Clean Development Mechanism (CDM)

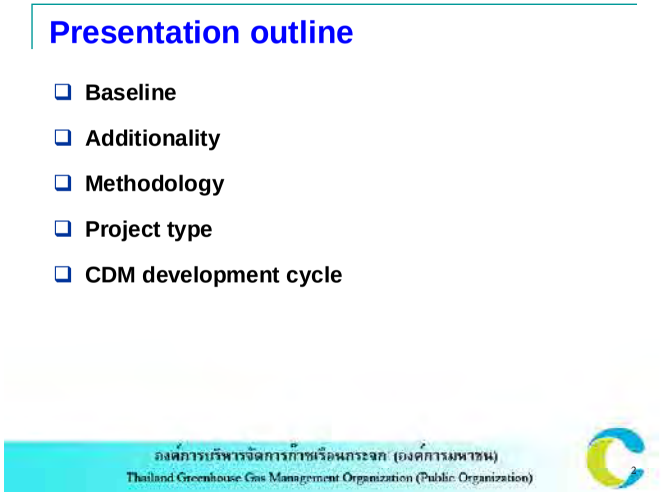
Target Groups

Code	Target group
C	- Advanced CDM developers - CDM consultant (In Thailand and other countries)

Update History

Version	Date	Update Contents
01	20/01/2011	Initial adoption

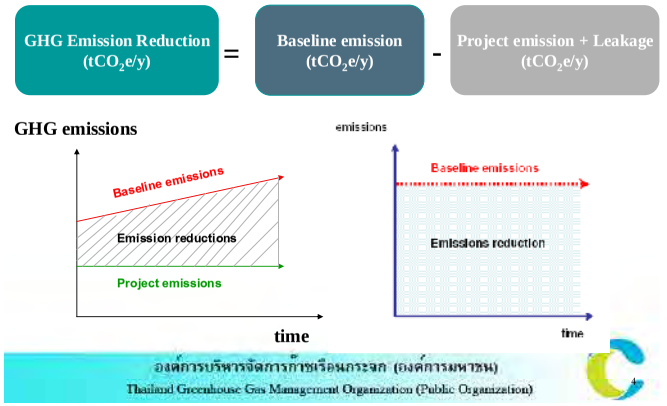
CDM 02-01	
	
Target audience of this presentation is; - Advanced CDM developers - CDM consultant - In Thailand and other countries	

CDM 02-02	Target Group: consultant
	

CDM 02-03	Target Group: consultant

CDM 02-04	Target Group: consultant

Baseline and GHG Emission Reduction



Key Points

- This slide describes why baseline is essential and how baseline is used in order to determine the emission reduction of the CDM project
- The difference between GHG emissions from baseline scenario, called **Baseline Emissions** (shown in the red line), and GHG emissions that are generated through the proposed CDM project activity, called **Project Emissions** (shown in the green line), is GHG emission reductions
- Amount of baseline emissions and project emissions are different by each project type;
  - e.g. renewable energy generation project does not generate any GHG emission from project activity, and therefore, project emission is zero. In this case, amount of emissions from baseline will become the emission reductions.

Reference and Additional Information

CDM 02-05	Target Group: consultant

Baseline: what is baseline?

- Baseline scenario is needed to identify emission reduction by proposed project activity.
- Baseline is different by each project, depending on technology/ measure, project type, condition, policy, etc.
- Baseline scenario is

> the scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity

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Key Points

- Baseline is one of the concepts that PP must understand as to implement CDM project
- It is necessary to determine emission reduction amount, or amount of credit PP will receive
- Baseline scenario is a **project-specific** situation that would happen in the absence of the proposed project activity

Reference and Additional Information

CDM 02-06	Target Group: consultant

Example of registered PDD

A.1 Title of the project activity:

Title: TBEC Tha Chang Biogas Project
Version: 14
Date: 10th September 2010

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Key Points

- This slide shows the example of registered PDD of CDM project in Thailand.
- The first section of PDD, section A.1, including the title of the project, version of PDD and date of preparation.
- The title of this project is TBEC Tha Chang Biogas Project.

Reference and Additional Information

http://cdm.unfccc.int/Projects/Validation/DB/FM5QCP12TAAWGA7OWCGMEFX9WRYZSQ/view.html

CDM 02-07	Target Group: consultant

Example of registered PDD

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

The following approved baseline and monitoring methodologies have been applied to the project:

- ACM0014 "Mitigation of greenhouse gas emissions from treatment of industrial wastewater" (ACM0014/Version 02.1, Sectoral Scope: 13, EB39)
- "Tool to calculate the emission factor for an electricity system" (Version 01.1, EB 35 Report, Annex 12)
- "Tool to determine project emissions from flaring gases containing methane" (Version 01 EB28 Report, Annex 13)

Identification of the baseline scenario and assessment of additionality has been performed using:

- "Tool for the demonstration and assessment of additionality" (Version 05.2, EB 39 Report , Annex 10)

Further details of these approved baseline and monitoring methodologies can be found at the UNFCCC CDM website at http://cdm.unfccc.int/methodologies/PAmethodologies/index.html.

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Key Points

- The section describes the title and reference of the approved baseline and monitoring methodology applied to the project activity.
- The latest approved versions of tools required by the methodology must also be described in this section along with the version of methodology and tool.

Reference and Additional Information

http://cdm.unfccc.int/methodologies/Pamethodologies/index.html

CDM 02-08	Target Group: consultant

UNFCCC/CCNUCC
CDM – Executive Board
ACM0014 / Version 04
Sectoral Scope: 13
EB 55

Approved consolidated baseline and monitoring methodology ACM0014

"Mitigation of greenhouse gas emissions from treatment of industrial wastewater"

I. SOURCE, DEFINITIONS AND APPLICABILITY

Sources

This consolidated baseline and monitoring methodology is based on elements from the following approved baseline and monitoring methodologies and proposed new methodologies:

- NM0038-rev: Methane Gas Capture and Electricity Production at Chisinau Wastewater Treatment Plant project, Moldova prepared by COWI A/S, Denmark;

.....
.....

This methodology also refers to the latest approved versions of the following tools:

- "Tool for the demonstration and assessment of additionality";
- "Tool to determine project emissions from flaring gases containing methane";
- "Tool to calculate the emission factor for an electricity system";
- "Tool to calculate baseline, project and/or leakage emissions from electricity consumption";
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

Key Points

- This slide shows the example of approved methodology naming ACM0014.
- The first part of methodology describes the sources of the methodology.
- The latest approved versions of tools required by the methodology are described in this part.

Reference and Additional Information

http://cdm.unfccc.int/methodologies/

CDM 02-09	Target Group: consultant

Methodology -- ACM0014

Table 1: Scenarios applicable to the methodology

Scenario	Description of the baseline situation	Description of the project activity
1	The wastewater is not treated, but directed to open lagoons that have clearly anaerobic conditions. In cases where solid materials are separated before directing the wastewater to the open lagoons, the solid materials have a different treatment than the wastewater	The wastewater is treated in a new anaerobic digester. In cases where solid materials are separated from the wastewater (both in the project and baseline scenarios), they will be treated separately and not treated with the new anaerobic digester employed for treatment of liquid effluents. The biogas extracted from the anaerobic digester and, if applicable, biogas[3] generated from the treatment of solid materials, is flared and/or used to generate electricity and/or heat. The residual from the anaerobic digester, after treatment, is directed to open lagoons or is treated under clearly aerobic conditions (e.g. dewatering and land application)

Key Points

- ACM0014 has 2 applicable scenarios concerning new treatment system for wastewater or sludge.
- The first scenario concerns to new wastewater treatment system
- For baseline situation, wastewater must be untreated and directly discharged to the open lagoons that have anaerobic conditions, whereas, project activity treats wastewater in anaerobic digester and produces biogas that is flared and/or used to generate electricity and/or heat. Residual from the digester is directed to open lagoon or is treated under aerobic conditions.

Reference and Additional Information

http://cdm.unfccc.int/methodologies/

CDM 02-10	Target Group: consultant

Methodology -- ACM0014

Scenario	Description of the baseline situation	Description of the project activity
2	The wastewater is treated in a wastewater treatment plant. Sludge is generated from primary and/or secondary settlers. The sludge is directed to sludge pit(s) that have clearly anaerobic conditions	The wastewater is treated in the same wastewater treatment plant as in the baseline situation. The sludge from primary and/or secondary settler is treated in one or both of the following ways: (a) The sludge is treated in a new anaerobic digester. The biogas extracted from the anaerobic digester is flared and/or used to generate electricity and/or heat. The residual from the anaerobic digester after treatment is directed to open lagoons or is treated under clearly aerobic conditions (e.g. dewatering and land application); (b) The sludge is treated under clearly aerobic conditions (e.g. dewatering and land application)

Key Points

- The second scenario of ACM0014 concerns to new sludge treatment system.
- For baseline situation, sludge is directed to anaerobic sludge pit, whereas, project activity treats sludge in new anaerobic digester or in aerobic conditions.
- The produced biogas in anaerobic digester must be flared and/or used to generate electricity and/or heat.

Reference and Additional Information

http://cdm.unfccc.int/methodologies/

CDM 02-11	Target Group: consultant

Methodology -- ACM0014

The following applicability conditions are for all scenarios:

- The average depth of the open lagoons or sludge pits in the baseline scenario is at least 1m;[4]
- Heat and electricity requirements per unit input of the water treatment facility remain largely unchanged in the baseline scenario and the project activity;
- Data requirements as laid out in this methodology are fulfilled.

The following applicability conditions are for Scenario 1:

- The residence time of the organic matter in the open lagoon system should be at least 30 days;[5]
- Local regulations do not prevent discharge of wastewater in open lagoons.
- Inclusion of solid materials in the project activity is only applicable where: (i) Such solid materials are generated by the industrial facility producing the wastewater, and (ii) The solid materials would be generated both in the project and in the baseline scenario.

The following applicability condition is for Scenario 2:

- The sludge produced during the implementation of the project activity is not stored onsite before land application to avoid any possible methane emissions from anaerobic degradation.

Key Points

- The applicability conditions for all scenarios and for scenario 1 and 2 must be followed.

Reference and Additional Information

http://cdm.unfccc.int/methodologies/

CDM 02-12	Target Group: consultant

Example of registered PDD

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

ACM0014 is applicable to project activities that aim at reducing methane emissions from industrial wastewater treatment. Of the two scenarios described in Table 1 of ACM0014, the project activity is applicable to scenario 1 as follows:

Scenario	Description of the Baseline Situation	Description of the Project Activity
1	The wastewater is not treated, but directed to open lagoons that have clearly anaerobic conditions.	The wastewater is treated in a new anaerobic digestor. The biogas extracted from the anaerobic digestor is flared and/or used to generate electricity and/or heat. The residual from the anaerobic digestor after treatment is directed to open lagoons or is treated under clearly aerobic conditions (i.e. land application).

Table B.2.a: Scenario applicable to the methodology

Key Points

- Section B.2 of PDD specifies the selected methodology and describes how the project activity is applicable to the methodology
- This example PDD uses ACM0014. The project activity that is treatment of wastewater in anaerobic digestor and flared and/or used the produced biogas to generate electricity or heat is applicable to scenario 1 of ACM0014.

Reference and Additional Information

http://cdm.unfccc.int/methodologies/

CDM 02-13	Target Group: consultant

Example of registered PDD

The project also complies with all other relevant applicability criteria as follows:

- The average depth of the open lagoons or sludge pits in the baseline scenario is at least 1 m.
  The average depth of individual lagoons varies between 6m and 2m, therefore the average depth of open lagoons is at least 1m.
- Heat and electricity requirements per unit input of the water treatment facility remain largely unchanged in the baseline scenario and the project activity;
  No heat is required by the biogas plant. Net electricity consumption in the Project Scenario is zero as the project will produce sufficient renewable electricity to meet the needs of the biogas plant. The balance of energy needs per unit input of the water treatment facility remain largely unchanged.
- Data requirements as laid out in this methodology are fulfilled.
  All necessary data requirements of the methodology are met as described in section B.6.2. and section B.7.
- The residence time of the organic matter in the open lagoon system should be at least 30 days;
  The residence time of the organic matter in the open lagoon system is 552 day. Please see Annex 3 for more details.
- Local regulations do not prevent discharge of wastewater in open lagoons.
  Discharge of wastewater in open lagoons is not prevented by Thailand regulation and it is standard practice for the industry.

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Key Points	Reference and Additional Information
− The project activity also complies wtih other relevant applicability criteria of ACM0014.	http://cdm.unfccc.int/methodologies/

CDM 02-14	Target Group: consultant

How to identify baseline? (1)

- Project proponent (PP) must identify baseline using the methods and steps specified in the baseline methodology(ies) that is applied to the project activity.
- Baseline methodologies shall require narrative descriptions of project. PP must analyze all reasonable baseline scenario options, which may include:
  - Continuation of the current activity
  - Implementation of the proposed project activity
  - Other scenarios
- PP must describe how a baseline scenario is selected among possible baseline scenario options.

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Key Points	Reference and Additional Information
− Following slides explain how PP can set baseline in order to calculate GHG emission reduction − PP first identify methodology that is applicable to proposed project *(methodology will be explained in later slides)* − PP can then find in the methodology about how to set the baseline.	

CDM 02-15	Target Group: consultant

How to identify baseline? (2)

- Baseline is determined by applying one of the following 3 patterns, depending on the baseline methodologies applied;
- Case 1: Methodology presents a fixed baseline scenario.
  - PP demonstrates that the baseline scenario is the only relevant and plausible business-as-usual scenario.
  - Small-scale methodologies and some large-scale methodologies

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Key Points

- There are 3 cases to determine baseline scenario. The first case is that the applied methodology presents a fixed baseline scenario. PP only demonstrates that the baseline is the only business-as-usual scenario.

Reference and Additional Information

CDM 02-16	Target Group: consultant

CDM – Executive Board — AM0009 / Version 04
Sectoral Scope: 10
EB 46

Identification of the baseline scenario and demonstration of additionality

Project participants shall apply the following procedure.

Step 1: Identify plausible alternative scenarios

The project activity involves three components. Plausible alternative scenarios should include alternatives for the following components:

Plausible alternative baseline scenarios for the associated gas and/or gas-lift gas from the project oil wells could include, *inter alia*:

G1: Release of the associated gas and/or gas-lift gas into the atmosphere at the oil production site (venting);
G2: Flaring of the associated gas and/or gas-lift gas at the oil production site;
G3: On-site use of the associated gas and/or gas-lift gas for power generation;
G4: On-site use of the associated gas and/or gas-lift gas for liquefied natural gas (LNG) production;
G5: Injection of the associated gas and/or gas-lift gas into an oil or gas reservoir;
G6: Recovery, transportation, processing of the associated gas and/or gas-lift gas and distribution of products thereof to end-users without being registered as a CDM project activity;
G7: Recovery, transportation and compression of the associated gas and/or gas-lift gas into a gas pipeline without prior processing, without being registered as a CDM project activity;
G8: Consumed on-site to meet energy demands without being registered as a CDM project activity;
G9: Recovery, transportation and utilization of the associated gas and/or gas-lift gas as feedstock for manufacturing of useful products.

Key Points

- This slide shows the example of methodology that presents a fixed baseline scenario. AM0009 provides plausible alternative scenarios of three components. One component showed in this slide is the associated gas and/or gas-lift gas from the project oil wells (G). This component has 9 plausible alternative scenarios.

(to be modified)

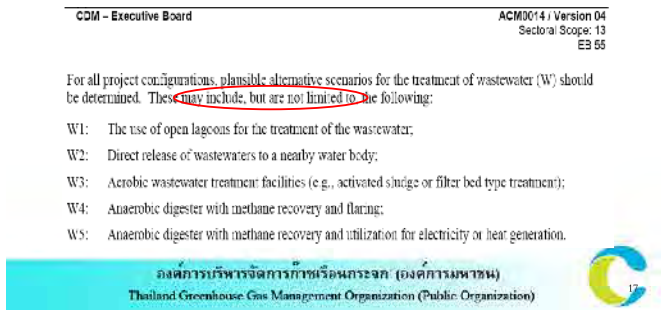
Reference and Additional Information

http://cdm.unfccc.int/methodologies/

CDM 02-17	Target Group: consultant

How to identify baseline? (3)

- Case 2: Methodology presents several possible baseline options for various components of the project activity.
  - PP identifies the most plausible baseline scenario, which is a combination of baseline options.



CDM – Executive Board — ACM0014 / Version 04, Sectoral Scope: 13, EB 55

For all project configurations, plausible alternative scenarios for the treatment of wastewater (W) should be determined. These may include, but are not limited to, the following:

W1: The use of open lagoons for the treatment of the wastewater;

W2: Direct release of wastewaters to a nearby water body;

W3: Aerobic wastewater treatment facilities (e.g., activated sludge or filter bed type treatment);

W4: Anaerobic digester with methane recovery and flaring;

W5: Anaerobic digester with methane recovery and utilization for electricity or heat generation.

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Key Points	Reference and Additional Information
– The second case is that the applied methodology presents several possible but not all baseline scenarios. PP must identify the most plausible baseline scenario.	http://cdm.unfccc.int/methodologies/

CDM 02-18	Target Group: consultant

How to identify baseline? (4)

- Case 3: Methodology does not present any baseline option and PP must present possible baseline options using a step-wise approach resembling the additionality/ combined tool for the identification of a baseline scenario.
  - To apply step 1a of the "Combined tool to identify the baseline scenario and demonstrate additionality"
  - Only applicable if all potential alternative scenarios are available options to project participants, such as
    - Modifications to an existing installation operated by PP
    - Construction of new facilities, if all alternative scenarios are available options to PP

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Key Points	Reference and Additional Information
– The third case is that the applied methodology does not present any baseline scenarios. PP must use a step-wise approach to identify the plausible baseline scenario.	http://cdm.unfccc.int/methodologies/

CDM 02-19	Target Group: consultant

Key Points	Reference and Additional Information

CDM 02-20	Target Group: consultant

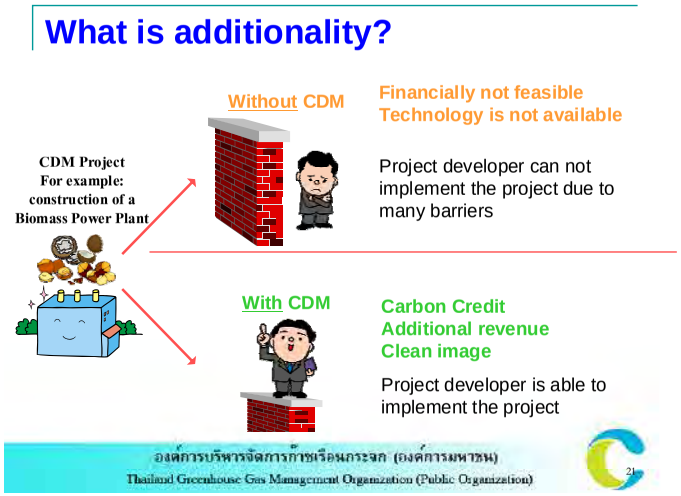
Additionality

- Project Proponents are required to prove "additionality" of proposed project activity in the project design document (PDD).
- Additionality is stipulated as;

> A CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.
>
> (para5. Paragraph 43 of the CDM modalities and procedures)

Key Points	Reference and Additional Information
– One of the principles of CDM is that project activity must be additional. – PP must prove in PDD that the proposed project is additional to that would occur in the absence of the project – **Additionality** is one of the key issues in CDM development and many PPs find it difficult to reasonably demonstrate additionality of their proposed project – This is also evident from the fact that most of the CDM projects that were rejected by the CDM Executive Board are due to insufficient demonstration of additionality	

CDM 02-21	Target Group: consultant

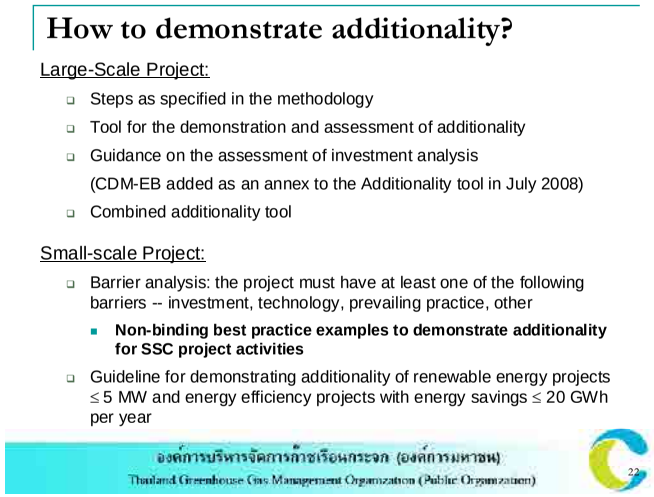


Key Points

- Example to show the concept of additionality (using a biomass power plant construction project)
- **Without CDM** and benefit from CER sales, project proponent usually finds many **barriers** to implement the project, including project is not financially feasible or attractive, and new clean technology is not readily accessible
- CDM can remove these barriers and enable PP to implement the project
- **Benefits** PP can receive from CDM includes additional revenue from carbon credit sales and also PP can receive clean image about their entity or products/ services from the customers/ clients, and market
- This CDM project can be considered **additional** since PP cannot carry out the project without CDM, but can implement the project if they register the project as CDM

Reference and Additional Information

CDM 02-22	Target Group: consultant

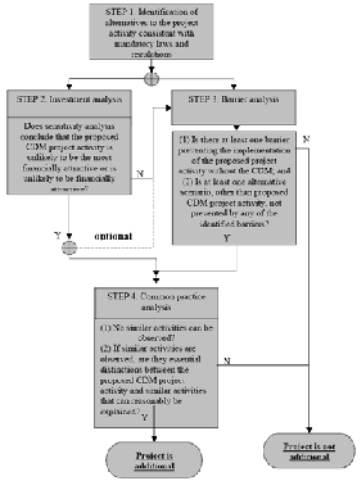


Key Points

- PP must describe in PDD about the project additionality
- Similar to baseline, PP can find the first step to prove, or demonstrate additionality in the applicable **methodology**
- Each methodology stipulates how to prove additionality of the project
- Steps of demonstrating addtionality of large-scale and Small-scale projects are different
- CDM EB has published several tools and guidance that allow PP to demonstrate additionality

Reference and Additional Information

CDM 02-23	Target Group: consultant



Additionality of Large-scale project

Tool for the demonstration and assessment of additionality

- Provides a step-wise approach:
- Identification of alternatives to the project activity
- Investment analysis to determine that the proposed project activity is either
  - Not the most economically or financially attractive
  - Not economically or financially feasible
- Barrier analysis: investment, technology, prevailing practice, other
- Common practice analysis

Key Points

- For barrier analysis, a project is considered as having:
  - investment barrier if similar activities have been implemented with grants or other non-commercial finance or no private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country.
  - technology barrier if skilled/ properly trained labor to operate and maintain the technology is not available in the relevant region or the technology is not available in the relevant region.
  - barrier due to prevailing practice if the project is first of its kind.
- Common practice analysis compares the CDM project with similar activity i.e. different investment climate, access to finance, technology or information.

