

Introduction of MRV Guidebook: One Hundred Questions about MRV: from National Greenhouse Gas Inventories to the Clean Development Mechanism

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MRV Guidebook Project

Objectives:

- ◆ To summarize various existing MRV schemes

Uniqueness and Added-Value

- ◆ MRV in plain language, while covering technical information in coherent format
- ◆ Asia's experience and actual cases
- ◆ Open process for participation

Target readers:

- ◆ Practitioners of MRV, policy makers, donor agencies, research organisations, etc.

Authors:

- ◆ Experts on GHG inventory, National Communications, CDM and other MRV schemes.

Organizing MRV Guidebook

100 questions and answers about
MRV

Scale

- National
- Sub-national/City
- Project

Theme

- Basic
- Technical
- Institutional
- Support

Level of understanding

- Beginners
- Experts
- Etc.

Table of Contents

1. Introduction

2. One Hundred Questions

2.1 Approach for Understanding

3. MRV at Glance

3.1 Overview

3.2 Quick Comparison

4. Sample Questions

4.1 National Level

4.1.1. National Greenhouse Gas Inventories

4.1.2. National Communications (In Process)

4.1.3. Biennial Reports and Biennial Update Reports

4.2 Sub-regional/City Level (In Process)

4.3 Project Level

4.3.1. Clean Development Mechanism

5. Way forward

6. Annexes

References

Extend to other MRV schemes:

◆ **GHG Protocol** (in cooperation with World Resource Institute)

◆ **Joint Crediting Mechanism** (in cooperation with Global Environment Center Foundation)

15

16

17

25

30

31

35

38

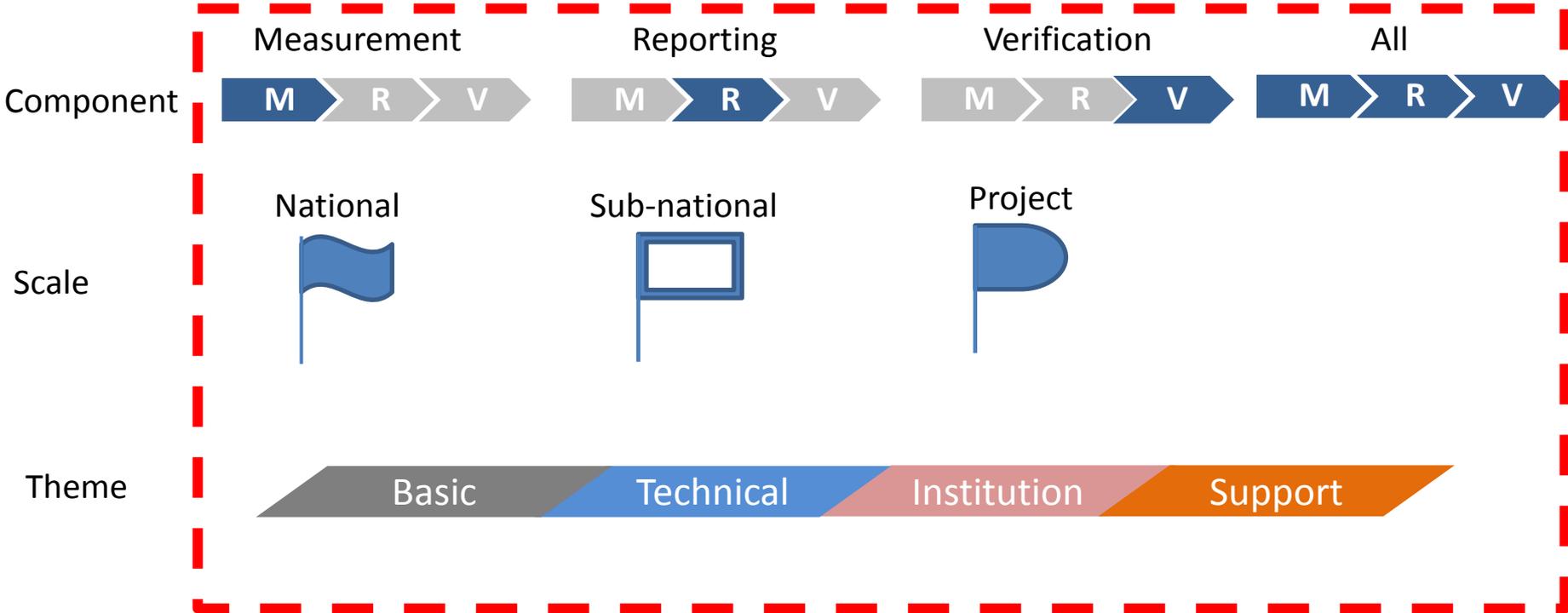
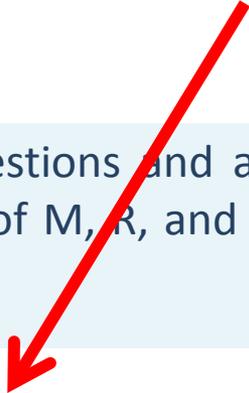
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4. Sample Questions

