

The 22nd Asia Pacific Seminar on Climate Change
“Measurement, Reporting and Verification (MRV) for Mitigation and,
Monitoring and Evaluation (M&E) for Adaptation in the Asia-Pacific Regions”
<Hanoi, Vietnam, June 27-28, 2013>

Introducing a variety of MRVs

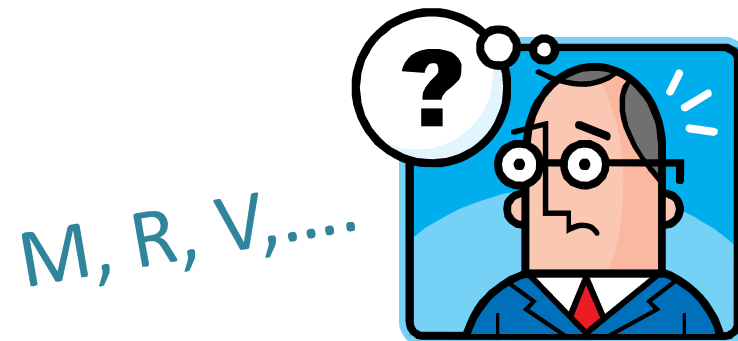
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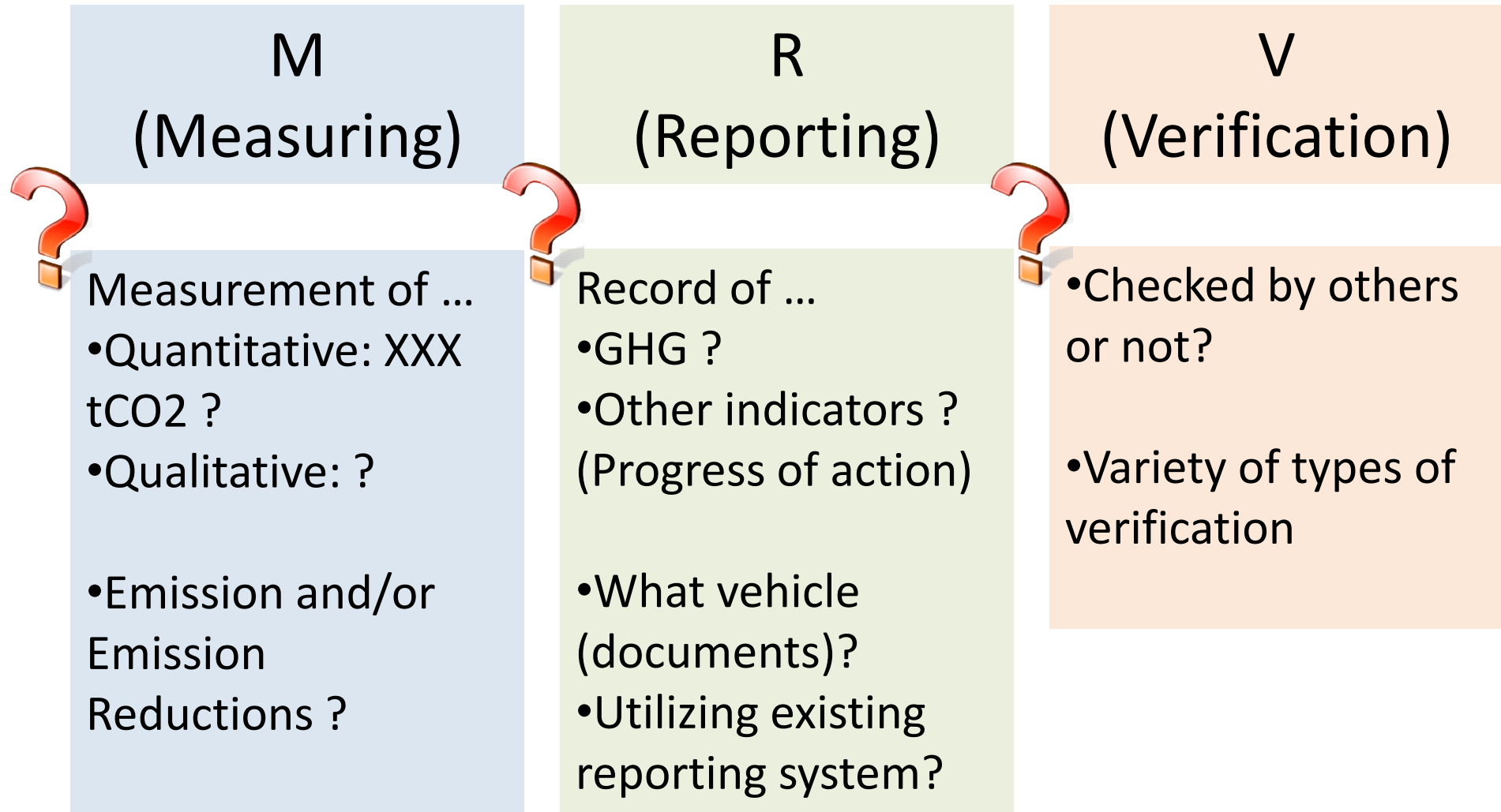


