CDM 10:
AR - CDM/ current situation and issues

23rd November 2010

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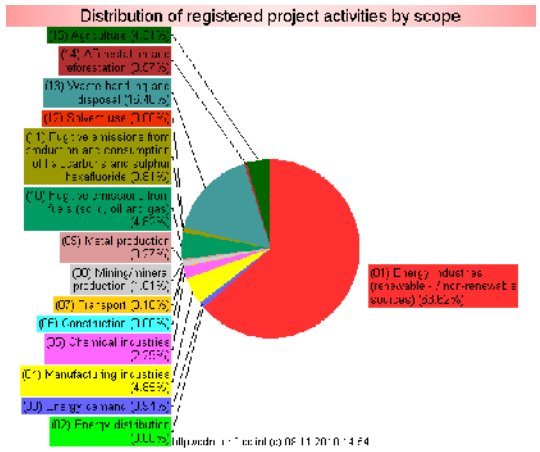
Contents สารบัญ

1. Current status of A/R CDM
1.1 Current status of CDM

1. สถานะปัจจุบันของ CDM ภาคป่าไม้
1.1 สถานะปัจจุบันของ CDM

- No. of registered projects (as of 8 Nov. 2010) : Total: 2,969, A/R: 17 (0.57%)
- Differences from emission reduction project include "non-permanence": Risk that removals by sinks are reversed because of death etc.

- จำนวนโครงการที่ได้มีการขึ้นทะเบียนแล้ว (ณ วันที่ 8 พฤศจิกายน 2553) : รวม : 2,969 โครงการ, ภาคป่าไม้: 17 โครงการ (0.57%)
- ความแตกต่างจากโครงการการลดการปลดปล่อยก๊าซเรือนกระจกจากโครงการอื่น คือความไม่ถาวร: มีความเสี่ยงที่ว่าการดูดซับก๊าซของต้นไม้ก๊าซอาจปลดปล่อยออกมาได้หากต้นไม้ตาย



Source: UNFCCC

1.2 Registered A/R CDM projects

1.2 โครงการ CDM ภาคป่าไม้ ที่ได้ทำการขึ้นทะเบียนแล้ว

- Projects (17):
  In 2006; 1
  In 2009; 10
  In 2010; 6
- Methodology (18):
  AM0001; 3
  AM0003; 4
  AMS0001; 7

- โครงการ (17):
  ปี พ.ศ. 2549; 1
  ปี พ.ศ. 2552; 10
  ปี พ.ศ. 2553; 6
- หลักการ (18):
  AM0001; 3
  AM0003; 4
  AMS0001; 7

No.	Registered	Host Parties	Other Parties	Methodology	Removals (tCO2-e/yr)
1	06/11/10	China	Italy, Spain	AR-AM0001 ver. 2	25,795
2	09/1/30	Moldova	Canada etc.	AR-AM0002 ver. 1	179,242
3	09/3/23	India		AR-AMS0001 ver. 4	11,596
4	09/4/28	Viet Nam		AR-AMS0001 ver. 4	2,665
5	09/6/5	India		AR-AM0001 ver. 2	57,792
6	09/6/11	Bolivia	Belgium	AR-AMS0001 ver. 4	4,341
7	09/8/21	Uganda	Italy	AR-AMS0001 ver. 5	5,564
8	09/9/6	Paraguay	Japan	AR-AMS0001 ver. 4	1,523
9	09/11/16	China		AR-AM0003 ver. 3	23,030
10	09/11/16	Peru		AR-AM0003 ver. 4	48,689
11	09/12/7	Ethiopia	Canada	AR-AM0003 ver. 4	29,343
12	10/1/2	Albania	Italy	AR-AM0003 ver. 4	22,964
13	10/1/15	India	UK	AR-AMS0001 ver. 5	3,594
14	10/4/16	Colombia		AR-AM0004 ver. 3	37,783
15	10/5/27	Chile	UK	AR-AMS0001 ver. 5	9,292
16	10/7/21	Brazil	Netherlands	AR-AM0005 ver. 2	75,783
17	10/9/15	China	Spain	AR-ACM0001 ver. 3	87,308
				Av. (large- scale)	58,773
				Av. (Small- scale)	5,511
				Av. (Total)	36,841

Source: UNFCCC

2. Basic Rules for A/R CDM
2.1 Advantage of A/R CDM Project Activity

2. กฎพื้นฐานสำหรับ CDM ภาคป่าไม้
2.1 ประโยชน์จากกิจกรรมโครงการ CDM ภาคป่าไม้

- A/R CDM project activity can:
  - be possible to absorb large volume of CO2 by low cost in case of large-scale of planting; and
  - contribute not only CO2 absorption but also environmental improvement/ regional development.

- กิจกรรมในโครงการ CDM ภาคป่าไม้สามารถ:
  - มีความเป็นไปได้ที่จะดูดซับก๊าซคาร์บอนไดออกไซด์ได้มากโดยมีค่าใช้จ่ายต่ำในกรณีการปลูกป่าในโครงการ CDM ขนาดใหญ่
  - ไม่เพียงแต่ดูดซับก๊าซคาร์บอนไดออกไซด์แต่ยังปรับปรุงสภาพแวดล้อมให้ดีขึ้น และการพัฒนาส่วนท้องถิ่น

2.2 Issues on A/R CDM & their solutions

2.2 ปัญหาเกี่ยวกับ CDM ภาคป่าไม้ และ การแก้ไข

- Issues:
  - Non-permanence (Forest will be vanishing someday.)
  - Uncertainty (Impossible to predict accurate amount of removals)
  - Long-term (necessary for forest growth)
- Solution:
  - Non-permanence -> CER (long-term/ short-term)
  - Uncertainty -> prediction by adequate sampling/ statistical methods
  - Long-term -> long-term crediting period

- ปัญหา:
  - ความไม่ถาวร (สักวันป่าจะหมดไป)
  - ความไม่แน่นอน (ไม่สามารถที่จะคาดการณ์ปริมาณก๊าซที่ถูกกักเก็บได้อย่างถูกต้อง
  - ระยะยาว (จำเป็นสำหรับความเติบโตของป่าไม้)
- การแก้ไข:
  - ไม่ถาวร -> CER (ระยะยาว/ ระยะสั้น)
  - ความไม่แน่นอน -> การทำนายโดยการสุ่มตัวอย่างอย่างเพียงพอ / วิธีการทางสถิติ
  - ระยะยาว -> ระยะเวลาในการคิดเครดิตระยะยาว

2.3 What is A/R CDM Project Activity?

2.3 อะไรคือกิจกรรมโครงการ CDM ภาคป่าไม้

- Definition of FOREST
  - (a) A single minimum tree crown cover value between 10 and 30 %;
  - (b) A single minimum land area value between 0.05 and 1 hectare;
  - (c) A single minimum tree height value between 2 and 5 meters

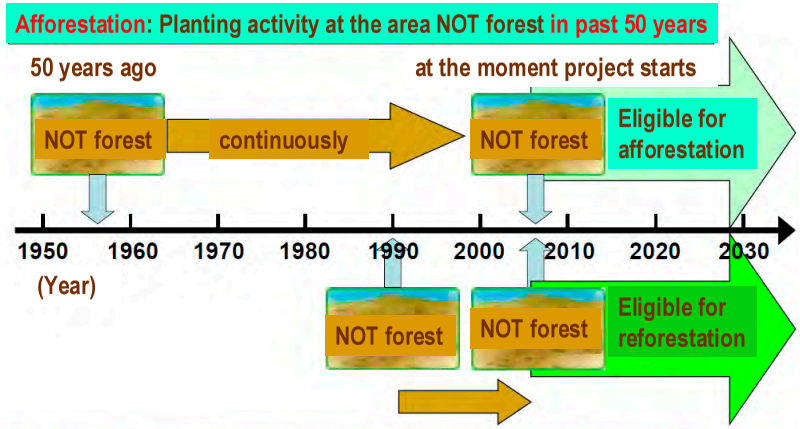
- คำนิยามของป่าไม้
  - (a) มีค่าการปกคลุมของเรือนยอดระหว่าง 10 - 30%;
  - (b) มีพื้นที่ระหว่าง 0.05 - 1 เฮคแตร์;
  - (c) ต้นไม้มีความสูงระหว่าง 2 - 5 เมตร