Reference and Additional Information

CDM 02-24	Target Group: consultant

Additionality of Large-scale project – Guidance on the assessment of investment analysis

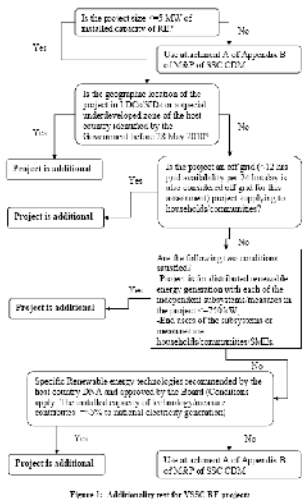
- General guidance for calculation and presentation of IRR/ NPV
  - Investment comparison analysis and benchmark analysis
  - Selection and validation of appropriate benchmarks
  - Sensitivity analysis

Key Points

- There are 3 methods for investment analysis include
  - simple cost analysis,
  - investment comparison analysis i.e. IRR, NPV, cost-benefit ratio
  - benchmark analysis i.e. IRR, bank's interest rate, company's internal benchmark, etc.
- Parameters that are frequently used in sensitivity analysis include investment cost, load factor, electricity price, raw material cost, etc.

Reference and Additional Information

CDM 02-25	Target Group: consultant



Additionality of very small-scale project

- Guideline for demonstrating additionality of renewable energy projects ≤ 5 MW and energy efficiency projects with energy savings ≤ 20 GWH per year

Key Points

- CDM EB issued this guideline in order to facilitate the registration of very small-scale project. If the project meets the requirement of this guideline, additionality proof can be omitted.
- This chart is used for very small-scale renewable energy project. There is another more chart for energy efficiency project.

Reference and Additional Information

CDM 02-26	Target Group: consultant

Key Points

Reference and Additional Information

CDM 02-27	Target Group: consultant

Large-scale Methodologies (AM and ACM)

- Approved Methodologies (AM): 73 meth.;
- Approved Consolidated Methodologies (ACM): 17 meth. active;
- 10 tools such as 'additionality tool' are available;
- ACM0002 (grid-connected renewable energy projects) is applied to more than 772 registered projects;
- On the other hand, some AMs and ACMs have no registered project

(as of 26 November 2010)

Key Points

- Methodologies (except A/R) are distinguished by 3 categories 1) Large-scale methodologies (AM), 2) Consolidated methodologies for large-Scale (ACM), and 3) small scale methodologies (AMS)
- (As of November 26, 2010) There are currently (73) active **AMs, or Approved Methodologies** and (17) active **ACMs, or Approved Consolidated Methodologies**
- Also, there are several "Tools" that are associated with AM and ACM.
- Some methodologies require to refer and apply these tools in calculating emissions or demonstrating additionality.
- The latest list of AM and ACM, as well as Tool is available at the CDM EB website

- It is interesting to know that sectoral distribution of registered CDM projects is not even. And the most frequently-used ACM, which is called **ACM0002**, has applied to more than 770 registered so far, while some Approved Methodologies and Approved Consolidated Methodologies are never used so far.

Reference and Additional Information

- List of AM and ACM, Tools

http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

CDM 02-28	Target Group: consultant

Small-scale Methodologies (AMS)

Type	Description	Number of approved small-scale meth.
I	**Renewable energy**	**8**
II	**Energy efficiency**	**11**
III	**Other types**	**40**

- AMS-I.D. is applied to 764 registered projects;
- Type III includes many Non-CO_2 methodologies such as CH_4, HFC23, and N_2O.

(all data is as of 26 November 2010)

Key Points

- Small-scale approved methodologies, or **AMS** (standing for **Approved Methodologies for Small-scale project activity**), are different from the large-scale methodologies in various points, including in principle;
- Methodology itself is usually **more simple and shorter**
- Baseline scenario is readily presented
- Method to demonstrate additionality is not written as principally all small-scale projects can follow the same guidance to prove additionality
- Monitoring parameters are fewer and formulae are less complicated

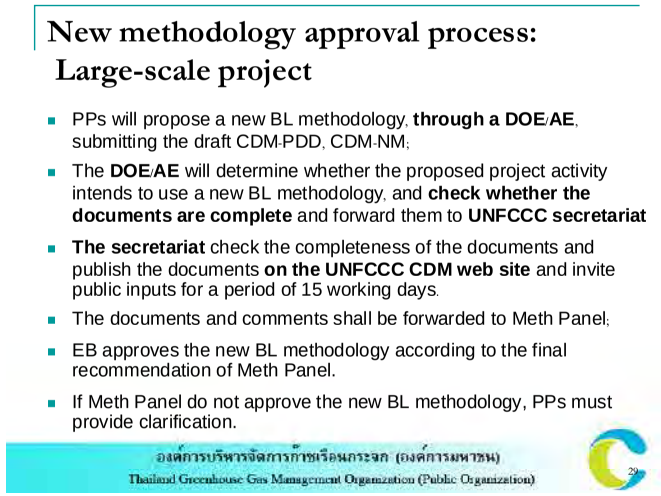
- Uneven distribution of registered projects among sectors is also seen in the small scale methodologies.
- Most frequently used small-scale methodology, which is called **AMS-I.D.** (grid-connected renewable electricity generation project), has been applied to 764 projects so far.

Reference and Additional Information

- List of AMS

http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

CDM 02-29	Target Group: consultant



Key Points

- In case PP cannot find any approved methodology that is applicable to their proposed project, a new methodology can be developed and submitted for approval. Once it is approved by CDM-EB, PP can apply that methodology to their CDM project.

- AE: applicant entity
- NM: new methodology
- Meth.: methodology

Reference and Additional Information

CDM 02-30	Target Group: consultant

Key Points

- The difference between the process for large-scale and small-scale is that for large-scale, only PP can submit new methodology through DOE; however, for small-scale, all PP, DOE, DNA, or stakeholders can directly submit the new methodology
- SSC-WG: small-scale working group

Reference and Additional Information

CDM 02-31	Target Group: consultant

Key Points

Reference and Additional Information

CDM 02-32	Target Group: consultant

Type of CDM project: Small-scale project

- Simplified rules and procedures:
  - Project proponent can use simplified PDD and methodologies;
  - Can save transaction costs and time

Type I: Renewable energy
- ❑ Max. capacity of 15 MW

Type II: Energy efficiency improvement
- ❑ Supply and/or demand side
- ❑ Max. saving of 60 GWh/year

Type III: Other project activities
- ❑ Emission reductions of less than 60,000 tons of CO_2 equivalent annually

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Key Points

- PP of **small-scale CDM project** can **benefit** from various points, including they can use more simple PDD format and methodology than large-scale, which also means they can save significant time and cost in preparing the document
- There are **three types of small-scale** CDM project activities depending on the technology/ sector of the proposed project
- A proposed project must fall within the maximum allowed project size defined by CDM Executive Board in order to be eligible to small-scale
- **Type I** project is a **renewable energy** project and its limit is 15 MW output capacity of the renewable unit
- **Type II** is **energy efficiency** project and its limit is 60 GWh of energy saving per year
- **Type III** project is all **other** project types not included in Type I and II, including waste and wastewater management, transportation, agriculture, etc., and limit is 60,000 CO_2-equivalent tons of emission reduction

Reference and Additional Information

CDM 02-33	Target Group: consultant

Type of CDM project: Bundle project

- Single verification and certification report (covers the same verification period)
- F-CDM-BUNDLE – information related the bundle
- PDD (CDM-SSC-PDD)
  - Single CDM-SSC-PDD: all project activities in the bundle belong to the same type, category and technology/ measure
  - If not: CDM-SSC-PDD for each of the project activities contained in the bundle must be submitted

Key Points	Reference and Additional Information
– **Bundling** is defined as bringing together of several small-scale project activities to make a single CDM project activity without the loss of distinctive characteristics of each project activity, including technology/ measure, location, and application of small-scale methodology. – The sum of the output capacity of projects within a sub-bundle projects must not exceed the maximum output capacity limit for its type. – PP must prepare and submit **bundling format** together with PDD. – The benefits of bundling may include reduction of project development costs, reduction of Engineering, Procurement and Construction (EPC) costs, reduction of O&M costs, reduction of transaction costs (general cost and CDM-related cost), and increase of total investment volume. (Source: CDM/JI Manual, Ministry of Environment, Japan, 2009)	– CDM/JI Manual, Ministry of Environment, Japan http://gec.jp/main.nsf/en/Activities-CDMJI_FS_Programme-CDMJI_Manual2009

CDM 02-34	Target Group: consultant

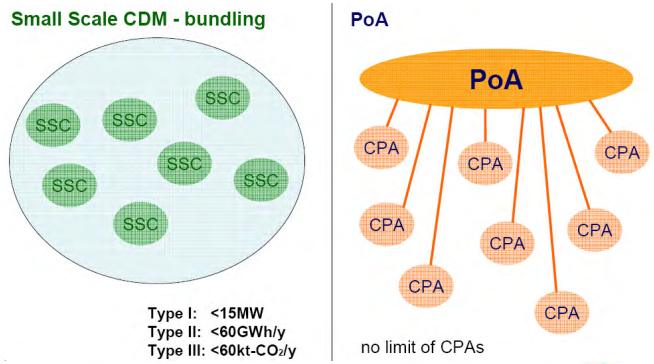
Progamme of Activities (PoA)

PoA is a voluntary coordinated action by a private/public entity which coordinates and implements any policy/measure or stated goal which leads to anthropogenic GHG emission reductions or net anthropogenic GHG removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of **CDM**

Key Points	Reference and Additional Information

CDM 02-35	Target Group: consultant

PoA -- CPA



Key Points

- Developing CDM projects as a PoA can reduce the transaction cost, time and risk compared with general CDM project because unlimited projects can be grouped together as a CPA and several CPAs can be included to the registered PoA. Besides, voluntary projects developed according to regional, national and local policy can also be registered as a PoA.

Reference and Additional Information

CDM 02-36	Target Group: consultant

PoA – Inclusion of CPA

- Unlimited number of CDM Programme Activities (CPAs) that is a project activity under a PoA.
- A CPA can be included in a registered PoA at any time during the duration of the PoA.
- The duration of the PoA shall not exceed 28 years, whereas crediting period of a CPA is as same as normal CDM project.

Key Points

Reference and Additional Information

CDM 02-37	Target Group: consultant

PoA – C/ME

- A PoA shall be proposed by the Coordinating or Managing Entity (C/ME) which shall be a project participants authorized by all participating host country DNAs
- C/ME shall obtain
  - Letters of Approval (LoA) for the implementation of the PoA from each Host Party and Annex I Party involved in the PoA
  - Letters of Authorization of its coordination of the PoA from each Host Party.
- To include an additional CPA in a registered PoA, the C/ME shall forward the completed specific CDM-CPA-DD form to any DOE, after having ensured that the CPA and the specific CDM-CPA-DD meets the requirements determined in the POA and its generic CDM-CPA-DD.
- C/ME may forward more than one specific CDM-CPA-DD at one time.

Key Points	Reference and Additional Information

CDM 02-38	Target Group: consultant

PoA – Project Design document

- **CDM-PoA-DD: additional information required**
  - Identification of the coordinating/managing entity
  - Description of the policy/measure or stated goal that the PoA seeks to promote
  - Definition of eligibility criteria for inclusion of a project activity as a CPA under the PoA
  - Description of a monitoring plan for a CPA
- **PoA generic CDM-CPA-DD**
  - specifies the generic information relevant to all CPAs that may be included in the PoA
- **Completed CDM-CPA-DD**
  - based on the application of the PoA to one real case.

Key Points	Reference and Additional Information

CDM 02-39	Target Group: consultant

PoA -- Validation & verification

- Validation
  - additionality
  - eligibility criteria for inclusion of a proposed CPA
  - operational and management arrangements
  - consistency between CDM-PoA-DD and the PoA generic CDM-CPA-DD; etc.
- Verification

  same as typical CDM project

Key Points	Reference and Additional Information
Points to be checked for validation of PoA.	

CDM 02-40	Target Group: consultant

PoA – registered PoA

Project Title	Country	C/ME	Project type	CER of the first CPA (tCO_2e/y)	CER of overall PoA (tCO_2e/y)
CFL lighting scheme – "Bachat Lamp Yojana	India	Bureau of Energy Efficiency	3: Energy demand	34,892	34,892
Methane capture and combustion from Animal Waste Management System (AWMS) of the 3S Program farms of the Instituto Sadia de Sustentabilidade	Brazil	Instituto Sadia de Sustenta-bilidade (ISS)	15: Agricul-ture	139	591,418
CUIDEMOS Mexico (Campana De Uso Intelegente De Energia Mexico) - Smart Use of Energy Mexico	Mexico	Cool nrg Carbon Invest-ments Pty Ltd	3: Energy demand	24,283	520,365

Key Points	Reference and Additional Information
– The first project distribute CFL (self-ballasted compact fluorescent) bulb to grid-connected residential household to displace ICL (incandescent lamp) and collect and dispose the used CFL. – The second project install biodigester and enclosed flare system. – The third project distribute energy efficient light bulbs to household across Mexico.	

CDM 02-41	Target Group: consultant

PoA – registered PoA (continued)

Project Title	Country	C/ME	Project type	CER of the first CPA (tCO_2e/y)	CER of overall PoA (tCO_2e/y)
Uganda Municipal Waste Compost Programme.	Uganda	National Environ-mental Manage-ment Authority (NEMA)	13: Waste handling & disposal	8,370	83,700
Masca Small Hydro Programme	Hondu-ras	Hidroeléc trica de Masca S.A. de C.V. (Hidroma sca)	E1: Energy industries	4,395	4,395

องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)
Thailand Greenhouse Gas Management Organization (Public Organization)
41

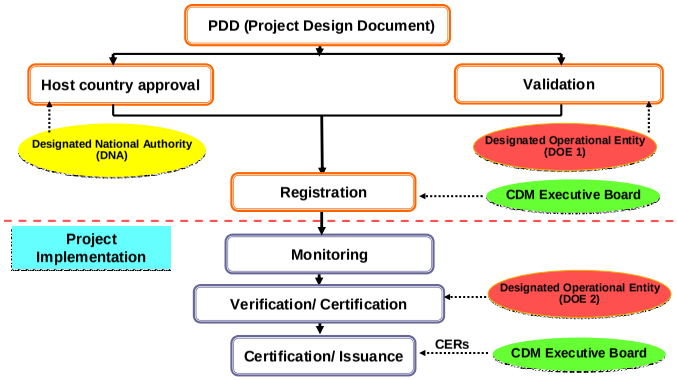
Key Points	Reference and Additional Information
– The common practice of the fourth project is landfill disposal. – The last project is hydroelectric project.	

CDM 02-42	Target Group: consultant

Key Points	Reference and Additional Information

CDM 02-43	Target Group: consultant

CDM Cycle



Key Points

- Chart shows general CDM project cycle from project design to CER issuance
- **Project Proponent (PP)** first prepares **Project Design Document (PDD)**, which describes project description, technology applied, baseline and additionality, how to monitor and calculate GHG emission reductions, etc. PP must use a standard format of PDD provided by CDM Executive Board
- Using the developed PDD, PP must obtain **national approval from TGO**, and also has to go through a **validation** process that will be conducted by a third independent party called **Designated Operational Entity (DOE)**.
- The project that has obtained national approval and also successfully passed the validation process can **apply to registration** to CDM Executive Board.
- After CDM project is registered and operation starts, PP must conduct **monitoring** activity in order to obtain data and information necessary to calculate GHG emission reduction amount from the project activity.
- Result of monitoring will be then checked by **DOE** through **verification** and amount of CER is decided in **certification** stage.
- After going through all these stages, **CER is issued** to the PP by the CDM Executive Board.

Reference and Additional Information

- PDD formats:
http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html
- List of DOEs:
http://cdm.unfccc.int/DOE/list/index.html

CDM 02-44	Target Group: consultant

Demonstration and assessment of prior consideration of the CDM

- New Project (starting date, on or after 2 August 2008)
  - Inform the start of the project activity and their intention to seek CDM status to a Host party DNA and the UNFCCC secretariat in writing within 6 months of starting date
- Existing Project (starting date, before 2 August 2008 and before the date of validation)
  - Indicate awareness of the CDM prior to starting date
  - Indicate that the benefits of the CDM were a decisive factor in the decision to proceed with the project

(e.g. minutes or notes of the decision by the Board of Directors)

Key Points

Reference and Additional Information

CDM 02-45	Target Group: consultant

Definition of Start date according to "Prior consideration of the CDM

- Starting Date : "the earliest date at which either the implementation or construction or real action of a project activity begins"
  - "the date on which the PP has committed to expenditures related to the implementation or related to the construction of the project activity"
- If starting date is before the date of publication of the PDD for global stakeholder consultation
  - Need to show how the benefits of the CDM were seriously considered prior to the starting date

Key Points	Reference and Additional Information

CDM 02-46	Target Group: consultant

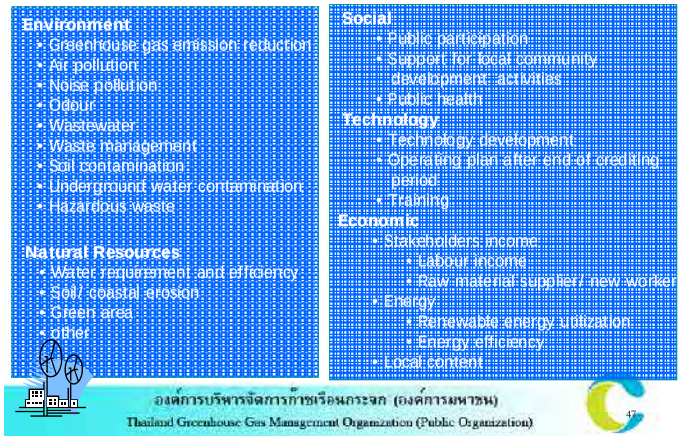
Host country approval -- required document

- PDD
- IEE-SD or EIA-SD report
  - Project details
  - Necessary data for analysis the sustainability of the project
  - Summary of the stakeholder consultation meeting

Key Points	Reference and Additional Information
– PP must submit PDD, IEE-SD or EIA-SD to TGO for LoA approval. – SD: Sustainable Development	http://www.tgo.or.th/index.php?option=com_content&task=view&id=32&Itemid=60

CDM 02-47	Target Group: consultant

Host country approval: SD-criteria of Thailand



Key Points

- The secretariat of Thailand Greenhouse Gas and Management Organization : TGO analyses project data and gives score to each indicator. Minus score indicates negative impact of the project, on the other hand, positive score indicates positive impact.
- The proposed CDM project will be evaluated as a sustainable CDM project only if total score of each dimension and the total score of the project is positive. The project is approved by the Board of Director.