- ◆ Visualizing MRV at various levels
- ◆ Aiming at encyclopedia of MRV

Guide to One Hundred Questions

The subsequent sections present sample questions and answers on various scales. The following icons can guide: which component of M, R, and V it refers to; which scale it is; and which theme it is related with.



National Greenhouse Gas Inventories prepared by non Annex I countries

	M	R	V
Purpose	To estimate GHG emissions and removals at national level	To report estimates on GHG emissions and removals as a part of National Communication (NC) and Biennial Update Report (BUR)	To increase the transparency of mitigation actions and their effects
Scope	National GHG emission/removal estimation database prepared based on UNFCCC Reporting Guidelines and IPCC Guidelines	Chapters on the national GHG inventories in the NC and BUR	International Consultation and Analysis
Procedure	Determined by each non-Annex I country based on Decision 17/CP.8	<ul style="list-style-type: none"> ◆ MRV at glance ◆ Organizing information with the same format ◆ Completeness and comprehensiveness 	
Institution	Depends on each non-Annex country's national circumstances (There is no particular decision for the institution.)	d on CP.17	
Standard	Paragraphs 8 to 12 in Decision 17/CP.8, Paragraphs 3 to 10 of Annex III of Decision 2/CP.17, Revised IPCC Guidelines, GPG(2000), GPG-LULUCF, 2006 IPCC Guidelines	Paragraphs 13 to 24 in Decision 17/CP.8, 1996 Revised IPCC Guidelines, GPG(2000), GPG-LULUCF, 2006 IPCC Guidelines	Annex IV of Decision 2/CP.17



Q: What are “Measurement, Reporting and Verification (MRV)” for national GHG inventories?

A: **Measurement (M)** is to estimate greenhouse gas (GHG) emissions and removals at national level. **Reporting (R)** means to report estimates on GHG emissions and removals to the Conference of the Parties (COP) for the United Nations Framework Convention on Climate Change (UNFCCC). **Verification (V)** is to verify whether the national GHG inventories are transparent, consistent, comparable, complete and accurate.

Measurement (M) :

GHG emissions and removals to be estimated are anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol. Among the GHG emissions and removals, Parties included in Annex of the United Nations Framework Convention on Climate Change (UNFCCC) (Annex I countries) are required to estimate CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, while Parties not included in Annex of the UNFCCC (non-Annex I countries) are required to estimate CO₂, CH₄ and N₂O. Sectors to be estimated are energy; industrial processes; solvent and other product use; agriculture; land use, land-use change and forestry; and waste.

Reporting (R):

Annex I countries need to report annual GHG inventories and chapters on GHG inventories in their National Communications (NCs) and Biennial Reports (BR), while non-Annex I countries need to submit chapters on GHG inventories in their NCs and Biennial Update Reports (BURs). Annex I countries also need to report methodologies on how to estimate GHG emissions and removals in their annual GHG inventories.

