CDM Typology Part II

CDM training program

2nd of June 2010

JICA expert team

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Objectives

The main objective of this lecture is for you to understand different CDM project types, such that from a basic description of a given project, you will be able to understand its emission reduction or carbon sink mechanism, and its appropriate CDM methodology.

Content:

PROFILE OF THE CURRENT CDM PROJECTS

CDM TYPOLOGY (PROJECT TYPE)

Types of CDM projects by status	Registered		
Type (rejected projects excluded)	Number	kCERs	2012 kCERs
Afforestation	2	21	137
Agriculture	0	0	0
Biomass energy	286	16602	98170
Cement	19	3214	21502
CO2 capture	2	24	139
Coal bed/mine methane	26	13819	62626
Energy distribution	2	67	739
EE households	8	315	1029
EE industry	57	1668	9582
EE own generation	138	23297	113143
EE service	5	59	330
EE supply side	20	3684	10862
Fossil fuel switch	45	25817	110288
Fugitive	12	8713	44332
Geothermal	9	1835	10101
HFCs	21	81696	476448
Hydro	622	58932	230037
Landfill gas	160	28065	154809
Methane avoidance	323	12094	65536
N2O	62	47860	246917
PFCs and SF6	6	1115	3754
Reforestation	13	442	2312
Solar	20	444	1228
Tidal	1	315	1104
Transport	3	305	1978
Wind	359	35238	150544
Total	**2221**	**365639**	**1817648**

Source: CD4CDM

REGISTERED CDM PROJECTS IN SRI LANKA

Project Name	Project Type
Magal Ganga Small Hydropower Project (9,9 MW)	Hydro
Hapugastenne and Hulu Ganga Small Hydropower Projects	Hydro
Small Hydropower Projects at Alupola and Badulu Oya.	Hydro
Sanquhar and Delta Small Hydro Power Projects	Hydro
Coconut shell charcoaling and power generation at Badalgama, Sri Lanka	Biomass energy
10 MW Biomass Power Generation Project - Tokyo Cement, Trincomalee	Biomass energy

Currently only hydro and biomass projects are registered as CDM, but there may be other opportunities as well.

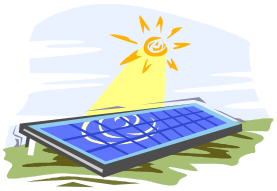
EMISSION REDUCTION/CARBON SINK MECHANISMS

Emissions Reduction and Carbon Sink

- Main objective of the CDM is to prevent release of the anthropogenic GHG emissions to the atmosphere.
- Two possible options
  - Reduce the GHG emissions (Emissions Reduction)
  - Prevent GHG reaching the atmosphere (Carbon Sink)

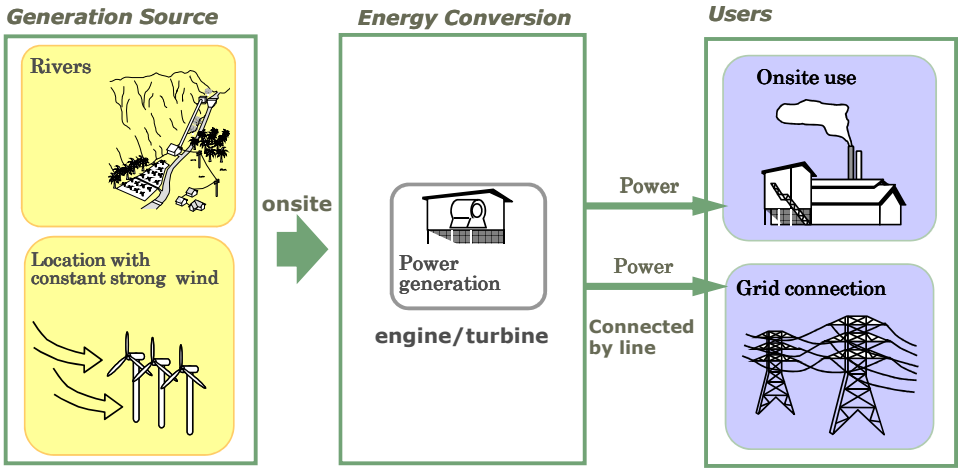
Afforestation and Reforestation projects belong to carbon sink project type

Rest of the CDM projects including renewable energy projects belong to GHG emissions reduction project type



Renewable Energy

- Renewable Energy CDM projects reduce GHG emissions by reducing the use of fossil fuel.
- If the renewable energy is supplied to the grid, it would reduce the "emission factor" of the grid.
- Includes wind, hydro, solar, biomass, geothermal, tidal power projects, and etc.

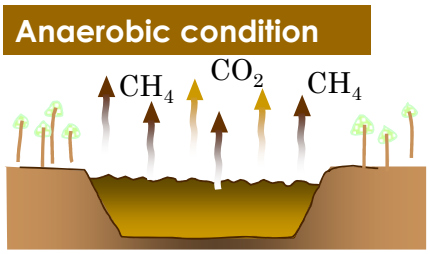


Destruction of High Global Warming Potential Greenhouse Gases

- 1 ton of HFC, N_2O and CH_4 have higher global warming potential than 1 ton of CO_2
- Therefore destruction of these gases will result in GHG emissions reduction.
- Examples: HFC destruction, N_2O destruction, landfill gas flaring, composting, and etc.

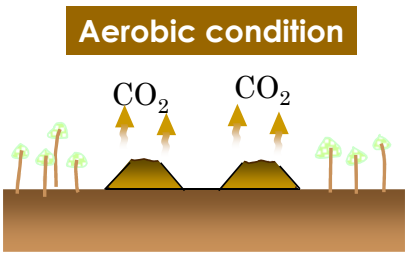
Greenhouse Gas	GWP
Carbon dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous oxide (N_2O)	310
Hydro-fluorocarbons (HFCs)	150–11,700
Perfluorocarbons (PFCs)	6,500–9,200
Sulphur hexafluoride (SF_6)	23,900

Baseline Scenario (Landfill site)



Fermentation induced by anaerobic condition Methane(CH_4) and carbon dioxide (CO_2) to be generated

Project Scenario (Composting)



Fermentation inhibited due to aerobic condition Only carbon dioxide (CO_2) to be generated

Efficient Use of Fossil Fuel

- Energy Efficiency:
  - If less fuel is required to travel the same distance, energy efficiency is achieved.
  - If less electricity is used to light the room (with same brightness), energy efficiency is achieved
  - If heat is recovered to generate electricity, energy efficiency is achieved.
- Example of energy efficiency projects include: cogeneration projects, Compact Fluorescent Lamps (CFL) installation projects, combined cycle power plant projects, steel mill waste heat recovery projects, and etc.

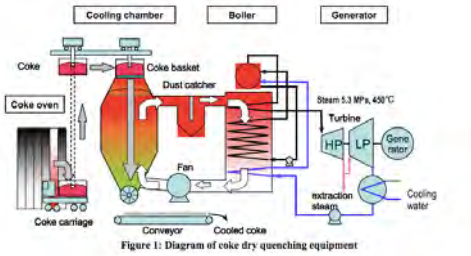
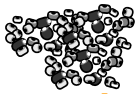


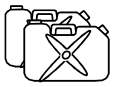
Figure 1: Diagram of coke dry quenching equipment

SWITCH TO LOW CARBON INTENSITY FOSSIL FUEL

- Coal emits more CO_2 than natural gas to produce equivalent amount of energy.
- Fuel switch from coal to natural gas will reduce CO_2 emissions.
- Example includes fuel switch from diesel powered boiler to natural gas boiler.


Coal


Diesel oil


Petroleum


Natural Gas

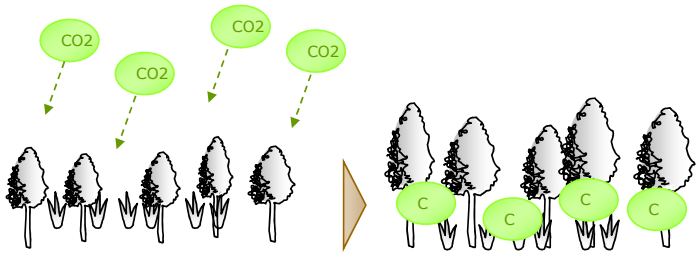
IPCC Default CO_2 emission factor for combustion

Fuel type	kgC/GJ	tCO_2/GJ
Lignite (Coal)	27.6	0.0755
Diesel Oil	20.2	0.0741
Motor Gasoline	18.9	0.0693
Liquefied Petroleum Gas	17.2	0.0631
Natural Gas	15.3	0.0561

Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2, Chapter 1, Table 1.4

CARBON SINK

- CO_2 is absorbed by the trees
- Trees fix the carbon during its growth, thus prevent emission of CO_2 to the atmosphere.
- Once the tree is combusted, CO_2 is released to the atmosphere. (permanence issue)
- Sustainable long term management of the forest is necessary for the carbon sink project.



CDM Category (Summary)

Emissions Reduction

Main Category	Subcategory	Registered projects	%of total
Renewable energy (to replace fossil fuel)	Hydro	622	28.01%
	Biomass	307	13.82%
	Wind Power	359	16.16%
	Other renewable energy	30	1.35%
Destruction of high global warming potential GHG	Methane gas destruction	509	22.92%
	N_2O destruction	62	2.79%
	HFC/PFC/SF_6 destruction	27	1.22%
Efficient use of fossil fuel	Heat Recovery	70	3.15%
	Energy Efficiency	172	7.74%
	Transportation	3	0.14%
Switch to low carbon intensive fossil fuel	Fuel Switch	45	2.03%
Carbon sink	Afforestation / Reforestation	15	0.68%

Carbon Sink

Other Emissions reduction projects that are not recognised as CDM

- Nuclear power plant project
  - CO_2 emission is close to zero
  - But pose environmental issues such as radioactive waste
- Carbon Capture and Storage (CCS) project
  - CO_2 will be stored underground
  - Carbon sink project
  - Unproven technology (especially its long-term effects)
  - It may be approved as a CDM project in the future
- Waste plastics as a fuel
  - Use plastic waste to make fuel pellets or even convert it into oil
  - Plastic waste is not considered as renewable energy
  - It actually does not contribute towards GHG emissions reduction
  - However, if it is a fuel switch project that result in lower carbon intensity it could be considered as a CDM project.

CDM METHODOLOGIES

METHODOLOGIES

- Some methodologies could be applied for various project types.
- For example, AMSI.D. could be applied for wind, solar, hydro, geothermal, tidal/wave, and renewable biomass power projects.
- Other methodologies are rather specific for a particular project.
- For example, AMS-III.G. is applicable only for land fill methane recovery projects.

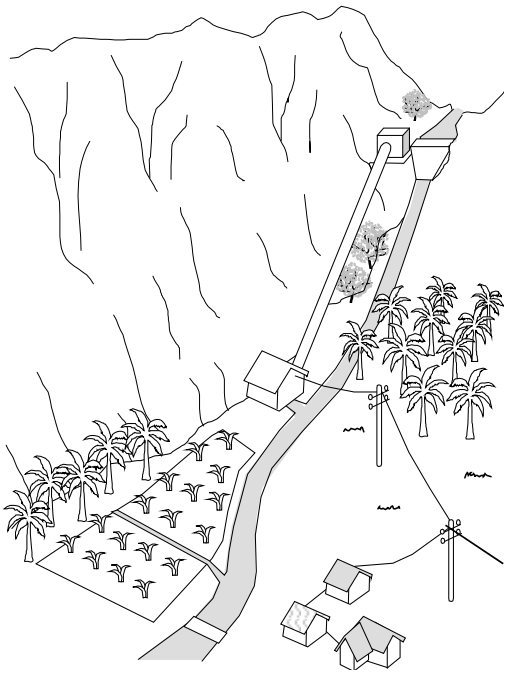
Please refer to the "CDM/JI Manual for Project Developers and Policy Makers 2009" (Approved methodologies, page119~127)

EXERCISE: IDENTIFYING CDM PROJECTS

EXAMPLE 1

Project description:

- 5MW hydro dam project
- The electricity will be sold to the grid



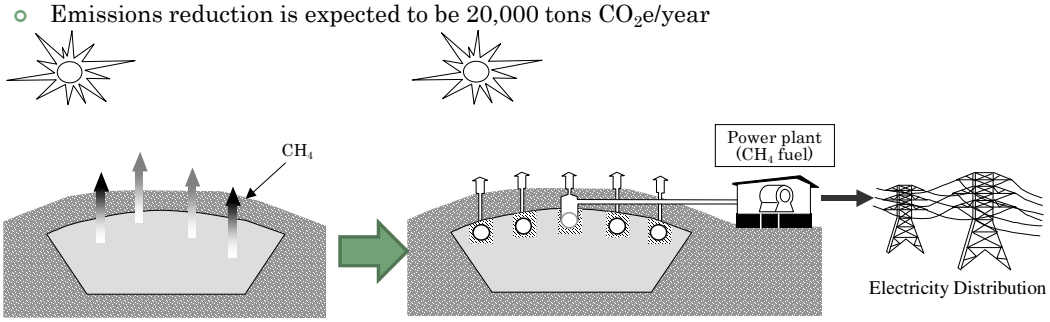
Questions:

1. What type of project is this?
2. What methodology could be used?
3. If the size of the hydro dam is 20MW, what methodology could be used?

EXAMPLE 2

Project description:

- Landfill gas collection and flare CDM project
- Part of the landfill gas will be used to generate electricity using 1MW gas turbine
- Emissions reduction is expected to be 20,000 tons CO_2e/year



Baseline Scenario | Project Activity

Questions:

1. What type of project is this?
2. What methodologies could be used?
3. What happens if emissions reduction is expected to be 200,000 tons CO_2e/year?

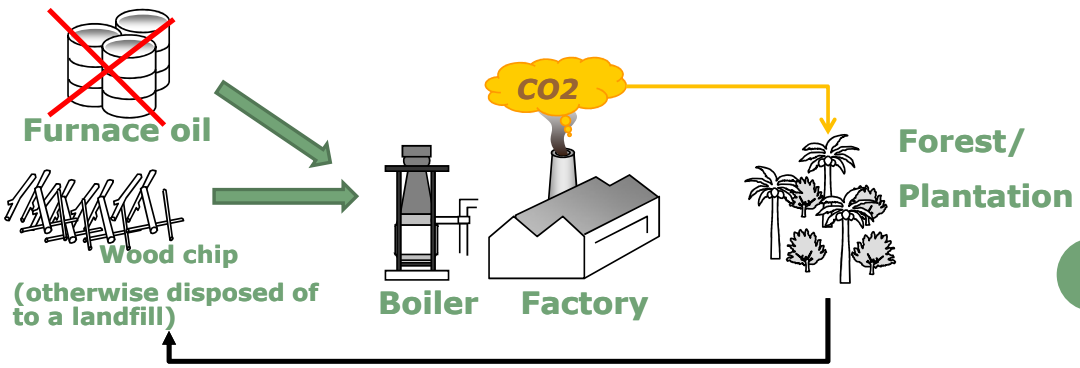
EXAMPLE 3

Project Description

- Fuel switch from furnace oil to wood chip
- Biomass boiler will replace the furnace oil boiler
- Steam generated from the boiler will be used in-house
- Wood chip will be collected from the saw mill. (other wise disposed of to a landfill)

Questions:

1. How is GHG emissions reduction achieved in this project activity?
2. Which CDM methodologies are applicable for this project activity?
3. Would it make a difference if the wood chip is produced by cutting trees from the nature reserve instead of it being residual waste collected from a saw mill?



USEFUL LINKS

- CD4CDM (http://www.cd4cdm.org/)
  - CDM database is available from the "CDM pipeline"
- UNFCCC methodologies section (http://cdm.unfccc.int/methodologies/index.html)
  - Have all the available methodologies
- Kyoto Mechanisms Information Platform (http://www.kyomecha.org/e/index.html)
  - Japanese CDM information website
  - "CDM in Charts" is particularly useful document for CDM developers

CDM Workshop

(Calculation Excercise of CDM Project Feasibility)

6 August 2010

JICA Expert Team

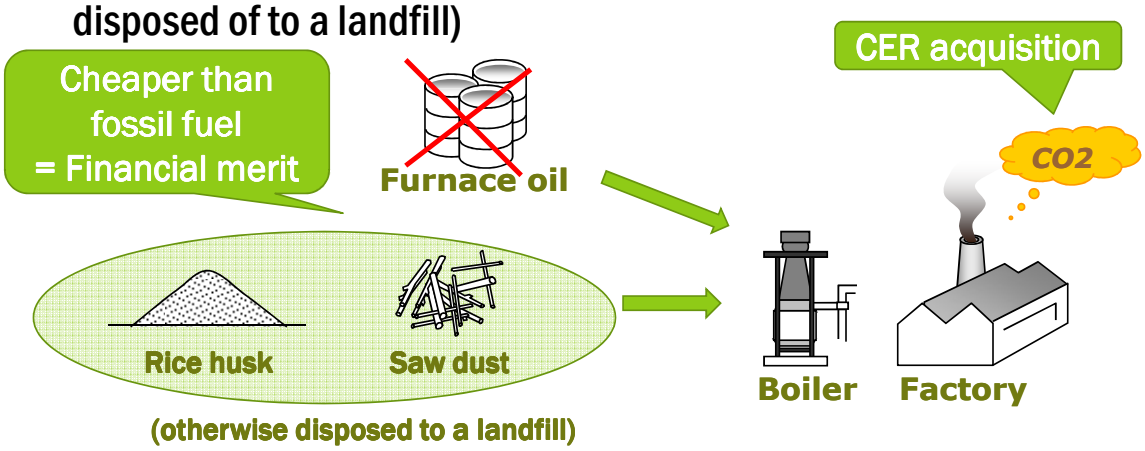
1.Objective of the Workshop

- To understand important factors to assess CDM project viability using simple examples.
- To understand basic concept of:
  - GHG emission reduction calculation
  - Simple project income and expenditure calculation

2. Description of the Example Case

Project Description

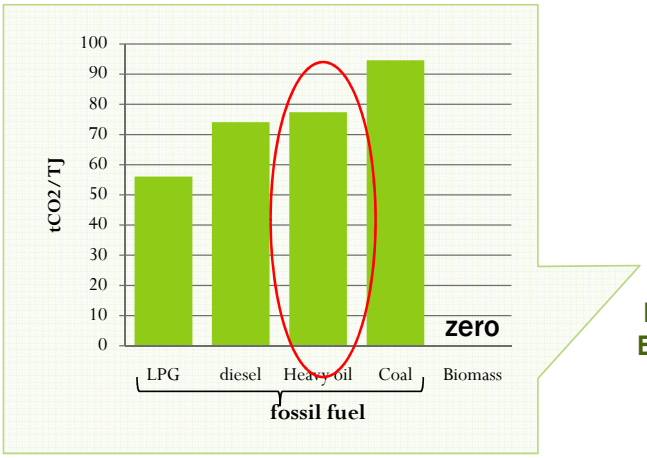
- Fuel switch from fossil fuel to biomass resources
- Biomass boiler will replace the furnace oil boiler
- Steam generated from the boiler will be used in-house
- Biomass will be collected from saw mill or rice mill (otherwise disposed of to a landfill)

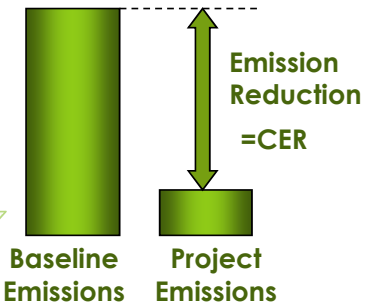


Small Scale Methodology Type III.C. Thermal energy production with or without electricity

3. Key Factors for Assessing Project Feasibility (1)

- GHG emission reduction amount (= Amount of CER)





Emission Reduction =CER → Baseline Emissions (tCO2) = Amount of energy to be replaced (t/y) × Emission Factor (tCO2/t)

Project Emissions (tCO2) = 0 (zero) For simplification

3. Key Factors for Assessing Project Feasibility (2)

- Financial benefit of the project

Financial benefit (project income)	=	Cost saving by fuel switch	+	CER sales

- Other factors to be considered(not considered in this exercise):
  - Suitable technology
  - The availability of biomass resources (Seasonal change of biomass resources)
  - Purchasing price of biomass resources including future prospect (Supply and demand balances)

