



Clean Development Mechanism (CDM) and Potential Sectors in Myanmar

presented by

Htun Paw Oo

Director, Forest Research Institute, Forest department, Myanmar
Phone/Fax : 067-416524, Email: friyezin@myanmar.com.mm.

°C over the 20th century.

- 1990s was the warmest decade/1998 the warmest year.
- The rise in temperature directly affects the climate:
 - About 10% decrease in the extent of snow cover
 - A reduction of about two weeks in the annual duration of lake- and river- ice cover
 - Average sea level rose 0.1 to 0.2 m
 - Global ocean heat content increased
 - Precipitation increased by 0.5 to 1% per decade
 - Frequency of heavy precipitation increased 2

Introduction

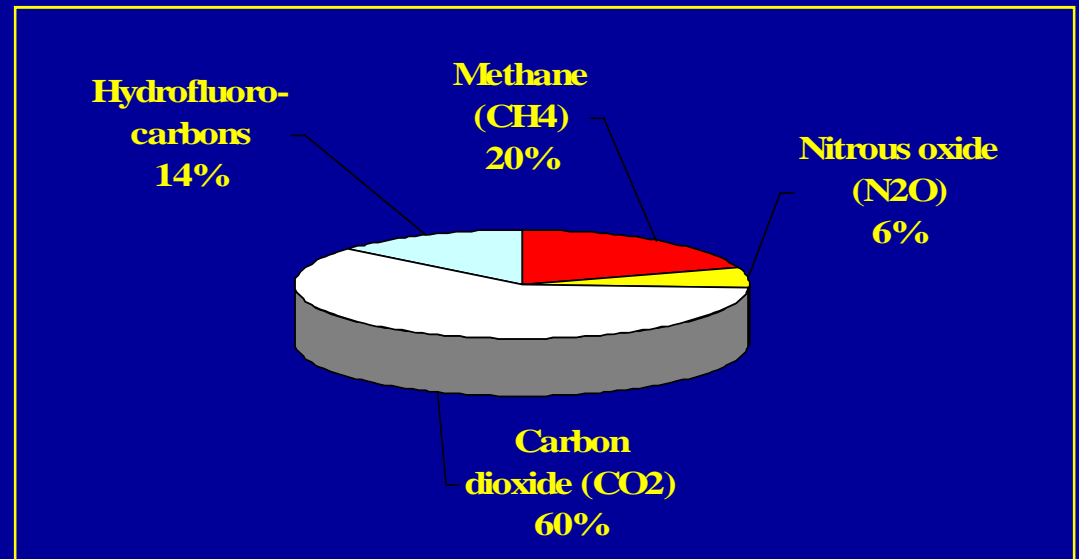
- Global warming affects the ecosystems of the earth:
 - **Global warming and climate change** (Contd.)
 - Changes in timing of biological events (flowering, breeding, arrival of birds, etc.)
 - Changes in species distribution ranges
 - Changes in species composition of communities
 - Increased frequency / intensity of pest and disease outbreaks
- Myanmar also encounters the climate changes :
 - Shorter monsoon duration / Decreased monsoon strength / Decreased annual rainfall

Major GHG, Source of emission and their Global Warming Potential (GWP)

GHG	Lifetime (years)	GWP	Main emission sources related to human activities
Carbon dioxide (CO ₂)	5 - 200	1	Fuel combustion, industrial process
Methane (CH ₄)	12	21	Agri., landfill, gas leak, fuel combustion
Nitrous oxide (N ₂ O)	114	310	Fuel combustion, agri., industrial process
Hydro fluorocarbons HFC-23 (CHF ₃)	260	11700	By-product of HCFC-22, aerosol, CFC substitution
HFC-134a (CH ₂ F, CF ₃)	13.8	1300	CFC substitution, aerosol
Perfluorocarbons PFC-116 (C ₂ F ₆)	10000	9200	Industrial process
Sulphur hexafluoride (SF ₆)	3200	23900	Industrial process

Major GHG and their contribution to global warming

❖ The concentrations of atmospheric GHG continued to increase as a result of human activities.