Reference and Additional Information

CDM 02-48	Target Group: consultant

VVM – Validation and Verification Manual

- approved by CDM-EB at forty-fourth meeting (EB44) revised at EB55
- provides requirements to DOEs for their validation and verification work
- promotes quality and consistency in the preparation of their validations and verification reports

DOEs must follow this manual and must integrate its provisions

Key Points

Reference and Additional Information

CDM 02-49	Target Group: consultant

Important points of VVM: Methods of Validation

The DOE will apply standard auditing techniques to assess the correctness of the information provided by the project participants using following methods:

- Document review
- Follow-up actions (e.g. on site visit and telephone or email interviews),
- Reference to available information relating to projects or technologies similar to the proposed CDM project activity under validation
- Review of the appropriateness of formulae and correctness of calculations.

Key Points	Reference and Additional Information

CDM 02-50	Target Group: consultant

Important points of VVM: Validation – CAR -

The DOE will raise a corrective action request (CAR) if one of the following occurs:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

Key Points	Reference and Additional Information

CDM 02-51	Target Group: consultant

Important points of VVM: Validation – CL and FAR

- The DOE will raise a clarification request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.
- The DOE will raise a forward action request (FAR) during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

Key Points	Reference and Additional Information

CDM 02-52	Target Group: consultant

Important points of VVM: Validation – Compatibility with methodologies

The DOE will ensure that the baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM Executive Board

- Project boundary;
- Baseline identification;
- Algorithms and/or formulae used to determine emission reductions;
- Additionality
- Monitoring methodology

Key Points	Reference and Additional Information

CDM 02-53	Target Group: consultant

Important points of VVM: Validation – Additionality of a project activity

- Prior consideration of the CDM
- Investment analysis
  - Describe in detail how the parameters used in any financial calculations have been validated;
  - Describe how the suitability of any benchmark applied has been assessed;
  - Confirm whether the underlying assumptions are appropriate and the financial calculations are correct

Key Points	Reference and Additional Information

CDM 02-54	Target Group: consultant

Important points of VVM: Validation – monitoring plan

The DOE will apply a two-step process to assessing compliance with this requirement, as follows;

- Compliance of the monitoring plan with the approved methodology
- Implementation of the plan
  - DoE will assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design;
  - State the DOEs opinion of the project participants ability to implement the monitoring plan

Key Points	Reference and Additional Information

CDM 02-55	Target Group: consultant

Validation -- Example of reasons of request for review and rejection

- The DOE did not sufficiently explain how it has validated the project emissions from processing the briquettes and pellets in the manufacturing facilities in line with VVM version 01.1 para 76 (request for review).
- The DOE is required to clarify how it has validated the common practice analysis in line with VVM para 120 (c). (request for review)
- Project participants and the DOE (DNV) have failed to substantiate that the methodology has been correctly applied in line with the requirements of VVM version 1.1, paragraph 70, (rejected)

Key Points	Reference and Additional Information

CDM 02-56	Target Group: consultant

Monitoring

- PPs must monitor every parameters specified in PDD -- section B.7: Application of the monitoring methodology and description of the monitoring plan
- PPs must ensure that the required data is accurately monitored and recorded to enable the calculation of the emission reductions achieved by the proposed project activity.
- PPs must have procedures to cope with emergency case, instrument failure and inconsistent data.

Key Points

- After registration, PP must conduct **monitoring** in which **PP will measure and calculate certain parameters** in order to calculate the amount of GHG emission reductions, and then record and report the monitoring result.
- Parameters to be monitored are described in the **approved methodology** applied to the project and they must also be described in PDD
- Depending on the sector, or methodology, or project size, **the number of parameters** to be monitored for one project is different.
- **Frequency of monitoring** is different by each parameter, from every 15 minutes to every year.
- Monitoring may be conducted by PP themselves or by an external entity such as consultant, but the monitoring report must be prepared by PP and submitted to DOE in order to get CERs
- PP is also required to establish and mention in PDD a **monitoring organization or structure**, in which responsible personnel or department and its monitoring responsibility is clearly described
- Although PP is not required to be ISO-certified entity, PP must describe in PDD about quality assurance/ quality control (**QA/QC**) procedures.
- Monitoring activity is extremely important for PP and investors since **it is directly related to the CER or revenue they can receive**.

Reference and Additional Information

CDM 02-57	Target Group: consultant

Verification -- Important points

- The DOE will apply standard auditing techniques to assess the quality of the information,
  - Desk review
  - On-site assessment
- The DOE will ensure that there is a clear audit trail that contains the evidence and records that validate or invalidate the stated figures.
- The DOE will ensure that monitoring has been implemented in accordance with the monitoring plan
  - All parameters have been sufficiently monitored and updated as applicable
  - The accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan

Key Points	Reference and Additional Information

CDM 02-58	Target Group: consultant

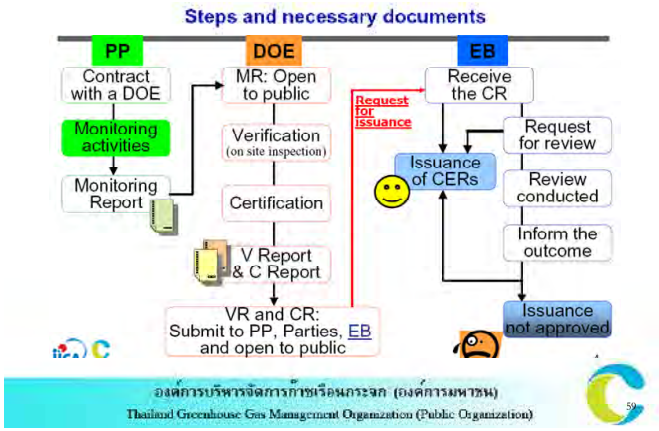
Difference of emission reduction in PDD and monitored results

Ref. No.	Project Name	Emission Reduction in PDD	Actual emission reduction compared to expected emission reduction
1519	Surat Thani Biomass Power Generation Project in Thailand	106,592	40.3%
1024	Phu Khieo Bio-Energy Cogeneration project (PKBC)	102,493	128.5%
1020	Dan Chang Bio-Energy Cogeneration project (DCBC)	93,129	117.7%
1036	Khon Kaen Sugar Power Plant	61,449	110.3%
1026	A.T. Biopower Rice Husk Power Project in Pichit, Thailand	70,772	98.6%

Key Points	Reference and Additional Information
– If actual emission reduction in monitoring report is less than the calculated figure in registered PDD, it means that PP will receive less CDM revenue than what they expect. – This table shows the figure of biomass project in Thailand. The actual emission reduction of four projects is close to or higher than the calculated figure in the PDD. Only one project has less than 50%.	

CDM 02-59	Target Group: consultant

Certification/ issuance of CER



Key Points

- PP can not contact directly to EB. They shall submit document via DoE.
- During the certification step, the MR is submitted to DoE in order to open for comment from public, verification and certification.
- The VR and CR prepared by DoE will be submitted to EB for issuance of CERs if there is no any request for review.

- MR : monitoring report
- VR : verification report
- CR : certification report

Reference and Additional Information

CDM 02-60	Target Group: consultant

Reasons of CER issuance rejection

- PP and DOE did not provide EB adequate evidence of the existence and significance of a barrier,
- DOE has accepted a modification of the approved monitoring methodology from PP without requesting a deviation to EB,
- DOE has not sufficiently verified that the monitoring plan is in accordance with the approved methodology,
- PP and the DOE could not demonstrate that independent assessment has been conducted to confirm that the claimed emission reductions result solely from the project activity,
- There is no reference on what time the daily sample was taken

Key Points

Even if the project is registered to CDM Executive Board and monitoring is conducted, CER was not issues to PP for some cases.

Reference and Additional Information

Aforestation/ Reforestation Clean Development Mechanism

Target Groups

Code	Target group
G	General audience and potential project proponent

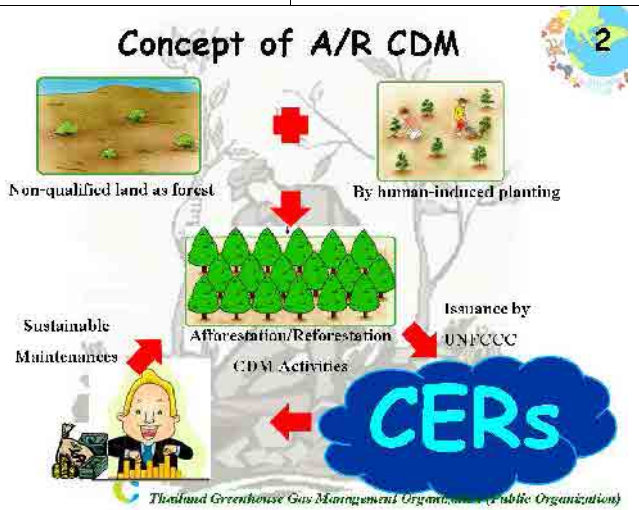
Update History

Version	Date	Update Contents
01	08/2011	Initial adoption

CDM 03-01	Target Group: G

Key Points	Reference and Additional Information
-	

CDM 03-02	Target Group: G



Key Points	Reference and Additional Information
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CDM 03-03	Target Group: G

Key Points	Reference and Additional Information

CDM 03-04	Target Group: G

Key Points	Reference and Additional Information

CDM 03-05	Target Group: G

Key Points

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CDM 03-06	Target Group: G

Key Points

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Reference and Additional Information

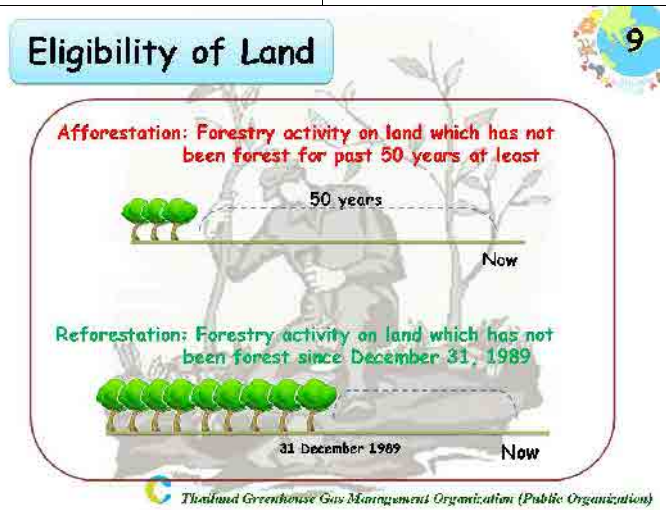
CDM 03-07	Target Group: G

Key Points	Reference and Additional Information

CDM03-08	Target Group: G

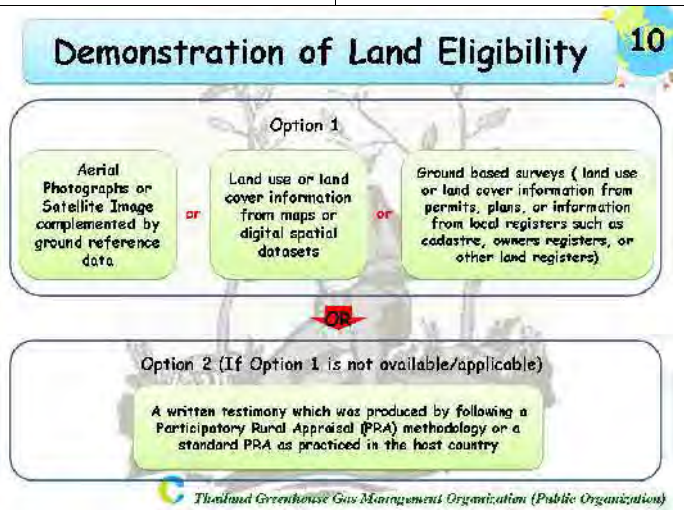
Key Points	Reference and Additional Information

CDM 03-09	Target Group: G



Key Points	Reference and Additional Information

CDM 03-10	Target Group: G



Key Points	Reference and Additional Information
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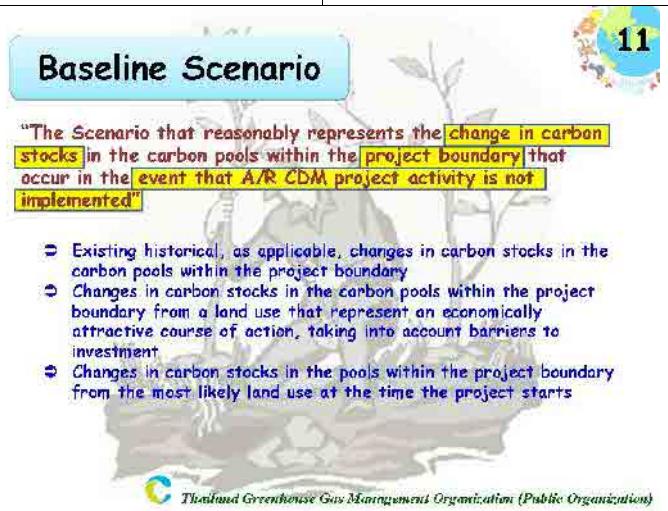
CDM 03-11	Target Group: G



Key Points	Reference and Additional Information
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CDM03-12	Target Group: G

Key Points	Reference and Additional Information
-	

CDM 03-13	Target Group: G

Key Points	Reference and Additional Information

CDM 03-14	Target Group: G

Key Points	Reference and Additional Information
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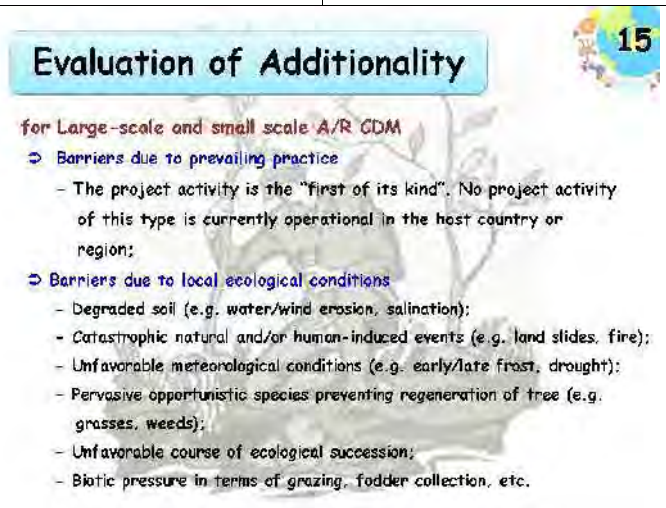
CDM 03-15	Target Group: G



Key Points	Reference and Additional Information
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CDM 03-16	Target Group: G

Key Points	Reference and Additional Information
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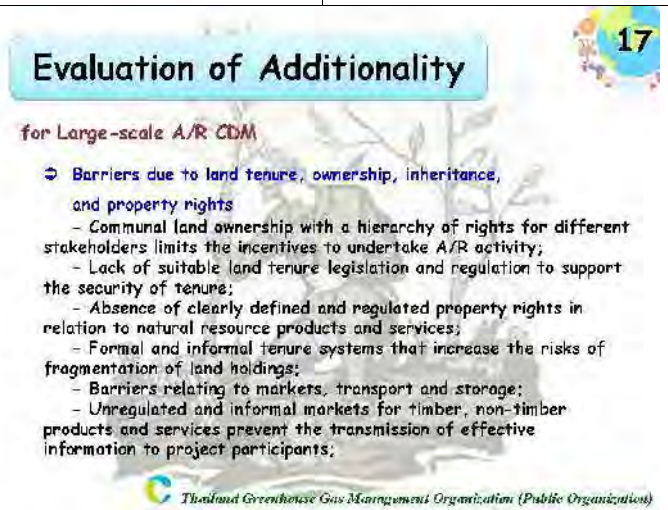
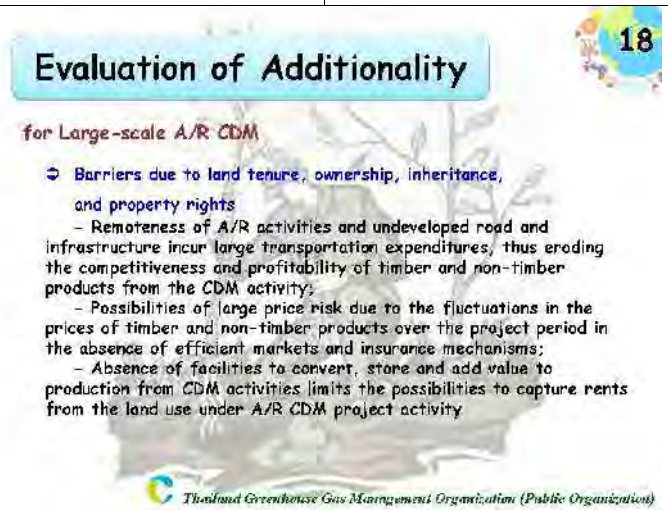
CDM 03-17	Target Group: G



Key Points	Reference and Additional Information

CDM 03-18	Target Group: G



Key Points	Reference and Additional Information
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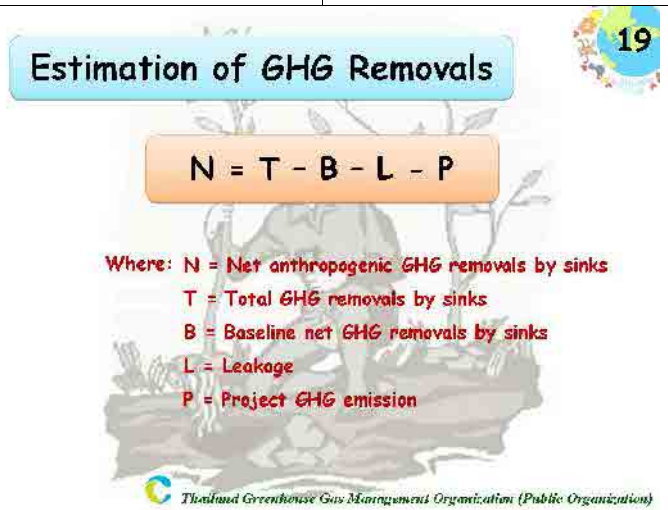
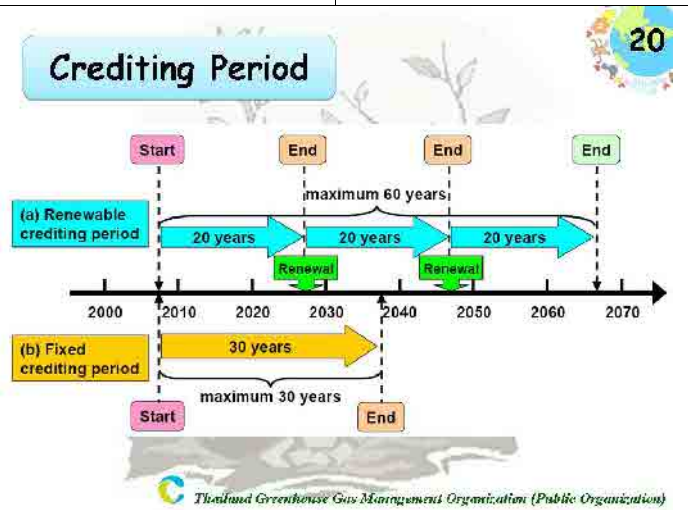
CDM 03-19	Target Group: G