Verification (V):

Verification has two levels; one is domestic level, and the other is international level. Verification activities implemented at the domestic level are quality control and quality assurance (QA/QC) activities, while those implemented at the international level are technical reviews of GHG inventories for Annex I countries and international consultation and analysis for non-Annex I countries.

Reference:

UNFCCC, “FOCUS: Mitigation – Reporting on national implementation and MRV” <http://unfccc.int/focus/mitigation/items/7173.php>

For Annex I Parties : UNFCCC, “Reporting Requirements” http://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/2759.php

UNFCCC, “Review Process” http://unfccc.int/national_reports/annex_i_ghg_inventories/review_process/items/2762.php

For non-Annex I Parties : UNFCCC, “National Communications and Biennial Update Reports from Non-Annex I Parties” http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php



Q: What is a Common Reporting Format?

A: **Common Reporting Format (CRF)** is EXCEL spreadsheets for reporting detailed quantified information on national GHG emissions and removals.

In detail

Common Reporting Format (CRF) is

- Composed with standardized format for each sector (categories) and for each year,
- Filled with numeric data and minimum information on estimation methodologies (Reference to National Greenhouse Gas Inventory report [NIR]).

- All Annex I Parties shall utilize CRF for their reporting to the UNFCCC, which means that quantified information submitted by all Annex I Parties is in the same format.



CRF enhances **Data Comparability** among Annex I Parties to the UNFCCC.

TABLE 1 SECTORAL REPORT FOR ENERGY (Sheet 1 of 2)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	SO ₂
Total Energy	1,145,900.52	40.13	24.7	1,799.31	2,674.44	164.00	146.33
A. Fuel Combustion (Sectoral Approach)	1,145,871.15	40.07	24.71	1,799.21	2,674.44	164.00	146.33
B. Energy Industries and Other Production	1,046,016.14	1.96	4.68	1,006.31	1,148.28	2.96	10.00
C. Transport	85,422.45	1.46	4.59	132.22	1,148.28	1.48	14.00
D. International Aviation and Shipping	14,444.11	0.07	0.10	0.24	0.24	0.10	0.24
E. Manufacturing Industries and Construction	1,782.12	0.08	0.02	0.06	1,175.00	0.00	2.12
F. Land Use, Land-Use Change and Forestry	1,142,128.39	3.96	8.26	1,000.00	1,219.00	9.99	128.39
G. Land Use, Land-Use Change and Forestry	184,110.01	2.35	1.49	28.18	321.59	1.58	11.81
H. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58
I. Land Use, Land-Use Change and Forestry	184,110.01	2.35	1.49	28.18	321.59	1.58	11.81
J. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58
K. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58
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W. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58
X. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58
Y. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58
Z. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	116.58

TABLE 1A(i) COMPARISON OF CO₂ EMISSIONS FROM FUEL COMBUSTION (Sheet 1 of 1)

FUEL TYPES	REFERENCE APPROACH		SECTORAL APPROACH ⁽¹⁾		DIFFERENCE ⁽²⁾	
	Apparent energy consumption ⁽³⁾ (PJ)	CO ₂ emissions (Gt)	CO ₂ emissions (Gt)	Energy consumption (PJ)	CO ₂ emissions (Gt)	CO ₂ emissions (Gt)
Total	1,145,900.52	4,438.11	4,438.11	1,145,900.52	4,438.11	0.00
A. Fuel Combustion (Sectoral Approach)	1,145,871.15	4,438.11	4,438.11	1,145,871.15	4,438.11	0.00
B. Energy Industries and Other Production	1,046,016.14	1.96	1.96	1,046,016.14	1.96	0.00
C. Transport	85,422.45	1.46	1.46	85,422.45	1.46	0.00
D. International Aviation and Shipping	14,444.11	0.07	0.07	14,444.11	0.07	0.00
E. Manufacturing Industries and Construction	1,782.12	0.08	0.08	1,782.12	0.08	0.00
F. Land Use, Land-Use Change and Forestry	1,142,128.39	3.96	3.96	1,142,128.39	3.96	0.00
G. Land Use, Land-Use Change and Forestry	184,110.01	2.35	2.35	184,110.01	2.35	0.00
H. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
I. Land Use, Land-Use Change and Forestry	184,110.01	2.35	2.35	184,110.01	2.35	0.00
J. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
K. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
L. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
M. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
N. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
O. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
P. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
Q. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
R. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
S. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
T. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
U. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
V. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
W. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
X. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
Y. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00
Z. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	1.61	1,058,018.38	1.61	0.00