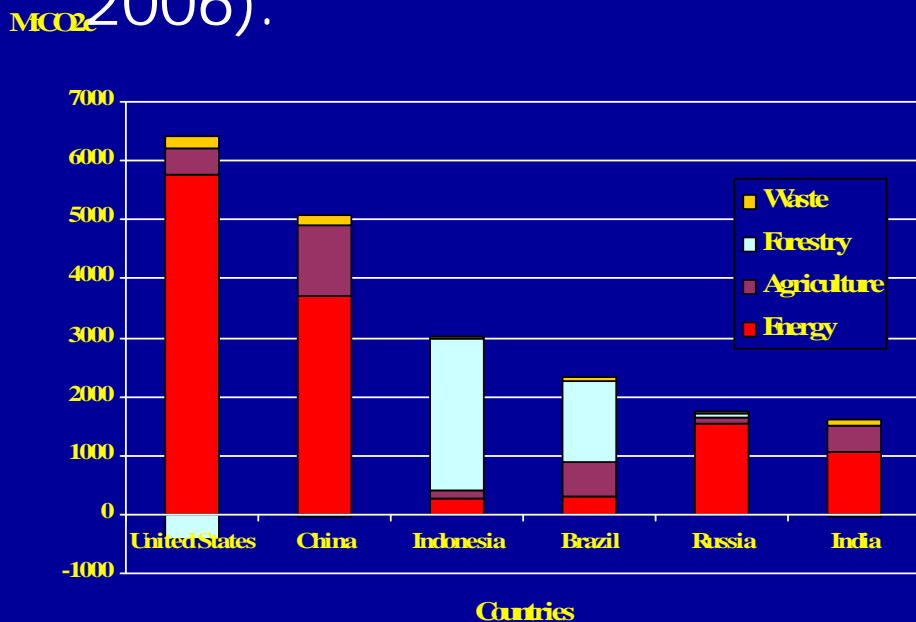
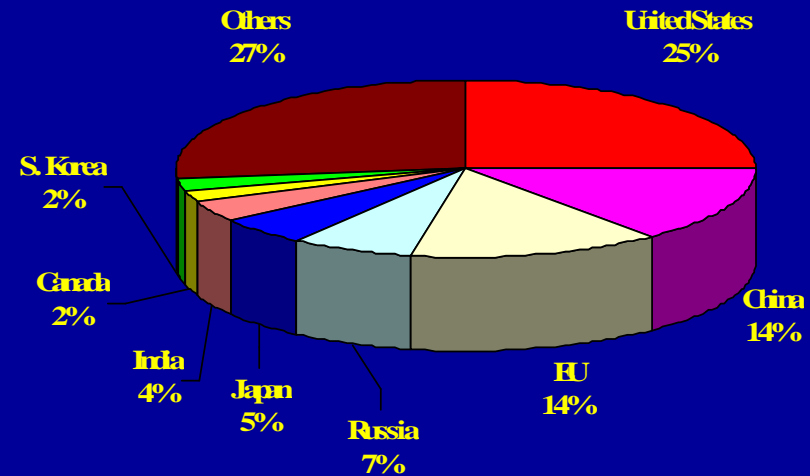
❖ The concentration of CO₂ has increased by 31% since 1750 (due to fossil fuel burning and land-use change).

❖ The concentration of CH₄ increased by 151% since 1750 (due to use of fossil fuels, cattle, rice agriculture and landfills).

❖ The concentration of N₂O increased by 17% since 1750 (from agricultural soils, cattle feed lots and chemical

GHG emissions in the world

- US emitted about a quarter of world CO₂ emission in 2000.
- ✓ US still a major emitter while China and Indonesia are in top six countries (in 2006).



- ❖ CO₂ emission in the world increased almost twice during 1971 and 1998.
- ❖ Industrialized countries remain constant.
- ❖ Shares from developing countries considerably increased.

International political regime to address climate change

- ❖ Jointly established in 1988 by the World Meteorological Organisation (WMO) and the United Nations Environmental Programme (UNEP).
 1. Intergovernmental Panel on Climate Change (IPCC)
- ❖ To assess available information on climate change research and to provide scientific advice to UNFCCC.
- ❖ The IPCC has three working groups and a Task Force on National Greenhouse Gas Inventories.
- ❖ Each has two co-chairs, one from the developed and one from the developing world, and a technical support unit.
- ❖ Produced a series of publications: Assessment reports, Special reports, Methodology reports,

International political regime to address climate change (Contd.)

2. United Nations Framework Convention on Climate Change (UNFCCC)

- The UNFCCC was opened for signature in June 1992 and entered into force in March 1994.
- Sets an ultimate objective of stabilizing atmospheric concentrations of greenhouse gases at safe levels.
- All countries have to address climate change, adapt to its effects, and report their actions.
- The Convention established the Conference of Parties (COP) as its supreme body with the responsibility to oversee the progress toward the aim of the Convention.

UNFCCC negotiation timeline and some important decisions

1992 – UNFCCC signed in Rio De Janeiro;

1994 – UNFCCC entered into force;

1995 – COP 1, Berlin; 1996 – COP 2, Geneva;

1997 – COP 3, Kyoto – Kyoto Protocol adopted;

1998 – COP 4, Buenos Aires; 1999 – COP 5, Bonn;

2000 – COP 6, The Hague; (2001– COP 6, Bonn) Bonn Agreement adopted;

2001 – COP 7, Marrakech – Marrakech Accords adopted;

(1st meeting of the CDM Executive Board)

2002 – COP 8, New Delhi – Delhi Declaration adopted;

2003 – COP 9, Milan; 2004 – COP 10, Buenos Aires;

2005 – COP 11 / MOP 1, Montreal

(Feb 2005 – Entry into force of the Kyoto Protocol)

2006 – COP 12 / MOP 2, Nairobi;

2007 – COP 13 (to be held in Bali, Indonesia)

International political regime to address climate change (Contd.)