At not forest area — By planting activities — Project activity to create forested area

Source: JIFPRO

2.4 Eligibility of lands

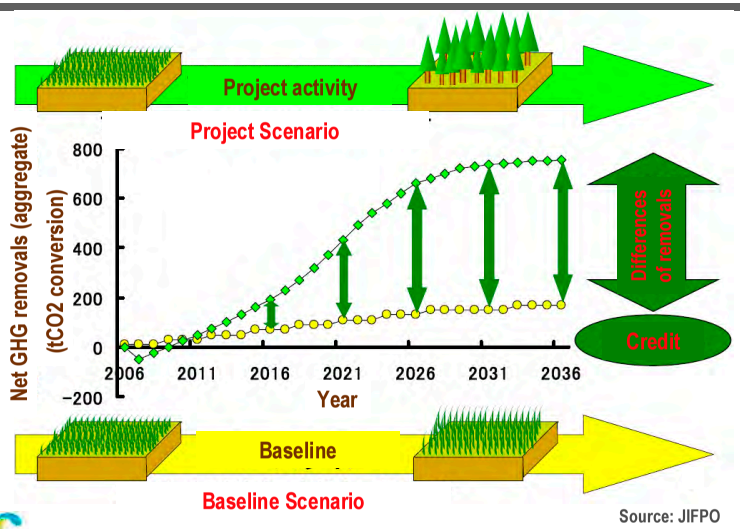
2.4 คุณสมบัติของพื้นที่



Source: JIFPRO

2.5 Credit to be able to achieve by A/R CDM

2.5 เครดิตเพื่อให้บรรลุตามโครงการ CDM ภาคป่าไม้



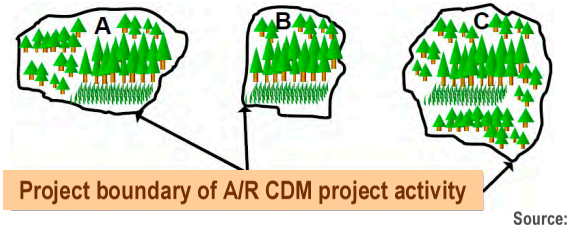
Source: JIFPO

2.6 Project boundary

2.6 ขอบเขตโครงการ

- Geographically delineates project activity under the control of the PPs.
- More than one discrete areas of land
  - Each: a unique geographical identification;
  - Not include the areas in between these discrete areas of land.

- อธิบายลักษณะภูมิศาสตร์ของพื้นที่อย่างชัดเจนภายใต้การควบคุมของผู้ร่วมโครงการ
- มากกว่าหนึ่งพื้นที่ที่ไม่ต่อเนื่อง
  - แต่ละพื้นที่: มีการบ่งชี้ลักษณะทางภูมิศาสตร์
  - ไม่รวมพื้นที่ที่อยู่ระหว่างพื้นที่ที่ไม่ต่อเนื่อง



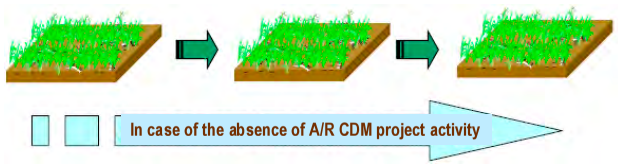
Source: JIFPO

2.7 Baseline Scenario

2.7 กรณีฐาน

- The baseline scenario for an A/R CDM project activity is the scenario that reasonably represents the sum of the changes in carbon stocks in the carbon pools within the project boundary that would occur in the absence of the A/R CDM project activity.

- กรณีฐานของ CDM ภาคป่าไม้ คือ กรณีที่แสดงถึงการเปลี่ยนแปลงของปริมาณการเก็บกักคาร์บอนในแหล่งสะสมคาร์บอนภายในขอบเขตโครงการที่เกิดขึ้นในขณะที่ไม่มีโครงการ



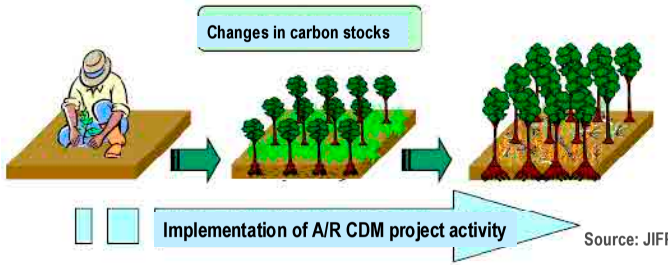
Source: JIFPO

2.8 Project Activity

2.8 กิจกรรมโครงการ

- An A/R CDM project activity is an afforestation or reforestation measure, operation or action that aims at achieving net anthropogenic GHG removals by sinks.

- กิจกรรมโครงการ CDM ภาคป่าไม้ คือ การปลูกป่าหรือ การฟื้นฟูป่า, การดำเนินการหรือกระทำเพื่อบรรลุวัตถุประสงค์ในการดูดซับก๊าซเรือนกระจกจากกิจกรรมของมนุษย์



Source: JIFPO

2.9 Calculation of net anthropogenic GHG removal by sink

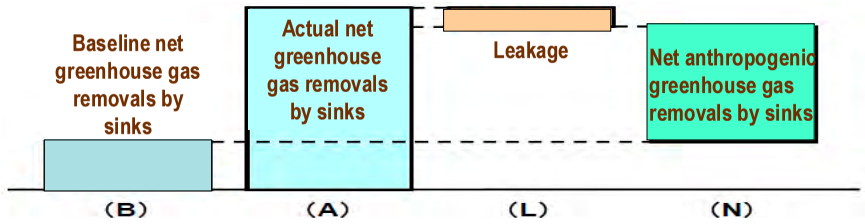
2.9 การคำนวณปริมาณการดูดซับก๊าซเรือนกระจกที่เกิดจากกิจกรรมของมนุษย์

$N = A - B - L$

- N: Net anthropogenic greenhouse gas removals by sinks
- A: Actual net greenhouse gas removals by sinks
- B: Baseline net greenhouse gas removals by sinks
- L: Leakage

$N = A - B - L$

- N: ปริมาณก๊าซเรือนกระจกสุทธิที่ดูดซับได้จาก กิจกรรมของมนุษย์
- A: ปริมาณก๊าซเรือนกระจกสุทธิที่ดูดซับได้จริง
- B: ข้อมูลฐานของปริมาณก๊าซเรือนกระจกที่ดูด ซับได้
- L: การรั่วไหล



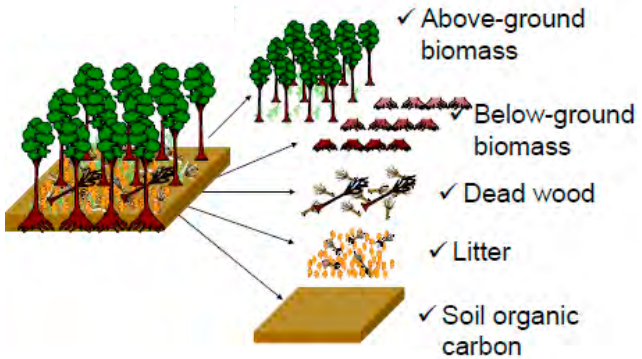
Source: JIFPO

2.10 Carbon Pools

2.10 แหล่งสะสมคาร์บอน

PPs should evaluate 5 carbon pools for calculation on change of carbon removals.