Presentation topics

- Identifying elements of MRV
- A recent academic discussion of different MRVs
- MRVs in different levels



MRV of Mitigation Actions (Digesting the concept)



MRVs in different schemes and systems

- ✓ EU-ETS, Regional ETS (California, Tokyo, etc.)
 - ✓ CDM/JI, Verified Carbon Standard (VCS), etc.
 - ✓ National GHG Inventory
 - ✓ Mandatory National Reporting System
 - ✓ National action plans and Sectoral strategies related to Climate Change Mitigation
 - ✓ Others
- Can we discuss all of these as a same “MRV” ???

A recent academic discussion of different MRVs

Table: MRV of GHG emissions/reductions

		Type I MRV of GHG emissions at organization level	Type II MRV of GHG reductions at project level for crediting	Type III MRV of GHG emissions at national level	Type IV MRV of GHG reductions by policy/action
Object		GHG emissions at organization level under GHG scheme	GHG reductions realized by individual project	GHG emissions at national / sub-national level	GHG reductions by policy / action at national / sub-national level
Aim		Determination of GHG emissions at covered organization under GHG scheme	Crediting and certification of amount of GHG reductions by individual project under GHG scheme	Determination of GHG emissions at national level and compliance assessment for developed countries under Kyoto Protocol	Quantitative evaluation of policy / action
Methodology	M / R	Monitoring and Reporting Guidelines under GHG scheme	Monitoring/Baseline /Calculation methodologies under GHG scheme	IPCC Guidelines and UNFCCC COP/CMP Decisions	(Unavailable)
	V	Verification Guideline under GHG scheme	Verification Guideline under GHG scheme	UNFCCC COP/CMP Decisions and Kyoto Protocol Art. 8 with related documents for review	(Unavailable)

(Ref: Ninomiya, IGES, 2012)

A recent academic discussion of different MRVs

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Implementatio n body	M / R	Covered organization under GHG scheme	Project participant of individual project	National government /sub-national government	(Unknown) (*Probably, gov't that is implementing the policy/action)
	V	Third-party verification body	Third-party verification body (e.g. DOE in CDM)	Expert Review Team under UNFCCC/ Kyoto Protocol Art.8	(Unknown)
Characteris tics		-Very high required level of accuracy -Technically well matured and sophisticated MRV -Sufficient knowledge and experiences accumulated in developed countries -Relatively simple	-Very high required level of accuracy -Technically well matured and sophisticated MRV -Globally operated via CDM all over the world -Technical difficulties inherited in baseline setting, additionality demonstration	-Medium required level of accuracy (not as much as Type I and II) -Technically matured and widely operated in developed countries -Not well established in developing countries -Relatively simple	-Undeveloped MRV -Required level of accuracy unknown, but possibly less than medium -Important MRV regarding effectiveness of international climate regime