3. Kyoto Protocol and Marrakech Accord

- 38 industrialized countries and 11 countries in Central and Eastern Europe committed to return their GHG emissions to an average of 5.2% below their 1990 levels over the period 2008–2012. (Kyoto Protocol)
- The targets cover six main greenhouse gases: (CO₂), (CH₄), (N₂O), (HFCs); (PFCs); and (SF₆).
- Negotiations continued after Kyoto to develop the Protocol's operational details.
- Parties agreed at COP 7 in Marrakech, Morocco to a comprehensive rulebook – the Marrakech Accords – on how to implement the Kyoto Protocol.

International political regime to address climate change (Contd.)

Kyoto Mechanisms for emission reduction

- ❖ The Kyoto mechanisms give countries and private sector companies the opportunity to reduce emissions anywhere in the world – wherever the cost is lowest – and they can then count these reductions towards their own targets.
- International Emissions Trading (ET) : Only Annex I Parties can participate. Carbon credits are called (1) Assigned amount Unit-AAU and (2) Removal Units-RMU.
- Joint Implementation (JI) : JI can only be implemented between developed countries and EIT countries. Carbon credits are termed as Emission Reduction Units (ERU).
- Clean Development Mechanism (CDM) : CDM can be implemented between Annex I countries and developing countries. Carbon credits are termed as Certified Emission Reduction (CER).

Global carbon market and carbon trading

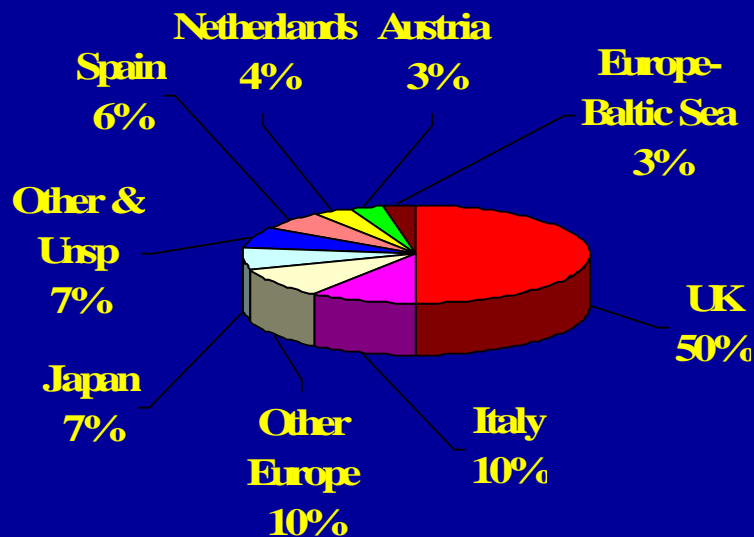
- ❖ The carbon markets become a prominent part of the response to climate change and become a credible and central tool for future climate mitigation.

	2005		2006	
	Volume (MtCO ₂ e)	Value (MUS\$)	Volume (MtCO ₂ e)	Value (MUS\$)
ET carbon market	328	7 971	1 131	24 620
Jl carbon market	11	68	16	141
CDM carbon market	351	2 638	475	5 257
Other compliance	20	187	17	79
TOTAL	710	10 864	1 639	30 098

Source: Karan & Philippe 2007

- The carbon market was dominated by the sale and re-sale of ET market, mainly in European Union, at a value of nearly US\$ 25 billion.
- Project-based activities primarily through CDM and JI mechanisms

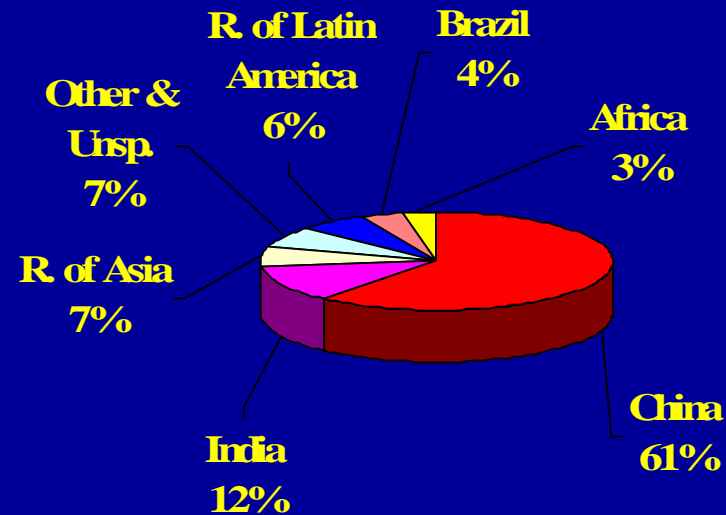
Global carbon market and carbon trading (Contd.)