ผู้เข้าร่วมโครงการควรพิจารณา 5 แหล่งสะสมคาร์บอน สำหรับคำนวณความเปลี่ยนแปลงของการดูดซับคาร์บอน



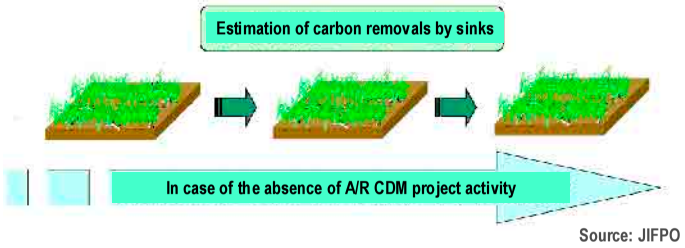
Source: JIFPO

2.11 Calculation of Baseline net GHG removals by sinks

2.11 การคำนวณข้อมูลฐานของปริมาณก๊าซเรือนกระจกที่ดูดซับได้

- Total amount on change of carbon removals of carbon pools in project boundary
- = Living biomass

- ผลรวมการเปลี่ยนแปลงทั้งหมดของปริมาณการดูดซับคาร์บอนจากแหล่งสะสมคาร์บอนในเขตโครงการ
- = ชีวมวล



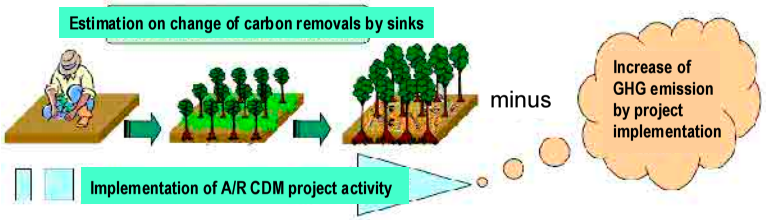
Source: JIFPO

2.12 Calculation of Actual net GHG removals by sinks:

2.12 การคำนวณปริมาณก๊าซเรือนกระจกสุทธิที่ดูดซับได้จริง

- Total amount on change of carbon removals of carbon pools in project boundary
- = Living biomass
- – Emission by project (increase of emission in project boundary)

- ผลรวมของการเปลี่ยนแปลงทั้งหมดของปริมาณการดูดซับคาร์บอน จากแหล่งสะสมคาร์บอนในเขตโครงการ
- = ชีวมวล
- ลบก๊าซที่ถูกปล่อยจากการดำเนินโครงการ (การเพิ่มขึ้นของการปล่อยก๊าซในขอบเขตโครงการ)



Source: JIFPO

2.13 Non-permanence of A/R CDM (tCER and lCER)

- Temporary CERs (tCER) and long-term CERs (lCERs):
  - The PPs shall select one of the following approaches to addressing non-permanence of an A/R CDM project activity
    (a) issuance of tCERs for the net GHG removals by sinks achieved by the project activity since the project starting date;
    or
    (b) issuance of lCERs for the net GHG removals by sinks achieved by the project activity during each verification period

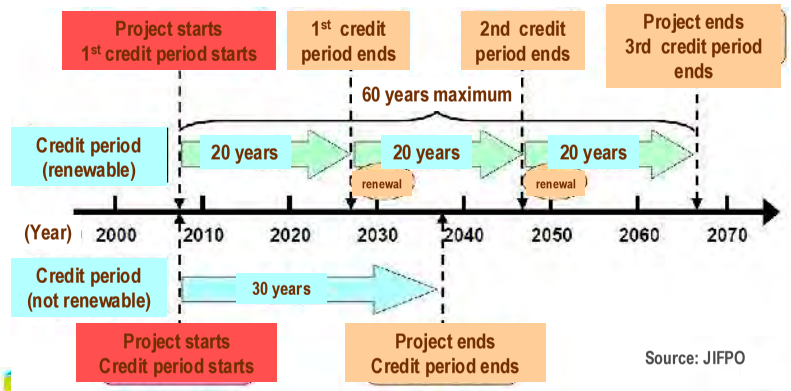
2.13 ความไม่ถาวรของ CDM ภาคป่าไม้ (tCER and lCER)

- ใบรับรองการการปล่อยก๊าซเรือนกระจกแบบชั่วคราว (tCER) และใบรับรองการปล่อยก๊าซเรือนกระจกแบบระยะยาว (lCERs):
  - ผู้เข้าร่วมโครงการจะต้องเลือกหนึ่งในวิธีการดังต่อไปนี้เพื่อเข้าถึงความไม่ถาวรของกิจกรรมโครงการของ CDM ในภาคป่าไม้
    (a) การออก tCERs จะทำได้เมื่อมีการดูดซับก๊าซเรือนกระจกจากการดำเนินโครงการโดยเริ่มตั้งแต่วันที่ที่เริ่มโครงการ
    หรือ
    (b) การออก lCERs จะทำได้เมื่อมีการดูดซับก๊าซเรือนกระจกจากการดำเนินโครงการโดยอยู่ในช่วงระยะเวลาการตรวจสอบ

2.14 Crediting Period

2.14 ระยะเวลาในการคิดเครดิต

- It begins at the start of the A/R CDM project activity and can be either:
  - A maximum of 20 years, may be renewed twice (total 60 years maximum)
  - A maximum of 30 years
- เริ่มตั้งแต่วันที่เริ่มดำเนินโครงการ และสามารถเลือกได้สองแบบดังนี้:
  - ระยะเวลาสูงสุด 20 ปี และอาจต่อได้อีก 2 ครั้ง (รวมสูงสุด 60 ปี)
  - ระยะเวลาสูงสุด 30 ปี



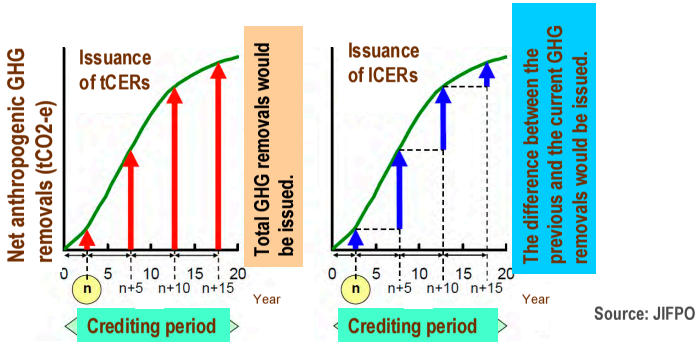
Source: JIFPO

2.15 Issuance of tCER/ lCER

- The initial verification and certification of an A/R CDM project activity may be undertaken at a time selected by the PPs. Thereafter, verification and certification shall be carried out every 5 years until the end of the crediting period.

2.15 การออก tCER/ lCER

- การตรวจสอบและรับรองคาร์บอนเครดิตของโครงการจะถูกกำหนดโดยผู้พัฒนาโครงการ และจะกระทำต่อเนื่องทุกๆ 5 ปี



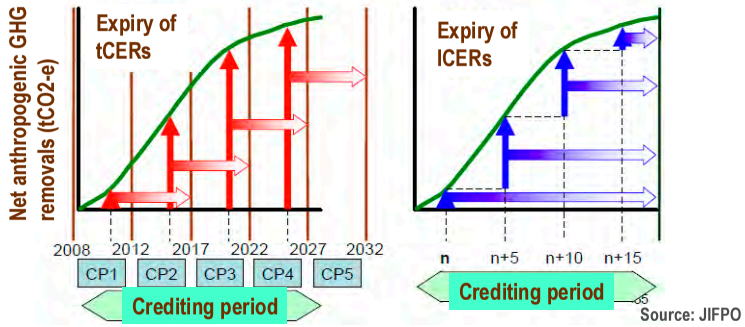
Source: JIFPO

2.16 Expiry of tCER/ lCER

2.16 วันหมดอายุของ tCER/ lCER

Each tCER shall expire at the end of the commitment period subsequent to the commitment period for which it was issued.
Each lCER shall expire at the end of the crediting period.

tCER จะหมดอายุเมื่อสิ้นสุดพันธกรณี ภายหลังจากพันธกรณีที่ออกใบรับรอง
lCER จะหมดอายุเมื่อสิ้นสุดระยะเวลาในการคิดเครดิต