4. Preconditions and Assumptions Used for Calculation

- Preconditions

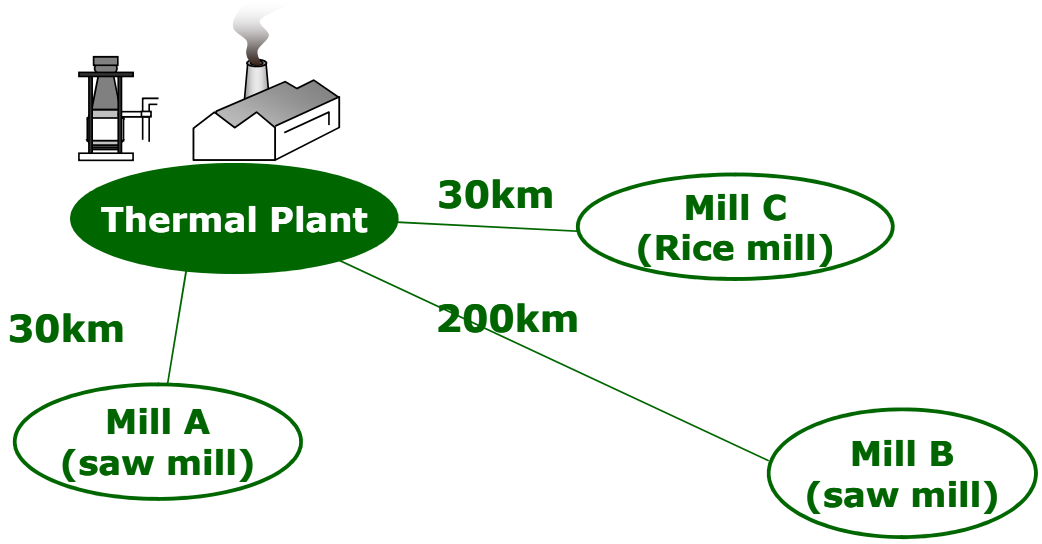
Item	Figure
Energy sources	Biomass (saw dust, rice husk)
Energy to be replaced	Furnace oil
Oil consumption	2 t_oil/day
Operating days	300 days/yr
Emission factor of furnace oil	3.19 kgCO2/kg_oil
Furnace oil price	33 Rupees/t_oil
Amount of biomass to replace 1 ton of oil	Rice husk: 3.3kg_biomass/kg_oil Saw dust: 2.5 kg_biomass/kg_oil
Biomass purchasing price	Rice husk: 3.0 rupees/kg Saw dust: 2.2 rupees/kg
Biomass transport cost	10 rupees/t/km
CER selling price	1500 rupees/tCER

Figures are assumptions, not necessarily reflect the actual situations

4. Preconditions and Assumptions Used for Calculation

- Assumptions (for the purpose of simplification)
  - Project initial cost is not considered.
  - CDM related cost (development cost, monitoring cost etc) is not included
  - Enough biomass is available at each mill throughout the year
  - Methane emissions from biomass decay process is not included in the calculation
  - Emissions related to biomass procurement is not considered
  - Additionality issue is not considered

5. Example Cases



- **Case1: Mill A (saw dust)**
- **Case2: Mill B (saw dust)**
- **Case3: Mill C (rice)**

6. Steps of Group Work

- Steps of Calculation Exercise of CDM Project Feasibility

Step1 **Amount of biomass required**

Step2 **Biomass procurement cost**

Step3 **Amount CER**

Step4 **CER sales**

Step5 **Financial benefit (cost saving) by fuel switch**

STEP1: Amount of Biomass Required

- What is the quantity of biomass resources to supply for the thermal energy demand?

Amount of Biomass Required (t/y)	=	Amount of oil to be replaced (ton/year)	×	Amount of biomass to replace 1 ton of oil (kg_bio/kg_oil)	
(Case A)	=	600 (ton/year)	×	2.5 (kg_bio/kg_oil)	= 1,500 ton/year
(Case B)	=	600 (ton/year)	×	2.5 (kg_bio/kg_oil)	= 1,500 ton/year
(Case C)	=	600 (ton/year)	×	3.3 (kg_bio/kg_oil)	= 1,980 ton/year

2ton/day × 300 day/year

STEP2: Biomass Purchasing Cost

- Biomass purchasing cost is a very important factor to plan a biomass project.

Biomass Procurement Cost (Rupees/year)	=	Amount of Biomass (ton/year)	×	(Purchasing cost (Rps/t)	+	Transport cost (Rps/t))
(Case 1)	=	1,500 (ton/year)	×	(2,200 (Rps/t)	+	300 (Rps/t))
	=	3,750 ('000 Rps/yr)				
(Case 2)	=	1,500 (ton/year)	×	(2,200 (Rps/t)	+	2,000 (Rps/t))
	=	6,300 ('000 Rps/yr)				
(Case 3)	=	1,980 (ton/year)	×	(3,000 (Rps/t)	+	300 (Rps/t))
	=	6,534 ('000 Rps/yr)				

10 Rps/t/km × 30km

STEP3: Amount of CER

- Simple calculation of amount of CER to be obtained

Amount of CER (tCO2/y)	=	Amount of oil to be replaced (ton/year)	×	Emission factor of oil to be replaced (tCO2/t_oil)		
(Case 1)	=	600 (ton/year)	×	3.12 (tCO2/t_oil)	=	1,872 tCO2/year
(Case 2)	=	600 (ton/year)	×	3.12 (tCO2/t_oil)	=	1,872 tCO2/year
(Case 3)	=	600 (ton/year)	×	3.12 (tCO2/t_oil)	=	1,872 tCO2/year

STEP4: Annual CER Sales

- Annual CER sales will be determined by CER amount and CER price

Annual CER sales (Rupees/tCO2)	=	Amount of CER (tCO2/y)	×	Unit CER price (Rupees/tCO2)

(Case 1)	=	1,914 (tCO2/year)	×	1,500 (Rps/tCO2)	=	2,871 '000 Rps/yr
(Case 2)	=	1,914 (tCO2/year)	×	1,500 (Rps/tCO2)	=	2,871 '000 Rps/yr
(Case 3)	=	1,914 (tCO2/year)	×	1,500 (Rps/tCO2)	=	2,871 '000 Rps/yr

STEP5: Annual Cost Saving by Fuel Switch

- Cost saving amount is the reduction of fuel procurement cost

Annual cost saving (Rupees/year)	=	Oil procurement cost (Rupees/year)	–	Biomass fuel procurement cost (Rupees/year)

(Case 1)	=	19,800 (Rupees/year)	-	3,750 (Rupees/year)	=	16,050 '000 Rps/yr
		2 (t/d) × 300 (d/y) ×33 (Rps/t)				
(Case 2)	=	19,800 (Rupees/year)	-	6,300 (Rupees/year)	=	13,500 '000 Rps/yr
(Case 3)	=	19,800 (Rupees/year)	-	6,534 (Rupees/year)	=	13,266 '000 Rps/yr

STEP6: Income / Expenditure

Item	Case1 ('000Rps/yr)	Case2 ('000Rps/yr)	Case3 ('000Rps/yr)	Remarks
a) Income				
CER sales	2,871	2,871	2,871	
Cost saving	16,050	13,500	13,266	
Total income	18,921	16,371	16,137	
b) Operation cost				
Biomass procurement cost				Purchase cost & Transportation
Maintenance cost	1,284	1,080	1,061	8% of the cost saving amount
Total cost	1,284	1,080	1,061	
c) Net income				
a)-b)	17,637	15,291	15,076	

Expected income for:

	Case1	Case2	Case3	
(5ys) 5 x net income/yr =	88,185	76,455	75,379	000 Rps
(10ys) 10 x net income/yr =	176,370	152,910	150,757	000 Rps

Summary/Conclusions

- What are the lessens learned through the exercise?
  - Biomass procurement plan (transportation distance, price of biomass, availability, seasonal fluctuation etc) is a very significant factor for biomass CDM project
  - Detail design of boiler such as size and technology will be affected by biomass type (quantity, characteristics of biomass)
  - Range of initial cost will be restricted by income and expenditure of the project

Post Kyoto Protocol Negotiations

-Outcome of the Copenhagen Climate Change Conference 2009-

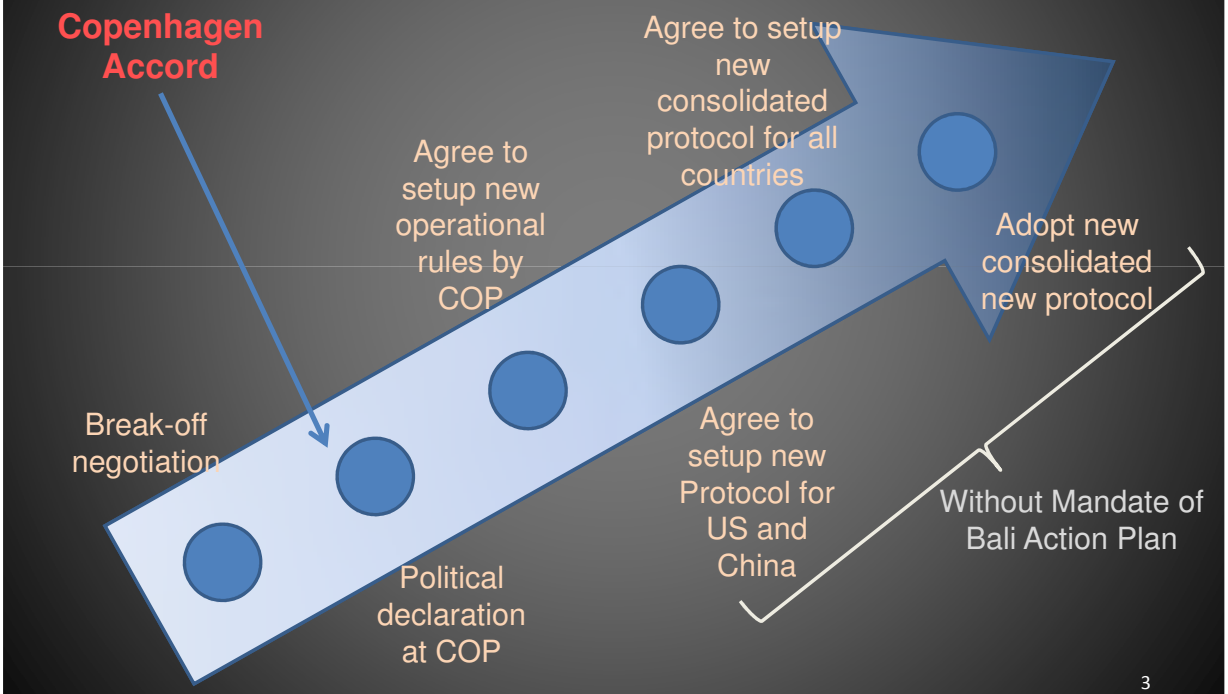
9 July 2010

Satoshi Iemoto

JICA Experts

What is your impression of the outcomes of Copenhagen Climate Change Conference?

Success or Failure ?



Media's report…

(News source: http://unfccc.int/press/news_room/items/2768.php?topic=all)

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Page last updated at 11:42 GMT, Friday, 18 December 2009

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Doubts over Copenhagen summit's last day

Leaders have gathered for the final scheduled day of the UN climate summit, amid uncertainty over the shape of any eventual deal.

A draft political agreement drawn up by a small group of countries including the UK, US and Australia was rejected during overnight discussions.

US President Barack Obama has arrived for the leaders' session

Delegates described the situation as "confusing" and "desperate".

US President Barack Obama told the conference he had come to the summit "not to talk but to act".

Addressing delegates on Friday, he said: "While the science of climate change is not in doubt, I think our ability to take collective action is in doubt right now, and it hangs in the balance."

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COPENHAG

Contents

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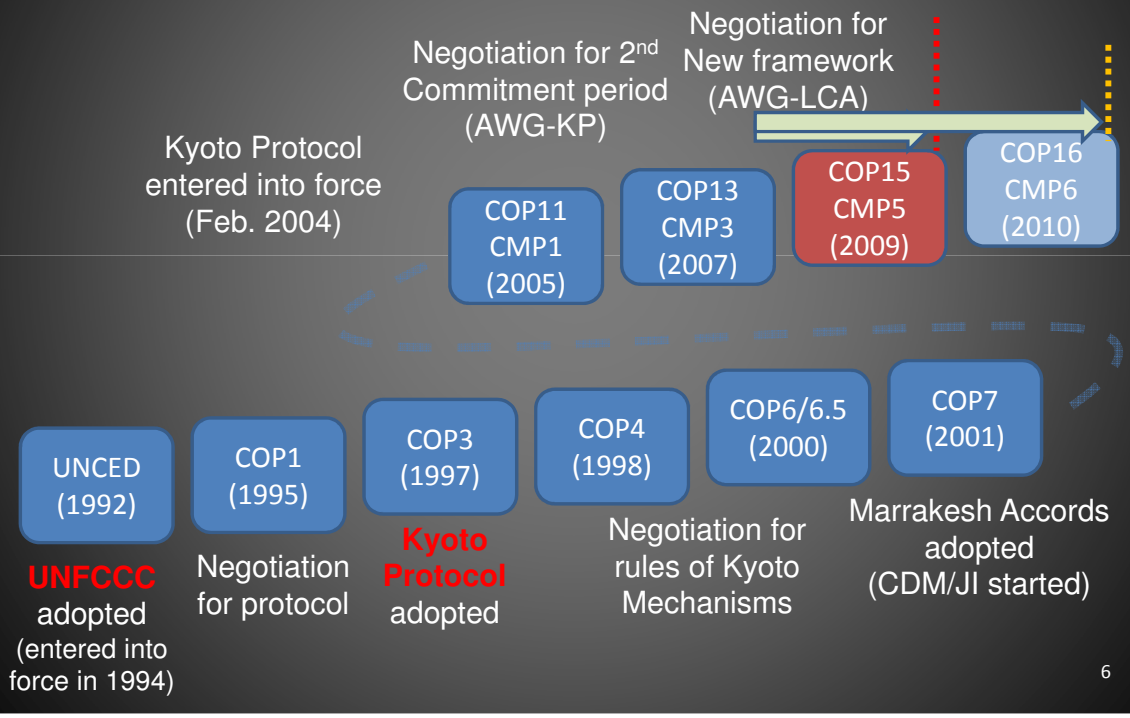
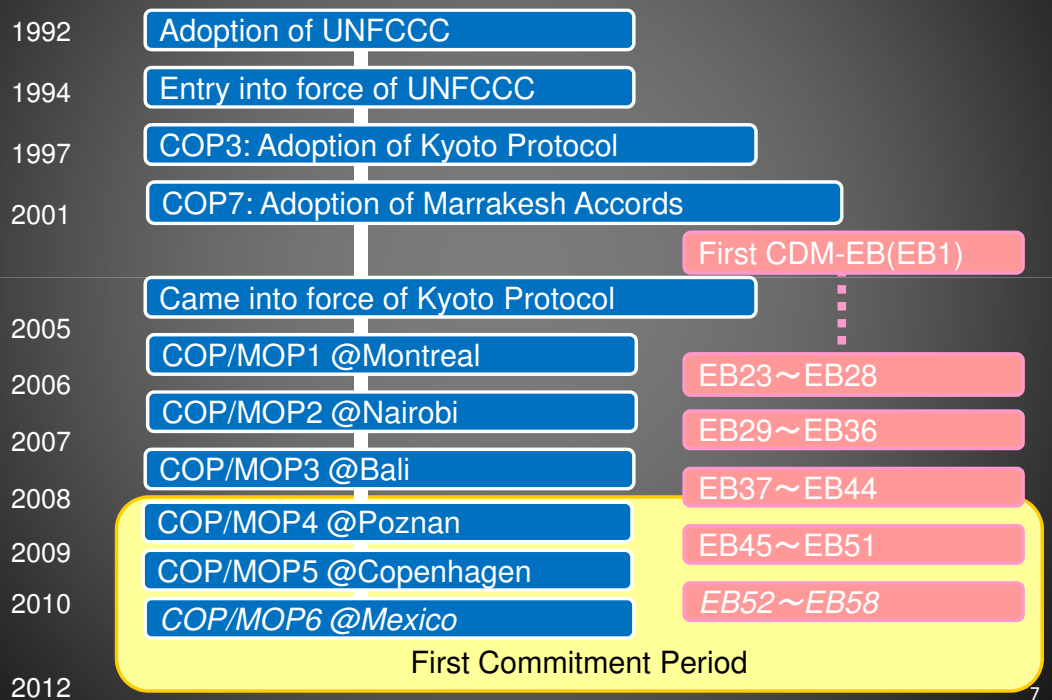
  - Expected Outcomes, Voluntary Targets
  - Outcomes of Copenhagen Climate Change Conference
  - Copenhagen Accord
  - Analysis of outcomes
- Current movements (after CMP5)

Brief history of Climate Change Negotiations



Brief history of Climate Change Negotiations



Recent meetings of Climate Change Negotiations

(Dec. 2008 – Dec. 2010)

2008	2009					2010				
Dec.	Apr.	Jun.	Sep.	Nov.	Dec.	Apr.	Jun.	*Aug.*	*Oct.*	*Dec.*
Poznan, Poland	Bonn, Germany	Bonn, Germany	Bangkok, Thailand	Barcelona, Spain	Copenhagen, Denmark	Bonn, Germany	Bonn, Germany	*Bonn, Germany*	*(TBD), China*	*Cancun, Mexico*
COP14					COP15					*COP16*
CMP4					CMP5					*CMP6*
SB29		SB30			SB31		SB32			*SB33*
AWG-KP6	AWG-KP7	AWG-KP8	AWG-KP9		AWG-KP10	AWG-KP11	AWG-KP12	*AWG-KP13*	*AWG-KP14*	*AWG-KP15*
AWG-LCA4	AWG-LCA5	AWG-LCA6	AWG-LCA7		AWG-LCA8	AWG-LCA9	AWG-LCA10	*AWG-LCA11*	*AWG-LCA12*	*AWG-LCA13*

SB: UNFCCC subsidiary bodies (SBSTA (for Scientific and Technological Advice) and SBI (for Implementation))
AWG-KP: Ad Hoc Working Group on Further Commitments for Annex I Parties to the Kyoto Protocol
AWG-LCA: Ad Hoc Working Group on Long-term Cooperative Actions under the Convention

Discussion of CDM issues at CMP

- CMP1 (Montreal, Canada, Dec. 2005)
  - Facilitate initiative of “Future CDM” (promote EE/RE project)
  - Review of definition of SSC project (Expand the applicability condition)
  - Agreed on guiding principle of CCS (CCS is feasible as CDM project (detail procedures are under discussion))
  - Adopt the eligibility guidance of Programmatic CDM (policy or standard cannot be considered as a CDM project)
  - Enhancement of EB and Secretariat

Discussion of CDM issues at CMP

- CMP2 (Nairobi, Kenya, Nov. 2006)
  - Facilitate initiative of “Future CDM”
  - Agreed on discussion schedule of CCS guidance (guidance will adopt at CMP4)
  - Improvements of regional distribution of CDM projects
  - “Nairobi Framework” adopted (Assist to LDCs by relevant UN organs)
  - 3 months extension for application of Retroactive credit (the end of Dec.2006 -> Mar.2007)
  - Request EB to arrange the sort of guidance of PoA (Guidance and PDD format)

Discussion of CDM issues at CMP

- CMP3 (Bali, Indonesia, Dec. 2007)
  - Facilitate initiative of “Future CDM”
  - Bali Roadmap” adopted (agreed on the negotiation schedule for next commitment period)
  - Assistance to developing countries: Agreed on establish the Adaptation Fund Board (Secretariat: GEF, Trustee: WB)
  - Change the upper limit of SSC project (6ktCO2 -> 12ktCO2)
  - Exempt of fees (e.g. registration fee) for CDM project at LDCs

Discussion of CDM issues at CMP

- CMP4 (Poznan, Poland, Dec. 2008)
  - Governance, Accreditation, Regional Distribution
  - Discussion on improvement of Kyoto Mechanisms on next commitment period (after 2013)
    - Chairperson’s guidance (draft idea) includes;
      - ✓ Right and wrong of scope/subject expansion of project
      - ✓ Introduce sectoral credit mechanisms
      - ✓ Credit issuances based on Party’s emission reduction activities
      - ✓ Accredit Co-benefit aspects as registration criteria
      - ✓ Emission Trading Scheme based on sectoral target
    - Invite parties to submit improvement of draft ideas

Discussion of CDM issues at CMP

- CMP5 (Copenhagen, Denmark, Dec. 2009)

➢ Agendas for current commitment period (-2012)

- Expand scopes of CDM
- Governance
- Regional Distribution
- Relationship with National policy (E+/E-)