Source: Karan & Philippe
2007

- ❖ European buyers dominated the primary CDM and JI market with 86% market share.
- ❖ Private sector buyers, banks and carbon funds, continued to buy large volumes of CDM assets, while public sector buyers continued to dominate JI purchases.

- Since 2002, about 920 MtCO₂e from CDM project activities have been transected.
- China dominated the CDM market on the supply side.
- Asia as a whole led the supply with an 80% market share.



Source: Karan & Philippe 2007

Clean Development mechanism (CDM)

- ❖ Aims to assist developing countries in achieving sustainable development by promoting environmentally friendly investment from industrialized countries.
- ❖ Developed countries can invest in low-cost abatement opportunities in developing countries and receive credit for the resulting emissions reductions.
- ❖ Developing countries will benefit not only from the increased investment flows, but also to fulfill sustainable development goals.
- ❖ The funding through the CDM assists developing countries in reaching some of their economic, social, environmental and sustainable development objectives
- ❖ Thus CDM offers an opportunity to make progress on climate, development and local environmental issues

Clean Development mechanism (CDM) Contd.

Project eligibility

Additionality

- ✓ CDM projects must result in "reductions in emissions that are additional to any that would occur in the absence of the project activity".
- ✓ The CDM projects must lead to real, measurable, and long-term benefits related to the mitigation of climate change.

Sustainable Development

- ✓ Social criteria – the quality of life, poverty alleviation;
- ✓ Economic criteria – financial returns, technology transfer;
- ✓ Environmental criteria – conservation of local environments, health and other environmental benefits

Clean Development mechanism (CDM) Contd.

Participation

- ✓ To participate in CDM, all parties must meet three requirements:
 - voluntary participation,
 - establishment of the National CDM Authority,
 - ratification of the Kyoto Protocol

National value and benefits

CDM can create significant co-benefits in developing countries, addressing local and regional environmental problems and advancing social goals. The CDM can specifically:

- Attract capital for projects for less carbon-intensive economy;
- Encourage the active participation of private and public sectors;

Clean Development mechanism (CDM) Contd.

Administration

The conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP)

- ❖ has authority over and provides guidance to the CDM;
- ❖ decides on the recommendations made by the EB on its rules of procedure and in accordance with provisions of decisions made by COP/MOP;
- ❖ decides on the designation of operational entities accredited by the EB;
- ❖ reviews annual reports of the EB;
- ❖ reviews the regional and sub-regional distribution of designated operational entities (DOEs) and CDM project activities; and
- ❖ assists in arranging funding of CDM project activities, as necessary;

Clean Development mechanism (CDM)

Administration (Contd.)

Executive Board (EB)

- ❖ Is composed of 10 members, each from Africa, Asia, Latin America and the Caribbean, Central Eastern Europe, and OECD regions, one from the small island developing states, and two each from Annex I and non-Annex I Parties.
- ❖ Has established the following panels and working groups:
 - Methodologies Panel (MP),
 - Working group on afforestation and reforestation project activities (AR WG),
 - Working group for small scale CDM project activities (SCC WG),
 - CDM accreditation panel (CDM AP),
 - CDM accreditation assessment team (CDM AT), and

Clean Development mechanism (CDM)

Administration (Contd.)

Executive Board (EB)

- ❖ Supervises the CDM, under the guidance of the COP/MOP;
- ❖ Makes recommendations to the COP/MOP on CDM modalities and procedures, and on the designation of Operational Entities;
- ❖ Approves new methodologies;
- ❖ Reviews provisions with regard to simplified modalities, procedures and the definitions of small scale CDM project activities;
- ❖ Makes recommendations to the COP/MOP for Makes technical reports to the public; and
- ❖ Develops and maintains the CDM registry, formally accepts a validated project as a CDM project (registration), instructs to issue CERs for a CDM project.

Clean Development mechanism (CDM)

Administration (Contd.)