A recent academic discussion of different MRVs

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Examples operated	-EU-ETS -Climate Registry -California Climate Action Registry (US) -Tokyo Metropolitan Gov't ETS (Japan) -Sectoral Trading Mechanism (STM)(EU)	-CDM -VCS -Joint Crediting Mechanism/Bilateral Offset Credit Mechanism (JCM/BOCM) (Japan)	-Submission and review of National GHG Inventory	(Unavailable) (*Quantitative evaluation of policy / action including NAMAs)
International standards/ Guidelines	ISO14064-1 (M/R) ISO14064-3 (V) ISO14065 (V) ISO14066 (V)	ISO14064-2 (M/R) ISO14064-3 (V) ISO14065 (V) ISO14066 (V)	IPCC Guideline (M/R) UNFCCC COP/CMP Decisions (R/V)	(Unavailable) (*Under consideration at UNFCCC)

(Ref: Ninomiya, IGES, 2012)

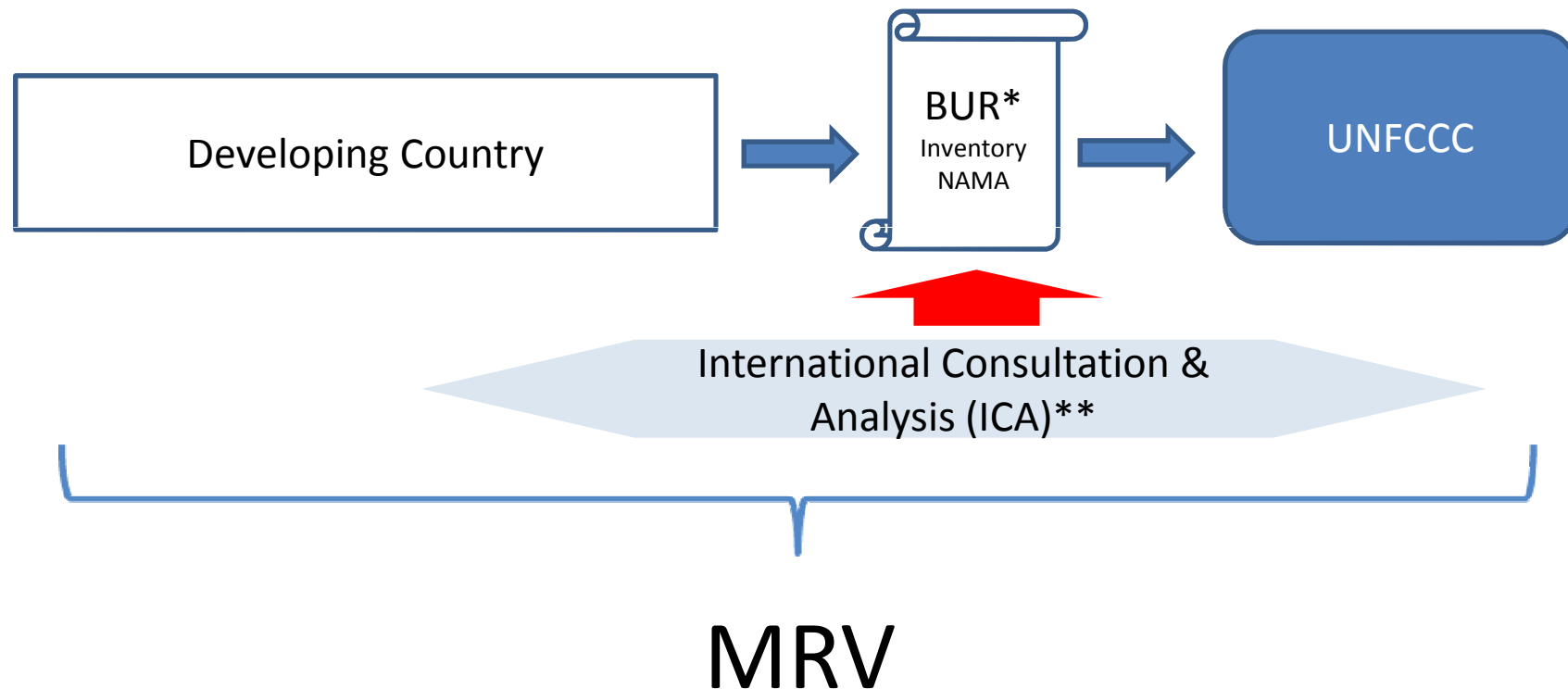
→ Above MRV classification, Type I, II, III and IV covers all Mitigation Actions?