(Outcomes)

- ✓ Strengthen financial support to less than 10 project country
- ✓ Simplified methodologies
- ✓ Set up appeal process
- ✓ Develop guidance on E+/E- policy

Discussion of CDM issues at CMP

- CMP5 (Copenhagen, Denmark, Dec. 2009)

➢ Agendas for next commitment period (2013-)

- Expand scopes of CDM (incl. Nuclear, CCS, etc.)
- Change rules and procedures
- New market mechanisms

(Outcomes)

- ✓ No decisions above issue (still remain “options”)

Expected outcomes

- From Annex I countries:
  - ✓New Protocol will be adopted (Kyoto Protocol will be terminated)
  - ✓Comprehensive Agreement incl. US and China
  - ✓Obligation to NAI countries as well AI
- From Non-Annex I countries:
  - ✓Keep the framework “Bali Action Plan + Kyoto Protocol” (= AI keeps their obligation)

Post 2012 Target

- Kyoto Protocol (Article 3.9)
  - ✓No expiring of the Kyoto Protocol
  - ✓Prerequisite: 2nd commitment period will continue after 2012
- CMP1 (Montreal)
  - ✓No blank period between 1st (2008-12) and 2nd (2013-??) commitment period
- CMP3 (Bali Action Plan)
  - ✓Negotiation will be concluded the end of 2009 (CMP5)

Bali Action Plan (Mandate for LCA)

- Bali Action Plan (1/CP.13)

1. *Decides* to launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session, by addressing, inter alia:

   (a) A shared vision for long term cooperative action, including a long-term global goal for emission reductions,…

   (b) Enhanced national/international action on mitigation of climate change, including, inter alia, consideration of:

   (ii) Nationally appropriate mitigation actions by developing country Parties, in the context of sustainable development, supported and enabled technology, financing and capacity-building , in a measurable, reportable and verifiable manner;

2. *Decides* that process be conducting…(skip)…AWG-LCA under the convention, that shall complete its work in 2009 and present the outcome of its work to the Conference of the Parties for adoption at its fifteenth session;

Voluntary Target for Copenhagen Conference

<Developed Countries (Annex I)>

Country	Target (2020)	Base Year	Flex Mechanisms
Australia	-5～-25%	2000	Market M, LUCF
Canada	-20%	2006	LUCF: 2%
EU-27	-20～-30%	1990	Market M
Iceland	-15%	1990	LUCF
Japan	-25%	1990	Market M, LUCF
NZ	-10～-20%	1990	Market M, LUCF
Norway	-20～-40%	1990	Market M, LUCF
Russia	-20～-25%	1990	?
Swiss	-20～-30%	1990	Market M, LUCF
Ukraine	-20%	1990	Market M
USA	-17%	2005	Market M
Total	**-12～-17%**	**1990**	

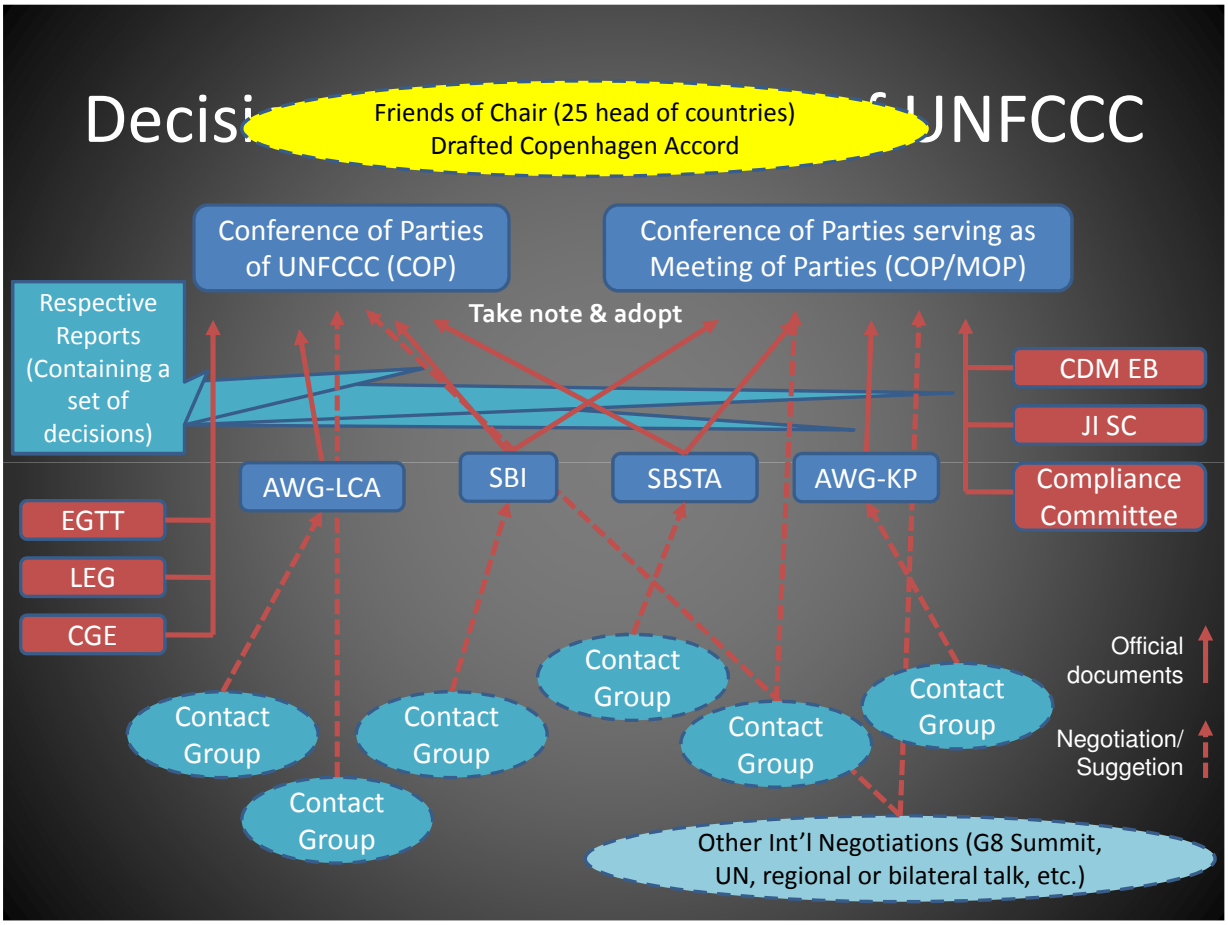
<Developing Countries (Non-AnnexI)>

Country	Target	Ref. Year	Remarks
Brazil	-36～-39%	2020	BAU
China	-40～-45%	2005	Basic unit of CO2 (2020)
India	-20～-25%	2005	Basic unit of CO2 (2020)
Indonesia	-26～-41%	2020	BAU, LUCF (Max: incl. Int'l assistance)
Maldives	Zero emission	2019	Net (incl. Carbon sinks)
Mexico	-5%	2020	BAU
Rep. Korea	-4%	2005	Absolute Amount (-30%/BAU)
Singapore	-16%	2020	BAU
S. Africa	-34%	2020	BAU w/int'l financial support

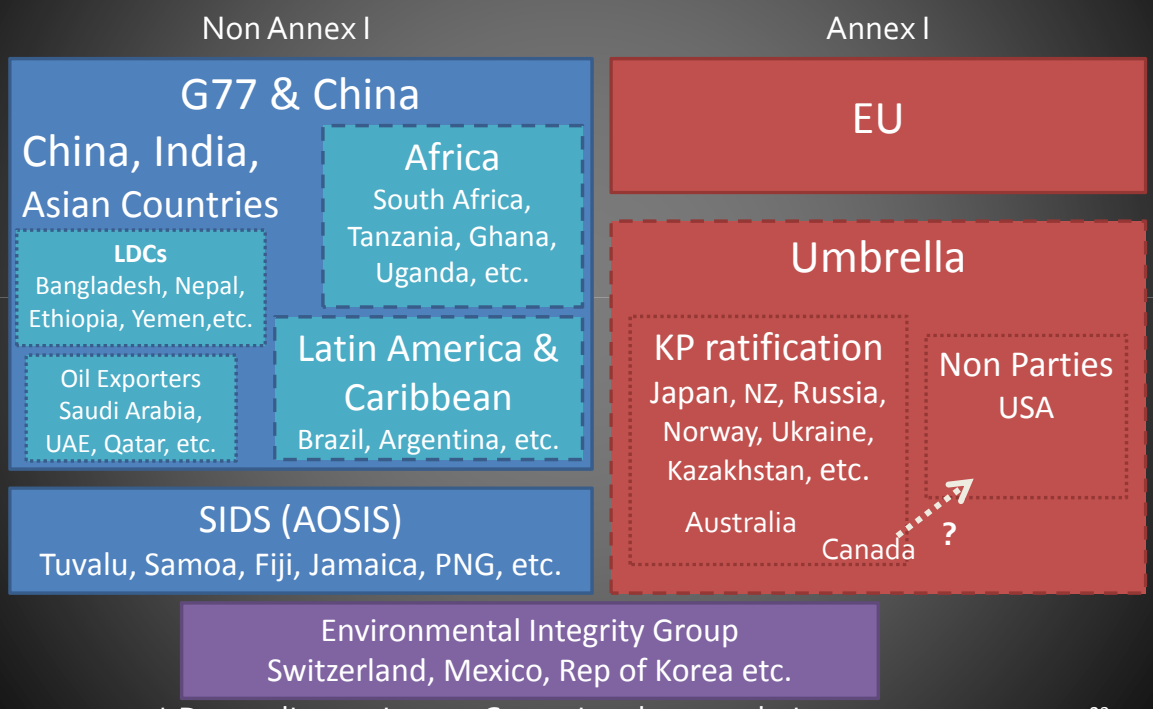
Confused conference management

In the 2nd week of COP15, Media person also lock out the conference venue. (Security reason)
Indian TV crews reported from the platform of subway station.

Decisi… of UNFCCC



Negotiation Blocs

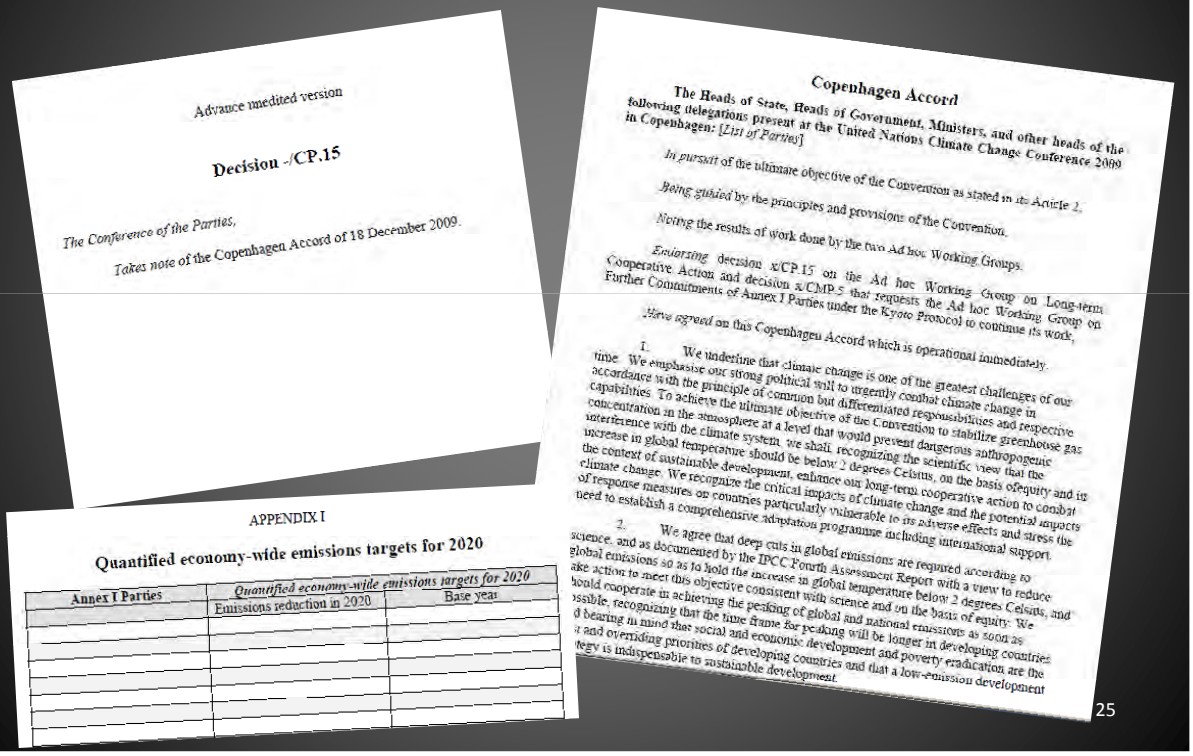


* Depending on Issues, Countries changes their groups.

Outcomes of Copenhagen CC Conference

- Copenhagen Accord drafted by Friends of the Chair (Head of 25 countries, incl. US, China, EU, Japan, Indonesia, Brazil, Ethiopia, etc.)
- "Take note" the Copenhagen Accord at the COP15 (not Adopt = couldn't achieve as COP decision) <strong opposed by Sudan, Cuba, Venezuela, Bolivia, etc.>
- AWG-KP and AWG-LCA will continue until Dec. 2010 at Mexico

Copenhagen Accord



Advance unedited version

Decision -/CP.15

The Conference of the Parties,

Takes note of the Copenhagen Accord of 18 December 2009.

APPENDIX I

Quantified economy-wide emissions targets for 2020

Annex I Parties	*Quantified economy-wide emissions targets for 2020*	
	Emissions reduction in 2020	Base year

Copenhagen Accord

The Heads of State, Heads of Government, Ministers, and other heads of the following delegations present at the United Nations Climate Change Conference 2009 in Copenhagen: [*List of Parties*]

In pursuit of the ultimate objective of the Convention as stated in its Article 2,

Being guided by the principles and provisions of the Convention,

Noting the results of work done by the two Ad hoc Working Groups,

Endorsing decision -/CP.15 on the Ad hoc Working Group on Long-term Cooperative Action and decision -/CMP.5 that requests the Ad hoc Working Group on Further Commitments of Annex I Parties under the Kyoto Protocol to continue its work,

Have agreed on this Copenhagen Accord which is operational immediately.

1. We underline that climate change is one of the greatest challenges of our time. We emphasise our strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities. To achieve the ultimate objective of the Convention to stabilize greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, we shall, recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change. We recognize the critical impacts of climate change and the potential impacts of response measures on countries particularly vulnerable to its adverse effects and stress the need to establish a comprehensive adaptation programme including international support.

2. We agree that deep cuts in global emissions are required according to science, and as documented by the IPCC Fourth Assessment Report with a view to reduce global emissions so as to hold the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity. We should cooperate in achieving the peaking of global and national emissions as soon as possible, recognizing that the time frame for peaking will be longer in developing countries and bearing in mind that social and economic development and poverty eradication are the first and overriding priorities of developing countries and that a low-emission development strategy is indispensable to sustainable development.

Copenhagen Accord

- [Preamble] Operational immediately
- [Para.1] Strong political will to urgently combat climate change (w/common but differentiated responsibilities principle)
- [Para.1] Global temperature should be below 2 degrees Celsius
- [Para.2] Cooperate in achieving the peaking of global and national emissions as soon as possible
- [Para.3] Developed countries shall provide adequate, predictable and sustainable financial resources, technology and capacity-building

Copenhagen Accord (cont.)

- [Para.4] Voluntary emission reduction targets for 2020 by Annex I (submit until 31 Jan. 2010)
- [Para.5] Voluntary mitigation actions by Non-Annex I (submit until 31 Jan. 2010)
- [Para.6] Immediate establishment of REDD-plus mechanisms
- [Para.7] Enhance cost-effectiveness, utilize market mechanisms

Copenhagen Accord (cont.)

- [Para.8] New and additional funding to developing countries from developed countries
  - ✓ Agreed to pledge 30 bil USD / year (2010-12) for mitigation and adaptation (Funding for Adaptation: Prioritized for vulnerable countries, LDCs, SIDS and Africa)
  - ✓ Developed countries commit to a goal mobilizing jointly 100 bil USD / year by 2020
  - ✓ Funding flow through the Copenhagen Green Climate Fund
    - [Para.10] Copenhagen Green Climate Fund shall be established as an operating entity of the financial mechanism of the Convention

Copenhagen Accord (cont.)

- [Para.11] Enhance action on Development and Transfer of Technology, Establish a Technology Mechanism
- [Para.12] Implementation review by 2015.
- [Para.12] Consider strengthening goal incl. 1.5 degree Celsius (--> Reflect strong opinion by AOSIS)

New Crediting Schemes

- NAMA crediting
- Sectoral crediting
- REDD-plus

-> all decisions were not concluded at Copenhagen and to be discussed at Cancun, Mexico (CMP6)

Pledge commitment under the Copenhagen Accord

- Target until 2012 (30 bil USD for 3 years(2010-12))
  - Japan
    - Pledge agreement until COP15: 9.2 bil
    - (New) Additional pledge agreement: 1 bil
    - (New) Mobilize from private sector: 4 bil
  - EU: 10 bil USD (Decided at EU summit)
  - US and other AI: 5 bil USD
- Target on 2020 (100 bil USD/year)
  - Depends on commitment by US

Analysis of outcomes of Copenhagen CC Conference

- High expectations from Annex I
- Annex I requested beyond the mandates of BAP to NAI
- Raised public & media concerns (high pressures from outside world)
- Too insist to establish the legal framework
- Negotiation managements were poor (by Gov't of Denmark)
- Insufficient trusteeship among Parties
- Exposed different opinions among NAI (AOSIS vs. Newly developing countries) etc.
- Developing countries got pledge commitment from AI

Voluntary commitment actions

- Copenhagen Accord requested voluntary actions by AI and NAI
  - [Para.4] Voluntary emission reduction targets for 2020 by Annex I (submit until 31 Jan. 2010)
  - [Para.5] Voluntary mitigation actions by Non-Annex I (submit until 31 Jan. 2010)
- Sri Lanka is not yet submit the voluntary mitigation action plan

List of commitment actions submission countries

Annex I (43 parties) (Percentage of emission reduction target in 2020)					
Australia (5%-15% or 25%)	EU	Ireland	EU	Netherlands	Iceland (30%)
Belarus (5-10%)		Greece		Austria	Japan (25%)
Canada (17%)		Spain		Poland	Kazakhstan (15%)
Croatia (5%)		France		Portugal	Liechtenstein (20%)
EU & 27 Member States (20/30%)		Italy		Romania	Monaco (30%)
EU: Belgium		Cyprus		Slovenia	New Zealand (20%)
EU: Bulgaria		Latvia		Slovakia	Norway (30-40%)
EU: Czech Rep		Lithuania		Finland	Russia (15-25%)
EU: Denmark		Luxembourg		Sweden	Switzerland (20/30%)
EU: Germany		Hungary		UK	Ukraine (20%)
EU: Estonia		Malta			USA (17%)

List of commitment actions submission countries

Non-Annex I (40 parties)			
Afghanistan	Congo	Israel	Peru
Antigua & Barbuda	Costa Rica	Jordan	Rep Korea
Armenia	Cote d'Ivoire	Madagascar	Moldova
Benin	Ethiopia	Maldives	San Marino
Bhutan	Eritrea	Marshall Islands	Sierra Leone
Botswana	Gabon	Mauritania	South Africa
Brazil	Georgia	Mexico	Macedonia
Cameroon	Ghana	Mongolia	Togo
Central African Rep	India	Morocco	Tunisia
China	Indonesia	PNG	San Marino

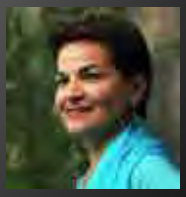
<Party's participation to the CA>
98% of Annex I Parties
26% of Non-Annex I Parties

Current movements (after CMP5)

- Bolivia hosted int'l conference (April 2010)
  - ALBA countries trying to negotiate outside of UN process. (*ALBA: Cuba, Ecuador, Venezuela, etc.)
- Germany and Mexico hosted informal ministerial meeting (May 2010)
  - 41 countries (AI and NAI) agreed to draft documents at CMP6 with reflection of CA.
  - Needed to consensus to set up 2nd Commitment period of KP (from NAI parties).