SUMMARY 1 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS (Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CH ₄	N ₂ O	HFC ₂₂	PF ₆	SF ₆	Total
Total (Net Emissions) ⁽¹⁾	1,145,871.15	23,664.76	25,575.79	4,438.11	6,323.11	4,348.50	1,248,279.74
A. Fuel Combustion (Sectoral Approach)	1,145,871.15	23,664.76	25,575.79	4,438.11	6,323.11	4,348.50	1,248,279.74
B. Energy Industries and Other Production	1,046,016.14	1.96	4.68	1,006.31	1,148.28	2.96	1,056,812.33
C. Transport	85,422.45	1.46	4.59	132.22	1,148.28	1.48	88,278.48
D. International Aviation and Shipping	14,444.11	0.07	0.10	0.24	0.24	0.10	14,846.86
E. Manufacturing Industries and Construction	1,782.12	0.08	0.02	0.06	1,175.00	0.00	1,767.28
F. Land Use, Land-Use Change and Forestry	1,142,128.39	3.96	8.26	1,000.00	1,219.00	9.99	1,264,576.64
G. Land Use, Land-Use Change and Forestry	184,110.01	2.35	1.49	28.18	321.59	1.58	186,333.15
H. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	1,068,243.49
I. Land Use, Land-Use Change and Forestry	184,110.01	2.35	1.49	28.18	321.59	1.58	186,333.15
J. Land Use, Land-Use Change and Forestry	1,058,018.38	1.61	6.77	971.82	897.41	8.41	1,068,243.49
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as reported in table 1(A)(i), sheets 1-4.
 a difference in energy consumption between the two approaches, data as reported in the Sectoral approach.
 In the column, subtract from the apparent energy consumption (Reference as in the Sectoral approach).
 consumption, derived using a detailed Sectoral approach, be compared to those
 be Sectoral approach with those calculated using the Reference approach, in detailed information and/or further details are needed to understand the content
 to be and provide a reference to relevant sections of the NIR where this difference

SECTOR	CO ₂	CH ₄	N ₂ O	HFC	PF ₆	SF ₆	Total
Total	1,145,871.15	23,664.76	25,575.79	4,438.11	6,323.11	4,348.50	1,248,279.74
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R. Land Use, Land-							