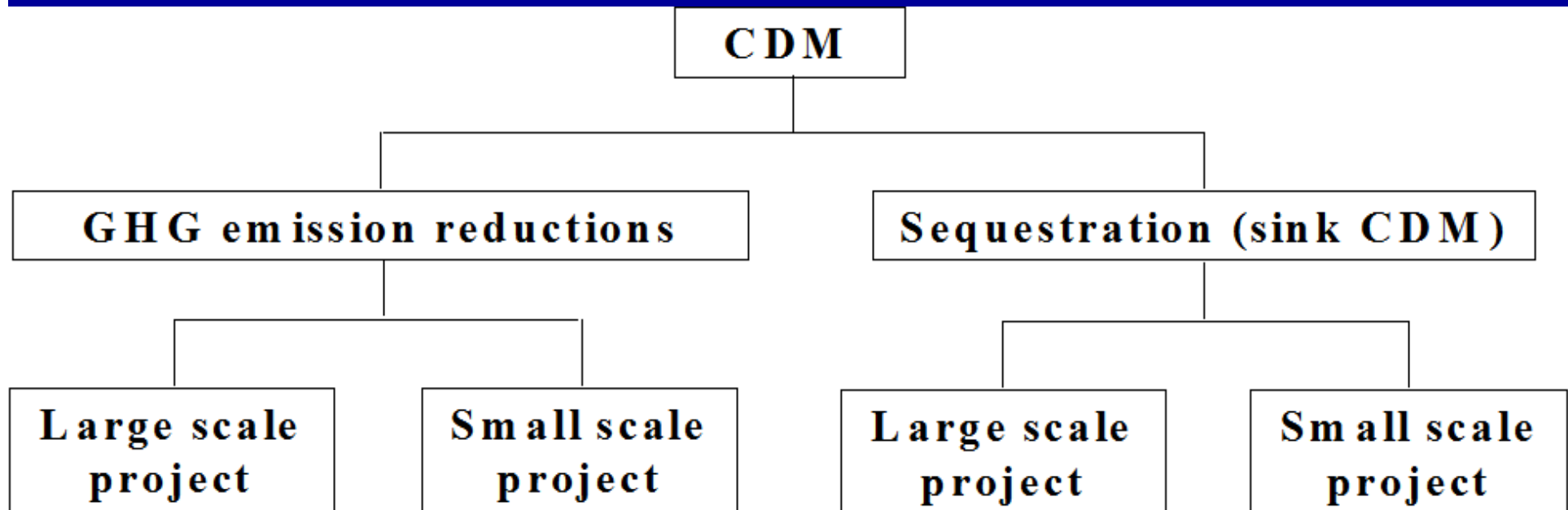
Designated Operational Entity (DOE)

- ❖ Is accredited and designated by the EB.
- ❖ Has two key functions:
 - Validates and subsequently requests registration of a proposed project activity; and
 - Verifies emission reduction of a registered CDM project activity and requests the EB to issue CERs accordingly.

Designated National Authority (DNA)

- ❖ Parties participating in CDM shall set up a DNA.
- ❖ CDM project participants shall receive written approval from the DNA of each Party involved.
- ❖ The detail of approval procedure is up to each Party.

Classification and scope of CDM project activities



Small scale CDM projects

- Renewable energy project activities with an output up to 15 MW
- Energy-efficiency improvement projects which reduce energy consumption up to 15 GWh per year
- Other project activities that both reduce emissions by sources and directly emit less than 15000 tons annually
- A/R CDM projects that sequesters less than 8000 tons