MRVs in different levels

<1> MRV for describing the international process

* Guidelines decided by 2/CP.17 Annex III

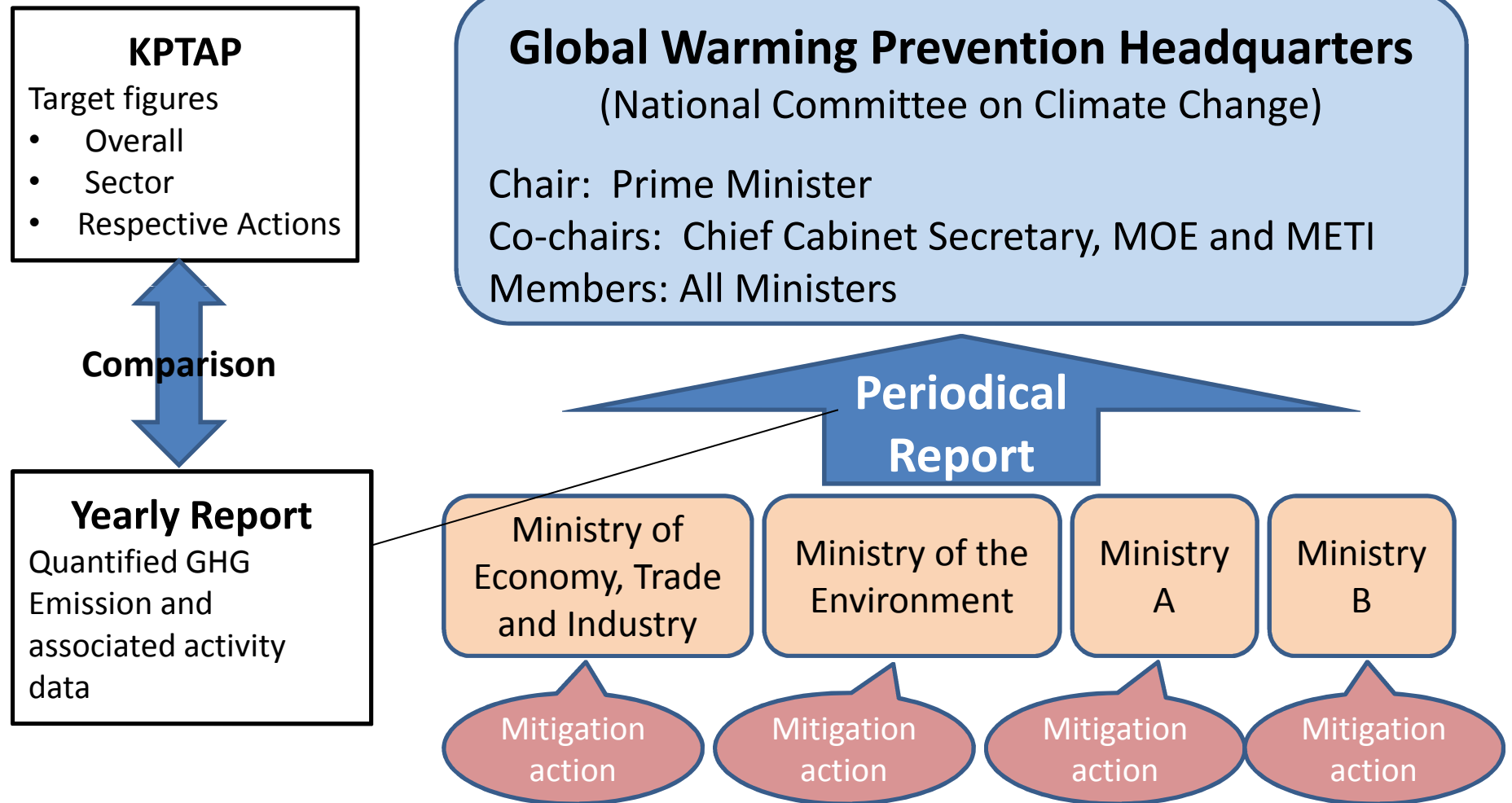
** Details are not yet decided (subject to further negotiations)



MRVs in different levels

<2> MRV at Policy Level

(Institutional Arrangement overseeing the Progress of Kyoto Protocol Target Achievement Plan (Japan's Mitigation Actions))



* This is the case of Japanese domestic institutional arrangement.

