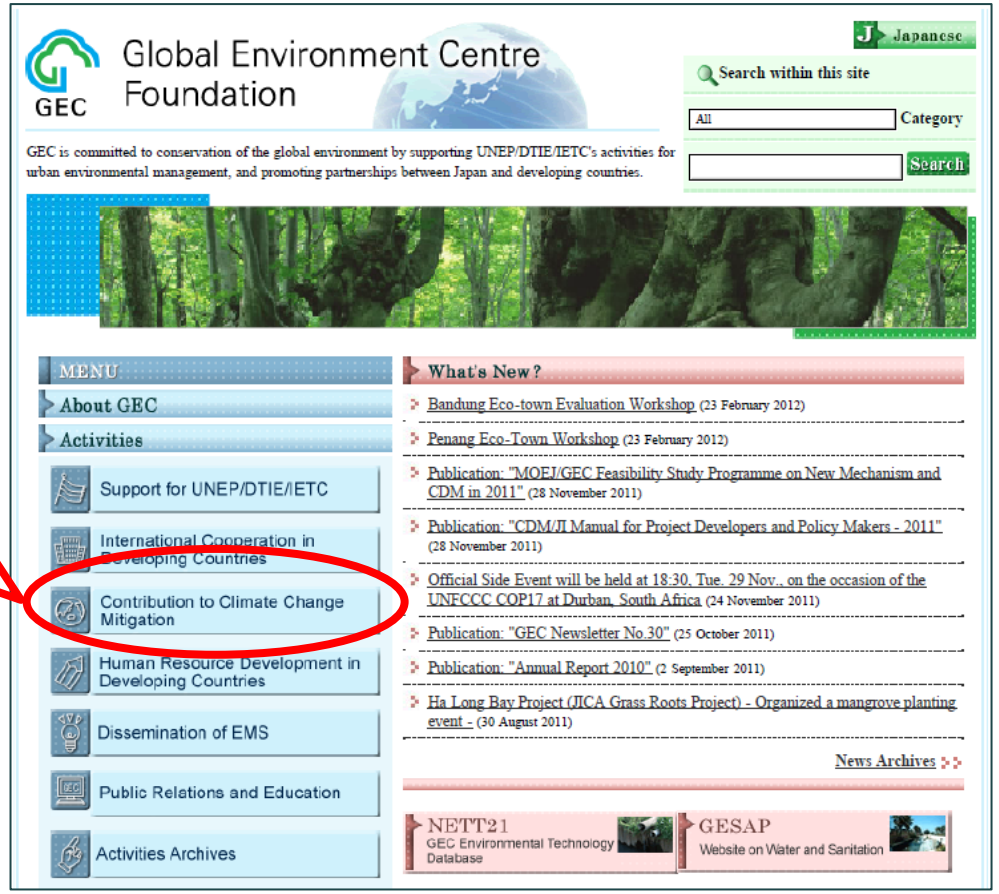
- **Verification:**
  - Trial verifications were conducted by third-party entities under MRV DS.
  - CDM DOEs or other organisations in host countries were asked to undertake the trial verification for JCM/BOCM, based on the draft MRV methodologies, with the monitoring reports based on the Calculation Spreadsheet (MS Excel) attached to the methodologies.
  - Although it should not be official JCM/BOCM verification scopes, some verifications investigated
    - Validity of Default Values set in the draft MRV methodologies; and
    - Validity of the concept or formula to quantify GHG emission reductions.
  - Some verifiers requested that the clear verification guidelines for JCM/BOCM were necessary.
  - Some DS/FS entities and their counterparts of Japanese DOEs made training opportunities for host countries' project operator and/or possible verifiers to make effective monitoring activities and/or verification tasks.

Final Reports of DS/FS 2012

- DS/FS 2012 just completed on 4th March 2013.

➔ DS/FS final reports will be available soon through the GEC website, at http://gec.jp.

Enter from here!



Thank you very much for your attention!

Tomoya MOTODA
Deputy Director, Carbon Management Dept.
Global Environment Centre Foundation (GEC)
cdm-fs@gec.jp

GEC