Current movements (after CMP5)

- AWG-LCA13 & AWG-KP (June 2010)
  - LCA Chair issued Chair's text (based on the negotiation) for next session, but most of the NAI parties denied to discuss it.
  - KP requested secretariat to analyze the legal matter relating to the gap between KP and New framework.
- New UNFCCC Executive Secretary (Ms. Christina Figueres) (July 2010)



Related News: Environment · Latin America

UN's Next Climate Chief Figueres Says Final Deal Unlikely in Her Lifetime

By Alex Morales - Jun 9, 2010

Christiana Figueres, a Costa Rican who on July 8 will take the helm of the United Nations body that organizes global climate-change treaty talks, said an all- encompassing deal is unlikely to happen in her lifetime.

Governments must instead focus on making incremental efforts to end global warming because the response "is going to require the sustained effort of those who will be here for the next 20, 30, 40 years," Figueres, 53, told reporters today in Bonn, where the latest two-week round of talks is taking place.

"I do not believe we will ever have a final agreement on climate change, certainly not in my lifetime," Figueres said. "If we ever have a final, conclusive, all-answering agreement, then we will have solved this problem. I don't think that's in the cards."

More than 190 nations are trying to reach a global deal to cut emissions from polluting industries such as power and cement after efforts to craft a treaty at a summit in Copenhagen in December failed amid recriminations among developed and developing countries. Figueres said she's confident governments will meet the challenge, and Brazilian, Indian and European

Thank you for your attention!

Satoshi Iemoto, JICA Expert

(Overseas Environmental Cooperation Center, Japan)

iemoto@oecc.or.jp

Stepwise Consideration of CDM

23 July, 2010
JICA Expert Team

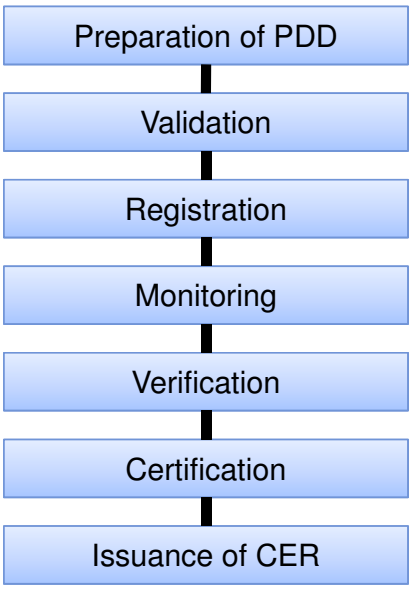
Content & Objectives

- Understand procedures to develop CDM project
- Explain & highlight purposes of each steps
- Understand roles and responsibilities of parties involved in CDM processes and how to deal with these parties

References

- UNFCCC Modalities and Procedures (Annex to Decision 17/CP.7)
- UNFCCC's: http://unfccc.int/2860.php/
- CD4CDM (UNEP/ReSo Center): http://cd4cdm.org (Contains CDM/JI Database)
- IGES: http://www.iges.or.jp/ (Contains CDM/JI in Chart)

1.1 CDM Project Cycle



Excerpt from lecture of June 24 by Ms. Kawamura.

1.2 Parties Involved in the Process

CDM EB
Supervise the CDM, under the authority and guidance of signatory counties.

UNFCCC Secretariat
Communication channel and practical administrative body for UNFCCC

DOE
Conduct validation/verification accredited by CDM-EB

DNA
Central authority to communicate with PP and other parties related to CDM work. Issue written approval to projects.

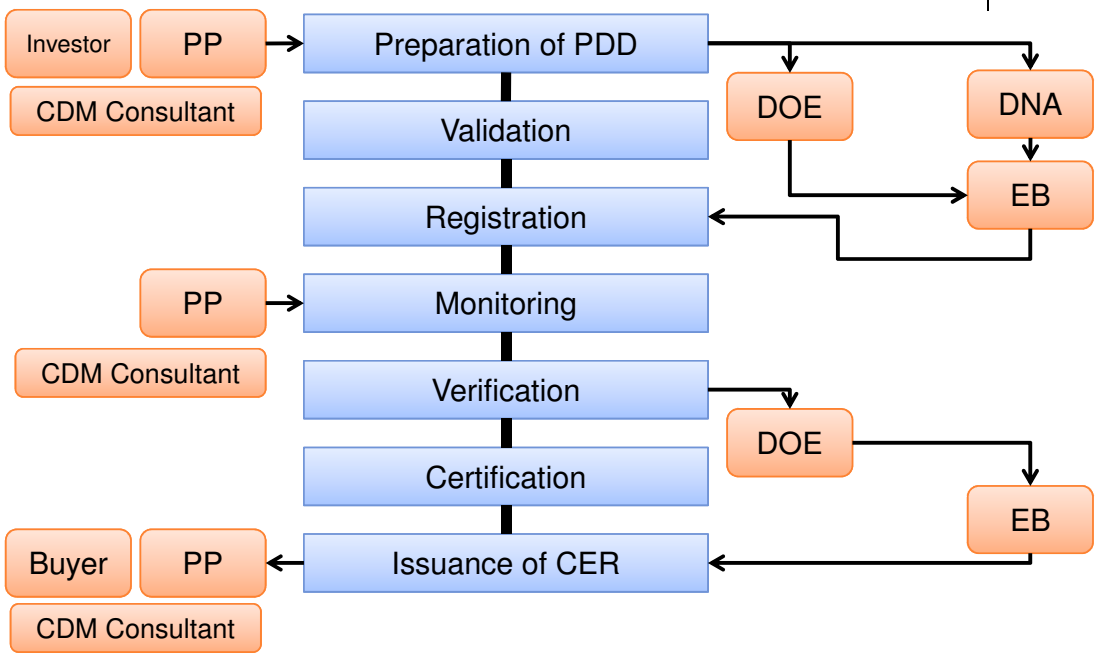
Credit Buyer
Some projects sell or commit to sell credits at the point of inception of the project

Financial Sources
Some projects requires external finance sources to realize projects

CDM Consultants
Assist PP where needed and engaged in consultancy services. Some directly or indirectly hands on CERs.

Project Participants
Public or private entity who wishes to have a distribution of CERs.Parties

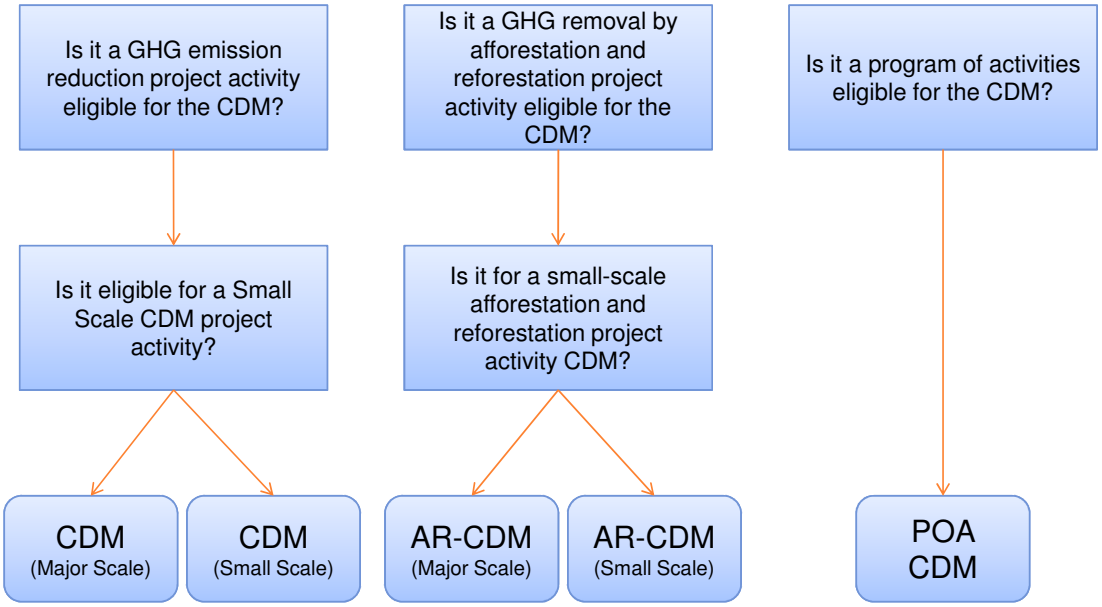
1.3 CDM Project Cycle



2. Project Inception

1. Appraise CDM Eligibility
   a. Typology of CDM
   b. Methodology applicability
   c. Project's Additionality
2. Assess Project's Feasibility
3. Assure CDM Consideration Record

2.1 Project Inception



2.2 Project Inception

1. Applicability of Methodology

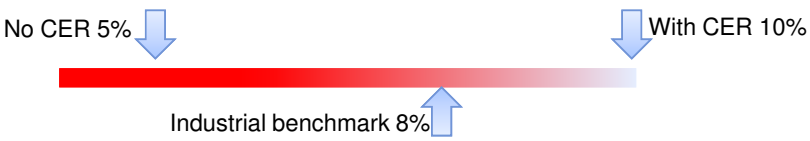
- Look up database and see if there are any precedent project you should refer.
- Examine Applicability Section of employed methodology.
- New Methodology Development is not recommended.
- Make sure the methodology is the latest.

2. Project Feasibility

- Regardless project's CER revenue, the project should be financially attractive for the sake of project participants.

Look up Databases
➔UNFCCC
➔CD4CDM

Cash In	Cash Out
Energy Saving Sales of Electricity Sales of Steam Tipping Fee … CER Revenue	Procurement Cost O&M Fuel Cost Labor Cost Consulting Fee … Validation Cost Registration Cost Verification Cost Commission



2.3 Project Inception

Project Starting Date

The project's starting date should be recorded to prove project's additionality.

The start date of a CDM project activity is "the earliest date at which either the implementation or construction or real action of a project activity begins"

( )contracts for equipment of construction/operation services required for the project activity

( )contracts of services/ payment of fees for FS

PDD should describe above date and explain how that date has been determined.

Reference: EB41 Report Para.57, EB49 Annex 22

2.4 Project Inception

1. Examine applicability of methodology and modify project rather than try to develop new methodology.
2. A project has been in place? No chance for CDM….
3. Make it financially viable, regardless CER revenue.

3.1 PDD Development

1. Use Latest Version of Templates
2. Focus Important Sections
3. Source, Source and Source

3.2 PDD Development

- Use Latest Version of PDD Templates and Methodology.

		Normal-scale CDM project activity		Small-scale CDM project activity	
Emission Reduction	PDD	CDM-PDD ver 3.2 (Att.1-1)	CDM Project Design Document	CDM-SSC-PDD ver.3 (Att.1-2)	CDM Project Design Document for Small-Scale project activities
				CDM-SSC-Bundle ver.2 (Att.1-3)	Form for submission of bundled Small Scale project activities form
		CDM-PoA-DD ver.1 (Att.1-4)	Programme of Activities Design Document	CDM-SSC-PoA-DD ver.1	Small-Scale CDM Programme of Activities Design Document
		CDM-CPA-DD ver.1 (Att.1-5)	CDM Programme Activity Design Document	CDM-SSC-CPA-DD ver.1	Small-Scale CDM Programme Activity Design Document
	Metho dology	F-CDM-AM-Subm ver.1	Form for submission of queries from DOEs to the MP regarding the application of approved methodologies	F-CDM-SSC-Subm ver.3	Form for Submissions on Small Scale Methodologies and Procedures
		F-CDM-AM-Rev ver.1	Form for submission of requests for revisions of approved methodologies to the MP		
		CDM-NM ver.3.1	CDM Proposed New Methodology: Baseline and Monitoring	F-CDM-SSC-NM ver.1	Form for proposed New Small-Scale Methodologies
A/R (chap.18)	PDD	CDM-AR-PDD ver.4	CDM Project Design Document for A/R project activities	CDM-SSC-AR-PDD ver.2	Project Design Document Form for Small-Scale A/R project activities
		CDM-PoA-DD-AR ver.1	Programme of Activities Design Document Form for A/R project activities	CDM-PoA-DD-SSC-AR ver.1	Programme of Activities Design Document Form for SSC-AR project activities
		CDM-CPA-DD-AR ver.1	CDM Programme Activity Design Document Form for A/R project activities	CDM-CPA-DD-SSC-AR ver.1	CDM Programme Activity Design Document form for SSC-AR project activities
	Metho dology	F-CDM-AR-AM-Subm ver.1	Form for submission of queries from DOEs to the AR WG regarding the application of Approved A/R Methodologies		
		F-CDM-AR-AM-Rev ver.1	Form for submission of requests for revisions of Approved Methodologies to the AR WG		
		CDM-AR-NM ver.3	CDM Proposed New Methodology: Baseline and Monitoring for A/R		

Source: CDM-JI In Chart Ver.9.0
www.iges.or.jp/en/cdm/report01.html

3.3 PDD Development

- Focus Important Sections
- Distinguish descriptive section and fact oriented sections
- Make sure your explanation is substantiate and supported by evidence.

Number
➔ Source or original data
Proportion
➔ Source and ensure the subject is appropriately treated
Census, Statistics
➔ Source and check date
Mechanical Specification
➔ Prepare an evidence

A	Gen. Description of Project Activity	
B	Application of a baseline and monitoring methodology	
B.1	Title of employed methodology	
B.2	Justification of methodology application	
B.3	Description of project boundary	
B.4	Description of baseline scenario identification	
B.5	Assessment and Demonstration of Additionality	
B.6	Emission Reductions	
B.7	Application of the monitoring methodology & Description of the monitoring plan	
B.8	Date of Completion of baseline study	
C	Duration of the project activity /crediting period	
D	Environmental Impacts	
E	Stakeholders' Comments	

3.4 PDD Development

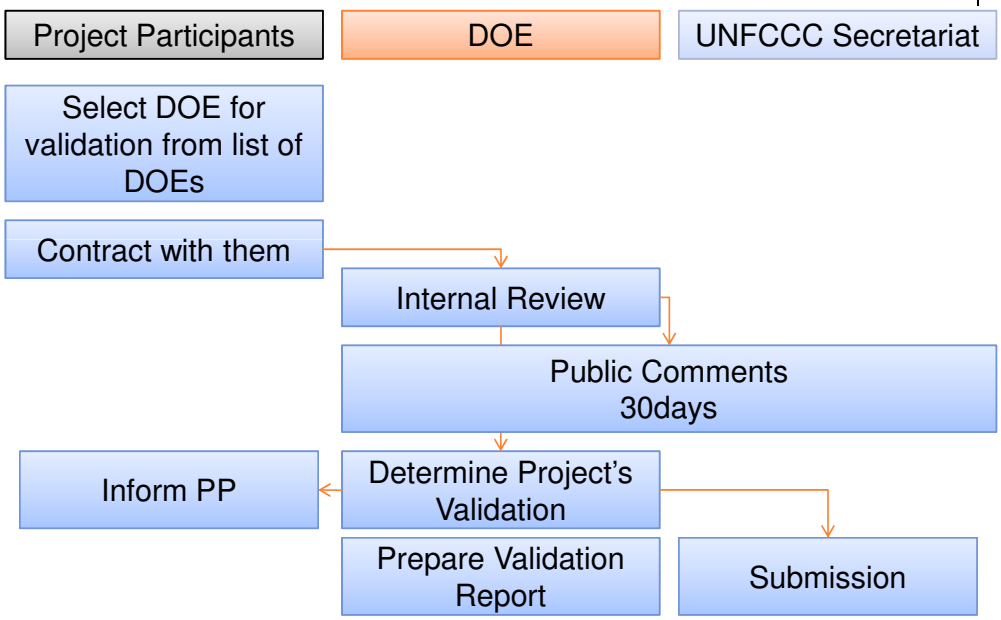
- Information critical for baseline development and additionality analysis needs to be set up by DNA or relevant government agencies
- In case the data is not available, the project participants has to perform its own calculation of parameters e.g.
  - Emission factors (to calculate emission reductions)
  - National target of introducing energy saving technologies (to prove an additionality)
  - Financial benchmarks (to prove financial additionality of project)

➔ Absence of key parameters ends up with inconsistent project approval by DNA and further questioned Sri Lanka projects' integrity

4.1 Validation

1. Process
2. Dialogues with DOE
   Why DOEs Asking Qs?

4.2 Validation Process



4.4 Validation

Baseline Analysis

- Based on approved/new methodology
- In a transparent and conservative manner
- On a project specific basis
- Taking into account national and/or sectoral policies and circumstances

Additionality = Emission reduction would not have been achieved without CDM

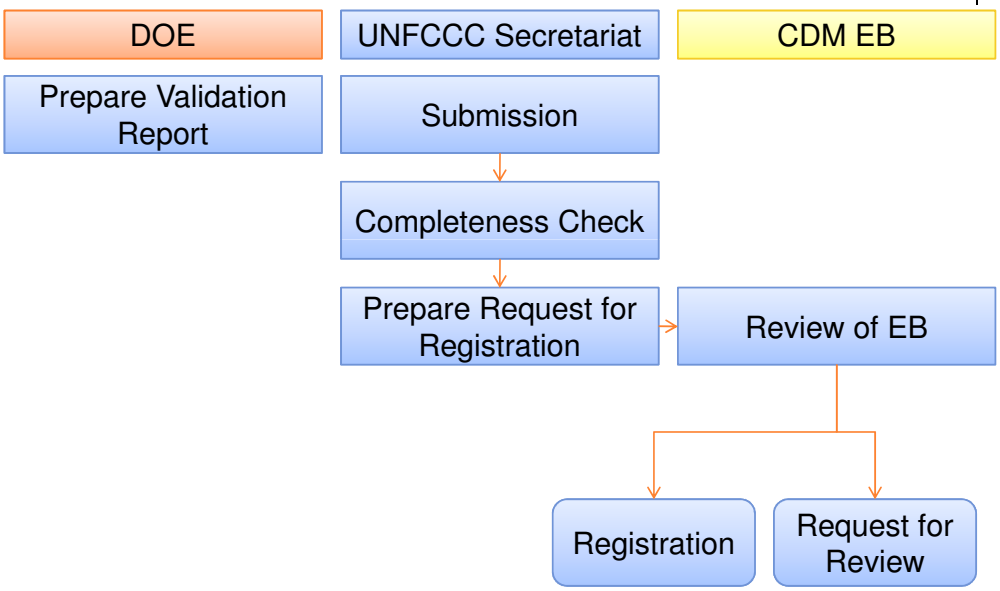
- Investment Barrier
- Technological Barrier
- Barrier due to prevailing practice
- Other Barrier

Validator needs to establish his/her confidence over the descriptions of PDD

5.1 Registration

1. Most projects need 2 EBs to register.
2. Review Request is tricky request.

5.2 Registration Process



5.3 Registration

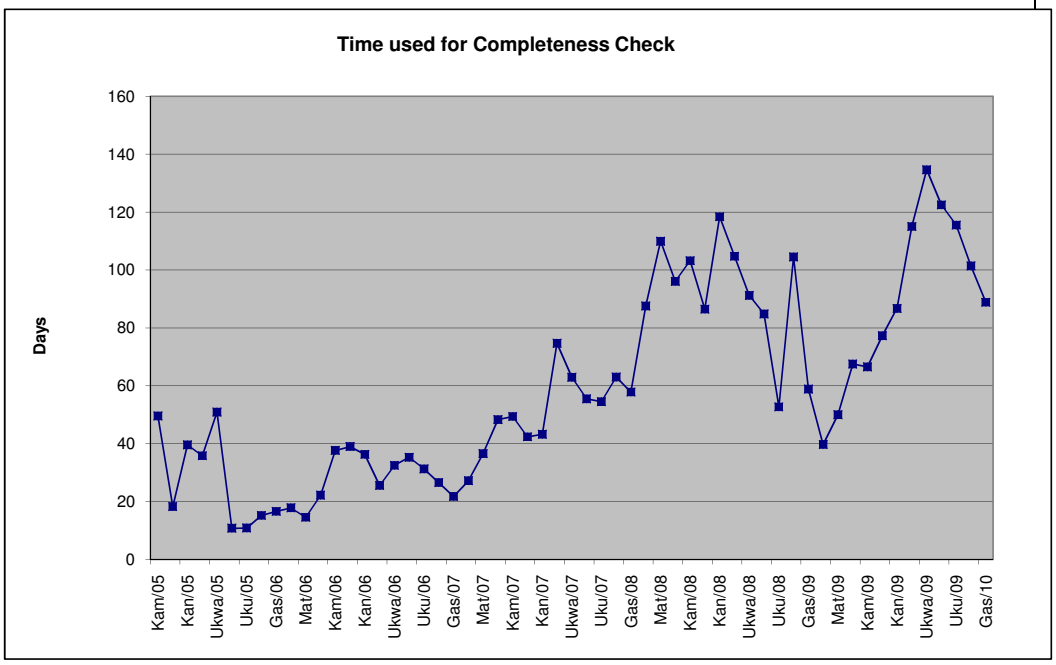
Completeness check

a. CDM PDD
b. A validation report
c. A valid letter of approval from each party involved
d. A registration request form
e. A letter of authorization for each PP
f. A modalities of communication

SOP-Admin Fee

- SOP Admin is charged for the share of proceeds to cover administrative expenses applied to the expected average annual emission reductions
- SOP Admin is USD 0.1/CER and USD 0.2/CER issued for any amount in excess of 15,000tCO2
- The maximum registration fee is no more than USD 350,000.