Key Points	Reference and Additional Information

CDM 03-20	Target Group: G



Key Points	Reference and Additional Information
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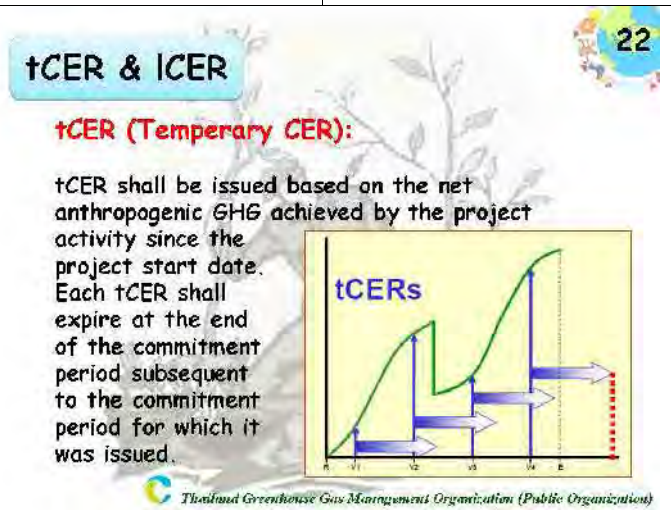
CDM 03-21	Target Group: G

Key Points	Reference and Additional Information

CDM 03-22	Target Group: G



Key Points	Reference and Additional Information
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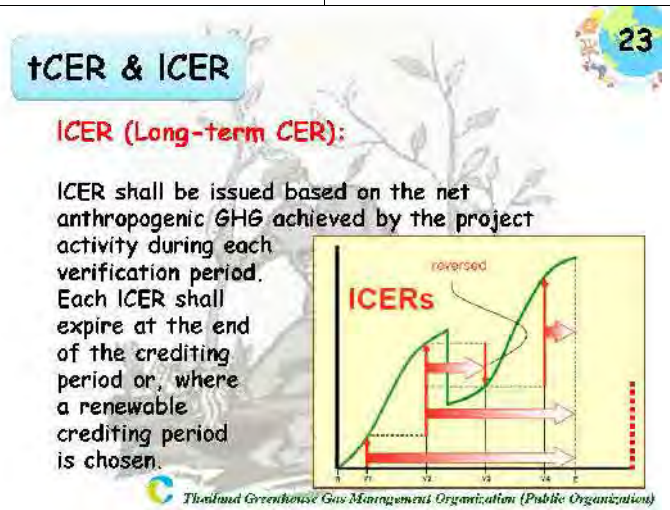
CDM 03-23	Target Group: G



Key Points	Reference and Additional Information

CDM 03-24	Target Group: G

Key Points	Reference and Additional Information
-	

CDM 03-25	Target Group: G

Small Scale A/R CDM

25

	Small Scale A/R CDM	Benefit/Disadvantage
Validation, Verification and Certification	It is possible to bundle several projects into one for process of validation, verification, certification and monitoring. The same DoE can be used for validation and verification.	Reduction of transaction cost
Registration fee	Lower than normal scale A/R CDM	Reduction of transaction cost ($/project)
	Share of proceeds to support developing countries is not deducted (normally 2%). Share for proceed for management of CDM EB is reduced	

Thailand Greenhouse Gas Management Organization (Public Organization)

Key Points	Reference and Additional Information

CDM 03-26	Target Group: G

Remarks for A/R CDM

26

1. The following points shall be described in PDD

* The A/R CDM project activity must contribute to sustainable development in host country based on principle of CDM
* Environmental and socio-economic impacts shall be analyzed. If any significant negative impact is detected, environmental impact assessment shall be conducted and action shall be taken.
* Project participants shall take action for comments by stakeholders.
* Regarding 'Diversion of ODA fund' ,project participants shall follow host country's interpretation.

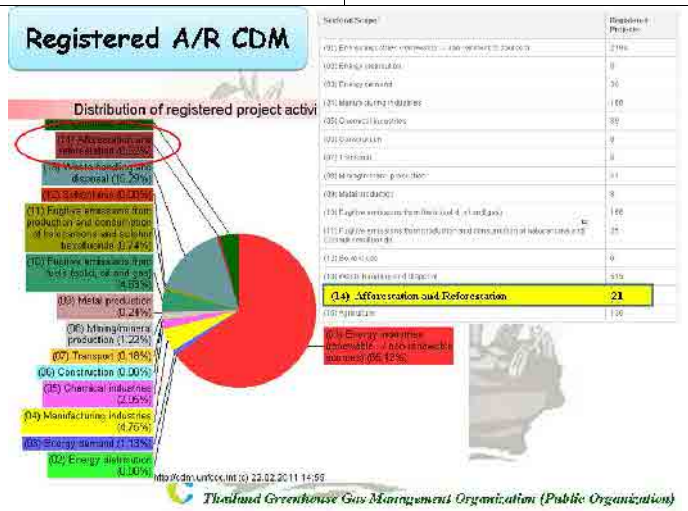
Thailand Greenhouse Gas Management Organization (Public Organization)

Key Points	Reference and Additional Information
-	

CDM 03-27	Target Group: G

Key Points	Reference and Additional Information

CDM 03-28	Target Group: G



Key Points	Reference and Additional Information
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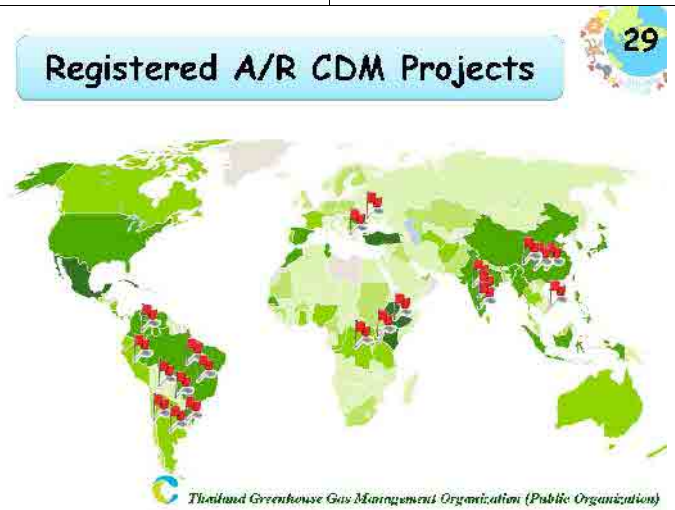
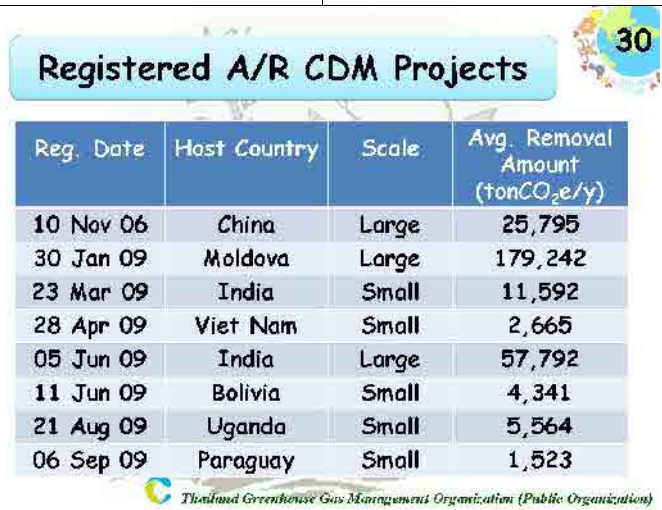
CDM 03-29	Target Group: G



Key Points	Reference and Additional Information

CDM 03-30	Target Group: G



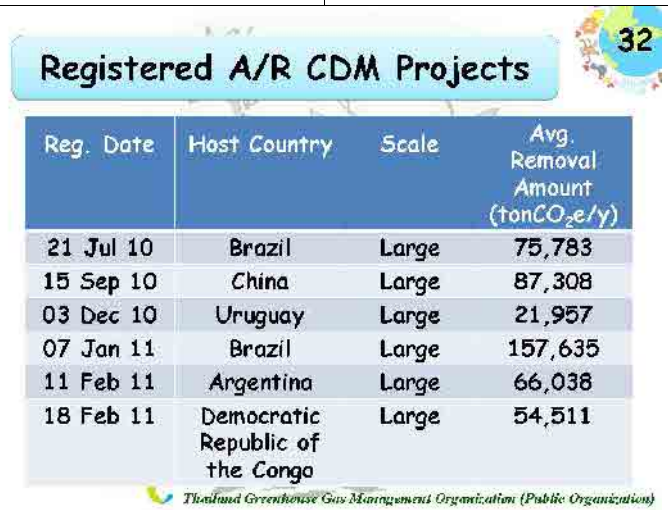
Reg. Date	Host Country	Scale	Avg. Removal Amount ($tonCO_2e/y$)
10 Nov 06	China	Large	25,795
30 Jan 09	Moldova	Large	179,242
23 Mar 09	India	Small	11,592
28 Apr 09	Viet Nam	Small	2,665
05 Jun 09	India	Large	57,792
11 Jun 09	Bolivia	Small	4,341
21 Aug 09	Uganda	Small	5,564
06 Sep 09	Paraguay	Small	1,523

Key Points	Reference and Additional Information
-	

CDM 03-31	Target Group: G

Key Points	Reference and Additional Information

CDM 03-32	Target Group: G

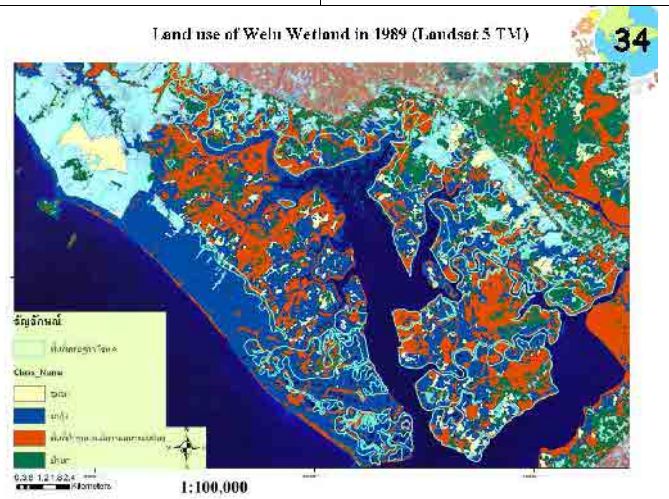


Key Points	Reference and Additional Information
-	

CDM 03-33	Target Group: G

Key Points	Reference and Additional Information

CDM 03-34	Target Group: G



Key Points	Reference and Additional Information
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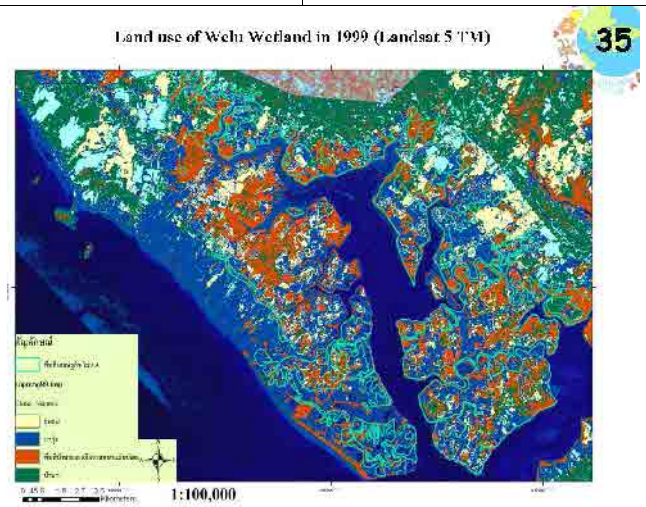
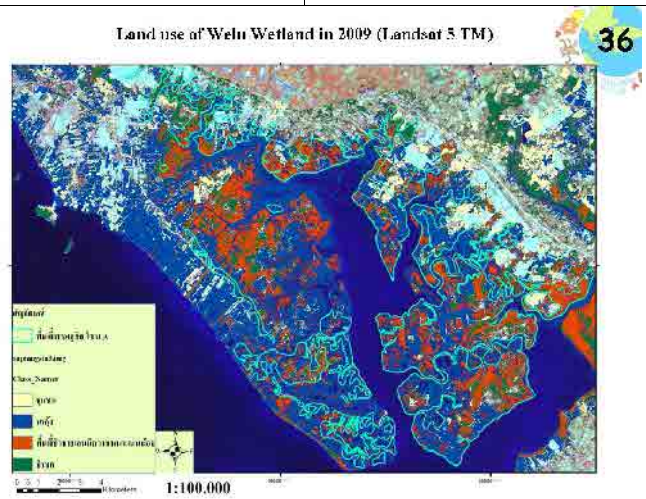
CDM 03-35	Target Group: G



Key Points	Reference and Additional Information

CDM 03-36	Target Group: G



Key Points	Reference and Additional Information
-	

CDM 03-35	Target Group: G

Key Points	Reference and Additional Information

CDM 03-38	Target Group: G

Key Points	Reference and Additional Information
-	

Carbon Trading

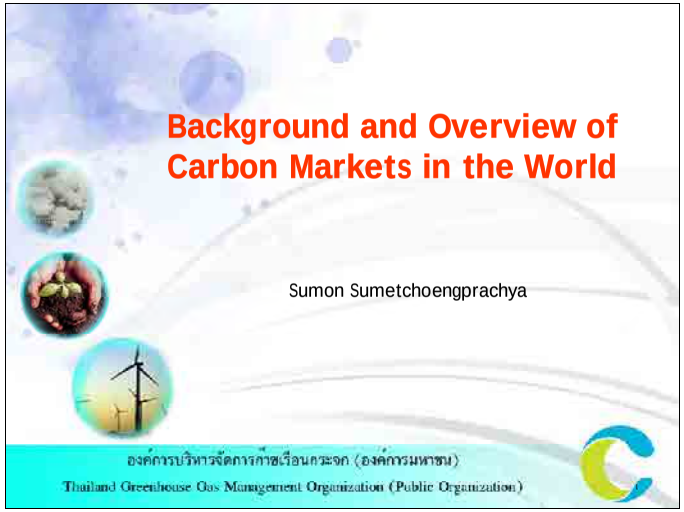
Target Groups

Code	Target group
G	General audience and potential project proponent
PP	Project proponent and Consultant

Update History

Version	Date	Update Contents
01	29/07/2010	Initial adoption

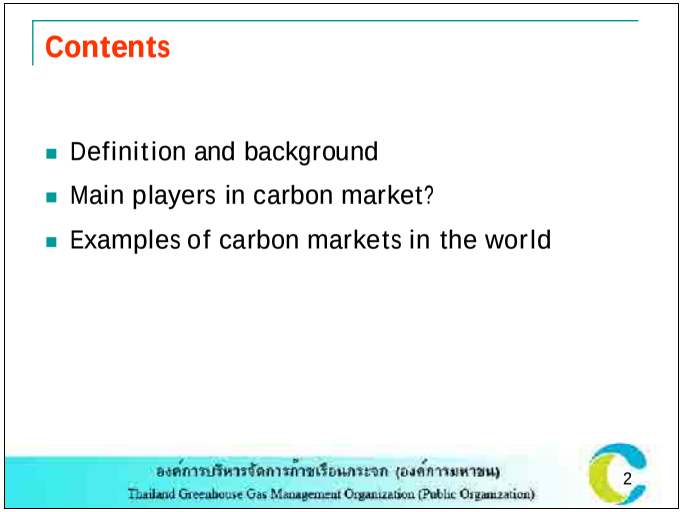
CT01-01	Target Group: G, PP



Objectives of the presentation:

- To understand **history** of 'emissions trading'
- To confirm the **importance and anticipated roles** of 'carbon trading'

CT01-02	Target Group: G



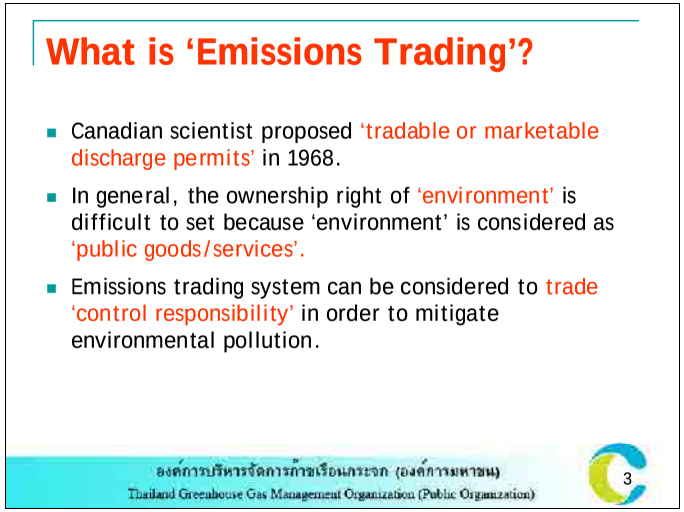
Key Points

Contents

- What is 'Emission Trading'?
- What is 'Carbon Credit'?
- Who are the main players in carbon market?
- Example of Carbon Emission Trading in the world

Reference and Additional Information

CT01-03	Target Group: G



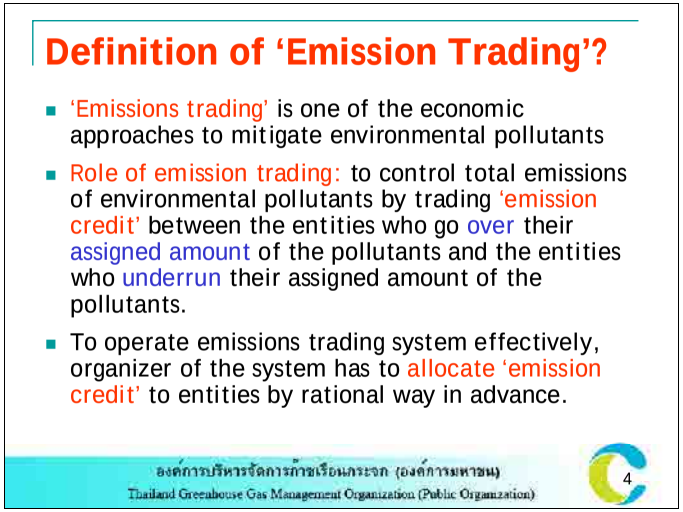
Key Points

- The **concept of carbon trading** originally comes from "**emission trading**", which was firstly proposed by Canadian scientist in 1968.
- In general, the ownership right of 'environment' is difficult to set because 'environment' is considered as 'public goods and services'.
- Emissions trading system allows targeted entities to trade "**control responsibility**" among themselves. In this way, entities who could control relatively cheaply would voluntarily control more, and **selling the excess control** to those wanted to control less due to economic reasons.

(Source: **Emissions trading: principles and practice** By Thomas H. Tietenberg)

Reference and Additional Information

CT01-04	Target Group: G



Key Points

Definition of "Emission Trading"

- 'Emissions trading' is one of the economic approaches to mitigate environmental pollutants such as SO_2, CO_2
- The role of this approach is to **control total emissions of environmental pollutants by trading 'emission credit'** between the entities who go over their assigned amount of the pollutants and the entities who under-run their assigned amount of the pollutants.
- In order to operate emissions trading system effectively, organizer of the system has to allocate 'emission credit' to entities by rational way in advance.
- This concept of "Emission Trading" also apply to "**Carbon Trading**", which was proposed to be a flexible mechanism under the **Kyoto Protocol** in order to mitigate Climate Change by the most effective way.

Reference and Additional Information

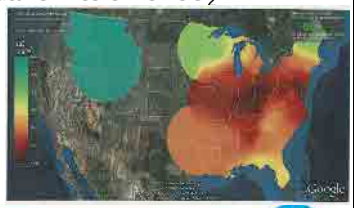
CT01-05	Target Group: G

History of 'Emissions Trading'?

SO_2 Trading in the USA

- The main air pollutants in the USA were SO_2 and NO_x in early 1980s.
- More than 2/3 of annual emission of SO_2 were from coal-fired or oil-fired power plants.

SO_2 concentration in 1989 →



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Key Points

- Example of success emission trading is the **SO_2 trading system in the USA**.
- In early 1980s, the main air pollutants and problems in USA were SO_2 and NOx
- More than 2/3 of annual emission of SO_2 was from coal-fired or oil-fired power plants.

Reference and Additional Information

CT01-06	Target Group: G

SO_2 Trading

Governing law of SO_2 trading

- Revision of the Clean Air Act in 1990.
- EPA's Acid Rain Program based on the Act in 1995.