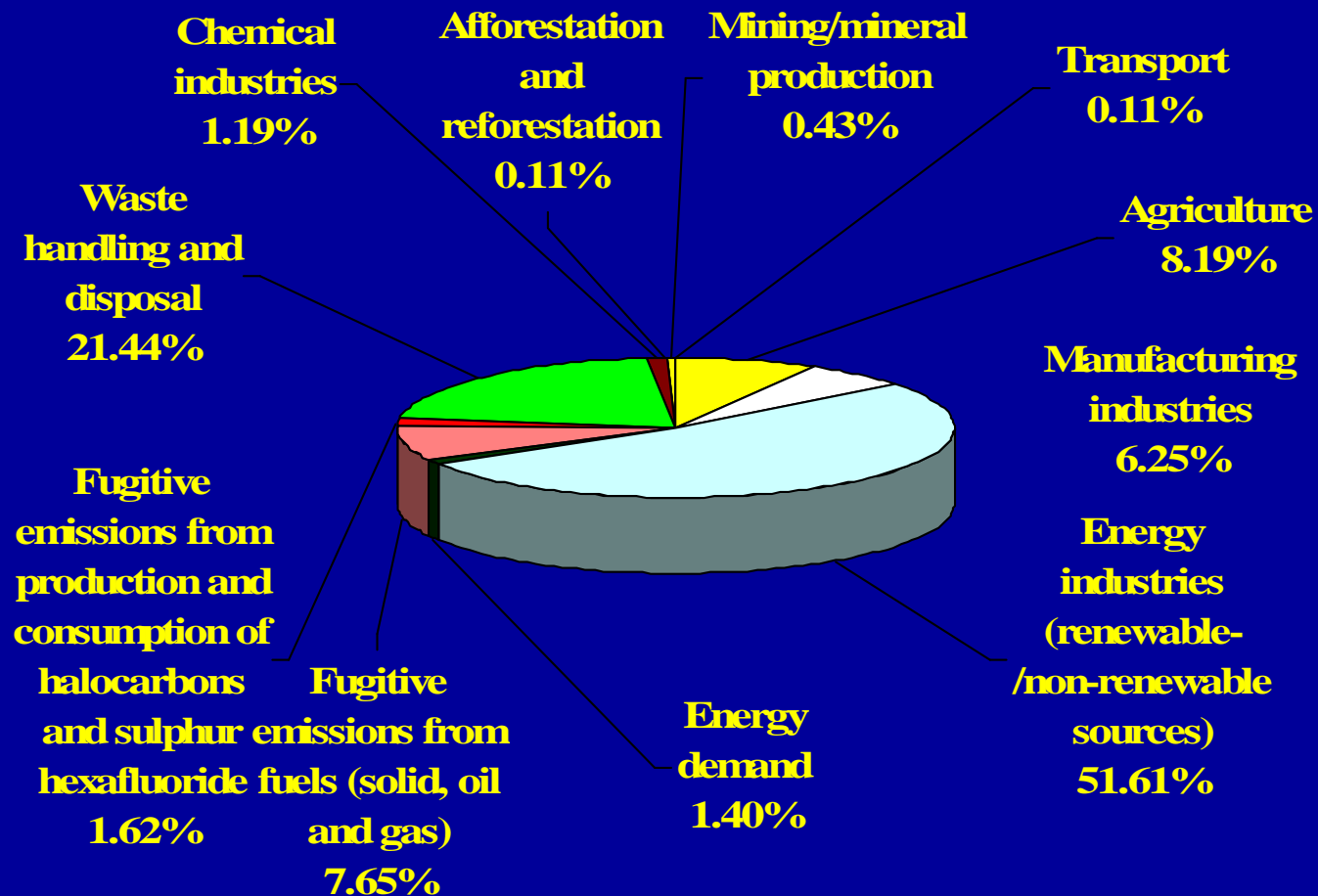
Scope of CDM project activities

	Sectoral scope	Examples	
1	Energy industries (renewable / non-renewable sources)	Renewable energy	Wind power, solar photovoltaic, hydro, geothermal
		Non-renewable energy	Combined heat and power, fuel switching from coal or fuel oil to natural gas
2	Energy distribution	Electricity	Transmission and distribution lines
3	Energy demand	Energy efficiency	High-efficiency equipment and lighting
4	Manufacturing industries	Energy efficiency	High-efficiency equipment
		Fuel switching	From coal to natural gas, clean coal technology
5	Chemical industries	Process change	Nitrous oxide abatement
6	Construction	Material substitution	Energy-saving measures, shorter transport distance for trucks
		Energy	Improved vehicle efficiency,

Scope of CDM project activities (Contd.)

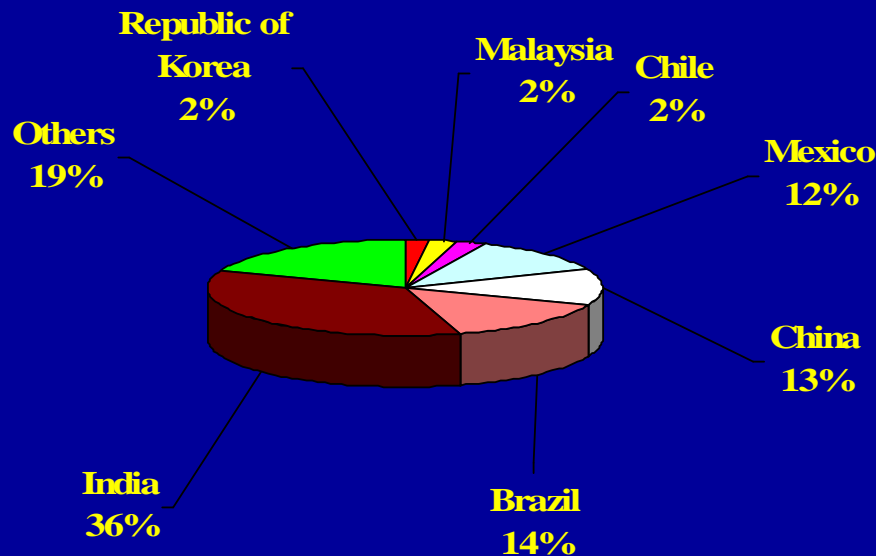
	Sectoral scope	Examples	
8	Mining/mineral production	Fuel substitution	Coal mine methane recovery
9	Metal production	Energy efficiency	Improved process efficiency
		Process change	Dry coke quenching
10	Fugitive emissions from fuels (solid, oil and gas)	Fuel substitution	Recovery and utilization of gas from oil wells
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	HFCs	Incineration of HFC-23 waste streams
12	Solvent use	Material substitution	Replacement with less GHG-emitting materials
13	Waste handling and disposal	Fuel substitution	Landfill gas recovery, wastewater treatment, animal waste treatment
1	Afforestation and		