<2> MRV at Policy Level

Progress Report for the Kyoto Protocol Target Achievement Plan (KPTAP)

Progress Report for the Kyoto Protocol Target Achievement Plan[↵]

April 5, 2013[↵]

Global Warming Prevention Headquarters[↵]

1 Current checking[↵]

The Global Warming Prevention Headquarters recently checked measures and policies taken to understand progress in the achievement of the Kyoto Protocol goals and summarized results in the hope of consistent achievement of the targets in the applicable term. The checking was conducted based on the progress management stipulated in the Kyoto Protocol Target Achievement Plan (TAP) that was fully revised to reflect the cabinet decision of March 28, 2008, aiming to consistently achieve goals.[↵]

2 Progress on measures[↵]

(1) Japan's total emission for greenhouse gases[↵]

Japan's 2011 total greenhouse gases emissions of nearly 1.37 billion tons (preliminary figures are converted into carbon dioxide, the same applies throughout), increased by 3.6% compared to the reference year (principally, 1990). Table 1 shows emission by gas and sector.[↵]

Table 1 Greenhouse gases emission[↵]

(in millions of ton)

	Reference year (Percentage of total)	2011 figures (Quick estimation) (Comparison with reference year)	2010 target (Comparison with reference year)
Energy-derived carbon dioxide	1,059 (84%)	1,173 (+10.7%)	1,076 through 1,089 (+1.6% through +2.8%)
Industrial sector	482 (38%)	420 (-12.8%)	424 through 428 (-12.1% through -11.3%)
Business and other sectors	164 (13%)	247 (+50.6%)	208 through 210 (+26.5% through +27.9%)
Household sector	127 (10%)	189 (+48.1%)	138 through 141 (+8.5% through +10.9%)
Transportation sector	217 (17%)	230 (+5.8%)	240 through 243 (+10.3% through +11.9%)
Energy conversion sector	67.9 (5%)	86.1 (+26.8%)	66 (-2.3%)
Non energy-derived carbon dioxide	85.1 (7%)	69.1 (-18.8%)	85 (-0.6%)
Methane	33.4 (3%)	20.1 (-39.9%)	23 (-32.3%)
Chlorine monoxide	32.6 (3%)	22.0 (-32.6%)	25 (-24.2% through -24.0%)
Three CFC alternatives	51.2 (4%)	23.5 (-54.0%)	31 (-39.5%)
Total	1,261 (100%)	1,307 (+3.6%)	1,239 through 1,252 (-1.8% through -0.8%)

<2> MRV at Policy Level

Progress Report for the Kyoto Protocol Target Achievement Plan (KPTAP)

e.g. Table: Progress of measures and policies related to emissions reduction and absorption of greenhouse gases