5.4 Registration

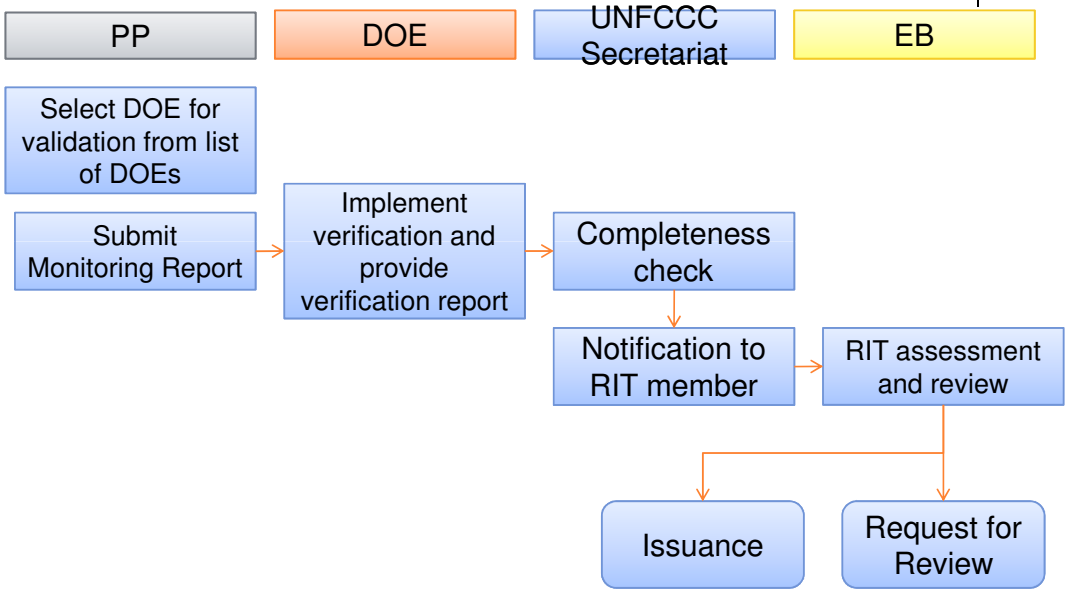


Source: CDM Database, CD4CDM

6.1 Verification

1. Monitoring is QC/QM process
2. Conduct 1st Verification Sooner

6.2 Verification Process



6.3 Verification

"Verification" is a process (PP choose 1st verification timing and following every 5 years) to decide emission reduction amounts by DOE.

1) Compliance

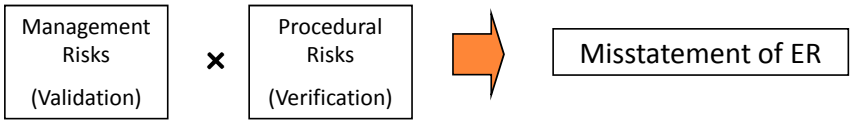
Does the project comply with KP and other host countries' regulations throughout the verified periods? It is hardly recognizable to issue CER when non-compliance occurred.

2) Technical Aspects

Does the project operate without significant engineering failure to achieve designed emission reductions?

3) Project Management

Does the project management system design in the monitoring plan effectively monitor the project performance?



6.4 Verification

Conduct 1st Verification sooner

- Earlier verification enables PP to deliver CERs sooner
  ➔ earlier cash-in.
- Make necessary amendment before project in trouble
  ➔ usually there are unintended changes undermined in the project from original PDD.
  ➔ you may need to claim changes after operation.

7.1 Changes after the operation

- Requests for deviation prior to the submitting request for issuance
- Changes from the project activity as described in the registered PDD (EB48 Annex 67)
  - Changes impact the additionality of the project activity
    - Changes in the effective output capacity due to increased installed capacity or number of units, or installation of units with lower capacity or units with a technology which is less advanced than that described in the PDD.
    - Addition of components or extension of technology
    - Removal or addition of one or more sites of a project activity registered with multiple-sites
    - Different values of those actual operational parameters relevant to determination of emission reduction which are within the control of project participant and which result in the IRR passing the benchmark as described in the registered PDD

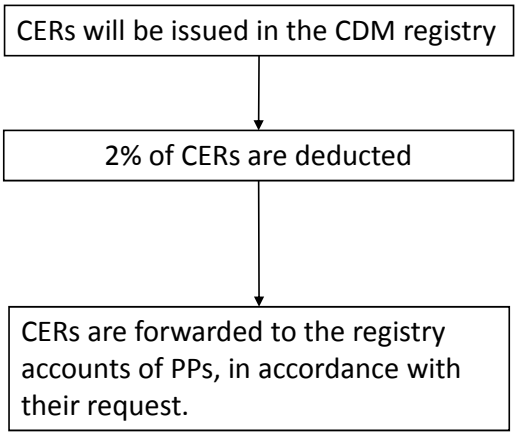
7.2 Changes in the operation

- Changes in the scale of CDM activity
  - Project, originally designed for small scale expands and no longer satisfies the conditions
- Changes which impacts applicability/application of baseline methodology
  - The original methodology is no longer applicable
  - Another methodology would have been applicable
  - Another baseline scenario would be more appropriate

Including changes in the monitoring plan, the DOE notify to EB to assess reported changes before the verification. Unless DOE receives guidelines from EB, DOE cannot proceed further processes including verification.
(EB49 Annex 28)

8.1 Issuance

Credit Issuance Procedure



Upon instruction of CDM EB, the CDM registry administrator in UNFCCC issues the specified quantity of CERs.

Among issued CERs, 2% of those will be deducted for share of proceeds to assist developing parties those are particularly vulnerable to the adverse effects of climate change to meet the cost of adaptation. (SOP-Adaptation)

Projects in LDCs shall be exempt from SOP.

The proportion of CERs distribution among project participants are exclusively decided by project participants.

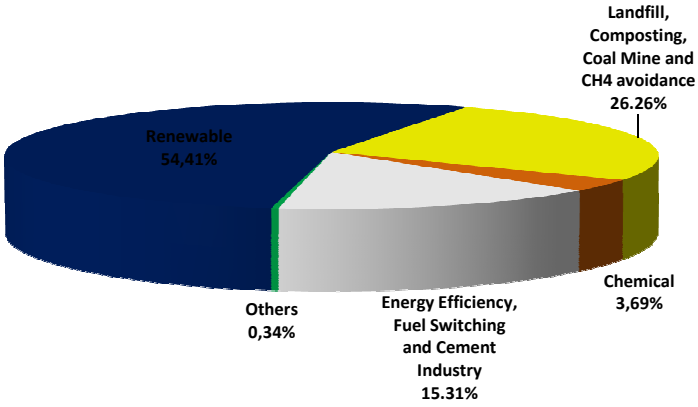
Energy Efficiency and CDM Projects

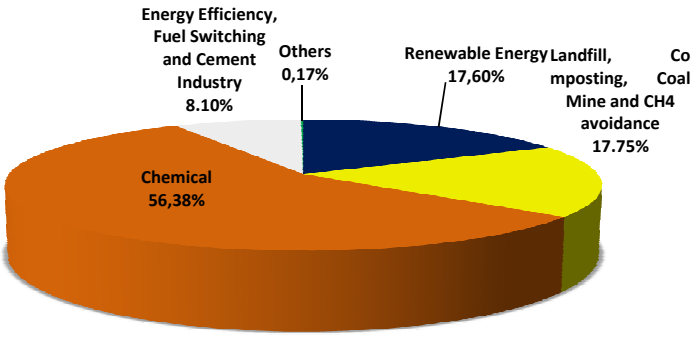
Jose R. Moreira
J-Power Consultant
August 6, 2010
Colombo, Sri Lanka

REGISTERED CDM PROJECTS

Number of CDM Projects by type

945 Registered Projects

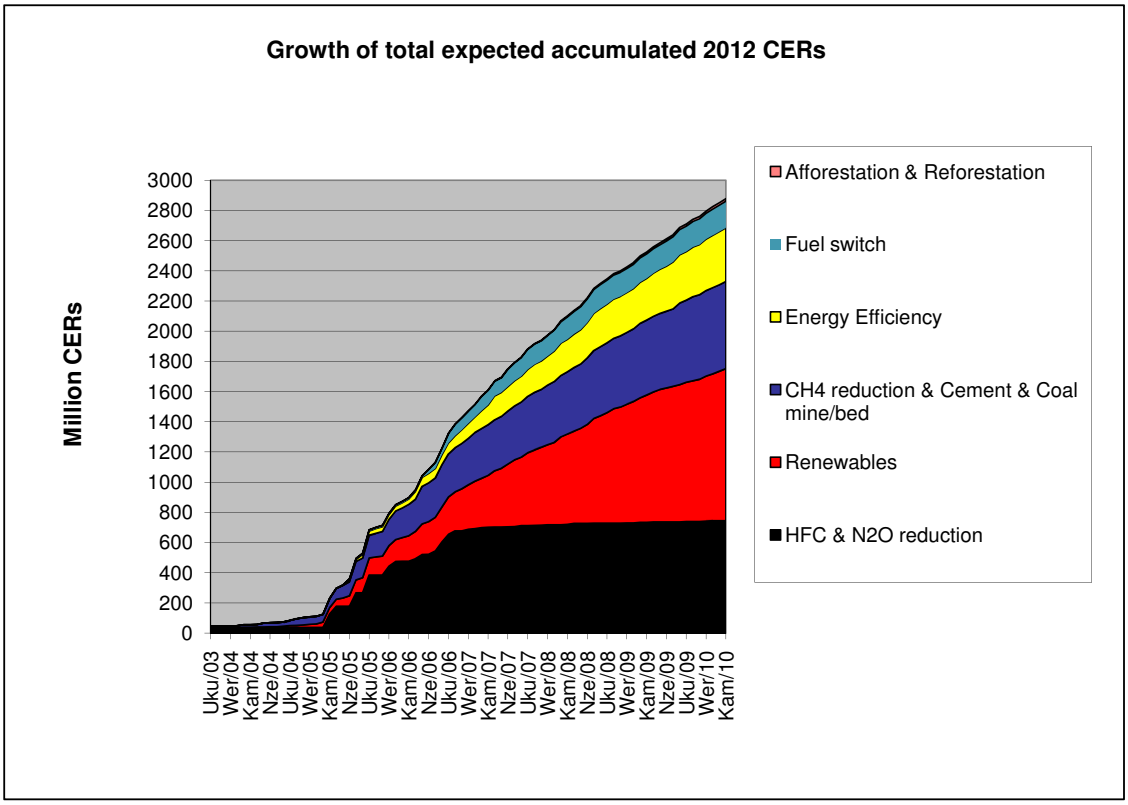




CERs to be generated by type

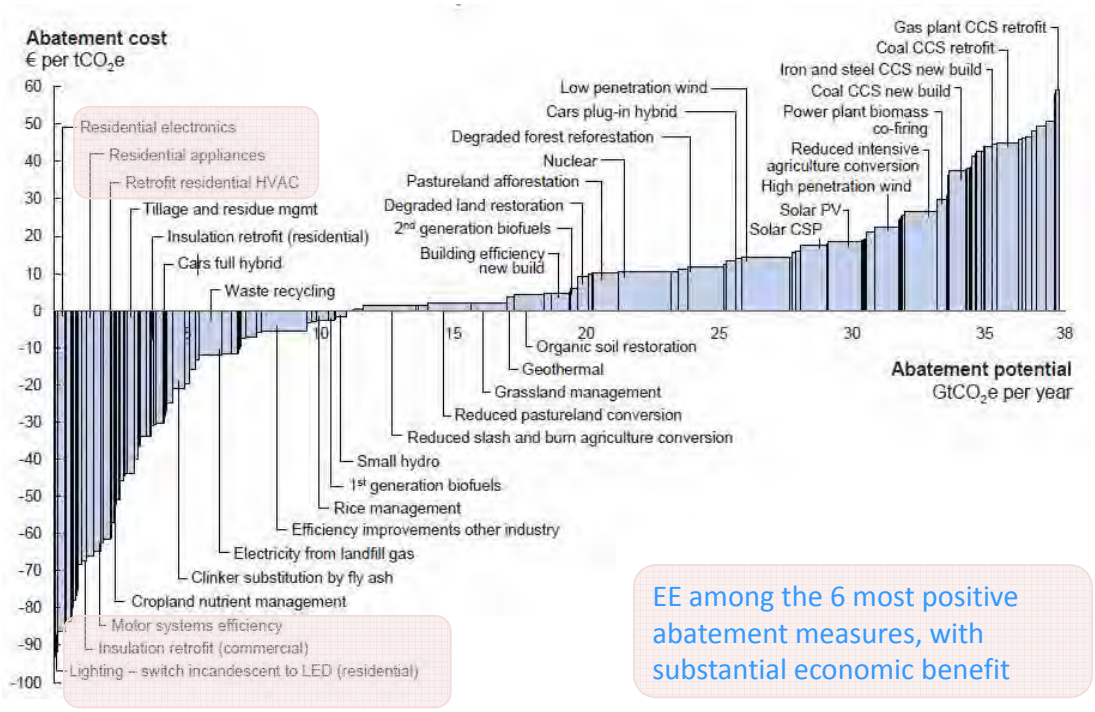
1,170,000,000 from Registered Projects

Source: UNFCCC and UNEP



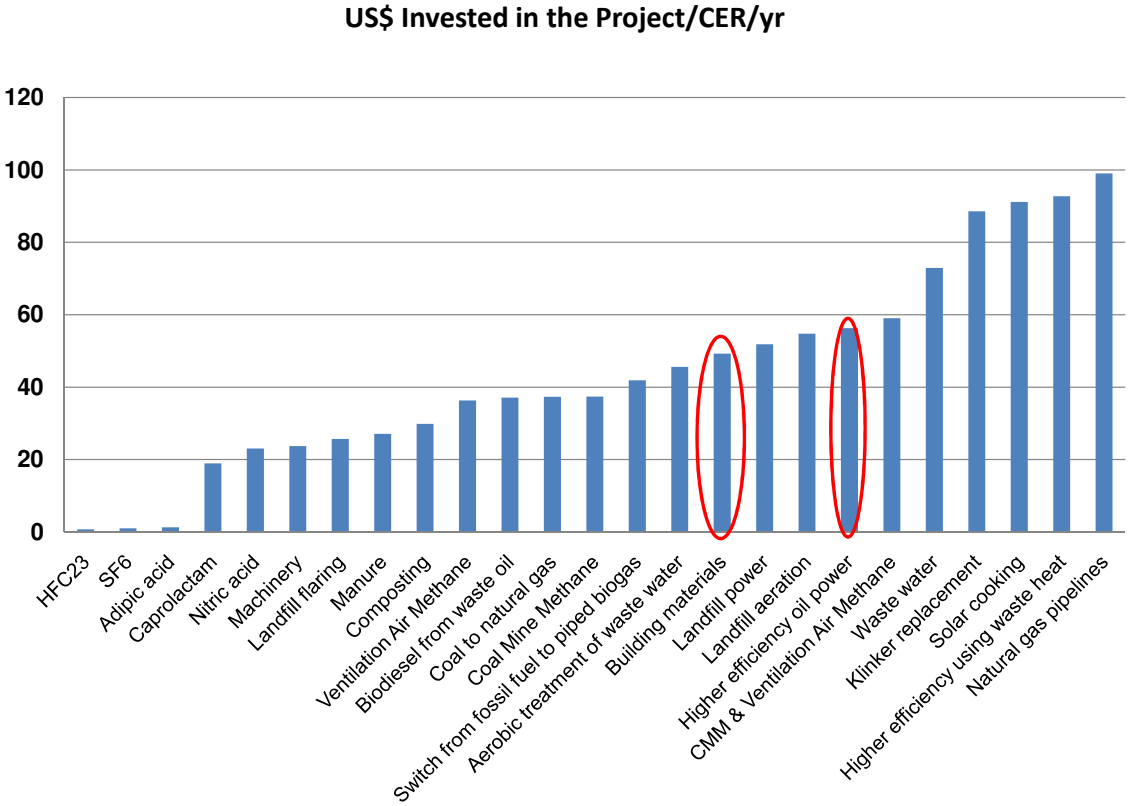
Energy Efficiency

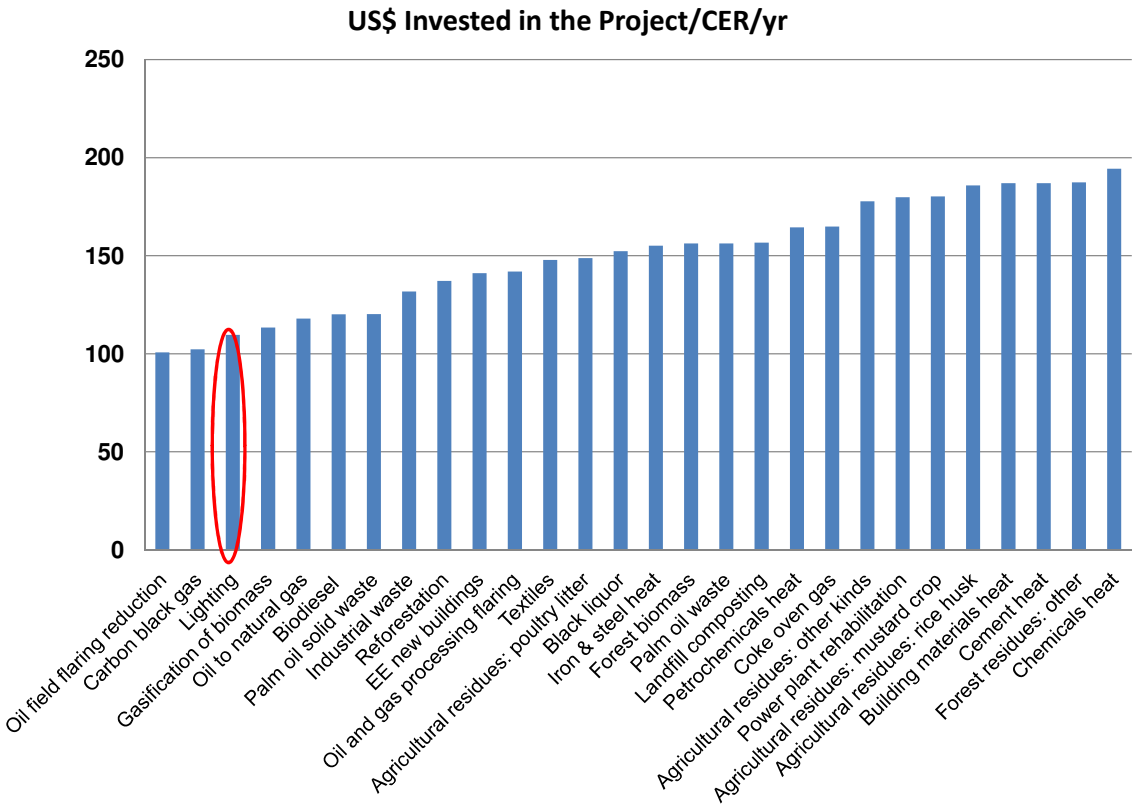
Mc Kinsey CO2 Abatement Cost Curve



EE among the 6 most positive abatement measures, with substantial economic benefit

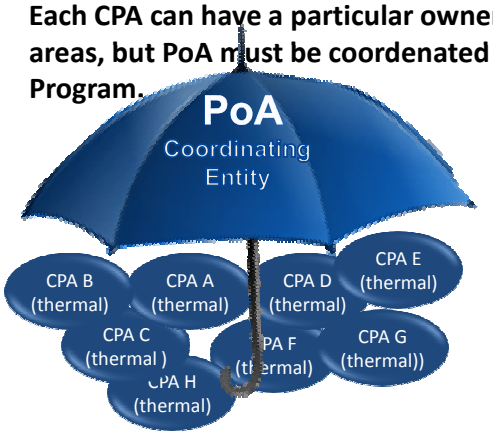
Source: McKinsey, 2009





Programmatic CDM

- **Programatic CDM is organized according with general rules of CDM. But, different to "bundling", when presenting the project for registration, <u>it is not required</u> to list all operational and actors that will participate in the project.**
- **A Program of Activity (PoA) can be understood as an umbrela project and the emission reductions are accounted at the level of each CDM Program of Activity (CPA).**
- **Each CPA can have a particular owner, must cover different geographical areas, but PoA must be coordenated by only one management unit for the all Program.**



Applicability: aggregate similar projects (using the same technology) not yet identified and that will be implemented during the lifetime of PoA.