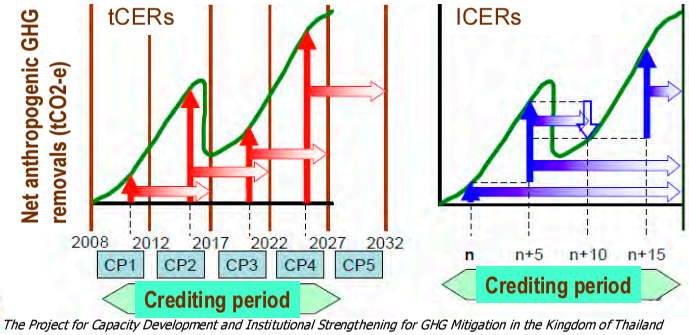
Source: JIFPO

2.17 Replacement of CERs

2.17 การทดแทน CERs

tCERs: Even when trees are cut right after tCERs are issued, the tCERs are still valid during the CP which they are issued.
ICERs: Where the certification report indicates a reversal of GHG removals since the previous certification, an equivalent quantity of CERs shall be replaced.

tCERs: แม้ว่าต้นไม้ถูกตัดแล้วหลังจากการออกใบรับรอง tCERs จะยังคงมีอายุในระหว่างช่วงพันธกรณีซึ่งได้รับการรับรองแล้ว
ICERs: รายงานการรับรองที่แสดงให้เห็นถึงปริมาณการปลดปล่อยก๊าซเรือนกระจกที่ลดลงจากที่ได้รับการรับรองก่อนหน้า ฉนั้นปริมาณเทียบเท่าของ CERs จะต้องถูกชดใช้คืน



Source: JIFPO

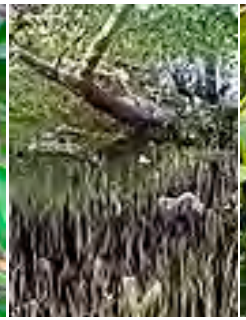
Typical mangrove species:

ตัวอย่างพันธ์ไม้ป่าชายเลน:

Genera in several families, in particular *Rhizophora* and related genera (family Rhizophoraceae), and *Avicenia* (family Verbenaceae or Avicenniaceae).

แบ่งออกเป็นหลายสายพันธ์ โกงกาง และ ตระกูลที่เกี่ยวข้อง (วงศ์ Rhizophoraceae) และแสม (วงศ์ Verbenaceae or Avicenniaceae)

Rhizophaora mucronata
Prop-root & Propagules



Avicenia marina
Aerial-root & Seeds

Source: Wikipedia

2.18 Demonstration of Additionality 1

2.18 การแสดงส่วนเพิ่มเติม 1

- PPs shall demonstrate the additionalities:
  - Net anthropogenic removals will increase those that would have occurred in the absence of the A/R CDM.
  - Project activity can be implemented, if the project is approved as A/R CDM. It will be demonstrated by financial analysis/ barrier analysis.

- ผู้เข้าร่วมโครงการจะต้องพิสูจน์ว่าโครงการมี additionality ดังต่อไปนี้:
  - โครงการมีปริมาณการดูดซับก๊าซเรือนกระจกเพิ่มมากขึ้นเมื่อเทียบกับการไม่มีโครงการ
  - กิจกรรมโครงการจะสามารถดำเนินการต่อเมื่อโครงการได้รับการอนุมัติให้เป็นโครงการ CDM ซึ่งจะถูกพิจารณาจากการวิเคราะห์ทางด้านการเงินและการวิเคราะห์อุปสรรคในการดำเนินงาน

2.19 Demonstration of Additionality 2

2.19 การแสดงส่วนเพิ่มเติม 2

- Financial Analysis:
  The evidence that IRR (internal rate of return) will NOT exceed bench mark without financial profit of CER selling.
- Barrier Analysis:
  PPs shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:
  - Investment barrier
  - Technological barrier
  - Barrier due to prevailing practice
  - Other barriers

- การวิเคราะห์ด้านการเงิน:
  หลักฐานที่ IRR (อัตราผลตอบแทนภายใน) จะเกินเกณฑ์มาตรฐานมีสาเหตุจากผลกำไรทางด้านการเงินจากการขาย CER
- การวิเคราะห์อุปสรรค:
  ผู้ร่วมโครงการสามารถอธิบายเพื่อแสดงให้เห็นว่าโครงการไม่สามารถเกิดขึ้นได้ถ้าเกิดอุปสรรคอย่างใดอย่างหนึ่ง ดังต่อไปนี้:
  - อุปสรรคด้านการลงทุน
  - อุปสรรคด้านเทคนิค
  - อุปสรรคเนื่องจากขาดแนวปฏิบัติที่ได้ผล
  - อุปสรรคอื่นๆ

2.20 Careful Attention to be paid

2.20 ข้อควรระวัง

- A/R CDM project activity should contribute sustainable development in host country.
- Environmental/ socio-economical impact assessment should be implemented. If any impacts are predicted, the mitigating measures should be prepared.
- Countermeasures to response to stakeholder's comments should be provided.
- Public funding from Annex I Parties does not result in a diversion of ODA (official development assistance).

- กิจกรรมโครงการ CDM ควรมีส่วนร่วมในการพัฒนาอย่างยั่งยืนให้แก่ประเทศเจ้าบ้าน
- ควรทำการประเมินผลกระทบสิ่งแวดล้อม/เศรษฐกิจและสังคม หากมีผลกระทบใดที่คาดการณ์ไว้ ควรเตรียมมาตรการเพื่อการป้องกัน
- ควรเตรียมข้อชี้แจงเพื่อตอบข้อคิดเห็นของผู้มีส่วนได้เสีย
- เงินทุนสาธารณะจากประเทศในภาคผนวกที่ 1 ไม่มีผลในการเบี่ยงเบนความช่วยเหลือในการพัฒนาอย่างเป็นทางการ

3. Small-scale A/R CDM
3.1 Small-scale A/R CDM 1

3. CDM ภาคป่าไม้ขนาดเล็ก
3.1 CDM ภาคป่าไม้ขนาดเล็ก 1

- Definition of small-scale A/R CDM project activity
  - Net GHG removals by sinks of less than 16,000 t-CO_2/year (each verification period)
    - If greater than 16,000 t-CO_2/year, the excess removals will not be eligible for the issuance of tCERs or lCERs.
  - Developed or implemented by low-income communities and individuals as determined by the host Party.
    - Prior to the submission of the validation report to the EB, the DOE have received from the PPs a written declaration of that.

- คำนิยามของโครงการปลูกป่าขนาดเล็ก
  - ปริมาณการดูดซับก๊าซเรือนกระจกน้อยกว่า 16,000 ตันคาร์บอนไดออกไซด์เทียบเท่าต่อปี (ตามแต่ละระยะเวลาการตรวจสอบ)
    - ถ้าปริมาณการดูดซับก๊าซเรือนกระจกมากกว่า 16,000 ตันคาร์บอนไดออกไซด์เทียบเท่าต่อปีส่วนที่เกินจะไม่สามารถออก tCERs หรือ lCERs ได้
  - เป็นการพัฒนาหรือดำเนินงานโดยที่ชุมชนมีรายได้ต่ำและโดยล้ำพัง กำหนดโดยประเทศเจ้าบ้าน
    - ก่อนที่จะยื่นรายงานการตรวจสอบให้กับ EB, DOE จะได้รับจดหมายแถลงการณ์จากผู้เข้าร่วมโครงการ

3.2 Small-scale A/R CDM 2

3.2 CDM ภาคป่าไม้ขนาดเล็ก 2

- Simplified modalities and procedures for small-scale A/R CDM project activity:
  In order to reduce transaction costs, modalities and procedures are simplified as follows:
  - The requirements for the PDD (project design document) are reduced;
  - Baseline methodologies by the project type are simplified;
  - Monitoring plans are simplified; and
  - The same operational entity may undertake validation, and verification and certification.