Specific measure [↗]	Evaluation indicators and the like for measures [↗]	2008 [↗]	2009 [↗]	2010 [↗]	2011 [↗]	2008 [↗]	2009 [↗]	2010 [↗]	2011 [↗]
		Actual figures [↗]				Predicted figures [↗]			
Promotion of measures in waste disposal [↗]	GHGs reduced (10,000 t-carbon dioxide) [↗]	-27.1 [↗]	-14.3 [↗]	- [↗]	- [↗]	16.7 [↗]	39.6 [↗]	62.8 [↗]	85.8 [↗]
	(1) Increment in waste power generation (non-industrial wastes) (GWh) [↗]	(1) -58 [↗]	(1) -92 [↗]	(1) 267 [↗]	(1) 267 [↗]	(1) 133 [↗]	(1) 278 [↗]	(1) 390 [↗]	(1) 582 [↗]
	(2) Increment in waste power generation (industrial residues) (GWh) [↗]	(2) 103 [↗]	(2) 304 [↗]	(2) 880 [↗]	(2) 880 [↗]	(2) 245 [↗]	(2) 490 [↗]	(2) 735 [↗]	(2) 980 [↗]
	(3) Estimate of sorted and collected plastic materials used for packaging (through designated corporations)(1,000 t) [↗]	(3) 604 [↗]	(3) 617 [↗]	(3) 635 [↗]	(3) 635 [↗]	(3) 731 [↗]	(3) 780 [↗]	(3) 869 [↗]	(3) 721 [↗]
Implementation of people's movement [↗]	GHGs reduced (10,000 t-carbon dioxide) [↗]	[↗]	[↗]	[↗]	[↗]	[↗]	[↗]	[↗]	[↗]
	(1) -1) Cool-Biz (execution ratio (%)) [↗]	(1) -1)71.6 [↗]	(1) -1)64.3 [↗]	(1) -1)58.6 [↗]	(1) -1)80.7 [↗]	(1) -1)61-63 [↗]	(1) -1)64-68 [↗]	(1) -1)66-73 [↗]	(1) -1)67-78 [↗]
	(2) -2) Cool-Biz (actual reduction (10,000 t-carbon dioxide)) [↗]	(2) -2)172 [↗]	(2) -2)185 [↗]	(2) -2)169 [↗]	(2) -2)156 [↗]	(2) -2)136 [↗]	(2) -2)139 [↗]	(2) -2)140 [↗]	(2) -2)141 [↗]
	(3) -1) Warm Biz (execution ratio (%)) [↗]	(3) -1)70.5 [↗]	(3) -1)63.5 [↗]	(3) -1)60.4 [↗]	(3) -1)73.1 [↗]	(3) -1)64-66 [↗]	(3) -1)67-71 [↗]	(3) -1)69-76 [↗]	(3) -1)70-81 [↗]
	(4) -2) Warm Biz (actual reduction (10,000 t-carbon dioxide)) [↗]	(4) -2)145 [↗]	(4) -2)107 [↗]	(4) -2)96 [↗]	(4) -2)- [↗]	(4) -2)136 [↗]	(4) -2)139 [↗]	(4) -2)140 [↗]	(4) -2)141 [↗]
Encouraging replacement of energy-saving devices [↗]	GHGs reduced (10,000 t-carbon dioxide) [↗]	[↗]	[↗]	[↗]	[↗]	[↗]	[↗]	[↗]	[↗]
	a) Number of devices introduced (10,000 unit) [↗]		a) 926 [↗]	a) 892 [↗]	a) 867 [↗]	a) 990 [↗]	a) 1,080 [↗]	a) 1,180 [↗]	a) 1,290 [↗]
	b) Energy-saving electric hot water server [↗]		b) 565 [↗]	b) 528 [↗]	b) 500 [↗]	b) 740 [↗]	b) 830 [↗]	b) 920 [↗]	b) 1,020 [↗]
	c) Dish washers [↗]	a) 15,494 [↗]	c) 17,220 [↗]	c) 18,542 [↗]	c) 19,138 [↗]	c) 14,430 [↗]	c) 16,540 [↗]	c) 19,140 [↗]	c) 22,220 [↗]
	d) Bulb-type fluorescent light [↗]	b) 1,530 [↗]	d) 1,607 [↗]	d) 1,689 [↗]	d) 1,773 [↗]	d) 1,580 [↗]	d) 1,710 [↗]	d) 1,840 [↗]	d) 1,970 [↗]
	e) Water-saving shower head [↗]	c) 6.6 [↗]	e) 7.1 [↗]	e) 7.7 [↗]	e) 8.4 [↗]	e) 8 [↗]	e) 10 [↗]	e) 11 [↗]	e) 13 [↗]
	f) Energy-saving controller for air conditioner compressor [↗]								
Improving of energy-saving performance of residential buildings [↗]	GHGs reduced (10,000 t-carbon dioxide) [↗]	550 [↗]	600 [↗]	660 [↗]	720 [↗]	[↗]	[↗]	930 [↗]	[↗]
	% [↗]	18 [↗]	26 [↗]	43 [↗]	48 [↗]	51 [↗]	59 [↗]	66 [↗]	69 [↗]