Programmatic CDM

"Programmatic CDM" project activities are the result of a "deliberate program," whether it is a public sector measure (voluntary or mandatory) or private sector. For example, the program could be a soft loan program for renewable energy.

Key characteristics of a "programmatic CDM" project are the following:

• The program results in a multitude of dispersed actions. Response to the program occurs at multiple sites and amongst a variety of actors (e.g., an appliance effic. program - an individual consumer receives a subsidy for upgrading their appliances)

• The activities and resulting emission reductions do not necessarily occur at the same time, but do respond to the same program. For example, some reductions may occur early in implementation of the program, while others may occur later.

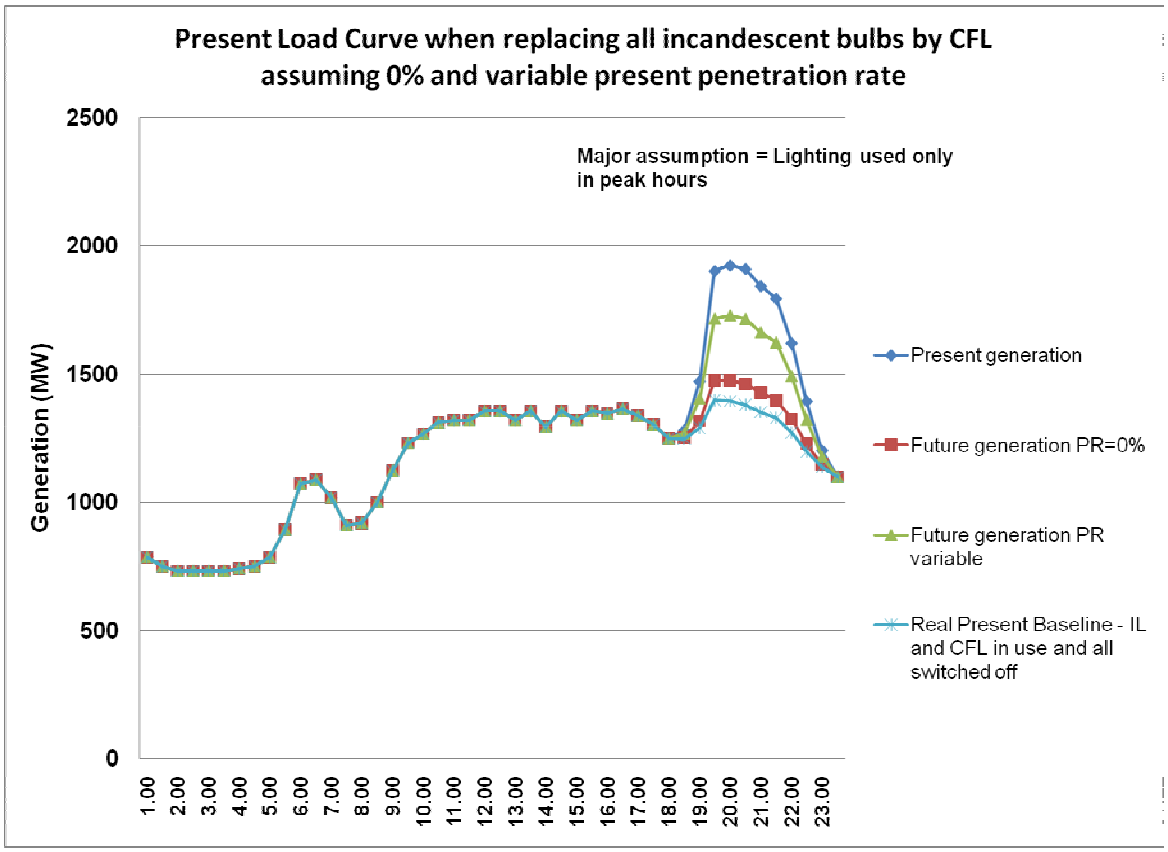
• The type, size, and timing of the actions induced by the program may not be known at the time of project registration; however, they are identified ex-post, attributable to the program, and verifiable.

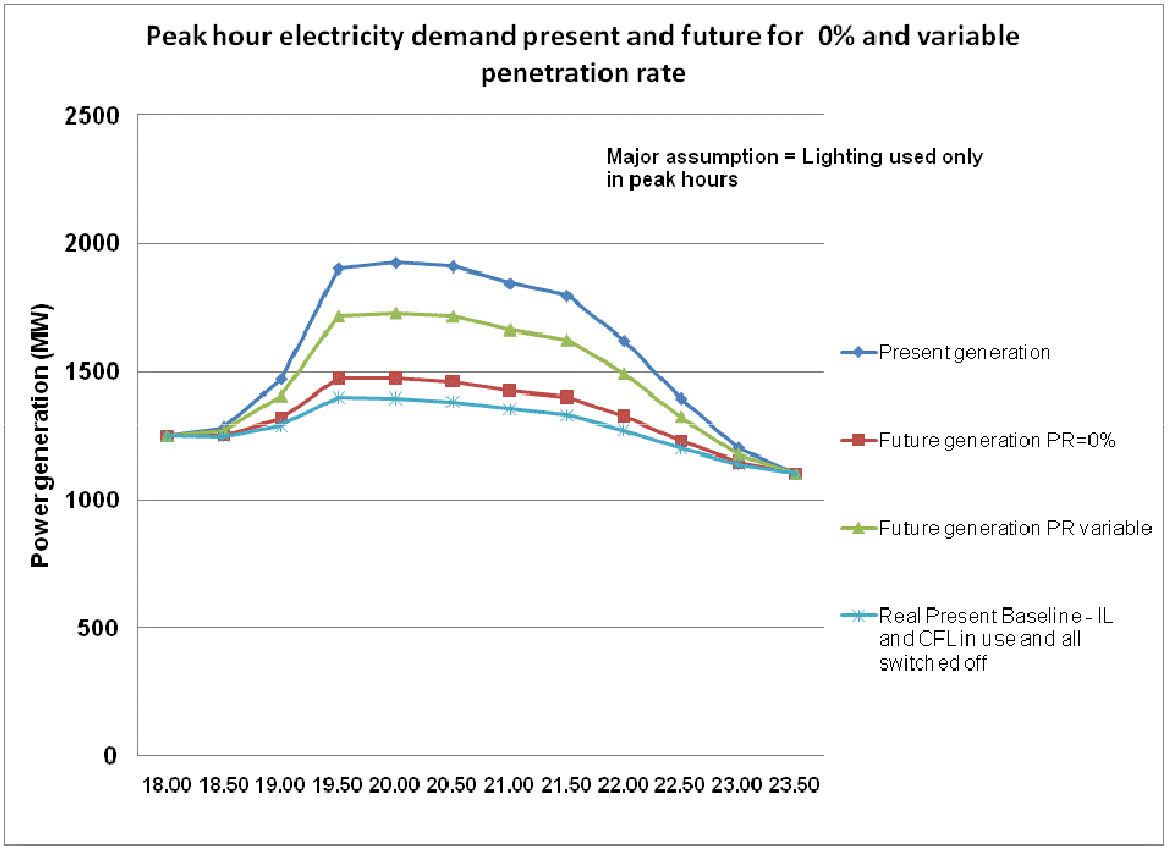
• • The project is submitted using one single Project Design Document.

Lighting Efficiency Project Sri Lanka

Jose Roberto Moreira

August 5, 2010


Present Load Curve when replacing all incandescent bulbs by CFL assuming 0% and variable present penetration rate
Major assumption = Lighting used only in peak hours
Generation (MW)
2500
2000
1500
1000
500
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
23.00
Present generation
Future generation PR=0%
Future generation PR variable
Real Present Baseline - IL and CFL in use and all switched off

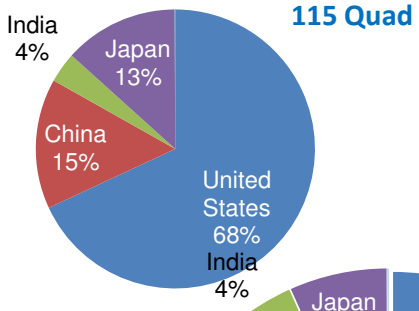

Peak hour electricity demand present and future for 0% and variable penetration rate
Major assumption = Lighting used only in peak hours
Power generation (MW)
2500
2000
1500
1000
500
0
18.00
18.50
19.00
19.50
20.00
20.50
21.00
21.50
22.00
22.50
23.00
23.50
Present generation
Future generation PR=0%
Future generation PR variable
Real Present Baseline - IL and CFL in use and all switched off

PROJECT INDICATORS

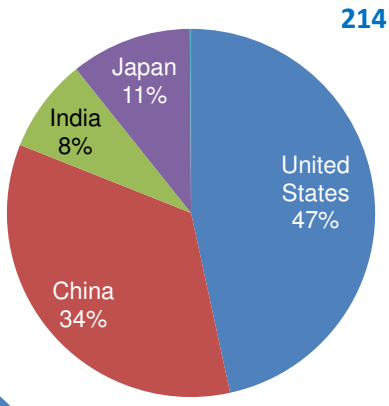
Demand Reduction on Peak Hours	**200 MW**
Number of CFLs distributed to consumers	**7 millions**
Total cost of EE plan without CER	**Rs$ 2.8 billion**
Total cost of EE plan with CER	**Rs$ 3.9 billion**
Total net cost EE with CER	**Rs$ 1.2 billion**
Total amount of electric. Saved	**15 GWh/month**
Total amount of subsidy avoided	**Rs$ 0.6 billion/month**
Investment on supply avoided	**Rs$ 0.11 billion/MW**
Total investment on supply avoided	**Rs$ 22 billion**
Total extra supply addition from subsidy	**Rs$ 5 MW/month**

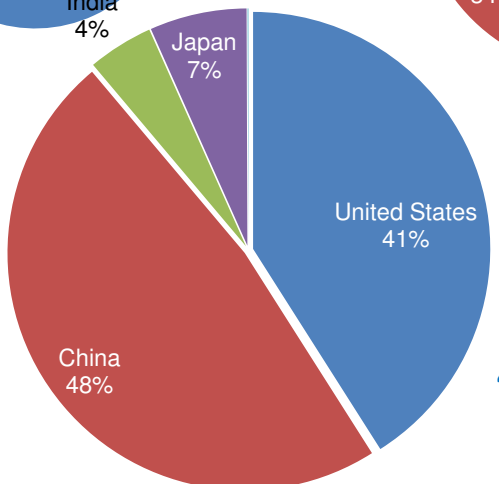
First Program Stage	**1 million CFLs**
Total net cost with CER	**0.2 billion**

Primary Energy Consumption for USA, China, India, and Japan by 1980



Primary Energy Consumption for USA, China, India, and Japan by 2006



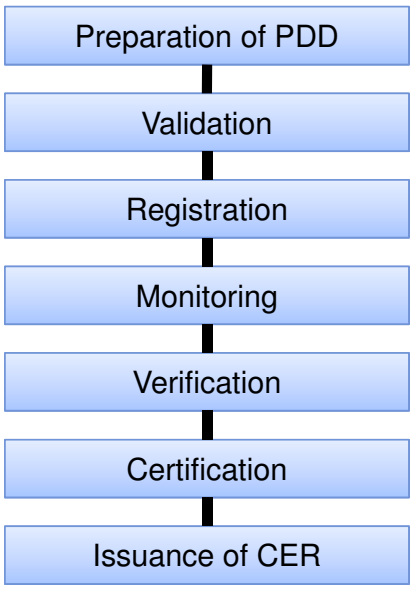


Prmary Energy Consumption for USA, China, India, and Japan by 2006 with 1980 energy intensity

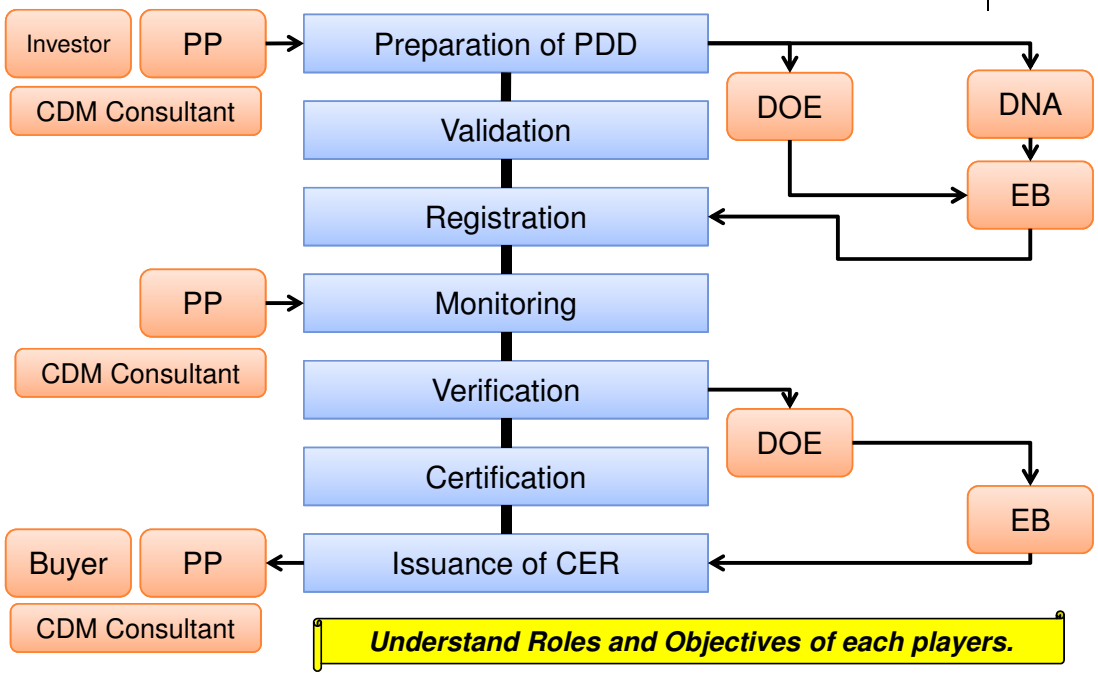
Review of Stepwise Considerations on CDM

6 August, 2010
JICA Expert Team

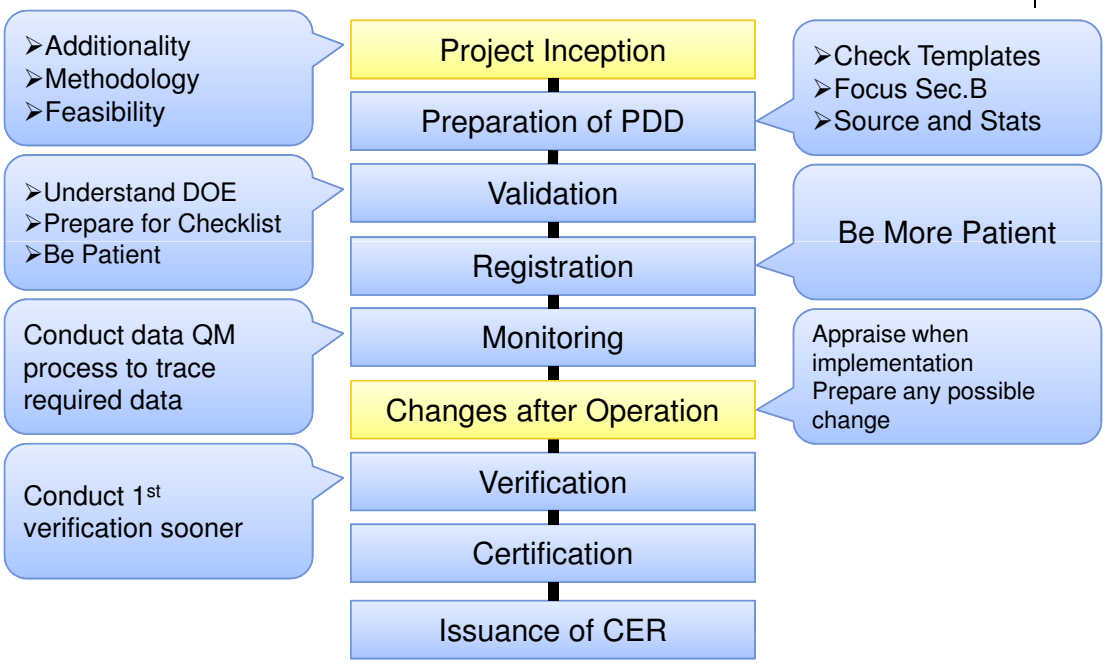
1. CDM Project Cycle



2. CDM Project Cycle



3. CDM Project Cycle



4. Financial Additionality

	Project Feasibility		CDM Feasibility		Total Project Feasibility		
Case A	100	△70			105	△73	32
Case B	70	△70	5	△3	75	△73	2
Case C	60	△70			65	△73	△18

Numbers in this diagram does not represent actual benchmarks for determining financial additionality.

5. Project Start Date & Evidence

Contracts signed for equipment or construction/operation services required for the project activity.

Contracts of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date

The start date shall be considered to be the date on which the PP has committed to expenditures related to the implementation or related to the construction of the project activity.

Board Decision/Management Decision to Execute CDM Project

For those project activities which do not require construction or significant pre-project implementation (e.g. light bulb replacement) the start date is to be considered the date when real action occurs. Pre-project planning is not considered “real action”.

6. GHG Accounting Principles

Principles	
Relevance	Use data, methods, criteria, and assumptions that are appropriate for the intended use of reported information
Completeness	Consider all relevant information that may affect the accounting and quantification of GHG reductions, and complete all requirements
Consistency	Use data, methods, criteria, and assumptions that allow meaningful and valid comparisons
Transparency	Provide clear and sufficient information for reviewers to assess the credibility and reliability of GHG reduction claims
Accuracy	Reduce uncertainties as much as is practical

Source: The GHG Protocol, Chapter 4. GHG Accounting Principles

CDM Development in Sri Lanka

Dr. Lalani Samarappuli
CDM Consultant

The Project for Capacity Development of CDM Promotion in Sri Lanka
JICA
20th August, 2010

Clean Development Mechanism

Implementing projects in Non Annex 1 countries (developing countries), that reduce emissions of GHG from the atmosphere and sell the amount reduced to Annex 1 countries (developed countries)

Specific Criteria of CDM Projects

- Must be voluntary
- Have country's approval
- Meet sustainable development goals of the country
- Reduce GHG emissions above and beyond BAU
- Include participation of stakeholders
- Not contribute to environmental decline
- Limited to non-nuclear technology
- Limited to countries ratified Kyoto Protocol

Sri Lankan Scenario

- UNFCCC - Adopted at Rio Summit in 1992
- Sri Lanka - Ratified the UNFCCC in November, 1993
- Kyoto Protocol - Adopted to the UNFCCC in 1997
- Sri Lanka - Acceded to the Kyoto Protocol in September, 2002
- Established DNA registered with UNFCCC EB in June, 2003

Sri Lankan Scenario contd.

- Initiated CDM Projects in 2003
- First CDM Project Registration with UNFCCC in 2005
- Sector – Energy Industry (03 Mini Hydro Projects)

Sri Lankan Scenario contd.

Registered Projects – 06

04 Mini Hydro and 02 Biomass

Quantity of projected CERs – 198 ktCO2e/year

Sri Lankan Scenario contd.