CDM project activities by scope



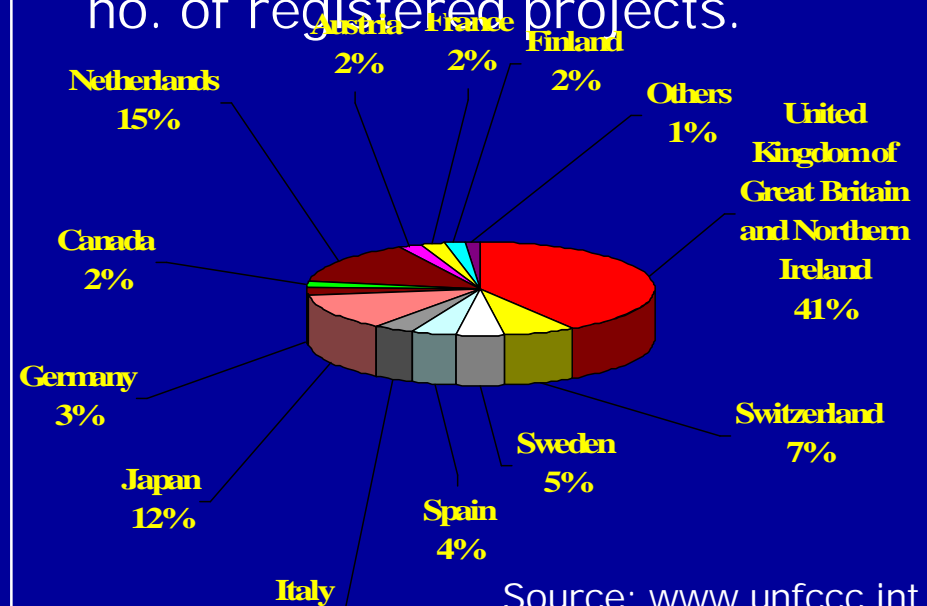
- Energy industries (renewable- / non-renewable sources) account over 50%.
- Waste handling has the second largest share.
- Due to the complicated nature of the projects, energy distribution, construction, metal production and solvent use sectors have no

Status of implementing CDM projects in the world



- ❖ As of June 2007, 1600 CDM projects, with a total potential of 1.9 billion CER units, are in the pipeline.
- ❖ 708 projects are already registered as CDM projects in EB.
- ❖ 47 developing countries host 708 registered CDM projects. India, Brazil, China and Mexico share 36%, 14%, 13% and 12% of the no. of registered projects.

- ❖ In most projects, Annex I countries take the roles of project developer and carbon credit buyer.
- ❖ UK involves in 41% of the CDM projects while Netherlands, Japan and Switzerland share 15%, 12% and 7% of the registered CDM projects respectively.



Source: www.unfccc.int

CDM project cycle

- The detailed modalities and procedures including the rules and regulations for the CDM, were formulated as the Marrakech Accords In December 2001.
- The CDM Executive Board was established as the UNFCCC secretariat oversees the CDM process.
- In order to register a CDM project activity, project proponents need to go through the steps as follows:

1. Planning a CDM project activity

Project participants should consider that

- (a) the planned project activity will assist the host country's sustainable development, and
- (b) the planned project activity is additional.

2. Preparing the project design document (PDD)

Project participants should

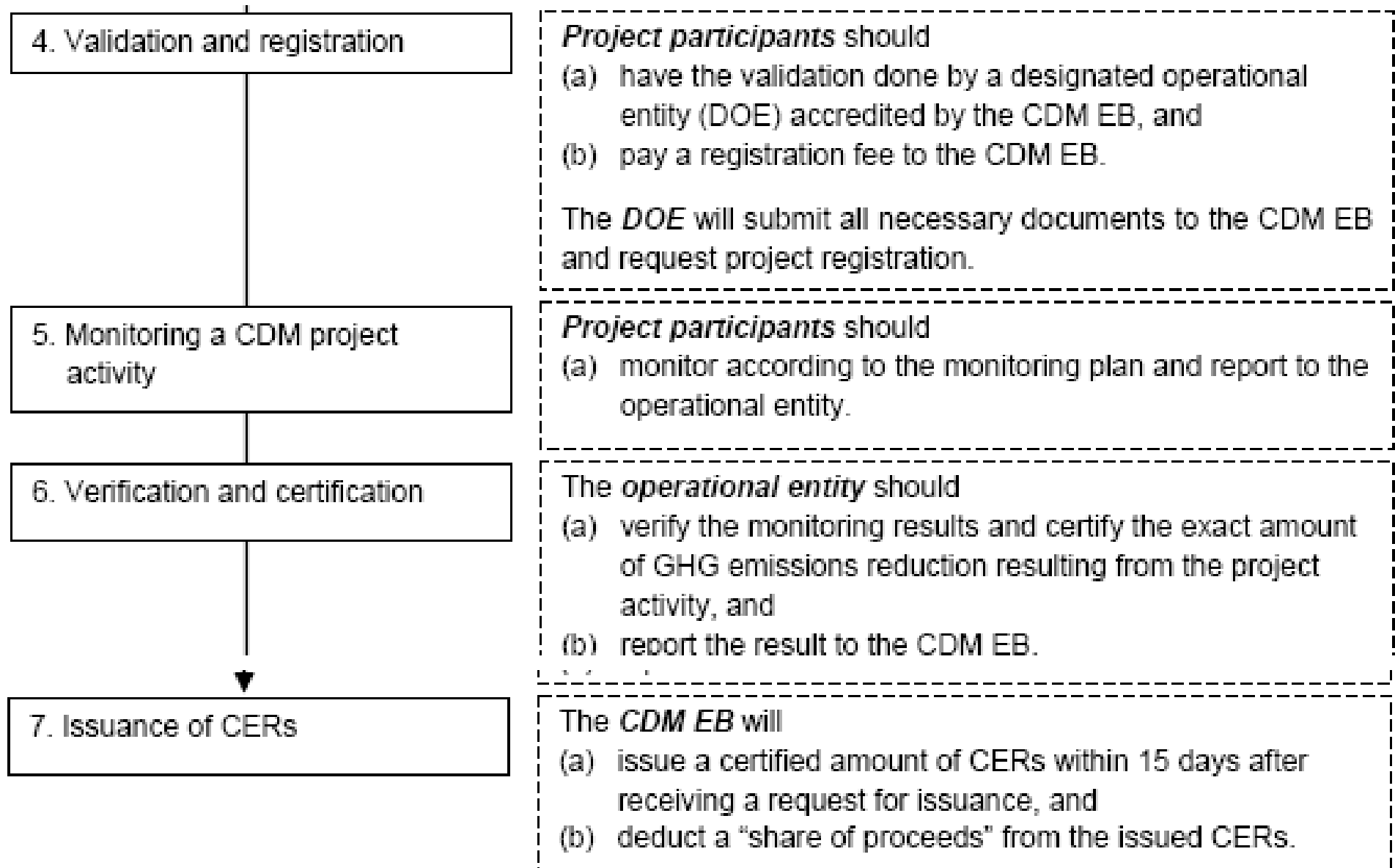
- (a) download the standard PDD form from the UNFCCC Web site and complete it according to the guidelines provided by the CDM EB.