MRVs in different levels

<3> MRV at Activity Level (Project or Entity Level)

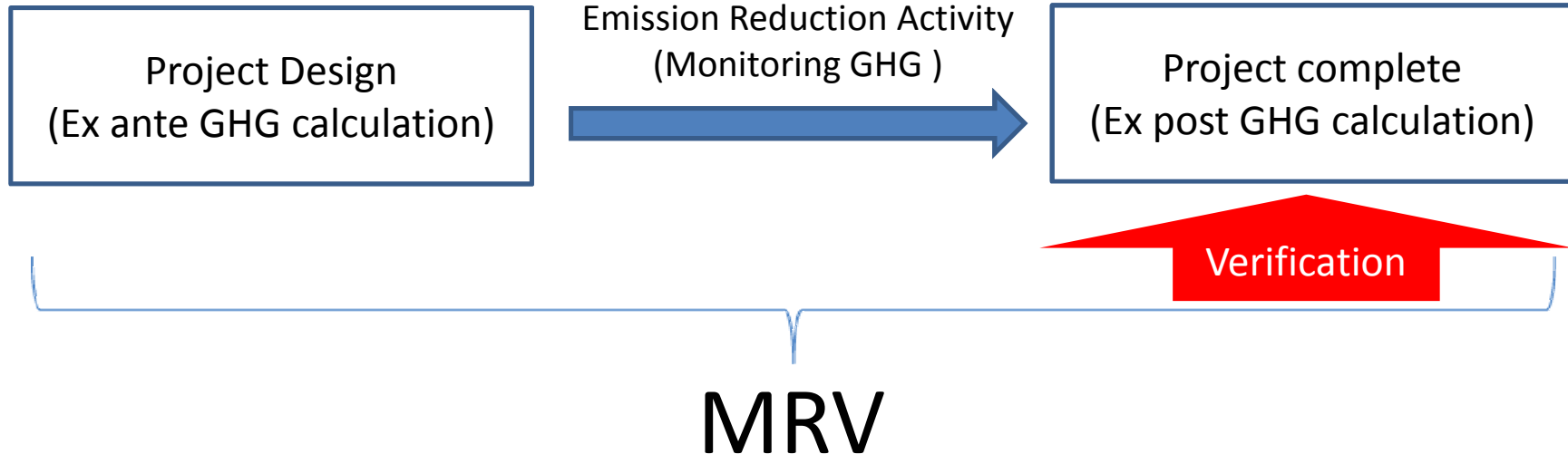


[Emissions Reduction per biodigester]

$$ER_y = BE_y - PE_{PL,y} - PE_{flare,y}$$

[Baseline Emissions per household]

$$BE_y = GWP_{CH_4} * D_{CH_4} * \sum_{j,LT} MCF_j * B_{0,LT} * N_{T,hh} * VS_{LT,y} * MS\%_{BIJ}$$



* Guidelines on methodologies are not yet decided by the UN

Discussion points

- MRV is a concept that integrates three steps: Measuring (M), Reporting (R) and Verification (V). But, necessary to identify various elements associated with MRV. (e.g. (1) Type I, II, III and IV (2) Qualitative and/or Quantitative (3) For offset purpose or not, etc.)
- Substantial differences among respective types of MRV. (maturity, accumulation level of knowledge and experiences, policy implications, required level of accuracy and etc.)
- Mitigation actions are structure in different layers. (National, Sectoral, Local, Programme, Project, etc.) MRV can be also in different layers.
- “MRV of NAMAs” are being considered and experimented by developing countries and under the UNFCCC.

Thank you for your attention.

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(New Mechanisms Information Platform)

- References (Table: “MRV of GHG emissions/reductions):

- Dr. Yasushi Ninomiya, IGES, “Classification of MRV of Greenhouse Gas (GHG) Emissions/Reductions: For the discussion on NAMAs and MRV”, IGES Policy Brief No. 25, November 2012

<http://pub.iges.or.jp/modules/envirolib/view.php?docid=4169>