- รูปแบบและขั้นตอนการจัดทำโครงการที่ง่ายสำหรับโครงการปลูกป่าขนาดเล็ก:
  เพื่อลดค่าใช้จ่ายในการดำเนินการทำให้รูปแบบและขั้นตอนมีความง่ายดังนี้:
  - ความต้องการเอกสารประกอบโครงการน้อยลง (PDD);
  - ใช้วิธีการกำหนดกรณีฐานแบบง่าย;
  - ใช้วิธีติดตามผลแบบง่าย; และ
  - ใช้หน่วยงานตรวจสอบเดียวกันในการตรวจสอบ ทวนสอบ และการให้การรับรอง

4. Mangrove reforestation small-scale A/R CDM project in Chantaburi province
4.1 Background

4. โครงการฟื้นฟูการปลูกป่าชายเลนขนาดเล็ก ณ จังหวัดจันทบุรี
4.1 ความเป็นมา

Assistance of JICA

- PPs request to TGO & JICA Expert Team to assist to prepare A/R CDM
- Mangrove reforestation project was selected.
- JICA Expert Team assists to prepare PDD.

Project site

- Located in Welu wetland (19,000 ha) in Chantaburi province
- Designated as "Reserved Forest" in 1962
- Drastically encroached in this 30 years
- Natural forest has been changing to shrimp pond.

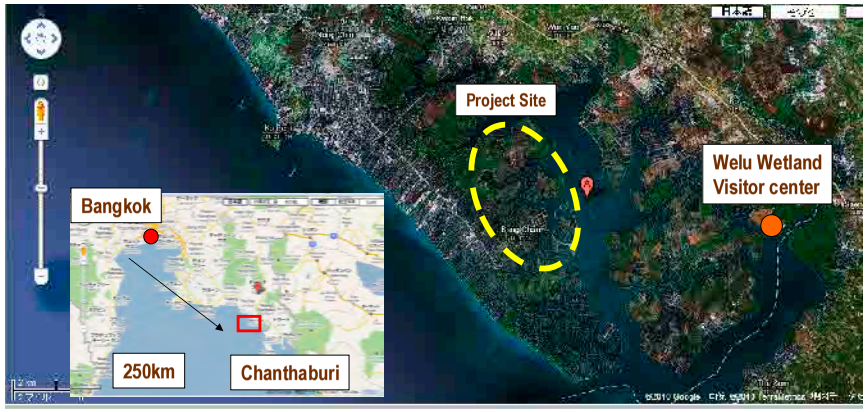
ความร่วมมือจากหน่วยงาน JICA

- ผู้เข้าร่วมโครงการได้ทำการร้องขอมายังองค์การบริหารจัดการก๊าซเรือนกระจก และทีมผู้เชี่ยวชาญจากใจก้า ให้ช่วยเหลือในเรื่องของการจัดเตรียมโครงการ CDM ภาคป่าไม้
- โครงการปลูกป่าชายเลนได้รับการคัดเลือก
- ทีมผู้เชี่ยวชาญใจก้าตกลงให้ความช่วยเหลือในเรื่องการจัดทำเอกสารออกแบบโครงการ

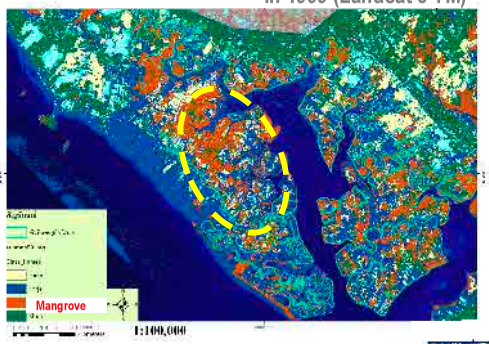
ที่ตั้งโครงการ

- ตั้งอยู่ที่ลุ่มน้ำเวฬุ (19,000 เฮกแตร์) ณ จังหวัดจันทบุรี
- กำหนดให้เป็น "ป่าสงวน" ในปี พ.ศ.2505
- ถูกบุกรุกอย่างรุนแรงในช่วง 30 ปีที่ผ่านมานี้
- ธรรมชาติของป่าถูกเปลี่ยนเป็นฟาร์มเลี้ยงกุ้ง

4.2 Project Site 4.2 ที่ตั้งโครงการ

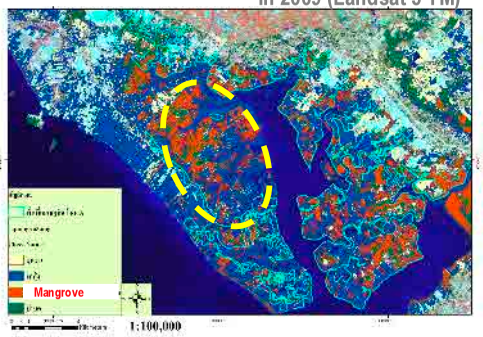


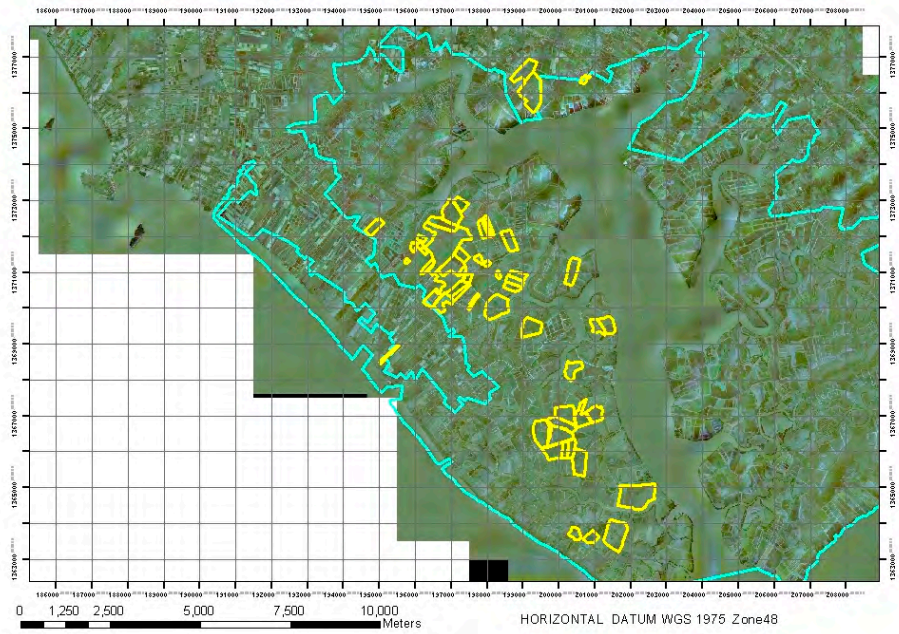
In 1999 (Landsat 5 TM)



Satellite images (1999 and 2009) (Encroachment of mangrove is in progress.)

In 2009 (Landsat 5 TM)





Mangrove forest has been destroying by development of shrimp ponds.

4.3 Conservation Activities

- Chantaburi province has been trying conservation of mangrove forest
- Royal Forest Department (RFD), Department of Marine and Coastal Resources (DMCR), and Chantaburi province has been implementing reforestation activities in several years.
- Encroachment is still going.

4.3 กิจกรรมการอนุรักษ์

- จังหวัดจันทบุรีได้พยายามที่จะอนุรักษ์ป่าชายเลน
- กรมป่าไม้, กรมทรัพยากรทางทะเลและชายฝั่ง และจังหวัดจันทบุรี ได้ดำเนินกิจกรรมการฟื้นฟูป่ามาอย่างต่อเนื่องในหลายปีที่ผ่านมา
- การบุกรุกพื้นที่ป่าสงวนยังคงมี

Nursery

Planting at shrimp pond in August 2010

A1-64

4.4 Preparation of AR-CDM PDD

- PPs: Chantaburi province, DMCR, RFD
- Selected species: *Rhizophora* sp., *Avicenia* sp. etc.
- Technical transfer of planting method: DMCR, KUFF
- Rights of land: RFD
- Land use rights: residents
- CER: ICER
- Project period/ crediting period: 30 years
- Methodology: AR-AMS0003