Main characteristics of SO_2 trading

- Participants: Thermal power plants (easy to monitor)
- Purpose: to mitigate the impact of acid rain
- Present SO_2 trading (2007)

  Total value of the SO_2 allowance market: 5.1 bil. US$

  Average price: 325 US $/t-$SO_2$, Allowable emission: 15.8 mil. t-SO_2

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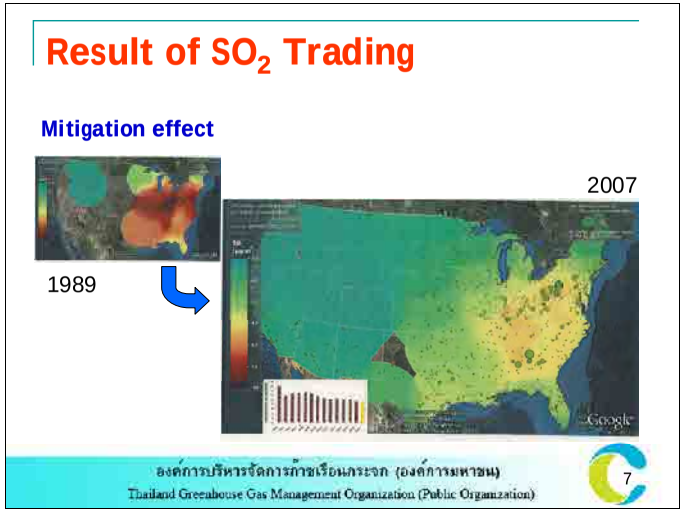
Key Points

- US established governing law of SO2 trading and set up main characteristics of SO2 trading under the EPA's **Acid Rain Program** to control SO2 emission from thermal power plants.

Reference and Additional Information

CT01-07	Target Group: G

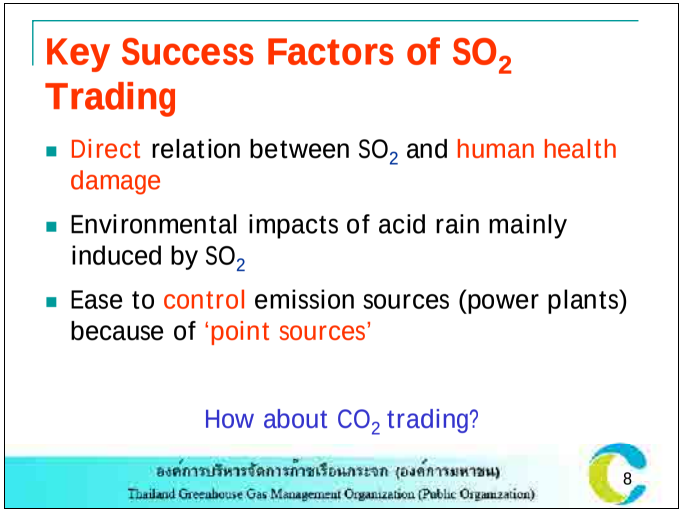


Key Points

- This SO2 trading system successfully mitigated SO2 within the country.

Reference and Additional Information

CT01-08	Target Group: G



Key Points

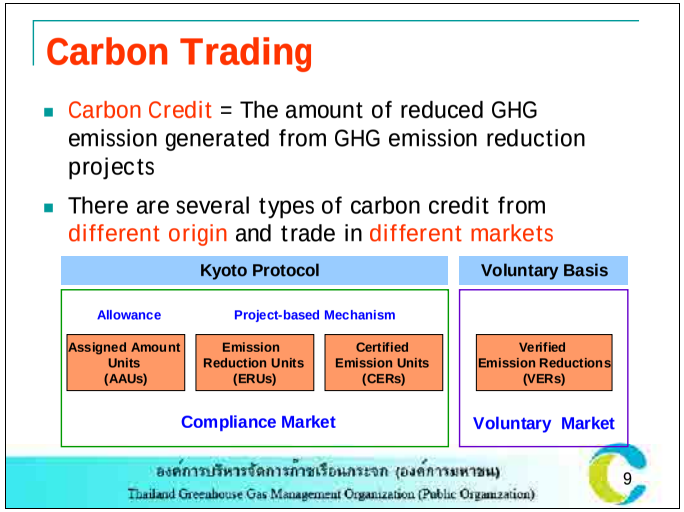
- **Key success factors** of effectiveness of SO2 trading are
  - Direct relation was found between SO2 and human health damage likes Asthma.
  - Environmental impacts of acid rain mainly induced by SO2
  - Easy to control emission from "point sources" (power plants), instead of mobile sources like cars

How about CO_2 trading?

- Do you think carbon market today is success or not?
- What are the key success factor of the market?

Reference and Additional Information

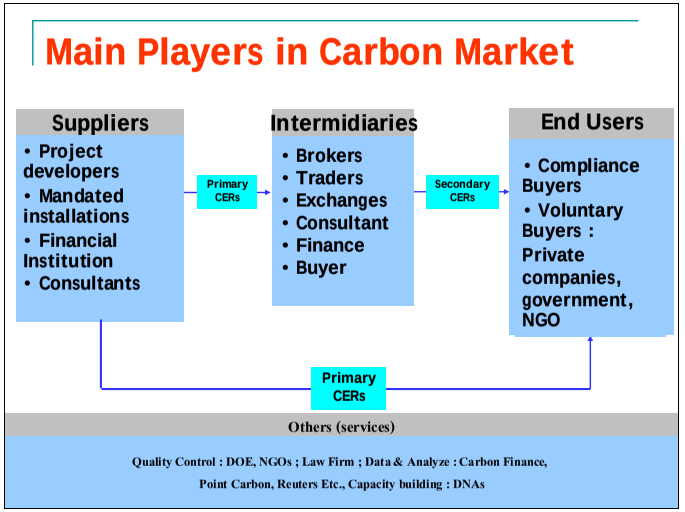
CT01-09	Target Group: G



Key Points / Additional Information

- **Carbon credit** is the amount of reduced GHG emission generated from GHG emission reduction projects and is traded in carbon market.
- There are several **types of carbon credit** from different origin and trade in different markets.
  - **AAUs or Assigned Amount Units**, This unit expressed as levels of allowed emissions or "assigned amounts" under "emission trading mechanism" between Annex I countries under Kyoto Protocol.
  - **ERUs or Emission Reduction Units**: An emission reduction unit generated by a joint implementation project under the Kyoto protocol
  - **CERs or Certified Emission Reductions**: this kind of unit is a credit generated from a clean development mechanism of Kyoto Protocol.
  - These three units must be certified and get approval by organization under **UNFCCC** and are traded in the Compliance Market.
- Another one is **VERs or Verified Emission Reductions**. It is a credit generated from voluntary GHG emission reduction project and traded in Voluntary Market.

CT01-10	Target Group: G



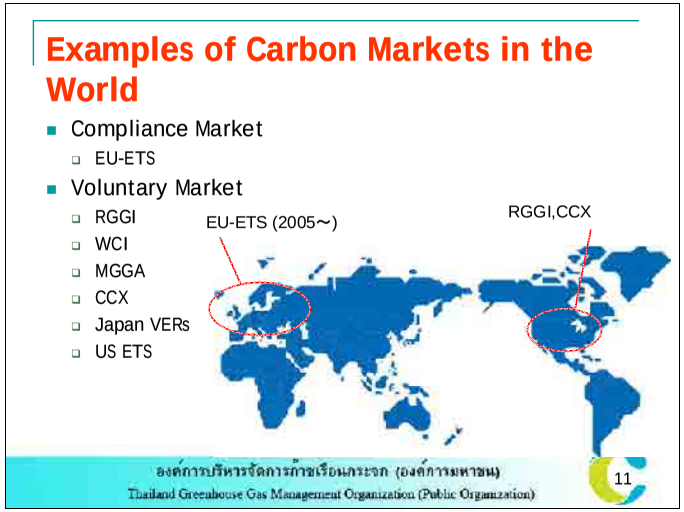
Key Points

Who is the Main Players in the carbon market?

- Generally, main players in the carbon market can be divided into 3 categories, which are
  - **Suppliers** who supply carbon credit into the market. For example, Project developer, Financial Institution or Consultants and etc.,
  - **Intermediaries**, who buy credits for trading purpose, for example Brokers, Traders and Exchange
  - **End Users**, who buy credit in order to comply the law or for good image, example of entities in this group are compliance buyers or voluntary buyers, such as government agencies or private companies.
  - Beside these players, there are other players who provide supporting services to players in the market such as DOE, Law firm and DNA

Reference and Additional Information

CT01-11	Target Group: G, PP

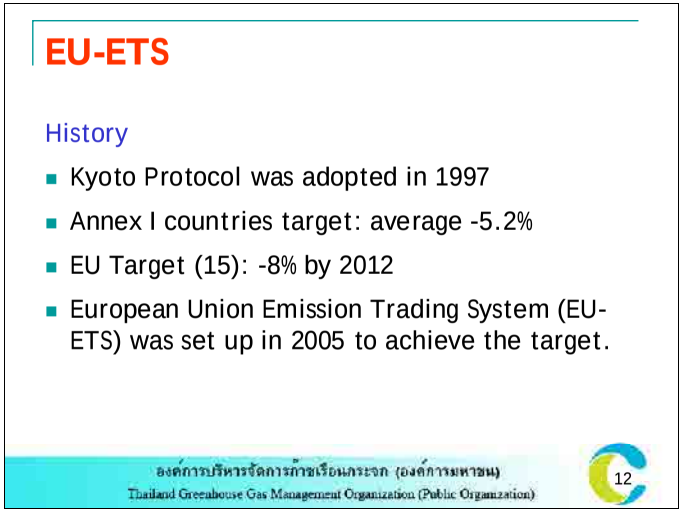


Key Points

- Current Carbon Emission Trading or Carbon Markets in the World.

Reference and Additional Information

CT01-12	Target Group: G, PP

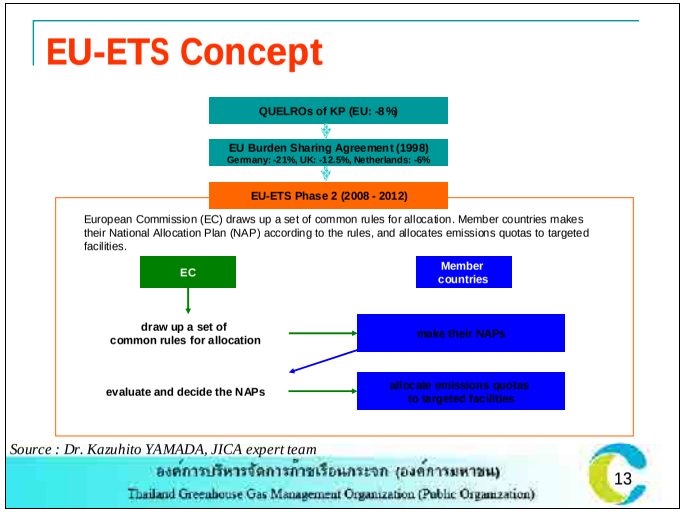


Key Points

- In 1997, the **Kyoto Protocol** was adopted and industrialized countries (except USA) pledged to reduce their greenhouse gas (GHG) emissions around 5.2% compared to 1990 emissions levels within 2012 to stabilize the GHG concentration in the atmosphere.
- The European Union (EU), which comprised 15 member states at that time, pledged to reduce its emissions as a group by 8%.
- As a result, EU started the **European Union Emission Trading System (EU ETS)** in 2005 to achieve this Kyoto target.

Reference and Additional Information

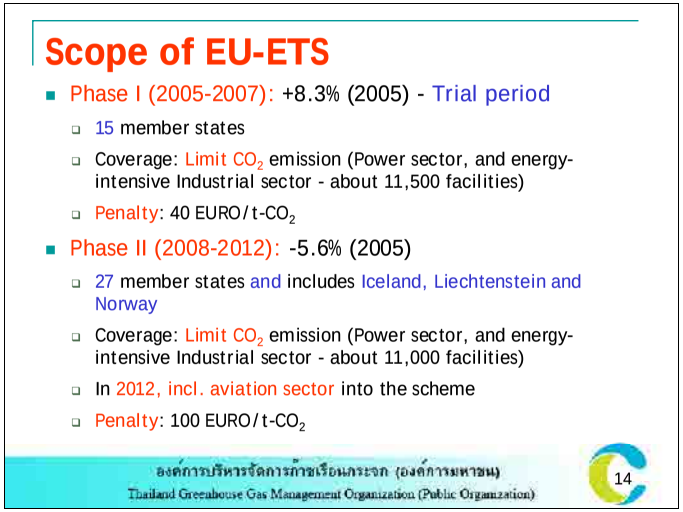
CT01-13	Target Group: G, PP



Key Points / Additional Information

- In carbon market, European Union Emission Trading Scheme or **EU ETS is the largest carbon emission trading system in the World**
- It is also the world's first international company-level 'cap-and-trade' system of allowances for emitting carbon dioxide (CO2) and other greenhouse gases
- This mandatory **cap-and-trade system** sets a **limit (a cap) of total emissions** for all targeted industries. The cap is translated into **emissions allowances** (so-called EU Emissions Allowances, or EUAs) and one allowance equals one ton of carbon dioxide equivalent (CO_{2e}). The allowances are issued to the factories free of charge or are sold at auctions.
- Before starting each trading period, European commission will draw up a set of common rules for allocation of EUA.
- Then each EU member state will develop a **National Allocation Plan (NAP)** and submit it to the European Commission for assessment. After EC evaluate and decide the NAP, each member countries will determine the total quantity of allowances to the factories in targeted industries.
- Thus, the overall cap of the EU ETS is the sum of the national caps. The national cap of each member state has to ensure that the member state is able to reach its Kyoto target.
- After receiving EUAs, the operators of the factories have to surrender one allowance for every ton CO2e emitted.
- Operators which do not have enough allowances to compensate the emissions of their factories can reduce their emissions or **buy allowances or offset credits from CDM projects (CERs) and JI projects (ERUs)**.

CT01-14	Target Group: G, PP



Key Points / Additional Information

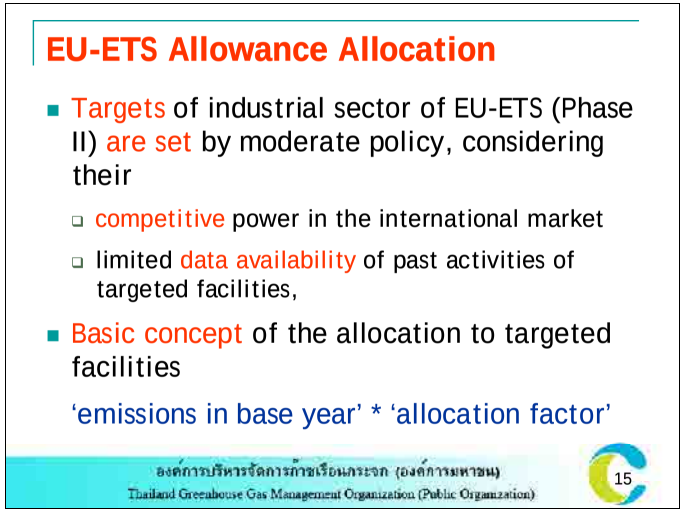
Phase I

- In the first trading period, from 2005 to 2007, the scheme covered CO2 emissions from **high-emitting factories in the power and heat generation industry** and in selected **energy-intensive industrial sectors**:
  - combustion plants, oil refineries, coke ovens, iron and steel plants and factories making cement, glass, lime, bricks, ceramics, pulp and paper.
- It is also called the 'trial period' or 'pilot phase' since the main intention was to establish an infrastructure for the cap-and-trade system (reporting and monitoring) and to gain experience ('learning by doing') for the following periods.

Phase II

- From 1 January 2008 the geographical coverage of the EU ETS has been extended beyond the 27 EU Member States to include Iceland, Liechtenstein and Norway. In some cases, a size threshold based on production capacity or output determines which individual plants in the sectors covered must participate in the system.
- At present some **11,000 installations in the EU** are included, accounting for **around 50 % of the EU's total CO2 emission** and about 40% of its overall greenhouse gas emissions.
- From 2012, the EU ETS will also include CO2 emissions from civil aviation. This means airlines of all nationalities will need allowances to cover the emissions from their flights to, from or within the EU.

CT01-15	Target Group: G, PP

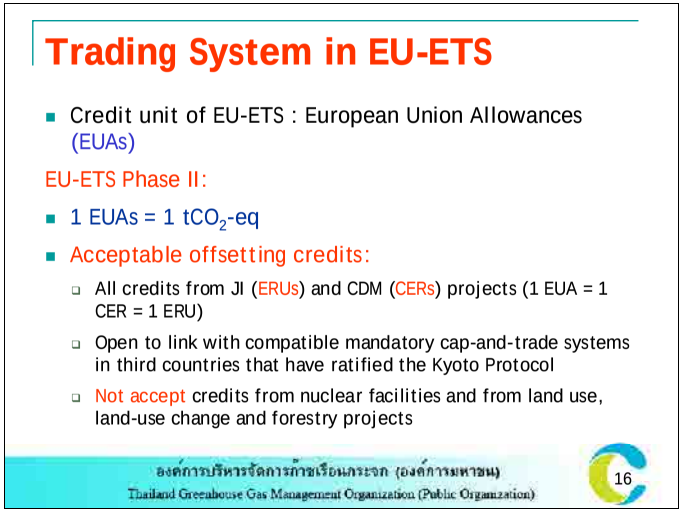


Key Points

- Targets of **industrial sector** are set by moderate policy, regarding to their competitiveness in the international market, and data availability of past activities of targeted facilities,
- Basic concept of the **allocation to targeted facilities** = ('emissions in base year' * 'allocation factor')

Reference and Additional Information

CT01-16	Target Group: G, PP



Key Points

- Credit unit of EU-ETS is called **European Union Allowances (EUAs)**
- In Phase II: 1 EUAs = 1 $tCO_{2\text{-eq}}$
- EU ETS accepts offset credits from emission-saving projects carried out under the Kyoto Protocol's such as Clean Development Mechanism (**CDM**) and Joint Implementation instrument (**JI**).
- It is also open to establishing formal links with compatible mandatory cap-and-trade systems in third countries that have ratified the Kyoto Protocol.
- During Phase II, Businesses can buy offsetting credits around 1.4 billion tonnes of CO2 – a yearly average of 280 million tonnes – to help offset their emissions.
- Alternatively, operators are allowed to use CERs or ERUs at least 11% of their allocation during 2008-2012
- However, EU-ETS does **not** accept credits from **nuclear facilities and from land use, land-use change and forestry projects**

Reference and Additional Information

CT01-17	Target Group: G, PP

Trading Volumes and Values in 2008-2009

Source: Point Carbon & Tisco Securities Co., Ltd.

	2008 figures		2009 figures		Change 2008-09		Average prices
	[Mt]	[€ mil.]	[Mt]	[€ mil.]	[Mt]	[€ mil.]	[€/t]
EU ETS	3,091	66,993	5,646	72,787	83%	9%	12.89
CDM	1,609	24,172	1,590	17,520	-1%	-28%	11.02
JI	72	720	44	399	-38%	-45%	9.00
AAU	43	330	138	1,379	221%	318%	9.99
RGGI	71	178	765	1,773	979%	897%	2.32
Other	34	119	75	284	118%	139%	3.80
Total	**4,920**	**92,511**	**8,258**	**94,143**	**68%**	**2%**	**11.40**

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Key Points

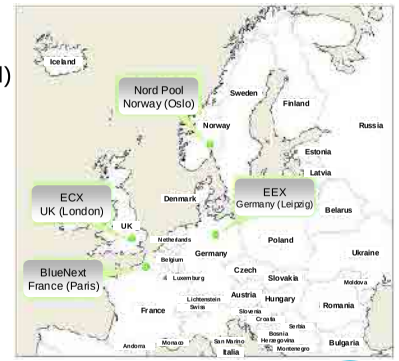
- Trading volumes and values of EU ETS and other markets in the World
- EU-ETS is the largest segment covering 68% and 77% of global trading volume and value, respectively
- Whereas CDM is the 2nd largest market in the world

Reference and Additional Information

CT01-18	Target Group: G, PP

Where are Main Exchanges of EU-ETS?