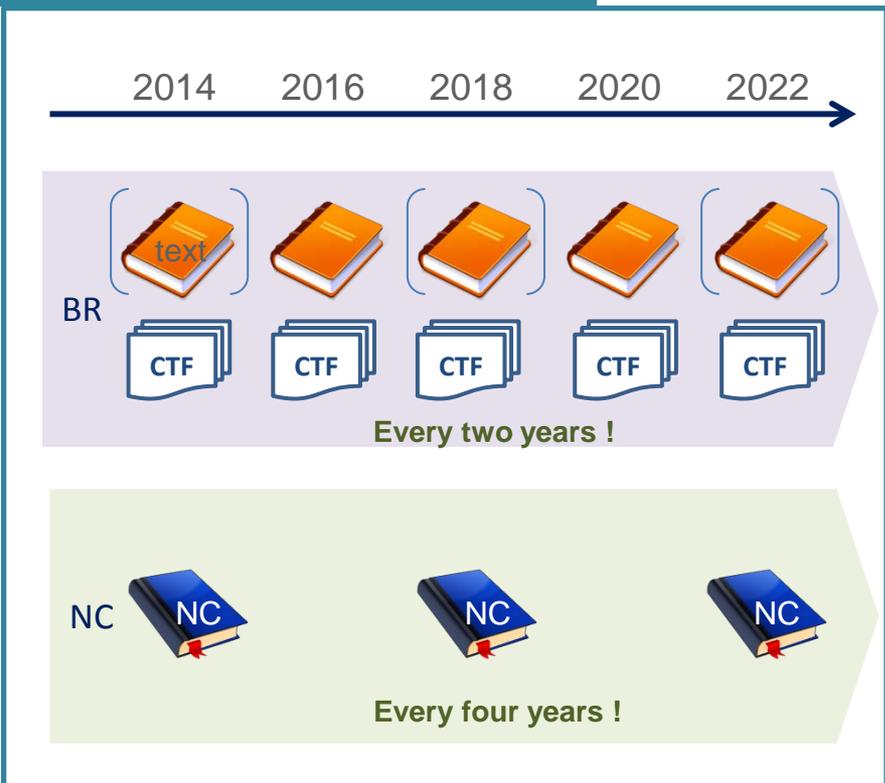
Q: What is a BR?

A: The Biennial Report (BR) is a report that developed country Parties should submit to the UNFCCC every two years, focusing on progress in achieving emissions reductions and on the provision of financial, technology and capacity-building support to developing country Parties.

In detail

- ✓ The purpose of BR is to enhance reporting in national communications (NC) of Annex I Parties on mitigation targets and the provision of financial, technological and capacity-building support to developing country Parties.
- ✓ Developed country Parties shall submit their first BRs by 1 January 2014, and their second and subsequent BRs two years after the due date of national communication (i.e. in 2016, 2020).
- ✓ Developed country Parties should present the BRs as an annex to the national communication or as a separate report in the years when the full national communications are submitted.
- ✓ Common tabular format (CTF) should be used for reporting quantitative data such as GHG emission trend, progress in achievement of emission reduction target and the provision of support.

Timeframe of BR and NC submission



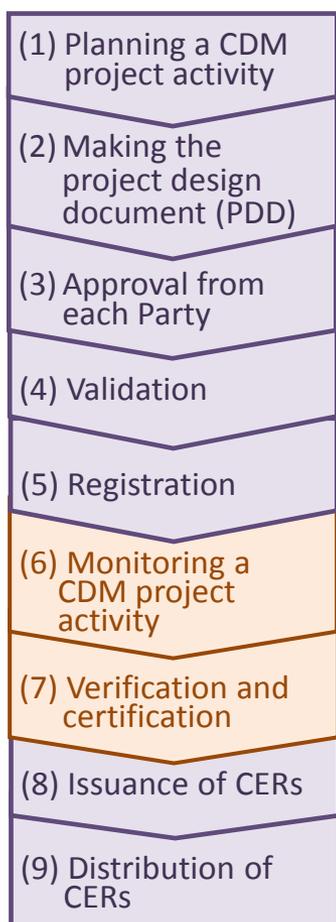
Reference:

UNFCCC. 2011. Decision 2/CP.17. "Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention", FCCC/CP/2011/9/Add.1 <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>

UNFCCC. 2012. Decision 19/CP.18. Common tabular format for "UNFCCC biennial reporting guidelines for developed country Parties" FCCC/CP/2012/8/Add.3

Q: What is MRV in the CDM?

A: MRV in the CDM normally starts after the implementation of project. “Monitoring” refers to the collection and archiving of data. “Reporting” is to make monitoring report. “Verification” involves the independent review and check of the monitoring report. Different monitoring methodology exists .



- ◆ PPs collect and archive all relevant data necessary for calculating GHG emission reductions by a CDM project activity, in accordance with the monitoring plan written in the PDD.

[\[CMP/2005/8/Ad1, p18 para56\]](#)[\[CMP/2005/8/Ad1, p18 para58\]](#)

- ◆ Verification is the periodic independent review and *ex post* determination of the monitored GHG emission reductions.