3. Getting approval from each party involved

Project participants should

- (a) learn about the approving process of concerned Parties and all the requirements from designated national authorities (DNAs), and
- (b) obtain the written approval of voluntary participation from the DNAs.

CDM project cycle (Contd.)



Preparedness to host a CDM project in Myanmar

- ✓ The government of Myanmar signed UNFCCC on 11 June 1992 and ratified the convention on 25 November 1994.
- ✓ Myanmar ratified Kyoto Protocol in 2003 as a non-Annex I party.
- ✓ Myanmar implemented ALGAS project which assessed the baseline GHG emissions in energy, forestry and land-use change, and agriculture sectors setting 1990 as a base year.
- ❖ DNA of Myanmar was established in 2006 in order to approve the proposed CDM projects and to provide information on CDM projects.
- ❖ Has 22 members from 15 ministries, is led by Minister of Ministry of Forestry, the secretariat and joint-secretariat are senior officials from FD.
- ❖ Is now preparing the procedures and to form the technical teams

Potential CDM projects in various sectors of Myanmar

GHG emission reduction projects

- **Energy Industries:**
 - ❖ **Non-renewable energy project activities** - Fuel switching from coal or fuel oil to natural gas; Replacement of fossil fuel with alternative fuels by biomass such as rice husk, palm kernel shell, agricultural residues, etc.
 - ❖ **Renewable energy project activities** - solar energy, wind power, hydroelectric power plant, geothermal, biogas, biomass.
- **Waste handling and disposal:** Landfill CDM projects have now high potential in this sector.
- **Transport:** Substitution of fossil fuel with bio-fuels and natural gas fuels.

Potential CDM projects in various sectors of Myanmar (Contd.)

Carbon sequestration (sink CDM) projects

- **Agriculture:** Methane production avoidance from biomass decay; gas recovery and utilization projects in livestock breeding; etc.
- **Afforestation and reforestation:** afforestation and reforestation activities, agroforestry programs; etc.

Challenges in implementing CDM projects in Myanmar

- **Awareness:** Since CDM is a very new issue and has a complicated and dynamic nature, project developers (especially decision makers) have little experience on developing CDM projects.
- **Transaction cost:** There are substantial amount of transaction cost in implementing a CDM project, from preparing a project design document, through monitoring, verification, registration stages to the sale of carbon credits.
- **Initial investment:** Normally, the project owner in host country has to bear all the project cost, and it becomes a major barrier for the developing countries to implement a CDM project.
- **Technology:** Many technologies in emission reduction

Conclusion

- Many developing countries are technically and financially benefiting in their sustainable development by hosting CDM projects.
- Myanmar, with many potential sectors for CDM projects, should implement the CDM projects to assist country's efforts to achieve sustainable development.
- Government organizations, companies and private sectors having potential eligible projects can develop CDM projects in collaboration with international technical groups and/or carbon credit buyers.

Thank You Very Much for
Your Attention!