- ECX: EUA/CER (mainly futures deal)
- Bluenext: EUA (mainly spot deal)



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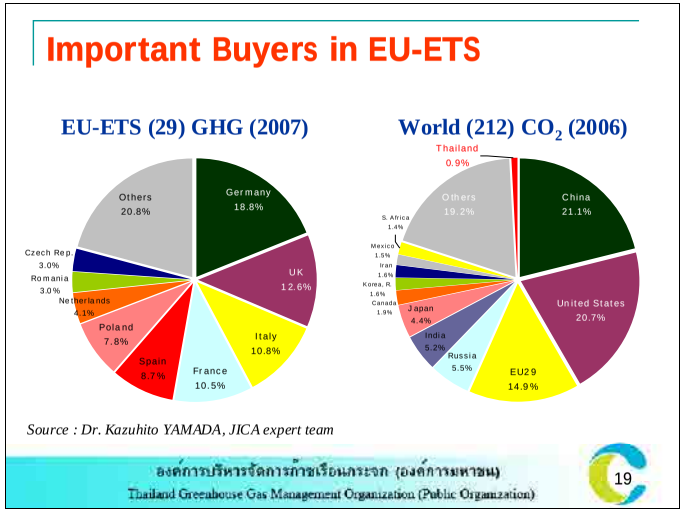
Key Points

- The main exchanges of EU-ETS is European Climate Exchange, located in UK and trading mainly on future credits
- Bluenext, which is located in Paris, trades mainly on spot deal

Reference and Additional Information

CT01-19	Target Group: G, PP

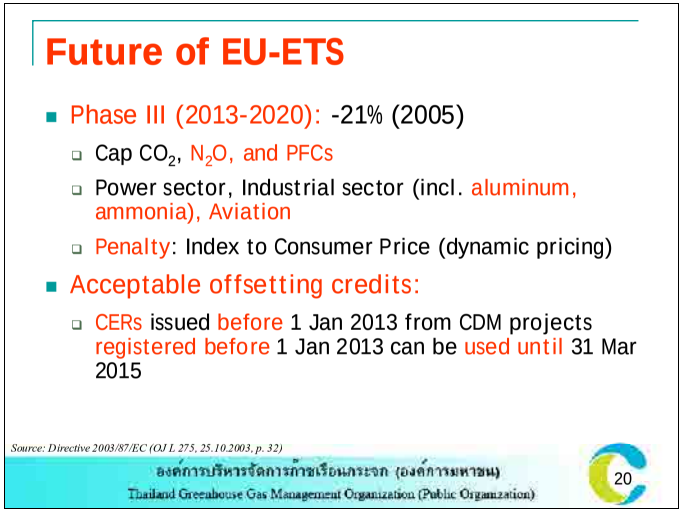


Key Points

- Important buyers in EU-ETS
- EU (29 countries) is ranked No. 4 of GHG emitter in the World.
- Germany, UK, and France are the main emitter among EU member states.
- There is a number of EU governments plan to buy credits totalling around 550 million tonnes of CO2 to meet their Kyoto committed targets.
- For example Department for Environment, Food And Rural Affairs from UK, GTZ from Germany, and Ministry of Foreign Affairs of Denmark.

Reference and Additional Information

CT01-20	Target Group: G, PP



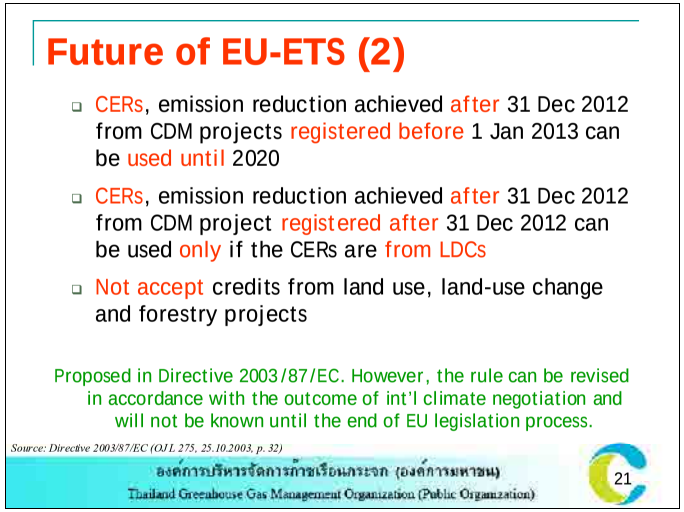
Key Points

- For the future of EU-ETS **Phase III**, which will operate from 2013-2020 and the member countries has to reduce GHG emission to **21% compared to 2005 emission level**
- Phase III will **include aluminum and ammonia facilities** into the scheme and the penalty may varied depending on Consumer price index.
- However, these are just proposals and it will not be known until international climate agreement is concluded and until the end of EU legislation process

Source: **Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003** – establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (OJ L 275, 25.10.2003, p. 32)

Reference and Additional Information

CT01-21	Target Group: G, PP

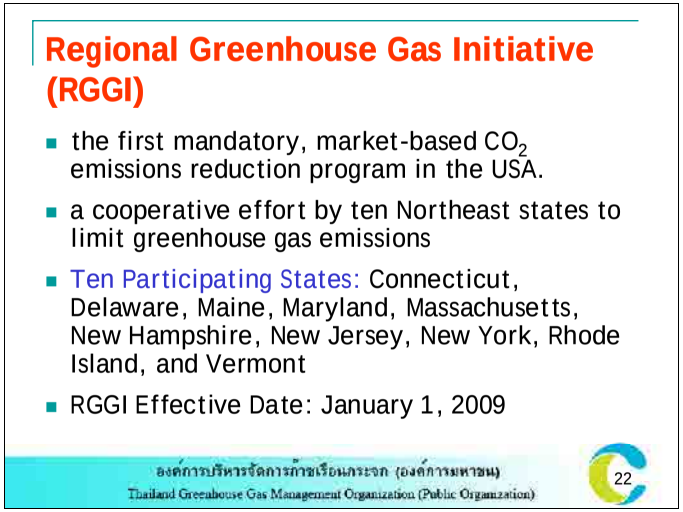


Key Points

Source: **Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003** – establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (OJ L 275, 25.10.2003, p. 32)

Reference and Additional Information

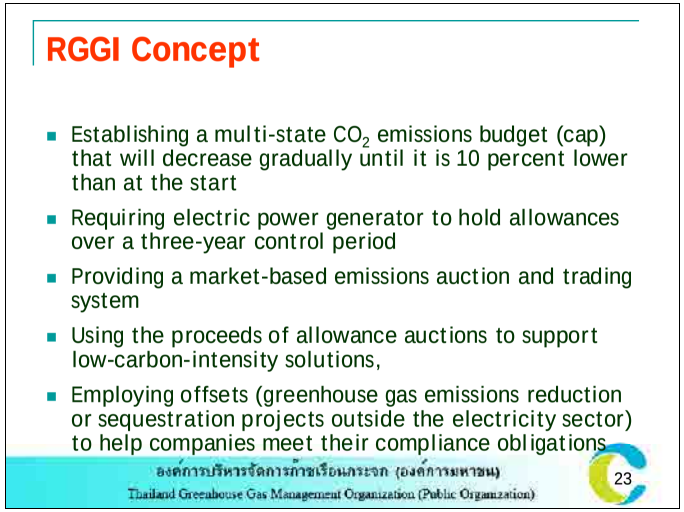
CT01-22	Target Group: G, PP



Key Points / Additional Information

- RGGI or Regional Greenhouse Gas Initiative is the first mandatory, market-based CO2 emissions reduction program in the USA.
- It is a cooperative effort by **ten Northeast states to limit greenhouse gas emissions**
- Members of RGGI consisting of the states who are signatory states to the RGGI agreement.
  - Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont
- Scope or target entities of RGGI is **Fossil fuel-fired electric power plants** (25 MW or greater in size), which covers approximately **225 facilities** region-wide.
- Regulated power plants can use a CO2 allowance issued by any of the ten participating states to demonstrate compliance with the state program governing their facility. So, the ten individual state programs function as a single regional compliance market for carbon emissions.

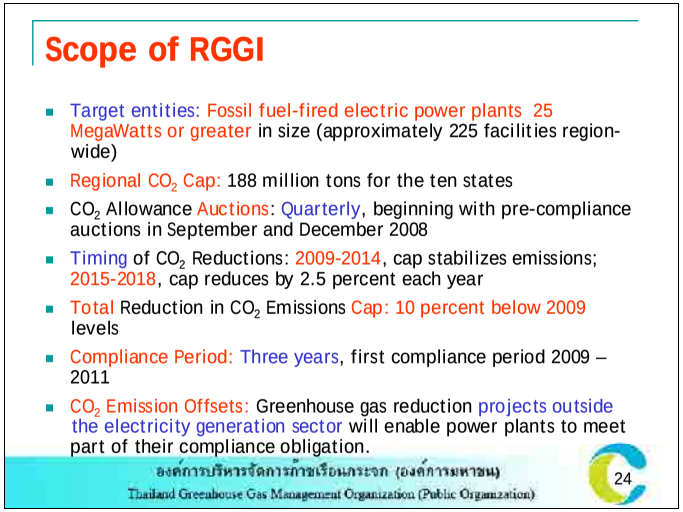
CT01-23	Target Group: G, PP



Key Points/ Additional Information

- To reduce emissions of greenhouse gases, the RGGI participating states are using a **market-based cap-and-trade approach** that includes:
  - Establishing a multi-state CO2 emissions budget (cap) that will decrease gradually until it is 10 percent lower than at the start
  - Requiring electric power generator to hold allowances equal to their CO2 emissions over a three-year control period
  - Providing a market-based emissions auction and trading system where electric power generators can buy, sell and trade CO2 emissions allowances
  - Using the proceeds of allowance auctions to support low-carbon-intensity solutions, including energy efficiency and clean renewable energy, such as solar and wind power
  - Employing offsets (greenhouse gas emissions reduction or sequestration projects outside the electricity sector) to help companies meet their compliance obligations
- RGGI's phased approach means that reductions in the CO2 cap will initially be modest, providing predictable market signals and regulatory certainty. Electricity generators will be able to plan for and invest in lower-carbon alternatives and avoid dramatic electricity price impacts.

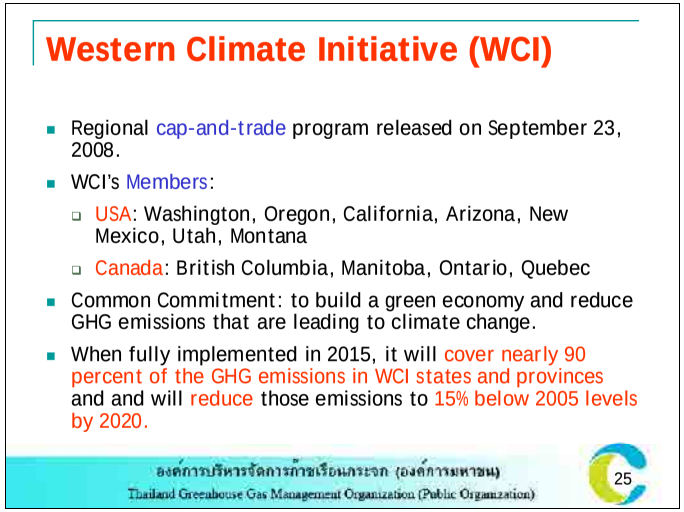
CT01-24	Target Group: G, PP



Key Points / Additional Information

- RGGI is composed of individual CO2 Budget Trading Programs in each of the ten participating states. This Budget means certain/maximum emission level.
- These programs are implemented through state regulations, based on a RGGI Model Rule, and are linked through CO2 allowance reciprocity
- Total Regional CO2 Cap is 188 million tons for the ten states
- There is timeline for CO2 Reductions:
  - 2009-2014, cap stabilizes emissions;
  - 2015-2018, cap reduces by 2.5 percent each year
- Total Reduction in CO2 Emissions Cap: 10 percent below 2009 levels by 2018
- Compliance Period: Three years, first compliance period 2009 – 2011
- RGGI accepts CO2 Emission Offsets from Greenhouse gas reduction projects outside the electricity generation sector to ensure that power plants meet part of their compliance obligation.

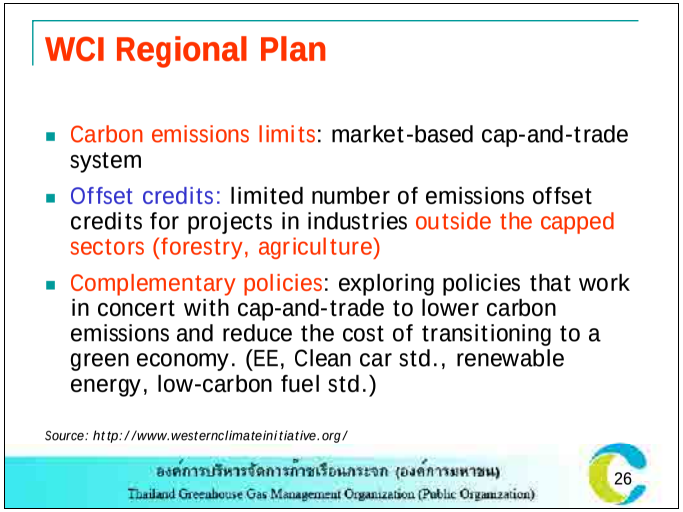
CT01-25	Target Group: G, PP



Key Points / Additional Information

- WCI or Western Climate Initiative
- The centerpiece of the WCI strategy is a regional cap-and-trade program. The WCI released the design of its program on September 23, 2008.
- **Seven U.S. states and four Canadian provinces** that comprise the Western Climate Initiative reflect diverse geographies, industries, climates, populations, and energy and transportation infrastructures.
- However, they have common commitment, which are to build a green economy and to reduce the greenhouse gas emissions that are leading to climate change.
- When fully implemented in 2015, this comprehensive program **will cover nearly 90 percent of the GHG emissions in WCI states and provinces** and will reduce those emissions to 15 percent below 2005 levels by 2020.

CT01-26	Target Group: G, PP

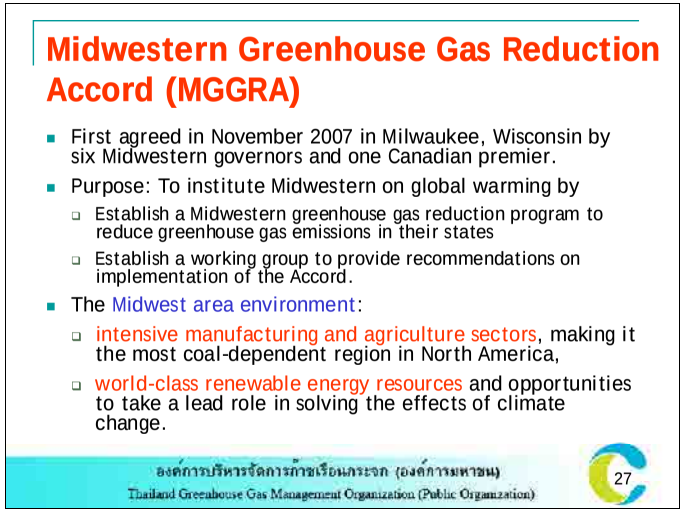


Key Points/ Additional Information

WCI jurisdictions' regional plan to reduce GHG emission and build green economy by including following elements

- **Carbon emissions limits.** Or use a market-based cap-and-trade system to provide incentives for companies and inventors to seek out new technologies that increase energy efficiency, promote greater use of renewable or lower-polluting fuels, and foster process improvements that reduce dependence on fossil fuels.
- **Offset credits.** To reduce abatement costs for emitters, a limited number of emissions offset credits will be allowed for projects in industries outside the capped sectors—such as forestry and agriculture.
- **Complementary policies.** To achieve the regional GHG emissions reduction goal and encourage investments in low-carbon technologies, complementary policies that work in concert with cap-and-trade are essential.
- The WCI jurisdictions will continue to explore—together and individually policies that work in concert with cap-and-trade to lower carbon emissions and reduce the cost of transitioning to a green economy.
- Energy efficiency measures that make factories, buildings, homes, and appliances more energy efficient and reduce fuel consumption.
- Clean car standards for new passenger vehicles that reduce carbon emissions and fuel costs for consumers.
- Use Renewable energy (such as Solar photovoltaic systems, community-scale wind turbines, geothermal systems, and generating systems that run on waste material) to meet power needs and reduce GHG emissions.
- Low-carbon fuel standards that encourage use of alternative transportation fuels, including electricity, biofuels, and hydrogen.

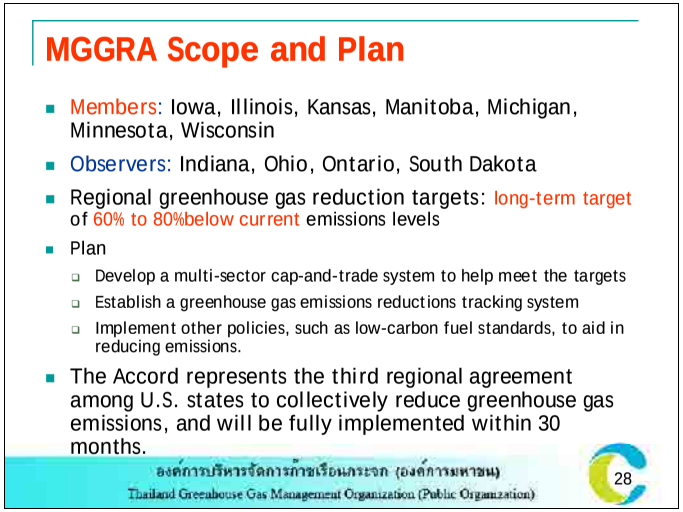
CT01-27	Target Group: G, PP



Key Points / Additional Information

- MGGA or Midwestern Greenhouse Gas Reduction Accord were first agreed in November 2007 in Milwaukee, Wisconsin by six Midwestern governors and one Canadian premiers
- Realizing the unique and major impact that the Midwestern states play in the emissions of carbon, these governors wanted to institute Midwestern practicality in the debate on global warming by establishing a Midwestern greenhouse gas reduction program to reduce greenhouse gas emissions in their states, as well as a working group to provide recommendations regarding the implementation of the Accord.
- While the Midwest has intensive manufacturing and agriculture sectors, making it the most coal-dependent region in North America, it also has world-class renewable energy resources and opportunities to allow it to take a lead role in solving the effects of climate change.

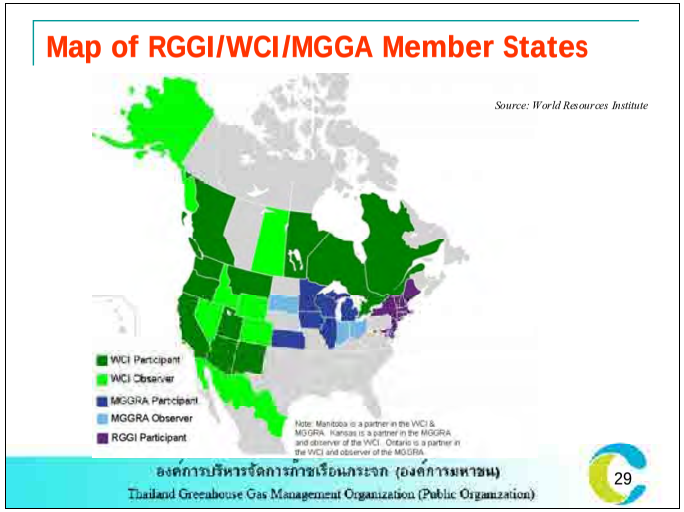
CT01-28	Target Group: G, PP



Key Points/ Additional Information

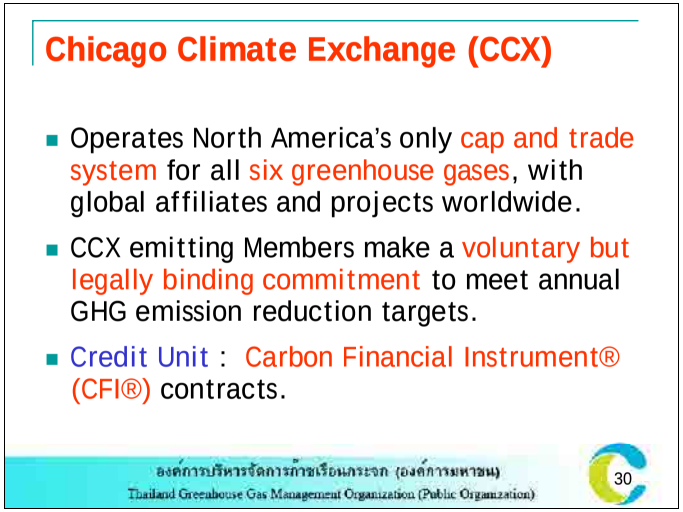
- MGGRA members consisting of the state of Iowa, Illinois, Kansas, Manitoba (Canada), Michigan, Minnesota, and Wisconsin; while there are also observers which are the state of Indiana, Ohio, Ontario (Canada), and South Dakota
- Under the Accord, members agree to establish regional greenhouse gas reduction targets, including a long-term target of 60 to 80 percent below current emissions levels, and develop a multi-sector cap-and-trade system to help meet the targets.
- Participants will also establish a greenhouse gas emissions reductions tracking system and implement other policies, such as low-carbon fuel standards, to aid in reducing emissions.
- The Accord represents the third regional agreement among U.S. states to collectively reduce greenhouse gas emissions, and will be fully implemented within 30 months.