Registered Projects – 06

03 Mini Hydro – Registered in 2005

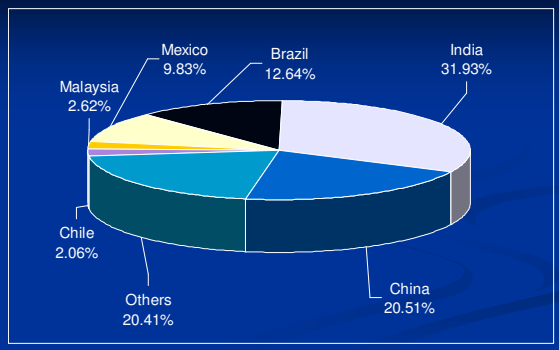
01 Mini Hydro – Registered in 2006

02 Biomass – Registered in 2009

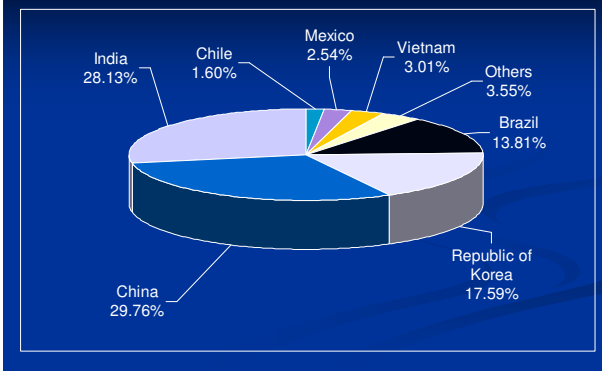
Sri Lankan Scenario contd.

- Request Registration - 01 Project
- At Validation – 12 Projects
- Notification for Prior Consideration of CDM – 44 Projects
- PDD Submission – 33
- PIN Submission – 134
- Rejected – 03 Projects

Registered Projects by Host Party

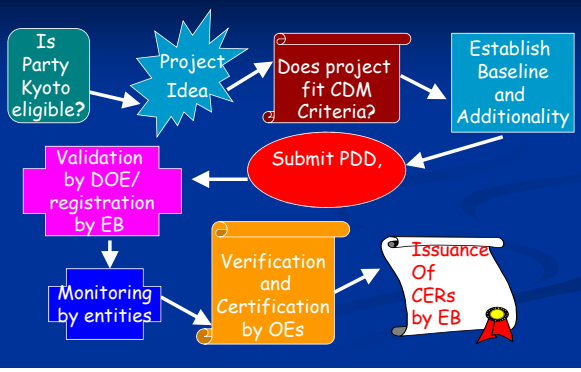


CERs Issued by Host Party



The Constraints

CDM Project Cycle



Identification of a CDM Project

- **Reduce GHG emissions above and beyond BAU**
- Additionality
- Potential sector
- Bundling of small projects
- Programmatic CDM

Example - Power Sector CDM Project

- Coal Power Plant generate 1140 g CO_2/KWh
- Natural Gas Plant generates 360 g CO_2/KWh
- Difference is 780 g if power generated using Natural Gas instead of Coal
- This 780 g can be sold as CDM credits

Transport Sector CDM Project

- Diesel Vehicle emits 3.14 kg CO_2/kg Fuel
- NG Vehicle emits 2.75 kg CO_2/kg Fuel
- Difference is 0.39 kg CO_2/kg Fuel
- This 0.39 kg CO_2 can be sold as CDM

Landfill Gas Recovery CDM Project

Baseline emissions = 100 t CH_4 /year

(without CDM) = 100 x 21(GWP) t CO_2/ year

= 2100 t CO_2/ year

Project scenario = 1 t CH_4 – After flared 2.75 CO_2

(with CDM) = 2.75 x 100 t CO_2 /year

= 275 t CO_2/year

The difference can be sold as a CDM Project

Example for Forest CDM Project

- Agro-forestry sequester 1000 t CO_2 ha^{-1}
- Degraded forest sequester 200 t CO_2 ha^{-1}
- Industrial forest plantation take up 800 t CO_2 ha^{-1}

Identification of a CDM Project

- **Reduce GHG emissions above and beyond BAU**
- Additionality
- Potential sector
- Bundling of small projects
- Programmatic CDM

Additionality

PP should provide explanation to show that the project would not have occurred due to:

- Investment barrier
- Access to finance barrier
- Technological barrier
- Barrier due to prevailing practice

Identification of a CDM Project

- **Reduce GHG emissions above and beyond BAU**
- Additionality
- Potential sector
- Bundling of small projects
- Programmatic CDM

Potential Sectors (15)

- Energy
- Industrial
- Transport
- Waste sector
- Forestry
- Agriculture

Identification of Scope, Type and Methodology

- Sectoral scope : Energy industries (renewable sources)
- Scope number : 1
- Type : RENEWABLE ENERGY PROJECTS
- Title of the approved baseline methodology : Grid connected renewable electricity generation
- Reference of the approved baseline methodology : AMS I.D. (Version 13)

Prior Consideration

PP should provide explanation/proof to show that the CDM was considered first

Calculation of CERs

- **Baseline emissions (tCO_2 e) – 45,199/yr**
- **Project emissions (tCO_2 e) – 1,399/yr**
- **Emission reductions (tCO_2 e) – 43,800/yr**

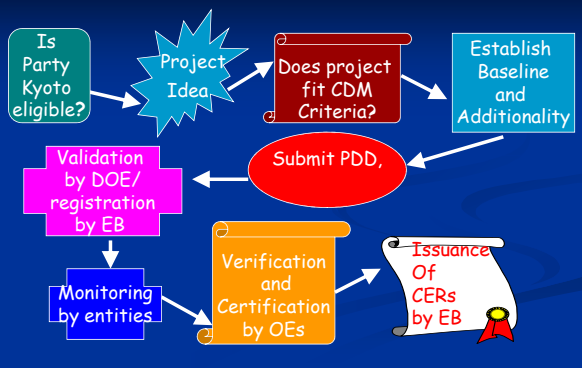
Identification of a CDM Project

- **Reduce GHG emissions above and beyond BAU**
- Additionality
- Potential sector
- Bundling of small projects
- Programmatic CDM

Constraints in developing PDD

- Inadequate technical capacity
- Financial constraints
- Information constraints
- Investment risks

CDM Project Cycle



Designated Operational Entity (DOE)

- Independent third party assigned by EB.
- Responsibilities:
  - Validate proposed CDM project
  - Verify and certify GHG reductions from CDM projects
  - Maintain publicly available list of CDM projects
  - Maintain amount of CERs approved for each project

Designated Operational Entity (DOE)

- DNV
- SGS
- SUD

Subsidiary companies in India

Validation/Validators

Function – Present to UNFCCC

- CARs and CLs
- Time period
  - Changing of methodologies by UNFCCC
  - Changing of validation protocol
  - Suspension of Registration

Constraints and Risks at Validation

- Inadequate technical capacity
- Information constraints
- Financial constraints

Registration

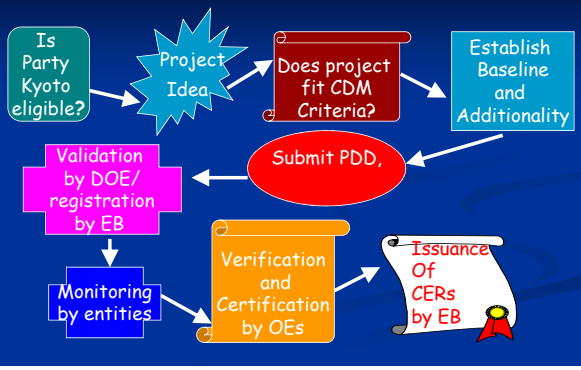
- Constraint
  - Given time period to address the issue
  - Small fee

Registration

Registered CDM Project

Target Achieved

CDM Project Cycle



Monitoring, Verification and Certification

Designated Operational Entity (DOE)

- Actual data collection and recording
- Quality assurance - Calibration of instruments

Issuance of CERs

- Correct price for CERs

Constraints in CDM development

- Inadequate technical capacity
- Financial constraints
- Information constraints
- Investment risks

ERP Agreements

Solutions

Intervention of DNA and SLCF – Ministry of ENV

- Project identification
- Bundling and Programmatic CDM
- PDD writing
- Information (data base)
- Support documents
- Local expertise

Solutions

Intervention of DNA and SLCF – Ministry of ENV

- Financing of CDM Projects
  - Loan guarantee
  - Upfront financing
  - Marketing support
    - Buyers
    - ERP Agreements

Sri Lankan Potential for CDM by Sectors

Sector	CO2 Reduction Potential (tCO2/yr)
Hydro Power	613,200
Wind	672,768
Biomass (Grid power)	1,680,000
Biomass (Industrial heat)	512,000
Biomass (Absorption refrigeration)	400,000
Energy conservation Electricity/Petroleum	178,500
Transport	600,000
Agro residue (rice husk/saw dust)	224,000
MSW	500,000
Forestry	1,352,000
Total	6,730,000

Batagoda et al, 2007.

Thank you

CDM Workshop

(Calculation Excercise of CDM Project Feasibility)

6 August 2010

JICA Expert Team

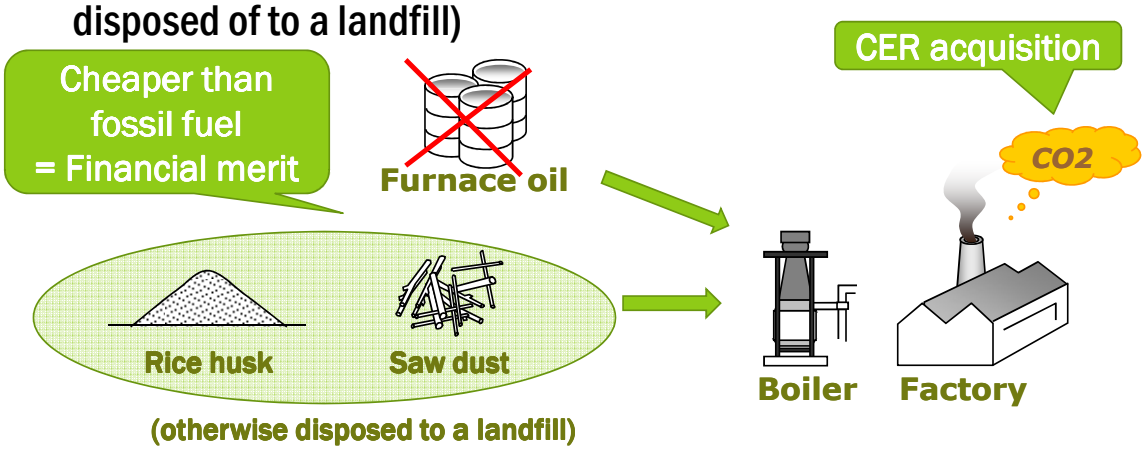
1.Objective of the Workshop

- To understand important factors to assess CDM project viability using simple examples.
- To understand basic concept of:
  - GHG emission reduction calculation
  - Simple project income and expenditure calculation

2. Description of the Example Case

Project Description

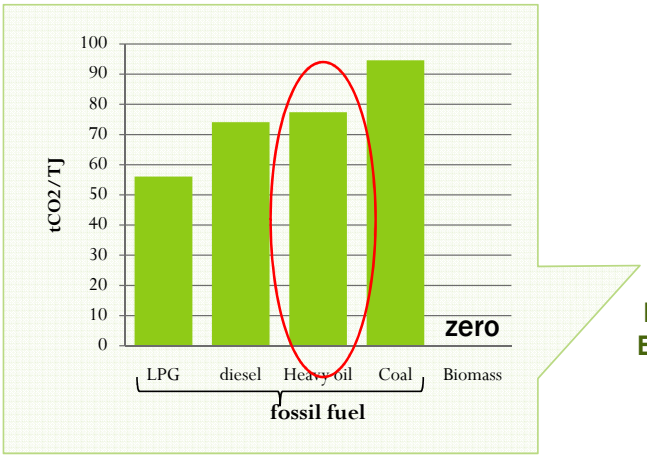
- Fuel switch from fossil fuel to biomass resources
- Biomass boiler will replace the furnace oil boiler
- Steam generated from the boiler will be used in-house
- Biomass will be collected from saw mill or rice mill (otherwise disposed of to a landfill)

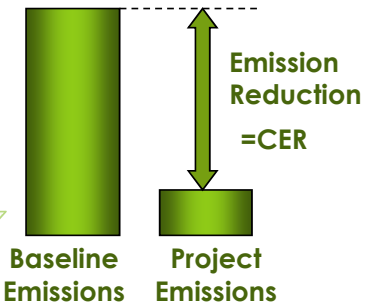


Small Scale Methodology Type III.C. Thermal energy production with or without electricity

3. Key Factors for Assessing Project Feasibility (1)

- GHG emission reduction amount (= Amount of CER)





Emission Reduction =CER → Baseline Emissions (tCO2) = Amount of energy to be replaced (t/y) × Emission Factor (tCO2/t)

Project Emissions (tCO2) = 0 (zero) For simplification

3. Key Factors for Assessing Project Feasibility (2)

- Financial benefit of the project

Financial benefit (project income)	=	Cost saving by fuel switch	+	CER sales

- Other factors to be considered(not considered in this exercise):
  - Suitable technology
  - The availability of biomass resources (Seasonal change of biomass resources)
  - Purchasing price of biomass resources including future prospect (Supply and demand balances)

4. Preconditions and Assumptions Used for Calculation

- Preconditions

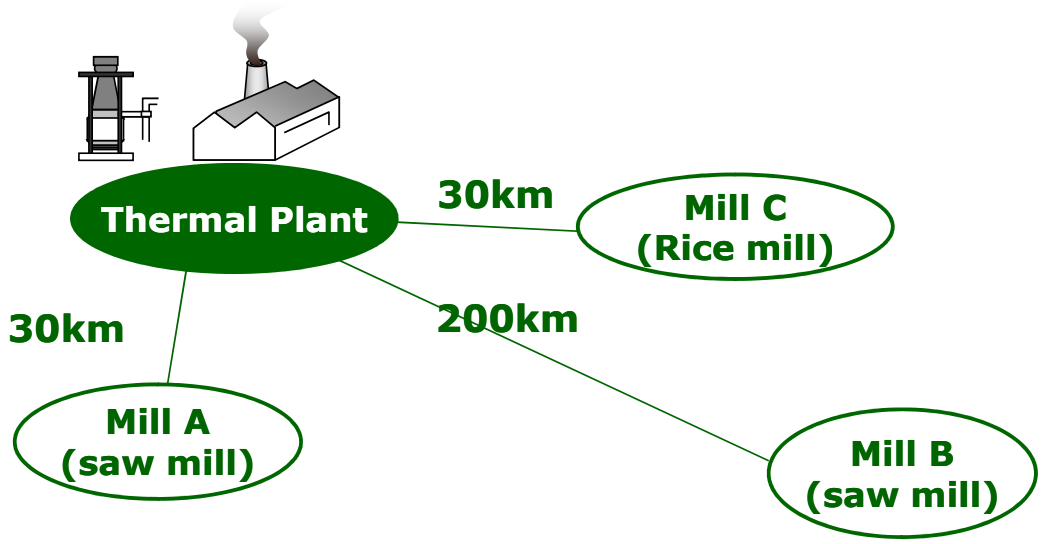
Item	Figure
Energy sources	Biomass (saw dust, rice husk)
Energy to be replaced	Furnace oil
Oil consumption	2 t_oil/day
Operating days	300 days/yr
Emission factor of furnace oil	3.19 kgCO2/kg_oil
Furnace oil price	33 Rupees/t_oil
Amount of biomass to replace 1 ton of oil	Rice husk: 3.3kg_biomass/kg_oil Saw dust: 2.5 kg_biomass/kg_oil
Biomass purchasing price	Rice husk: 3.0 rupees/kg Saw dust: 2.2 rupees/kg
Biomass transport cost	10 rupees/t/km
CER selling price	1500 rupees/tCER

Figures are assumptions, not necessarily reflect the actual situations

4. Preconditions and Assumptions Used for Calculation

- Assumptions (for the purpose of simplification)
  - Project initial cost is not considered.
  - CDM related cost (development cost, monitoring cost etc) is not included
  - Enough biomass is available at each mill throughout the year
  - Methane emissions from biomass decay process is not included in the calculation
  - Emissions related to biomass procurement is not considered
  - Additionality issue is not considered

5. Example Cases



- **Case1: Mill A (saw dust)**
- **Case2: Mill B (saw dust)**
- **Case3: Mill C (rice)**

6. Steps of Group Work

- Steps of Calculation Exercise of CDM Project Feasibility

Step1 **Amount of biomass required**

Step2 **Biomass procurement cost**

Step3 **Amount CER**

Step4 **CER sales**

Step5 **Financial benefit (cost saving) by fuel switch**

STEP1: Amount of Biomass Required

- What is the quantity of biomass resources to supply for the thermal energy demand?

Amount of Biomass Required (t/y)	=	Amount of oil to be replaced (ton/year)	×	Amount of biomass to replace 1 ton of oil (kg_bio/kg_oil)	
(Case A)	=	600 (ton/year)	×	2.5 (kg_bio/kg_oil)	= 1,500 ton/year
(Case B)	=	600 (ton/year)	×	2.5 (kg_bio/kg_oil)	= 1,500 ton/year
(Case C)	=	600 (ton/year)	×	3.3 (kg_bio/kg_oil)	= 1,980 ton/year

2ton/day × 300 day/year

STEP2: Biomass Purchasing Cost

- Biomass purchasing cost is a very important factor to plan a biomass project.

Biomass Procurement Cost (Rupees/year)	=	Amount of Biomass (ton/year)	×	(Purchasing cost (Rps/t)	+	Transport cost (Rps/t))
(Case 1)	=	1,500 (ton/year)	×	(2,200 (Rps/t)	+	300 (Rps/t))
	=	3,750 ('000 Rps/yr)				
(Case 2)	=	1,500 (ton/year)	×	(2,200 (Rps/t)	+	2,000 (Rps/t))
	=	6,300 ('000 Rps/yr)				
(Case 3)	=	1,980 (ton/year)	×	(3,000 (Rps/t)	+	300 (Rps/t))
	=	6,534 ('000 Rps/yr)				

10 Rps/t/km × 30km

STEP3: Amount of CER

- Simple calculation of amount of CER to be obtained

Amount of CER (tCO2/y)	=	Amount of oil to be replaced (ton/year)	×	Emission factor of oil to be replaced (tCO2/t_oil)		
(Case 1)	=	600 (ton/year)	×	3.12 (tCO2/t_oil)	=	1,872 tCO2/year
(Case 2)	=	600 (ton/year)	×	3.12 (tCO2/t_oil)	=	1,872 tCO2/year
(Case 3)	=	600 (ton/year)	×	3.12 (tCO2/t_oil)	=	1,872 tCO2/year

STEP4: Annual CER Sales

- Annual CER sales will be determined by CER amount and CER price

Annual CER sales (Rupees/tCO2)	=	Amount of CER (tCO2/y)	×	Unit CER price (Rupees/tCO2)

(Case 1)	=	1,914 (tCO2/year)	×	1,500 (Rps/tCO2)	=	2,871 '000 Rps/yr
(Case 2)	=	1,914 (tCO2/year)	×	1,500 (Rps/tCO2)	=	2,871 '000 Rps/yr
(Case 3)	=	1,914 (tCO2/year)	×	1,500 (Rps/tCO2)	=	2,871 '000 Rps/yr

STEP5: Annual Cost Saving by Fuel Switch

- Cost saving amount is the reduction of fuel procurement cost

Annual cost saving (Rupees/year)	=	Oil procurement cost (Rupees/year)	–	Biomass fuel procurement cost (Rupees/year)

(Case 1)	=	19,800 (Rupees/year)	-	3,750 (Rupees/year)	=	16,050 '000 Rps/yr
		2 (t/d) × 300 (d/y) ×33 (Rps/t)				
(Case 2)	=	19,800 (Rupees/year)	-	6,300 (Rupees/year)	=	13,500 '000 Rps/yr
(Case 3)	=	19,800 (Rupees/year)	-	6,534 (Rupees/year)	=	13,266 '000 Rps/yr

STEP6: Income / Expenditure

Item	Case1 ('000Rps/yr)	Case2 ('000Rps/yr)	Case3 ('000Rps/yr)	Remarks
a) Income				
CER sales	2,871	2,871	2,871	
Cost saving	16,050	13,500	13,266	
Total income	18,921	16,371	16,137	
b) Operation cost				
Biomass procurement cost				Purchase cost & Transportation
Maintenance cost	1,284	1,080	1,061	8% of the cost saving amount
Total cost	1,284	1,080	1,061	
c) Net income				
a)-b)	17,637	15,291	15,076	

Expected income for:

	Case1	Case2	Case3	
(5ys) 5 x net income/yr =	88,185	76,455	75,379	000 Rps
(10ys) 10 x net income/yr =	176,370	152,910	150,757	000 Rps

Summary/Conclusions

- What are the lessens learned through the exercise?
  - Biomass procurement plan (transportation distance, price of biomass, availability, seasonal fluctuation etc) is a very significant factor for biomass CDM project
  - Detail design of boiler such as size and technology will be affected by biomass type (quantity, characteristics of biomass)
  - Range of initial cost will be restricted by income and expenditure of the project

CDM Training Program Final Examination

20 August 2010

Prepared by: JICA Expert Team

Name: _____

Organization: _____

Please answer the following questions by ticking (✓) or choosing the right answer(s) from the options in accordance with the instructions.