4.4 การเตรียมเอกสารออกแบบโครงการสำหรับโครงการ CDM ภาคป่าไม้

- ผู้เข้าร่วมโครงการ: จังหวัดจันทบุรี, กรมทรัพยากรทางทะเลและชายฝั่ง และ กรมป่าไม้
- พันธ์ไม้ป่าชายเลนที่คัดเลือก: โกงกาง และ แสม เป็นต้น
- การถ่ายทอดวิธีการปลูกต้นไม้: กรมทรัพยากรทางทะเลและชายฝั่ง และคณะวนศาสตร์ มหาวิทยาลัยเกษตรศาสตร์
- เจ้าของที่ดิน: กรมป่าไม้
- สิทธิการใช้ที่ดิน: ประชาชนผู้อยู่อาศัย
- ใบรับรองการปล่อยก๊าซเรือนกระจก (CER): ใบรับรองการปล่อยก๊าซเรือนกระจกระยะยาว (ICER)
- ระยะเวลาโครงการ/ระยะเวลาในการคิดเครดิต: 30 ปี
- หลักการ: AR-AMS0003

Carbon Trading 1: Background, history and overview of carbon trading markets in the world

April, 2010

Deputy Chief Advisor of JICA Expert Team
Kazuhito YAMADA

Carbon Trading 1:
Background, history and overview of carbon trading markets in the world

- What is 'Carbon Trading'?
- Who are the main players?
- Summary of Carbon Emission Trading in the world
- From my personal experience:
- - Who develop CDM/JI projects?
- - How to evaluate those projects
- - How to contract ERPA

Objectives of this section

Objectives of this section are:

To understand history of 'emissions trading',

To confirm the importance and anticipated roles of 'carbon trading', and

To consider and discuss the following issues:

- Why do we trade carbon in Thailand?
- When will we start to trade carbon in Thailand?
- Who will organize 'carbon trading' in Thailand?
- What is the most important thing for 'carbon trading' in Thailand?

What is 'Emissions Trading'?

Definition of 'emission trading'

- 'Emissions trading' is one of the economic approaches to mitigate environmental pollutants such as SO_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 underrun 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.

What is 'Emissions Trading'?

History of emissions trading of the pollutants

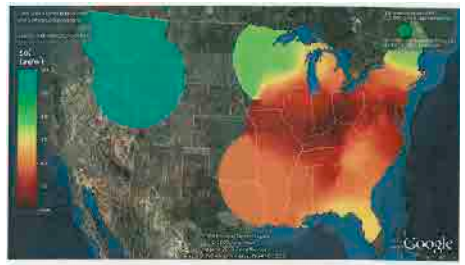
- We have experienced the emissions trading of air pollutants before 'carbon trading'.
- Canadian scientist proposed 'tradable or marketable discharge permits' in 1968.
- In general, the ownership right of 'environment' is difficult to set because 'environment' is considered as 'global common'.
- Emissions trading system can be considered to trade the 'right to use' in order to mitigate environmental pollution.

What is 'Emissions Trading'?

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 →



What is 'Emissions 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.

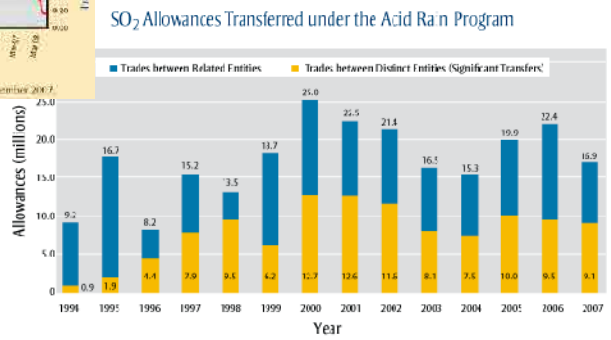
Main characteristics of SO_2 trading

- 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$

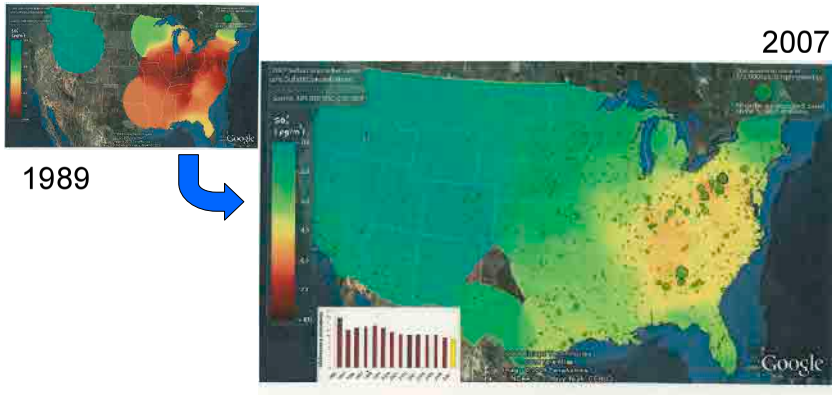
  Average price: 325 US $/t-$SO_2$, Allowable emission: 15.8 mil. t-SO_2

What is 'Emissions Trading'?



What is 'Emissions Trading'?

Result of SO_2 trading: Mitigation effect



What is 'Emissions Trading'?

Reasons of effectiveness of SO_2 trading

- Direct relation between SO_2 and human health damage
- Environmental impacts of acid rain mainly induced by SO_2
- Ease to control emission sources (power plants) because of 'point sources'

We should consider the difference between SO_2 and CO_2!

Who are the main players of carbon trading?

- Private entities
- Government/municipal governments
- Carbon brokers
- Citizens

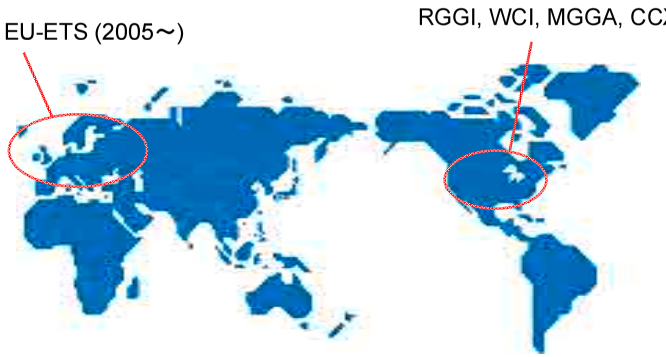
Who are participants?
Who are organizers or controllers?

Who will be winner?
Who will be loser?

Summary of Carbon Emission Trading in the World

- ICAP
- EU-ETS
- RGGI
- WCI
- MGGA
- CCX

ICAP = participants of EU-ETS, RGGI, WCI, and Australia, NZ, Norway, Tokyo (observers: Japan, Ukraine)



Summary of Carbon Emission Trading in the World

EU-ETS -1-

29 Participants:

Austria, Belgium, Bulgaria, Cyprus, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italia, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portuguese, Romania, Slovakia, Slovenia, Spain, Sweden, UK

About 80% of transaction volumes and values in 2007-08 was occupied by that of EU-ETS.

Summary of Carbon Emission Trading in the World

EU-ETS -2-

Transaction Volumes and Values, Global Carbon Market, 2007 and 2008

Markets	Volume ($MtCO_2e$)		Value (US$ million)	
	2007	2008	2007	2008
Voluntary OTC	43.1	54.0	262.9	396.7
CCX	22.9	69.2	72.4	306.7
Other exchanges	0	0.2	0	1.3
Total Voluntary Markets	**66.0**	**123.4**	**335.3**	**704.8**
EU ETS	2,061.0	2,982.0	50,097.0	94,971.7
Primary CDM	551.0	400.3	7,426.0	6,118.2
Secondary CDM	240.0	622.4	5,451.0	15,584.5
Joint Implementation	41.0	8.0	499.0	2,339.8
Kyoto [AAU]	0.0	16.0	0.0	177.1
New South Wales	25.0	30.6	224.0	151.9
RGGI	-	27.4	-	108.9
Alberta's SGER[a]	1.5	3.3	13.7	31.3
Total Regulated Markets	**2,919.5**	**4,090.0**	**63,710.7**	**119,483.4**
Total Global Markets	**2,985.5**	**4,213.5**	**64,046.0**	**120,188.2**

Source: Ecosystem Marketplace, New Carbon Finance.

Notes: (a) Assume a CA$10 price for Alberta offsets and Emission Performance Credits based on interviews with market participants.