CT01-29	Target Group: G, PP



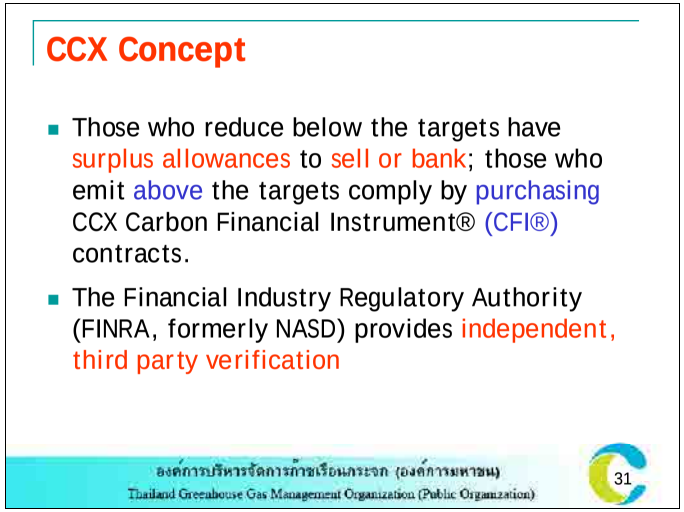
Key Points	Reference and Additional Information

CT01-30	Target Group: G, PP



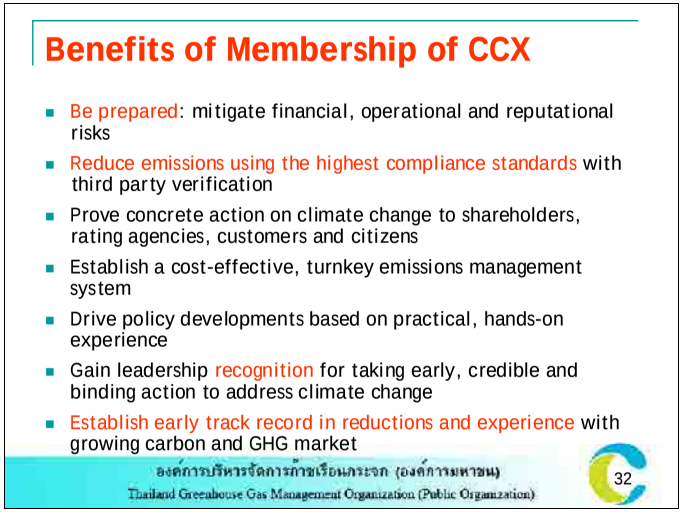
Key Points	Reference and Additional Information

CT01-31	Target Group: G, PP



Key Points	Reference and Additional Information

CT01-32	Target Group: G, PP



Key Points	Reference and Additional Information

CT01-33	Target Group: G, PP

Tokyo Cap-and-Trade (T-CAT)

Tokyo:

- Population: 13 million, GDP (2006): 815 billion US$
- Rapid increase of CO_2 emission from Commercial sector

Source : Dr. Kazuhito YAMADA, JICA expert team

	1990 ($Mt\text{-}CO_2$)	2000 ($Mt\text{-}CO_2$)	2006 ($Mt\text{-}CO_2$)	2006/1990
Industry	9.8	6.8	5.2	-47.0%
Commercial	15.7	18.9	20.6	+31.1%
Household	13.0	14.3	14.4	+11.0%
Transport	14.8	17.6	14.7	-1.1%
Others	1.0	1.2	1.0	-0.5%
Total	54.4	58.8	55.9	+2.8%

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Key Points

- Japan has a commitment to reduce GHG emission by 6% compared to 1990 emission level by 2012
- Since there is rapid increase of CO2 emission from Commercial sector, Tokyo Metropolitan Government initiated **mandatory** CO2 emission trading program called T-CAT in Tokyo Metropolitan Area

Reference and Additional Information

CT01-34	Target Group: G, PP

Concept and Scope of T-CAT

- Start: 1st April 2010
- Target Gas: energy-related CO_2
- Cap coverage: 1,400 installations (including 1,100 business facilities and 300 industrial facilities)
- Targeted facilities: consumption of fuels, heat and electricity >1,500 kl/year (crude oil equivalent)
- Compliance period: 5 years
  - 1st: 2010 to 2014
  - 2nd: 2015 to 2019

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Key Points

- T-CAT started on 1st April 2010
- Target Gas is **energy-related CO_2**
- It covers **1,400 installations** that consume fuels, heat and electricity more than 1,500 kl of crude oil equivalent /year
  - 1,100 business facilities
  - 300 industrial facilities)
- Compliance period: 5 years
  - 1st: 2010 to 2014
  - 2nd: 2015 to 2019

Reference and Additional Information

CT01-35	Target Group: G, PP

Concept and Scope of T-CAT (2)

- Compliance factor:

  1st Compliance Period: 6% or 8%

  * 6% for factories (and buildings receiving energy from district heating and cooling plants)

  * 8% for rest of the buildings

  2nd Compliance Period: 17% (planned)
- Monitoring and Reporting: every year
- Penalty:

  Non-compliance is required to reduce 1.3 times in the next period

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Key Points

Compliance factor or reduction target of T-CAT in each compliance period:

- **1st Compliance Period**
  - 6% reduction for factories (and buildings receiving energy from district heating and cooling plants)
  - 8% reduction for rest of the buildings (commercial buildings)
- **2nd Compliance Period**
  - 17% but not concluded yet.
- Monitoring and Reporting will be carried out every year
- **Penalty** for Non-compliance facility is required to reduce 1.3 times in the next period

Reference and Additional Information

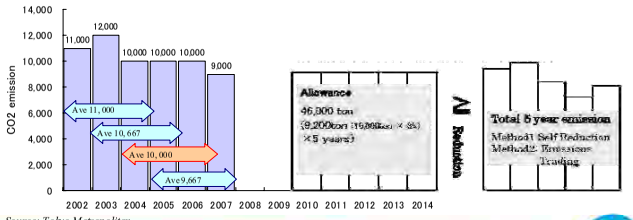
CT01-36	Target Group: G, PP

T-CAT Allowance Allocation

- Allowance allocation:

  Base year emission* × Compliance factor × Compliance period (5 years)

  *Base year emission: Average emission of past 3 years



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Thailand Greenhouse Gas Management Organization (Public Organization)
36

Key Points

Allowance allocation for each facility can be calculated by:

Base year emission* ×
Compliance factor (or reduction target) ×
Compliance period (5 years) ,where

- *Base year emission is equal to Average emission of past 3 years, which is selected by facilities

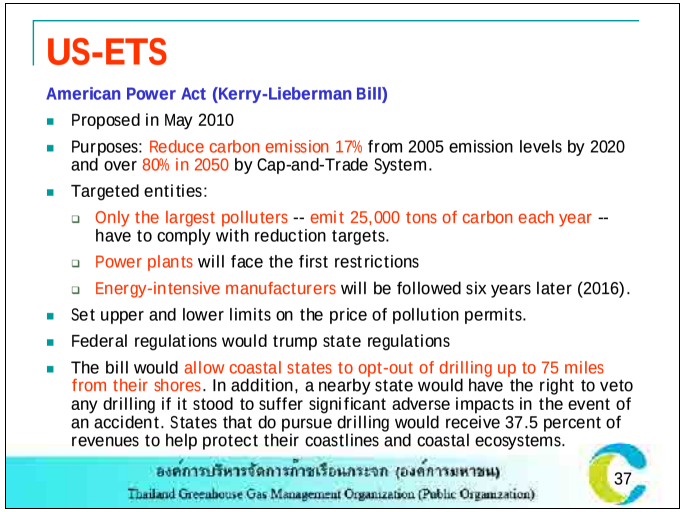
Example,

- One facility selects base year emission from 2004 to 2006, which has average emission equal to 10,000 ton CO2
- While its Compliance factor for 1st compliance period is 8% reduction
- As a result, allowance for this facility is calculated:

  10,000 ton of base year emission ×
  reduction target 8% ×
  5 years of the 1st compliance period.
  = 46,000 tonCO2 allowance

Reference and Additional Information

CT01-37	Target Group: G, PP

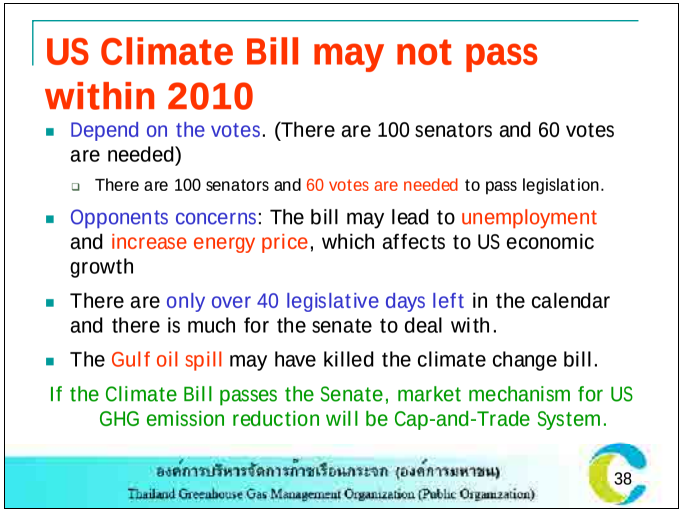


Key Points/ Additional Information

American Power Act (Kerry-Liberman Bill)

- This bill was proposed in May 2010 aiming to reduce carbon pollution for 17% from 2005 emission levels by 2020, 42% by 2030; and 83% by 2050 by capping emissions in certain sectors and allowing for trading of pollution permits.
- **Targeted entities** of this bill will cover:
  - Only the largest polluters -- those that emit 25,000 tons of carbon each year -- have to comply with reduction targets. Power plants will face the first restrictions, followed six years later by energy-intensive manufacturers.
- The regulations **will cover only about 2 percent of America's businesses, or 7,500 factories and plants**. But that 2 percent accounts for 75 percent of America's greenhouse gas emissions.
- A small percentage of the greenhouse gas emission allowances under the proposed cap-and trade system would go to domestic wildlife and natural resource protection starting in 2019.
- The bill includes a hard "price collar," or upper and lower limits, on the price of pollution permits.
- **Oil companies** would be subject to pollution allowances, but those permits would be kept off of the "carbon market."
- The **manufacturing industry** would not be required to reduce emissions until 2016. Additionally, manufacturing companies would get financial assistance in the interim period if energy bills were to go up. They would also get some assistance buying allowances after 2016.
- The states regulations would not be permitted to operate their own cap-and-trade programs after the federal regulations enacted, though the measure would provide compensation for any lost revenue for those states that have already passed such measures.
- Consumers would get rebates and energy discounts to offset any increase in the price of energy.
- Mindful of the accident in the Gulf, the bill would allow coastal states to opt-out of drilling up to 75 miles from their shores. In addition, a nearby state would have the right to veto any drilling if it stood to suffer significant adverse impacts in the event of an accident. States that do pursue drilling would receive 37.5 percent of revenues to help protect their coastlines and coastal ecosystems.

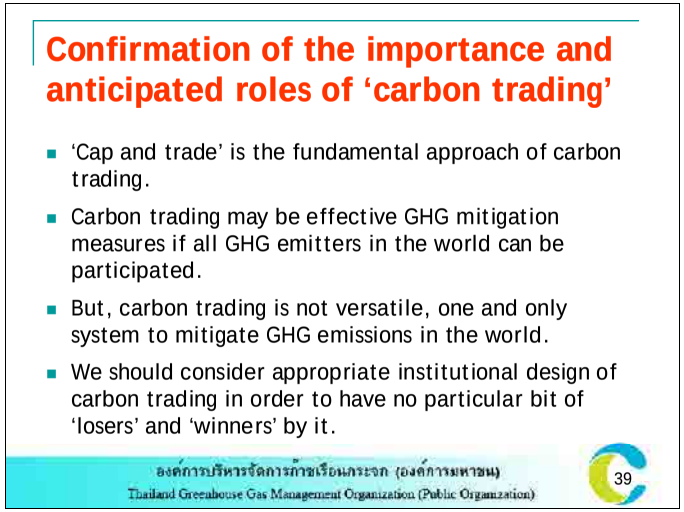
CT01-38	Target Group: G, PP



Key Points/ Additional Information

- From current situation, many analysts said that US Climate Bill may not pass within 2010.
- Lindsay Graham (Republican Senator) withdrew from the bill so it is now depending on the votes.
  - There are 100 senators in US now and 60 votes are needed to ensure passage of any legislation.
  - According to interviews conducted by Greenwire, the current vote count is this; yes - 26; probably yes - 11; no - 22; probably no - 10; fence sitters - 31.
- Opponents of the bill say that the bill may lead to unemployment and increase energy price, which affects to US economic growth
- Since there are only just over 40 legislative days left in the calendar and there is much for the senate to deal with apart from climate change legislation. There may simply not be enough time to get it done this year.
- The Gulf oil spill may have killed the climate change bill - In March 2010, President Obama unveiled a plan for offshore drilling. In the face of the oil spill, President Obama has put a halt on offshore drilling and it will be some time before the ban is lifted.
- Given the limited days before the mid term elections in November and the strong opposition against a cap-and-trade system, the already low probability for passing climate change legislation has got lower.
- However, if the bill passes the senate, the US market mechanism for GHG emission reduction will be cap-and-trade system.

CT01-39	Target Group: G, PP



Key Points

- 'Cap-and-trade' is the fundamental approach of market mechanism for GHG emission reduction.
- However, carbon trading may be an effective GHG mitigation measure **if all GHG emitters in the world can be participated**.
- Carbon trading is not versatile, not the one and only system to mitigate GHG emissions in the world.
- We should consider **appropriate institutional design of carbon trading** in order to have no particular bit of 'losers' and 'winners'.

Reference and Additional Information

CT01-40	Target Group: G, PP

UNFCCC Structure and Negotiations

Target Groups

Code	Target group
G	General audience, project proponent, public organization in Thailand

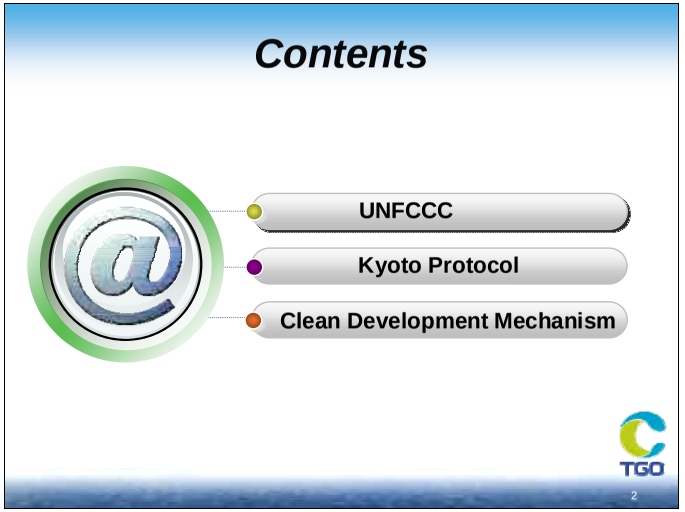
Update History

Version	Date	Update Contents
01	29/07/2010	Initial adoption

UN 01-01	Target Group: G

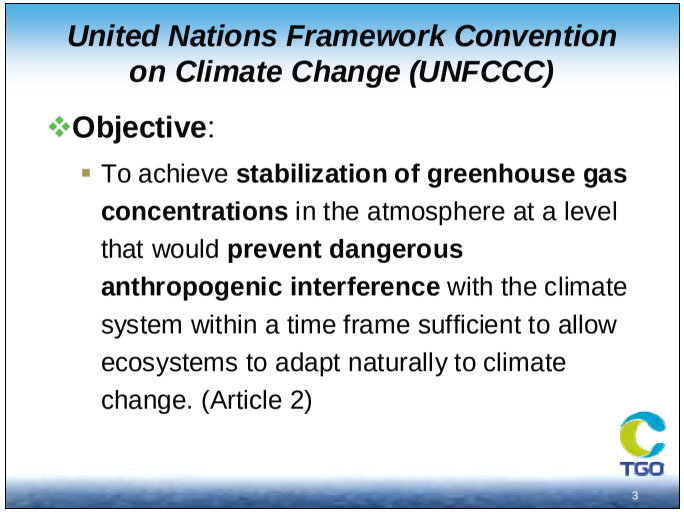
(Mention that history or update of international negotiation on climate change is not covered in this presentation)

UN 01-02	Target Group: G



Key Points	Reference and Additional Information

UN 01-03	Target Group: G



Key Points

- UNFCCC Article 2

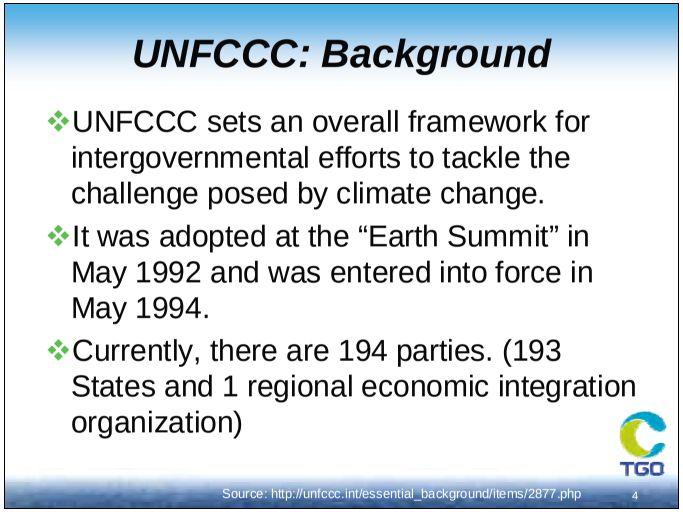
The **ultimate objective** of this convention … is to achieve… stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Reference and Additional Information

- Text of UNFCCC

http://unfccc.int/essential_background/convention/background/items/2853.php

UN 01-04	Target Group: G



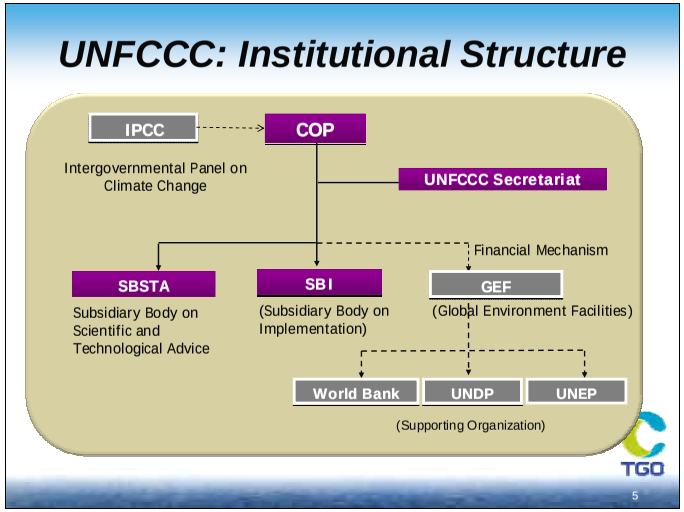
Key Points

Reference and Additional Information

- Status of ratification

http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php

UN 01-05	Target Group: G



Key Points

Conference of the Parties (COP)

- The supreme body of the UNFCCC
- review the implementation of the UNFCCC
- adopt decisions to further develop the UNFCCC's rules, and negotiate new commitments.

Secretariat:

- makes arrangements for sessions of the UNFCCC bodies,
- helps Parties to fulfill their commitments, compiles and disseminates data and information
- confers with other relevant international agencies and treaties.
- It is based in Bonn, Germany.

Subsidiary Body for Scientific and Technological Advice (SBSTA):

- SBSTA provides advice to the COP on matters of science, technology, and methodology, including guidelines for improving standards of national communications and emission inventories.
- SBSTA meets at least twice a year

Subsidiary Body for Implementation (SBI)

- SBI helps the COP to assess and review the UNFCCC's implementation
- deals with financial and administrative matters.
- held at the same time as SBSTA sessions.