[\[CMP/2005/8/Ad1, p18 para61\]](#)

☞ Verification is carried out by a designated operational entity (DOE).

☞ There is a formal procedure for verification.

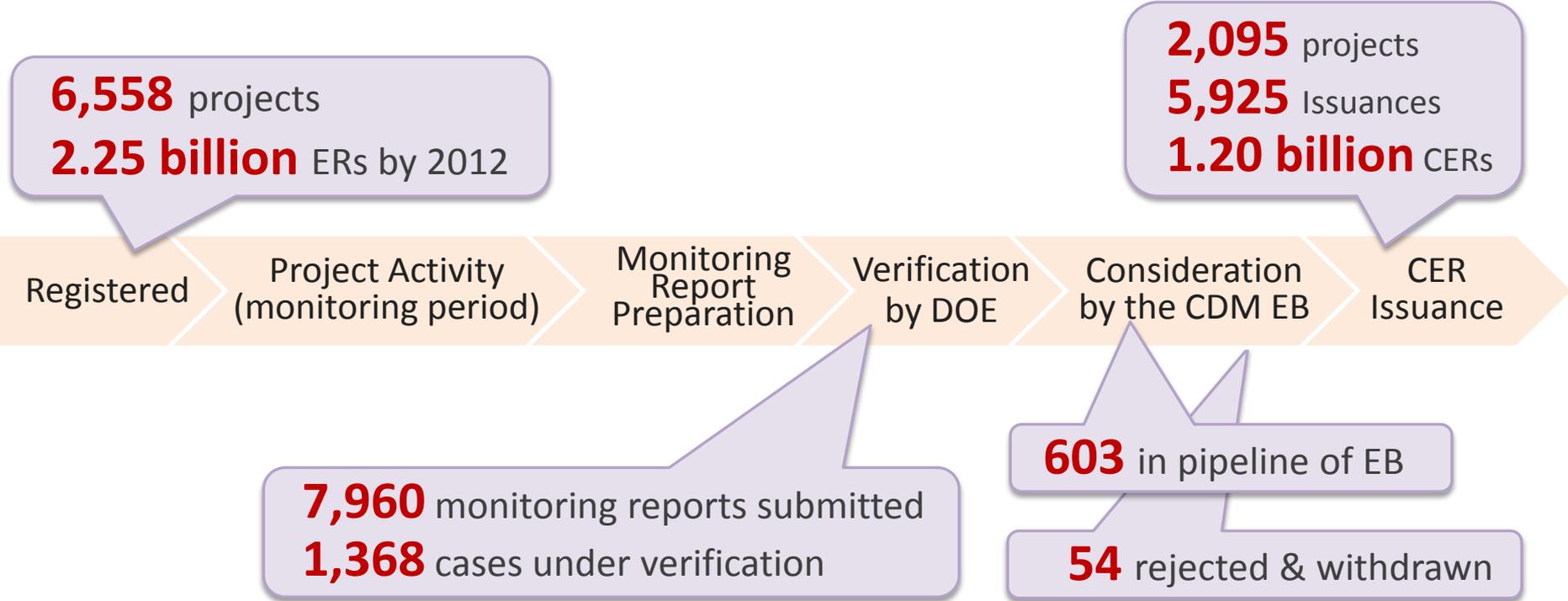
☞ Certification is the written assurance by a DOE that a project activity achieved the reductions in GHG emissions as verified.

[\[CMP/2005/8/Ad1, p18 para61\]](#)

☞ Certification is also done by a DOE.

Q: How many projects have been MRVed in the CDM?

A: Approximately, 1/3 of registered CDM projects (2,095) has gone through the MRV. The MRV in the CDM is the periodical cycle and will be repeated continuously. I.e. A project will do MRV many times during its crediting period.



Source: IGES CDM monitoring and issuance database as of March 2013

Schedule in 2013 and beyond