[1] Functional Background of CDM

Marks: ／9

[Q1] Please check the CORRECT description (1 answer) about greenhouse gasses (GHGs).

[ ]	There is no definition about GHGs under UNFCCC.
[ ]	There are six (6) gasses defined as GHGs under UNFCCC.
[ ]	SOx and NOx are GHGs defined under UNFCCC.
[ ]	1 ton of every GHG has the same impact on global warming.

[Q2] Please select the proper combination of words for [a] and [b].

Sri Lanka is categorized as [a] under Kyoto Protocol and can participate in CDM projects as [b] country.

[ ]	[a] Annex I party	[b] Investing
[ ]	[a] Annex I party	[b] Host
[ ]	[a] Non-annex I party	[b] Investing
[ ]	[a] Non-annex I party	[b] Host

[Q3] Please check the INCORRECT description (1 answer) about Certified Emission Reduction (CER).

[ ]	CER is emission reduction amount achieved by a CDM project activity certified by the UNFCCC.
[ ]	The unit of CER is 1 ton of CO2
[ ]	Tradable units of the CDM
[ ]	CER can be issued by Designated National Authority (DNA) of each country.

[Q4] Please select the INCORRECT description (1 answer) about Clean Development Mechanism (CDM).

[ ]	CDM is one of the flexible mechanisms under the Kyoto Protocol.
[ ]	The only mechanism under Kyoto Protocol, applicable to both Annex I & non-Annex I parties
[ ]	The reduced amount of GHGs resulting from a CDM project can be used as part of quantified emission reduction targets for Annex I parties
[ ]	Project participants can create and use a new baseline methodology without approval by CDM EB.
[ ]	CER can be dealt at market

[Q5] <A> is key organizations relevant to CDM. Please draw lines to connect "Organization" <A> and the correct description about each organization from <B>.

<A>: Organization			<B>: Description
Project Participants (PPs)	●	●	The government organization responsible for issuance of host/investment countrie's approval for proposed CDM projects.
Designated National Authority (DNA)	●	●	(a) a Party involved, and/or (b) a private and/or public entity authorized by a Party involved to participate in a CDM project activity.
Designated Operational Entity (DOE)	●	●	Independent auditors that assess whether a potential project meets all the eligibility requirements of the CDM (validation) and whether the project has achieved greenhouse gas emission reductions (verification and certification).
UNFCCC	●	●	The organization supervising the CDM, under the authority and guidance of the CMP.
CDM Executive Board (CDM EB)	●	●	A multilateral convention aimed at stabilising greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system

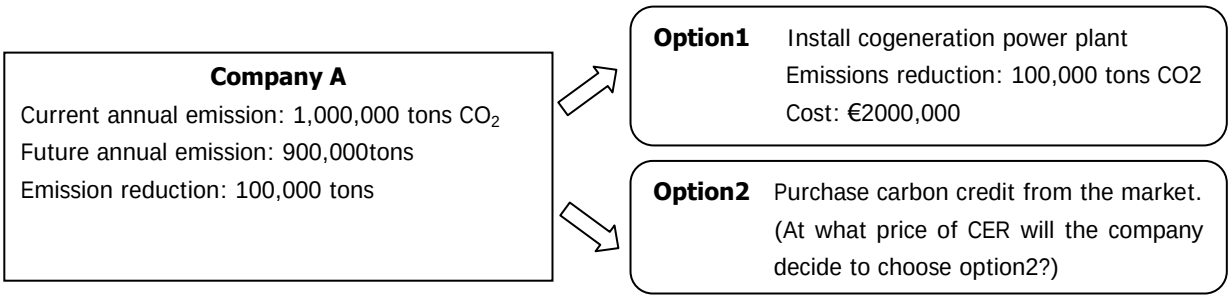
[2] Carbon Credit Market

Marks: ／3

[Q1] Please identify market based approaches (3 answers) among the GHG emissions management initiatives.

[ ]	Carbon Taxation
[ ]	Mandatory flaring of a landfill gas
[ ]	Domestic Cap and Emission Trading Scheme
[ ]	Ban manufacture of products that contain HFC
[ ]	Clean Development Mechanism Scheme

[Q2] Company A is currently emitting 1,000,000 tons of CO_2 per year from its factory. The company is legally required to reduce 100,000 tons of CO_2 emissions this year. They need to install €2,000,000 gas cogeneration power plant to meet this target, or alternatively purchase 100,000 tons CO_2 emission reduction worth of CER from the European Climate Exchange. At what price will the company decide to purchase CER from the market? Please tick the most appropriate box below:



[ ]	CER price of more than €20 per ton of CO_2e
[ ]	CER price of less than €20 per ton of CO_2e
[ ]	CER price of less than €100 per ton of CO_2e
[ ]	CER price of more than €100 per ton of CO_2e

[Q3] Please select a factor (1 answer) among the following action/events that likely increase the market price of the CER.

[ ]	Demand for CER is greater than its supply
[ ]	Global Economic Crisis
[ ]	Over allocation of EUA by the European Commission
[ ]	Global reduction in demand for manufactured goods

EUA: Carbon credits used in the European Union Emissions Trading Scheme (EU ETS).

[3] CDM Typology

Marks: ／11

[Q1] Please select the INCORRECT description (1 answer) about the Small Scale CDM.

[ ]	There is a limit in size to be qualified as Small Scale CDM project
[ ]	Baseline Methodologies and monitoring plans are same as full scale projects
[ ]	Simplified PDD format is applied
[ ]	Simplified additionality establishment method is applied
[ ]	The same DOE can undertake validation, verification and certification

[Q2] Please select the project NOT ELIGIBLE for bundling.

[ ]	A
[ ]	B
[ ]	C

A

3 wind farm projects with total capacity 19 MW.

B

10 energy saving projects with total saving amount is 50 GWh /year

C

5 composting project that reduce emission 15,000 tCO2/ year in total.

[Q3] <A> are the key organizations relevant to CDM. Please draw lines to connect "Organization" <A> and correct description about the organization <B>.

<A>: Terms			<B>: Description
Program of Activity (PoA)	●	●	A framework to implement programmatic CDM
CDM Project Activity (CPA)	●	●	A private or public entity in charge of the followings: - communication with CDM Executive Board - coordinating of the PoA framework - management of the monitored data - Ensuring no double counting
Coordinating and Managing Entity (CME)	●	●	Individual CDM projects implemented under the programmatic CDM

[Q4] Please select the INCORRECT description (1 answer) about programmatic CDM.

[ ]	Program of Activity (PoA) is applicable for the efforts to meet "mandated policy/measure"
[ ]	PoA must determine a coordinating and managing entity
[ ]	PoA can start with only one CPA
[ ]	Boundary can be beyond one country
[ ]	CPAs can be added: - at any time during PoA period (28 years for emission reduction projects) - by anybody within the PoA boundary - with no limit in number - without project registration procedures (no need individual project registration)

[Q5] Please identify 3 projects from the list below that is clearly NOT ELIGIBLE as CDM.

[ ]	a) Nuclear power plant project
[ ]	b) Carbon Capture and Storage (CCS) project
[ ]	c) Reforestation Project
[ ]	d) Small scale hydro dam project
[ ]	e) Landfill gas combustion project
[ ]	f) Waste plastic to energy project
[ ]	g) Fossil fuel to biomass fuel switch project at a waste plastic recycling centre
[ ]	h) Coal to natural gas fuel switch project

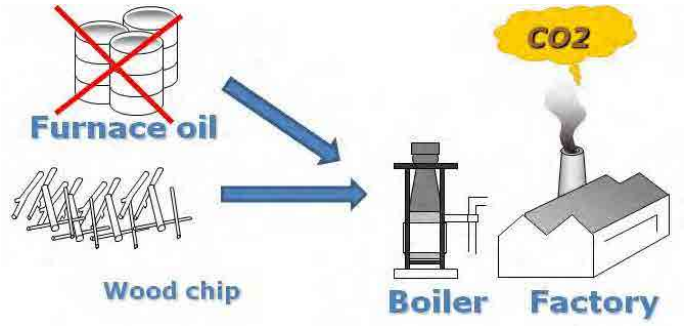
[Q6] Please match the Greenhouse gas described inside the box with the Global Warming Potential indicated in the table below:

(a)Methane (CH4)	(b) Nitrous Oxide (NO2)	(c) Carbon dioxide (CO2)

Green house gases	Global Warming Potential
[ ]	1
[ ]	21
[ ]	310
Hydro-fluorocarbons (HFCs)	150~11,700
Perfluorcarbons (PFCs)	6,500~9,200
Sulphur hexafluoride (SF6)	23,900

[Q7] The project below was rejected by CDM EB due to the fact that the source of biomass was not eligible for CDM. Please select the most suitable reason (1 answer) why the source of biomass for this project is not eligible for CDM from the list below.

Description of the project:
The project aims at fuel switch from boiler system using furnace oil into a woodchip fired steam generation system.



[ ]	Woodchips are procured from saw mills.
[ ]	Woodchips are regarded as neither carbon neutral nor sustainable biomass as they are procured from the natural forest.
[ ]	The woodchip are the residues that would have been disposed at landfill without the CDM project.
[ ]	The woodchip was procured from the mill 150km away from the project factory.

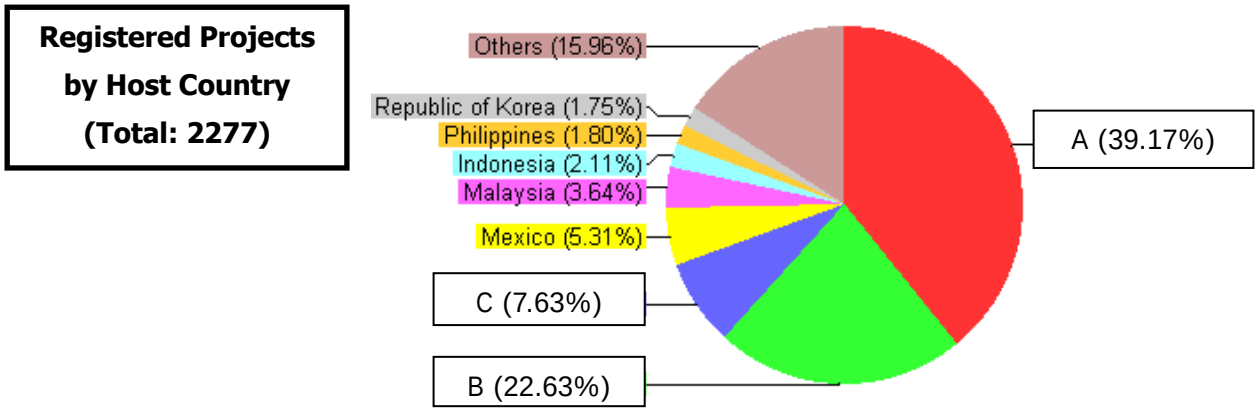
[4] Institutional Background of CDM

Marks: ／3

[Q1] Which is correct sentence in regard to ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC)? Please select the option from below sentences (1 answer).

[ ]	Reduce Greenhouse Gas (GHG) emission 5% against 1990 levels
[ ]	Achieve Sustainable Development and Greenhouse Gas (GHG) emission reduction
[ ]	Stabilization of Greenhouse Gas (GHG) concentrations in the atmosphere

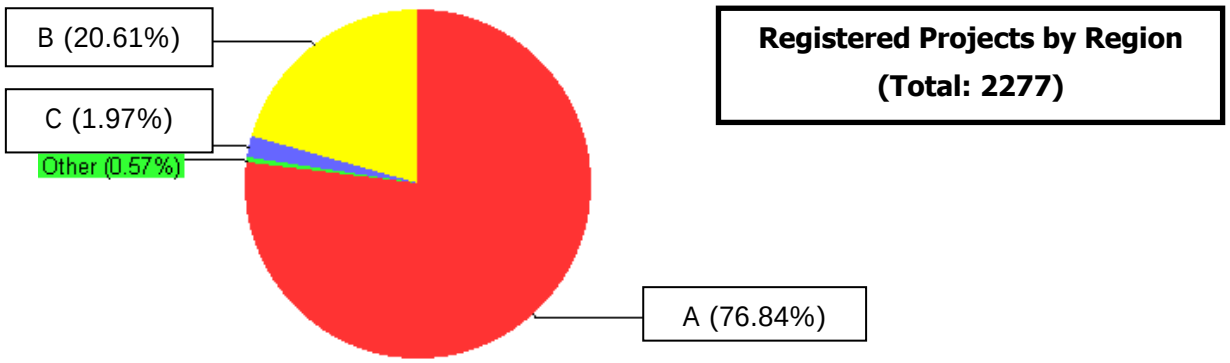
[Q2] Please fill in the appropriate country name at the following blank box.



(Above data from UNFCCC-CDM website as of 7 July 2010)

[ ]	A: India	B: Brazil	C: China
[ ]	A: Brazil	B: China	C: India
[ ]	A: China	B: India	C: Brazil

[Q3] Please select the region name at the following blank box.



(Above data from UNFCCC-CDM website as of 7 July 2010)

[ ]	A: Latin America	B: Africa	C: Asia & Pacific
[ ]	A: Asia & Pacific	B: Latin America	C: Africa
[ ]	A: Asia & Pacific	B: Africa	C: Latin America

[5] Post Kyoto

Marks: ／3

[Q1] Please select the legal status of the Copenhagen Accord from below options (1 answer).

[ ]	International treaty/protocol
[ ]	COP decision
[ ]	No legal binding document

[Q2] Which COP/CMP meeting decides the negotiation schedule of post first commitment period of Kyoto Protocol? Please select the option from below (1 answer).

[ ]	COP12/CMP2 (2006, at Nairobi, Kenya)
[ ]	COP13/CMP3 (2007, at Bali, Indonesia)
[ ]	COP14/CMP4 (2008, at Poznan, Poland)

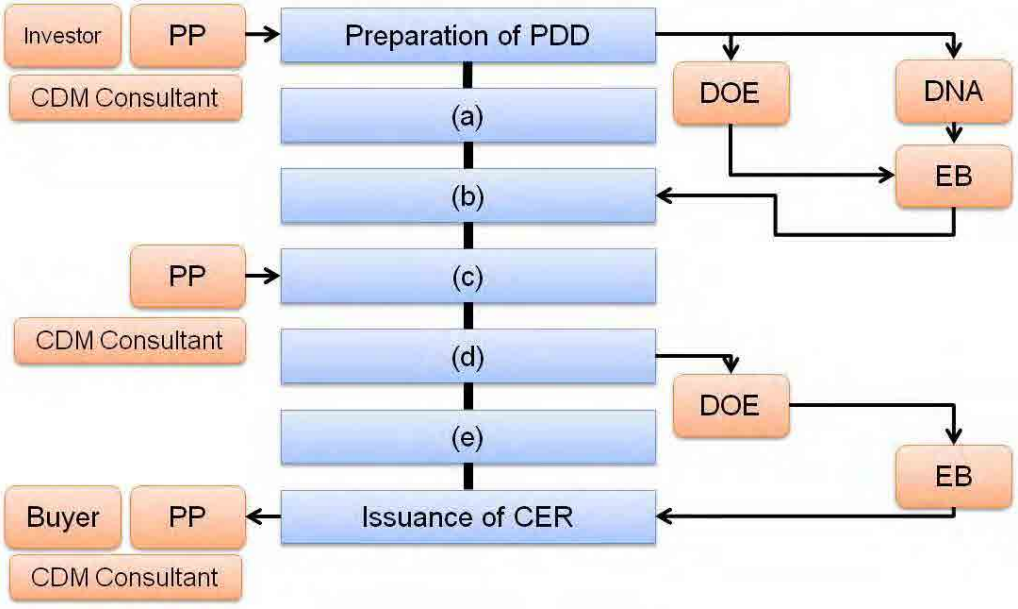
[Q3] Did Government of Sri Lanka submit their voluntary mitigation actions based on the Copenhagen Accord yet?

[ ]	Yes
[ ]	No

[6] Stepwise Consideration of CDM

Marks: ／12

[Q1] Fill out the diagram of CDM project flow by choosing appropriate activities listed in a box. *(3 points)*



(a)	(b)	(c)	(d)	(e)

① Verification	② Monitoring
③ Validation	④ Certification
⑤ Rejection	⑥ Registration

[Q2] Match Greenhouse Gas accounting principles and explanations.

Principles	Answer
Relevance	[ ]
Completeness	[ ]
Consistency	[ ]
Transparency	[ ]
Accuracy	[ ]

Explanations of Principles
1) Use data, methods, criteria, and assumptions that allow meaningful and valid comparisons
2) Use data, methods, criteria, and assumptions that are appropriate for the intended use of reported information
3) Provide clear and sufficient information for reviewers to assess the credibility and reliability of GHG reduction claims
4) Reduce uncertainties as much as is practical
5) Consider all relevant information that may affect the accounting and quantification of GHG reductions, and complete all requirements.

[Q3] Choose validity of date as a project starting date for CDM.

Valid	Invalid	Description of Date
		Date of contract with consultant to execute a feasibility study of pilot project
		Date of contract to purchase heavy equipments to build a plant for proposed CDM project
		Date of CFL lump installed in a household in programmatic CDM activity
		Date of contract to conduct a preliminary survey to build hydro power station

[7] PDD(Project Design Documents)

Marks: ／9

[Q1]There have been approximately 150 projects failed to be registered under CDM so far. The table shows the numbers of rejected CDM projects specified by the reasons for that rejection. Fill the blanks of the table with the reasons for rejection shown in the box.

Number of rejected CDM projects by the reasons for rejection

Reasons	Number of Rejected Projects
1.	64
2. Additionality	186
(1)	102
(2)	49
(3) Other Additonality Issues	35
(4) Other Reasons	11

(a) Investment Analysis
(b) Baseline and Monitoring Methodology
(c) Barrier Analysis

[Q2] Which of the following cases will be deemed additional ? Please mark √ for the case that will be deemed additional.

[ ]	**Case 1:** Company B in Sri Lanka has already determined that it will upgrade its turbines, and has sufficient financing and access to suitable technology. Company A offers to partner with Company B and present this project as a CDM project, creating CDM credits corresponding to the activity they have planned.
[ ]	**Case 2:** Company A, a power producer in Japan, decides that instead of replacing its turbines, it would like to explore buying CER credits at lower cost. Company B in Sri Lanka, also a power producer, would like to replace its old turbines, provided the company can obtain financing and access to high efficiency turbine technology. Company A approaches Company B, offering to purchase CDM credits and transfer technology and expertise.

[Q3]Choose what barrier is discussed in the following sentences from the boxes shown below.

(1) Legal and Regulatory/Policy Barriers
(2) Financial/Investment Barriers
(3) Technological Barriers
(4) Social/Cultural Barriers
(5) Common Practice Barriers

[ ]	Company A had been trying to develop a mini-hydropower project in a certain rural area. However, there was strong resistance from the surrounding residents. However, Company A and the surrounding residents have agreed on the development under the term that a certain portion of income from CERs is allocated for socio-economic welfare of the rural communities. In this regard, CDM development is indispensable to realize this project.
[ ]	Company B, a manufacturing factory in Sri Lanka developed a CDM project to install a new biomass gasifier from Japan. That technology is the first of its kind in Sri Lanka and Company C, a gasifier producer in Japan is going to provide that technology in exchange of CERs arising from the CDM project.
[ ]	Company D in Sri Lanka was trying to develop a landfill methane capture project under CDM. Company D had to prove that landfill methane capture is not the conventional practice at the existing landfills in Sri Lanka to demonstrate additionality of its project.
[ ]	Company E could not have converted the existing turbine to the new advanced one unless the income from CERs improved the Project Internal Rate of Return (PIRR) to make the commercial bank of Sri Lanka confident to finance the project.
[ ]	Pig farm A in Sri Lanka plans to collect methane from pig manure treatment pond within its farm. It also plans to use the collected methane for energy purposes. To conduct this plan as a CDM project, the farm has to identify whether there are any laws or regulations that provide collection and utilization of methane in the treatment process of pig manure in Sri Lanka.

TOTAL SCORE:	/50