Summary of Carbon Emission Trading in the World

RGGI : Regional Greenhouse Gas Initiative -1-

- RGGI is a cooperative effort by ten Northeast and Mid-Atlantic states to limit greenhouse gas emissions. RGGI is the first mandatory, market-based CO_2 emissions reduction program in the USA.
- The states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont are signatory states to the RGGI agreement. These ten states have capped CO_2 emissions from the power sector, and will require a 10 percent reduction in these emissions by 2018.
- RGGI is composed of individual CO_2 Budget Trading Programs in each of the ten participating states. These ten programs are implemented through state regulations, based on a RGGI Model Rule, and are linked through CO_2 allowance reciprocity. Regulated power plants can use a CO_2 allowance issued by any of the ten participating states to demonstrate compliance with the state program governing their facility. Taken together, the ten individual state programs function as a single regional compliance market for carbon emissions.

Summary of Carbon Emission Trading in the World

RGGI : Regional Greenhouse Gas Initiative -2-

To reduce emissions of greenhouse gases, the RGGI participating states are using a market-based cap-and-trade approach that includes:

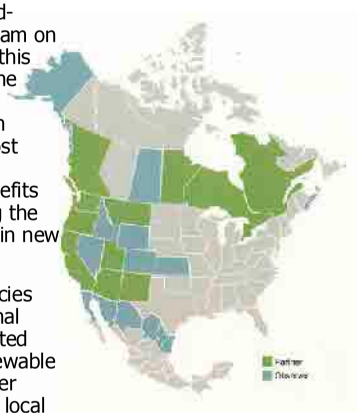
- Establishing a multi-state CO_2 emissions budget (cap) that will decrease gradually until it is 10 percent lower than at the start
- Requiring electric power generator to hold allowances equal to their CO_2 emissions over a three-year control period
- Providing a market-based emissions auction and trading system where electric power generators can buy, sell and trade CO_2 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 CO_2 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.

Summary of Carbon Emission Trading in the World

WCI：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. When fully implemented in 2015, this comprehensive program will cover nearly 90 percent of the GHG emissions in WCI states and provinces. Analyses conducted on the WCI design indicate that the region can mitigate the costs of reduction emissions and realize a cost savings through increased efficiencies and reduced fuel consumption. These savings come in addition to the benefits for the region from a cleaner environment and promoting the kinds of investment and innovation that will spur growth in new green technologies and build a strong green economy.



The WCI is also working together on complementary policies that support the cap-and-trade program, provide additional opportunities to address climate change and achieve related co-benefits of increased energy efficiency, increased renewable energy generation, improved air quality and reduced water pollution, job growth, and increased provincial, state and local revenue.

Summary of Carbon Emission Trading in the World

MGGA：Midwestern Greenhouse Gas Reduction Accord -1-

- Nine Midwestern governors and two Canadian premiers have signed on to participate or observe in the Midwestern Greenhouse Gas Reduction Accord (Accord), as first agreed to in November 2007 in Milwaukee, Wisconsin. 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.
- 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. The geographic location and ideologically centrist beliefs of the Midwestern region provide its leaders with an ability to push the federal policy debate in a productive direction. Through the Accord, these governors agreed to establish 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.

Summary of Carbon Emission Trading in the World

MGGA：Midwestern Greenhouse Gas Reduction Accord -2-

Members

- Iowa
- Illinois
- Kansas
- Manitoba
- Michigan
- Minnesota
- Wisconsin

Observers

- Indiana
- Ohio
- Ontario
- South Dakota

Summary of Carbon Emission Trading in the World

CCX：Chicago Climate Exchange -1-

- Chicago Climate Exchange (CCX) operates North America's only cap and trade system for all six greenhouse gases, with global affiliates and projects worldwide.
- CCX Members are leaders in greenhouse gas (GHG) management and represent all sectors of the global economy, as well as public sector innovators. Reductions achieved through CCX are the only reductions made in North America through a legally binding compliance regime, providing independent, third party verification by the Financial Industry Regulatory Authority (FINRA, formerly NASD). The founder and chairman of CCX is economist and financial innovator Dr. Richard L. Sandor, who was named a Hero of the Planet by Time Magazine in 2002 for founding CCX, and in 2007 as the "father of carbon trading."
- CCX emitting Members make a voluntary but legally binding commitment to meet annual GHG emission reduction targets. Those who reduce below the targets have surplus allowances to sell or bank; those who emit above the targets comply by purchasing CCX Carbon Financial Instrument® (CFI®) contracts.

Summary of Carbon Emission Trading in the World

CCX：Chicago Climate Exchange -2-

Goals of CCX:

- To facilitate the transaction of GHG allowance trading with price transparency, design excellence and environmental integrity
- To build the skills and institutions needed to cost-effectively manage GHGs
- To facilitate capacity-building in both public and private sectors to facilitate GHG mitigation
- To strengthen the intellectual framework required for cost effective and valid GHG reduction
- To help inform the public debate on managing the risk of global climate change

Benefits of Membership:

- Be prepared: mitigate financial, operational and reputational risks
- Reduce emissions using the highest compliance standards with third party verification
- Prove concrete action on climate change to shareholders, rating agencies, customers and citizens
- Establish a cost-effective, turnkey emissions management system
- Drive policy developments based on practical, hands-on experience
- Gain leadership recognition for taking early, credible and binding action to address climate change
- Establish early track record in reductions and experience with growing carbon and GHG market

From my personal experience: Who develop CDM/JI projects?

- CDM developers
- Carbon funds (governments and private entities)
- Private companies in host countries
- Private companies in investment countries
- International/regional banks (WB, ADB, etc.)
- Governmental organizations in investment countries (JICA, NEDO)

From my personal experience: How to evaluate those projects?

From the viewpoint of CDM project:

- Ability of DNA in host country
- Feasibility of CDM project type
- Applicability of the technology used by CDM project

From the viewpoint of business development:

- Country risk of host country
- C/B of the project (w or w/o CER)
- Stability of business itself

From my personal experience: How to contract ERPA?

What is the ERPA ?

ERPA = Emission Reduction Purchase Agreement

- ERPA type 1：
  Agreement between Investor in investment country and Project participant in host country
- ERPA type 2：
  Agreement between Project participant in investment country and Project participant in host country

→ Finally, the most important issue is:
'Who will take the risk of CDM projects?'

Confirmation of the importance and anticipated roles of 'carbon trading'

- Carbon trading may be effective GHG mitigation measures if all GHG emitters in the world can be participated.
- 'Cap and trade' is the fundamental approach of carbon trading.
- 'Cost-effectiveness' will be the most important point from the experience of SO_2 trading.
- But, carbon trading is not versatile, 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' by it.

Discussion points of 'carbon trading'

- Why do we trade carbon in Thailand?
- When will we start to trade carbon in Thailand?
- Who will organize 'carbon trading' in Thailand?
- What is the most important thing for 'carbon trading' in Thailand?

Carbon Trading 2: Overview of EU-ETS and Tokyo Cap-and-Trade

27, April, 2010

Deputy Chief Advisor of JICA Expert Team
Kazuhito YAMADA

Objectives of presentation

Objectives of this presentation are:

To understand history and success of 'EU-ETS',

To understand the plan of 'Tokyo Cap-and-Trade', and

To discuss:

- Why do we trade carbon in Thailand?
- When will we start to trade carbon in Thailand?
- Who will organize 'carbon trading' in Thailand?
- What is the most important thing for 'carbon trading' in Thailand?