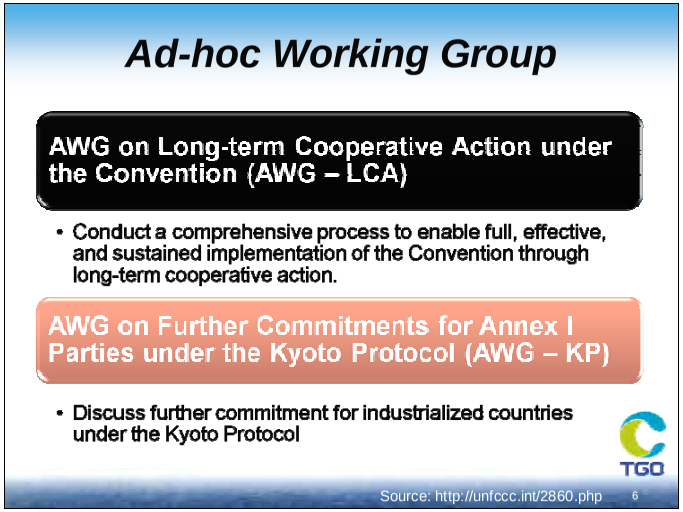
The Intergovernmental Panel on Climate Change (IPCC):

- an independent institution created by the World Meteorological Organization and the UNEP
- IPCC works with the UNFCCC and is a crucial source of information on climate change.
- It publishes a comprehensive progress report on the state of climate change science every five years, as well as Special Reports or Technical Papers on specific issues at the request of the COP or SBSTA.

The Global Environment Facility (GEF)

- the UNFCCC's financial mechanism, which channels funds to developing countries on a grant or loan basis, including funds received from Annex II Parties.
- As part of the Marrakesh Accords agreed to at COP 7 (Marrakesh, Morocco, 2001), the GEF expanded the scope of activities eligible for funding, including work on adaptation and capacity-building.
- The GEF manages the Special Climate Change Fund (SCCF) and the LDC Fund.
- World Bank, UNDP, and UNEP are supporting organization to GEF, help managing fund.

UN 01-06	Target Group: G



Key Points

Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA) COP13

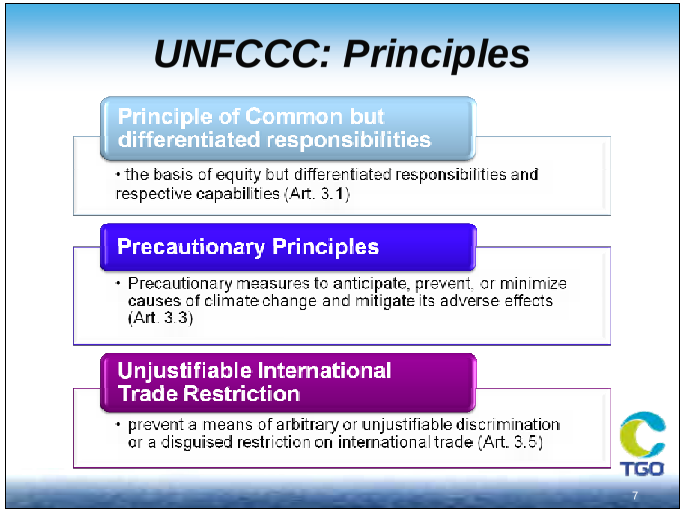
- a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its 15th session.
- It decided that the process shall be conducted under a subsidiary body under the Convention, the AWG-LCA, that shall complete its work in 2009 and present the outcome of its work to the COP for adoption at its 15th session.

Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP)

- To discuss future commitments for industrialized countries under the Kyoto Protocol

Reference and Additional Information

UN01-07	Target Group: G



Key Points and Additional Information

- Some of the major principles of UNFCCC

Art. 3.1

- "The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof."

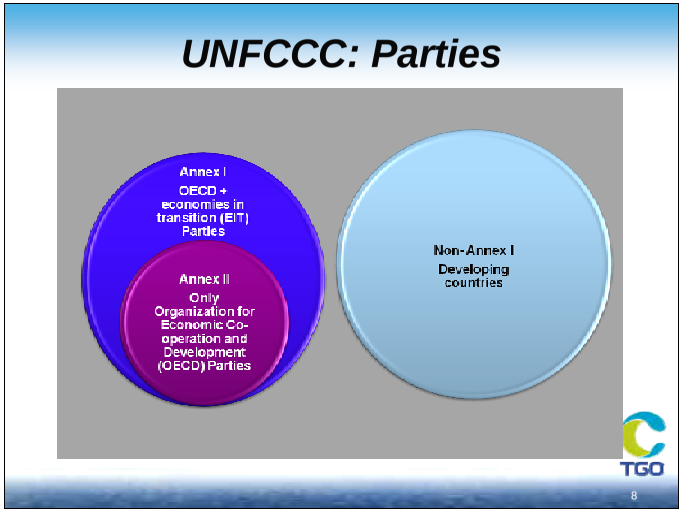
Art.3.3

- "The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. …"

Art. 3.5

- "The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade."

UN01-08	Target Group: G



Key Points and Additional Information

Annex I Parties

- include the industrialized countries that were members of the OECD (Organization for Economic Co-operation and Development) in 1992,
- plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

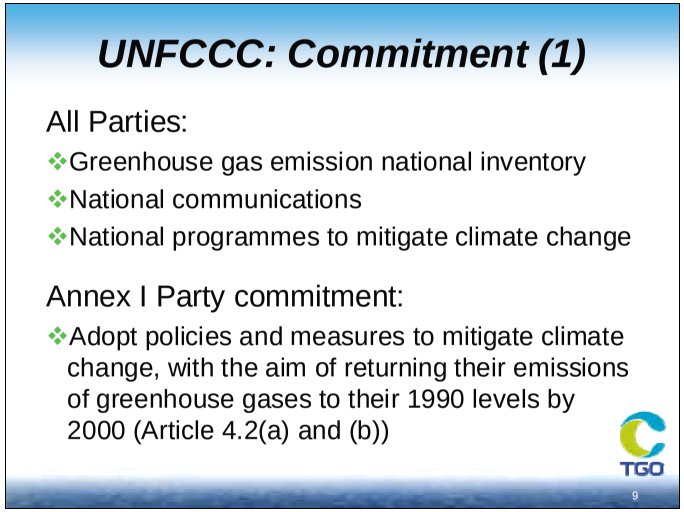
Annex II Parties

- consist of the OECD members of Annex I, but not the economic in transition (EIT) Parties.
- They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change.
- They have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries.
- Funding provided by Annex II Parties is channeled mostly through the Convention's financial mechanism.

Non-Annex I Parties

- mostly developing countries. Certain groups of developing countries are recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought.
- Others (such as countries that rely heavily on income from fossil fuel production and commerce) feel more vulnerable to the potential economic impacts of climate change response measures.
- The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology transfer.

UN01-09	Target Group: G



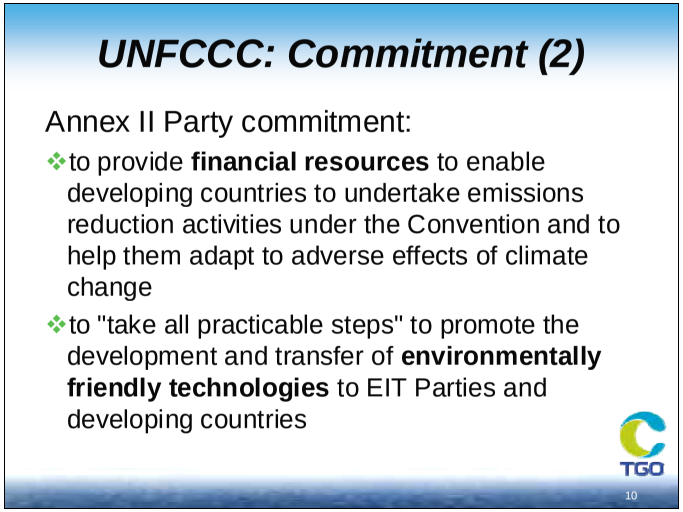
Key Points

Art. 4 Commitments

- All Parties, taking into account their **common but differentiated responsibilities** and their specific national and regional development priorities, objectives and circumstances, shall:
- Develop, periodically update, publish and make available to the COP, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the COP;
- Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change

Reference and Additional Information

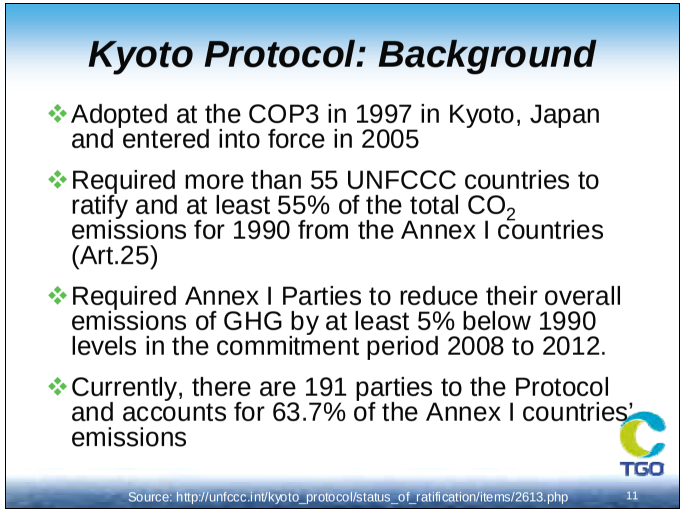
UN01-10	Target Group: G



Key Points

Reference and Additional Information

UN01-11	Target Group: G



Key Points

Art 3.1

- The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by **at least 5 per cent below 1990 levels in the commitment period 2008 to 2012**.

Art. 25

- This Protocol shall enter into force on the 90th day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex 1 which accounted in total for at least 55% of the total CO2 emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession.

- For the purpose of this Article, "the total carbon dioxide emissions for 1990 of the Parties included in Annex I" means the amount communicated on or before the date of adoption of this Protocol by the Parties included in Annex I in their first national communications submitted in accordance with Article 12 of the Convention.

Ratification to entry into force

- USA withdrew the KP so the total CO2 did not reach 55%.
- Russia ratified the KP later which increased the total CO2 emission to more than 55%. And then KP entered into force.

Reference and Additional Information

- Text of Kyoto Protocol

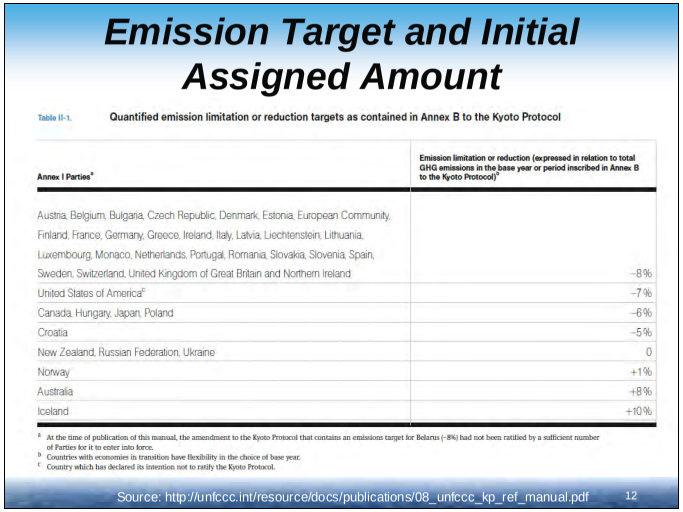
http://unfccc.int/kyoto_protocol/items/2830.php

- Status of ratification

http://unfccc.int/kyoto_protocol/

status_of_ratification/items/2613.php

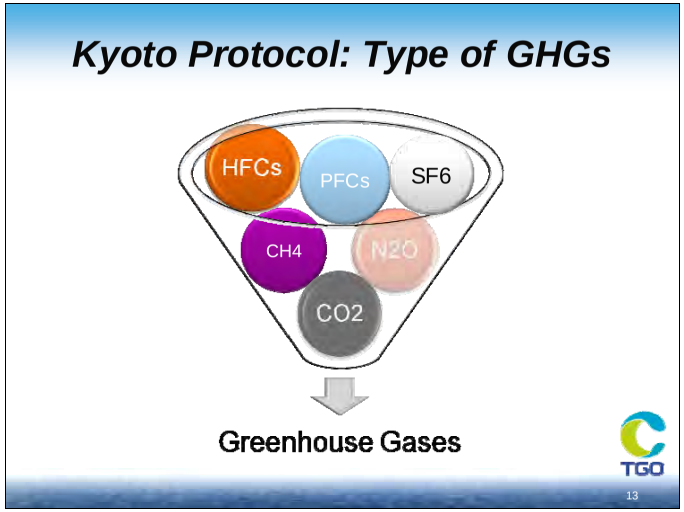
UN01-12	Target Group: G



Key Points

Reference and Additional Information

UN01-13	Target Group: G



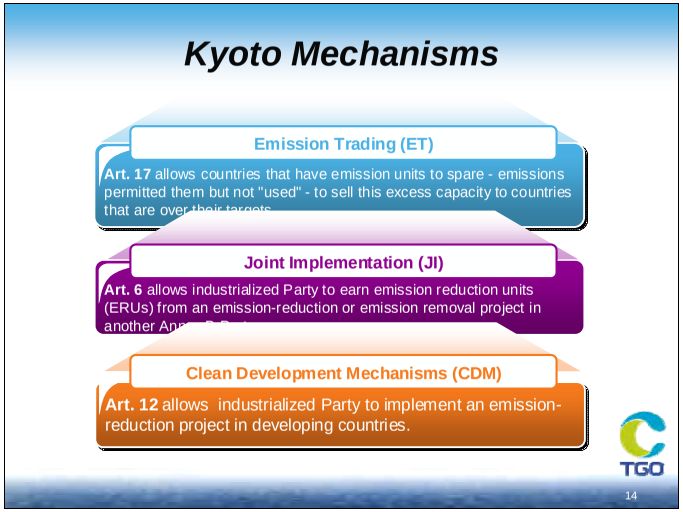
Key Points

The Protocol addresses six main greenhouse gases

1. Carbon dioxide (CO2)
2. Methane (CH4)
3. Nitrous oxide (N2O)
4. Hydrofluorocarbons (HFCs)
5. Perfluorocarbons (PFCs)
6. Sulphur hexafluoride (SF6)

Reference and Additional Information

UN01-14	Target Group: G



Key Points and Additional Information

The Kyoto mechanisms:

- Stimulate sustainable development through technology transfer and investment
- Help Annex I Parties to meet their targets by reducing emissions or removing carbon from the atmosphere in other countries in a cost-effective way
- Encourage the private sector and developing countries to contribute to emission reduction efforts

ET (Carbon Market)

- Parties with commitments under the Kyoto Protocol (Annex B Parties) have accepted targets for limiting or reducing emissions. These targets are expressed as levels of allowed emissions, or “assigned amounts,” over the 2008-2012 commitment period.
- The allowed emissions are divided into “assigned amount units” (AAUs).
- Article 17 of the Kyoto Protocol, allows countries that have emission units to spare - emissions permitted them but not "used" - to sell this excess capacity to countries that are over their targets.

JI

- Article 6, allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another Annex B Party which can be counted towards meeting its Kyoto target.
- Joint implementation offers Parties a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while the host Party benefits from foreign investment and technology transfer.

CDM

- Article 12, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries.
- Such projects can earn saleable certified emission reduction (CER) credits which can be counted towards meeting Kyoto targets.
- The mechanism stimulates sustainable development and emission reductions, while giving industrialized countries some flexibility in how they meet their emission reduction or limitation targets.

UN01-15	Target Group: G

CDM & Carbon Credit from CDM

- **Purpose of CDM** (KP Art.12.2)
  - To assist Annex I Parties in achieving compliance with their emissions reduction targets of the Kyoto Protocol
  - To assist non-Annex I Parties in achieving sustainable development and in contributing to the ultimate objective of the UNFCCC
- **Annex I Parties** : carry out project activities to reduce GHG emissions
  - Credits will be issues based on emission reduction

Credits from CDM = Certified emission reductions (CERs) unit : ton CO2equivalent/year

- Annex I Parties can use CERs to achieve their commitments under the Kyoto Protocol

TGO

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Key Points

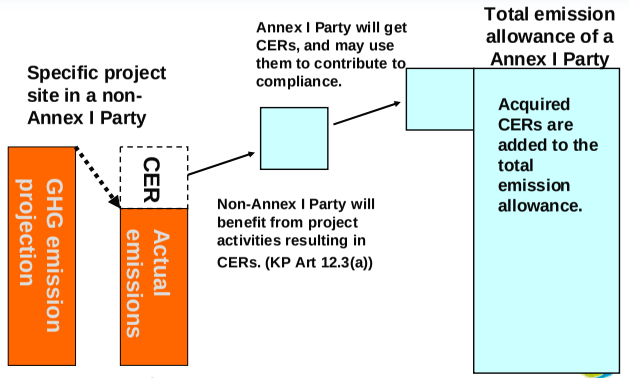
Reference and Additional Information

- CDM website

http://cdm.unfccc.int/index.html

UN01-16	Target Group: G

Carbon Credit from CDM



Source: IGES (June 2010)

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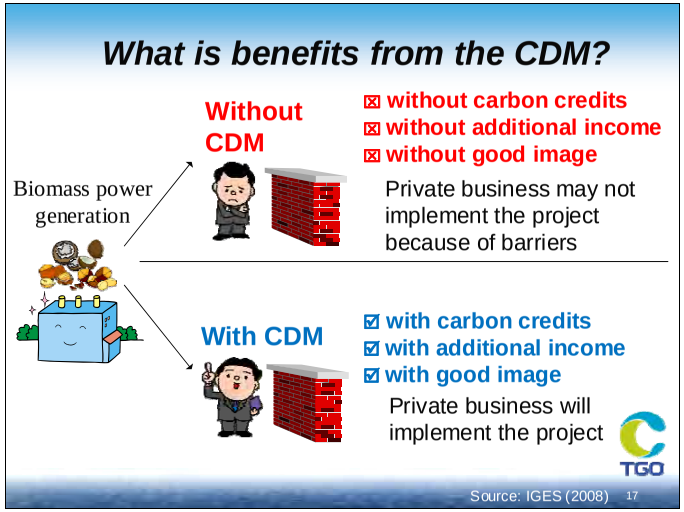
Key Points

- Annex I Parties which have ceilings for GHG emissions (emission caps), assist non-Annex I Parties which don't have emission caps, to implement project activities to reduce GHG emissions (or remove by sinks),
- and credits will be issued based on emission reductions (or removals by sinks) achieved by the project activities.
  - A Party where CDM project is implemented is called a host Party.
  - The credit from the CDM is called certified emission reduction (CER).
- Annex I Parties can use CERs to contribute to compliance of their quantified GHG emissions reduction targets of the Kyoto Protocol.
  - As a result, the amount of emission cap of Annex I Parties will increase.

Reference and Additional Information

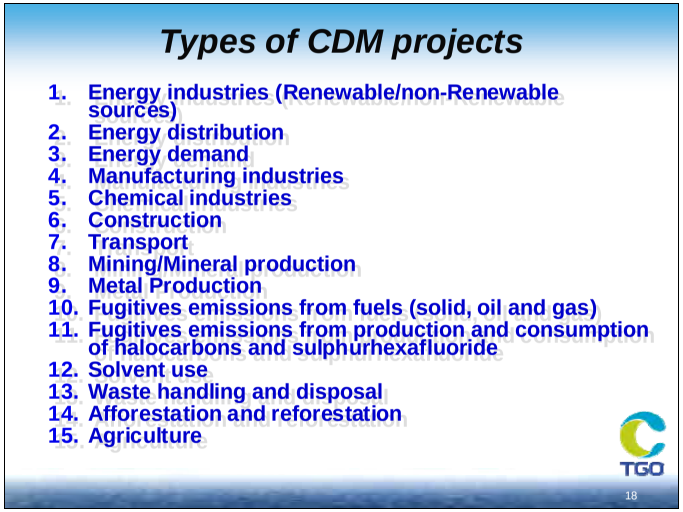
Source: "CDM in Charts" 2010 Ministry of Environment, Japan, Institute for Global Environmental Strategies

UN01-17	Target Group: G



Key Points	Reference and Additional Information

UN01-18	Target Group: G



Key Points	Reference and Additional Information
- Most popular types of CDM project activities in Thailand are so far • Sector 1 Energy Industries (e.g. introduction of renewable power generation like biomass), and • Sector 13 Waste handling (e.g. avoidance of methane emissions from solid waste disposal site or wastewater)	- Sectoral Scopes of CDM http://cdm.unfccc.int/DOE/scopes.html