Carbon Trading 2: Overview of EU-ETS

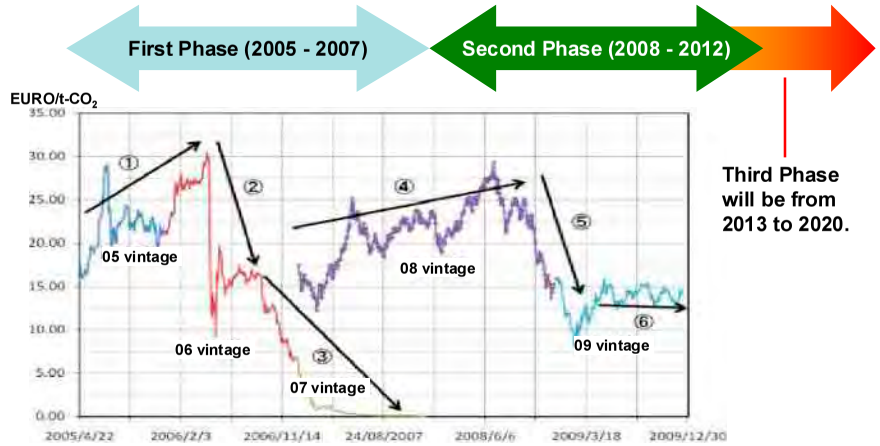
- Has EU-ETS succeeded?
- Do you know the history of EU-ETS?
- What is the design of EU-ETS?
- Who are the targeted entities of EU-ETS?
- How to allocate 'allowance' of EU-ETS?
- Where are main exchanges of EU-ETS?
- Important characteristics of EU-ETS (1) GHG emissions
- Important characteristics of EU-ETS (2) Challenging Phase III
- Discussion

Has EU-ETS succeeded?

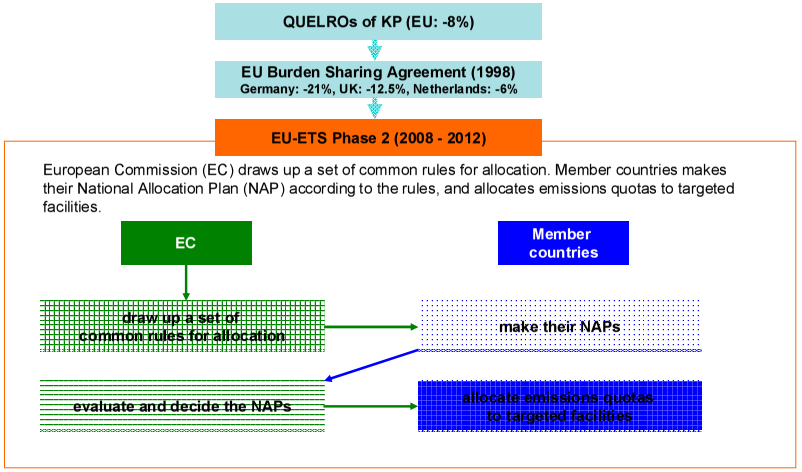
Yes, EU-ETS has succeeded:

- Everyone knows that EU-ETS is the first system in the world to trade carbon for the mitigation of climate change,
- EU-ETS has been playing a role of trigger for other developed countries such as USA and Japan to facilitate developing 'domestic carbon cap-and-trade scheme', and
- EU-ETS has found problems to be solved by 'learning by doing'.

Do you know the history of EU-ETS?



What is the design of EU-ETS?



Who are the targeted entities of EU-ETS?

Phase I (2005-2007): +8.3% (2005)

- Power sector, and Industrial sector (about 11,500 facilities)
- Penalty: 40 EURO/t-CO_2

Phase II (2008-2012): -5.6% (2005)

- Power sector, and Industrial sector
- Penalty: 100 EURO/t-CO_2

Phase III (2013-2020): -21% (2005)

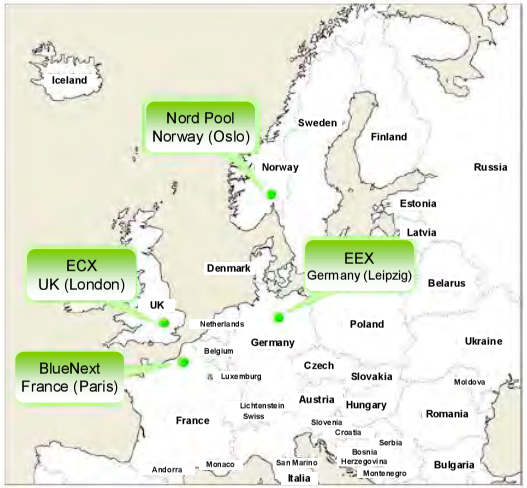
- Power sector, and Industrial sector (include aluminum, ammonia), Aviation
- Penalty: Index to Consumer Price (dynamic pricing)

How to allocate 'allowance' of EU-ETS?

- Targeted facilities of EU-ETS (Phase II) are plants for production of power sector and industrial sector.
- Targets of industrial sector are set by moderate policy, considering their competitive power in the international market, and limited data availability of past activities of targeted facilities,
- On the other hand, targets of power sector are set by strict rule because cost increases by the allocation is easy to shift to consumers by power companies.
- Basic concept of the allocation to targeted facilities
  'emissions in base year' * 'allocation factor'

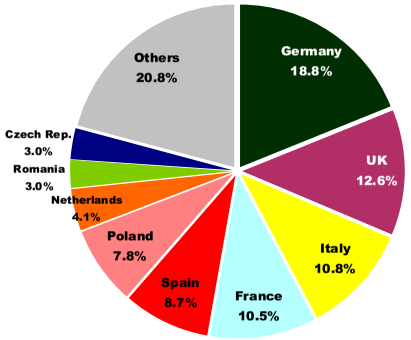
Where are main exchanges of EU-ETS?

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

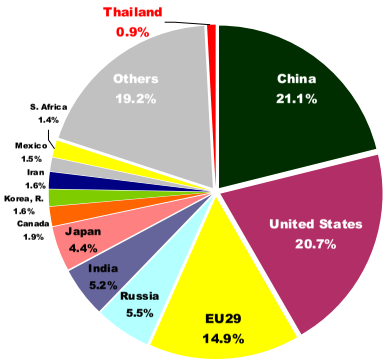


Important characteristics of EU-ETS (1)
GHG emissions

EU-ETS (29) GHG (2007)



World (212) CO_2 (2006)



Important characteristics of EU-ETS (2)
Challenging Phase III

- Phase III target is challenging: -21%

year	Cap in total (million t-CO_2)
2013	1,974
2014	1,937
2015	1,901
2016	1,865
2017	1,829
2018	1,792
2019	1,756
2020	1,720

Discussion

- Has EU-ETS succeeded?
- What is the reason of success?
- Why and how do we trade carbon in Thailand?

Carbon Trading 2:
Overview of Tokyo Cap-and-Trade (T-CAT)

- What is the background of T-CAT?
- What is the design of T-CAT? (1)
- What is the design of T-CAT? (2)
- Who are the targeted entities of T-CAT?
- How to allocate 'allowance' of T-CAT?
- Discussion

What is the background of T-CAT?

Tokyo:

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

	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%

What is the design of T-CAT? (1)

- 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 is >1,500 kl/year (crude oil equivalent)
- Compliance period: 5 years (Start: 1st April 2010)

  1st: 2010 to 2014, 2nd: 2015 to 2019
- Allowance allocation:

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

  *Base year emission: Average emission of past 3 years

What is the design 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

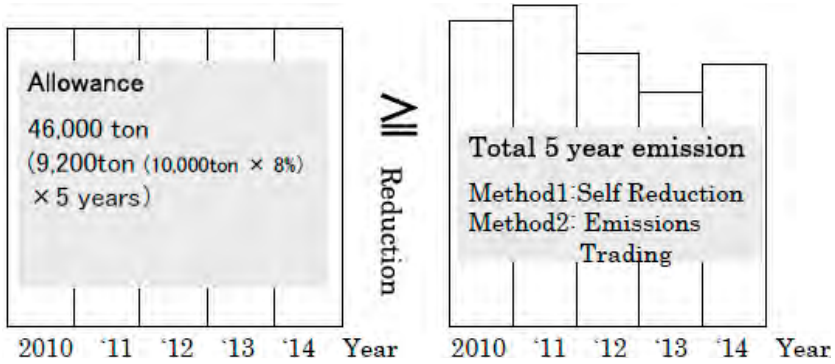
  2nd Compliance Period: 17% (planned)
- Monitoring and Reporting: every year
- Penalty:

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

How to allocate 'allowance' of T-CAT?

Example:

- Base year emission: 10,000 t-CO_2/y, -8% reduction



Discussion

- Can you establishe 'Bangkok Cap-and-Trade (B-CAT)'?
- Who are targeted entities in B-CAT?
- Who are supporters and detractors about B-CAT?

The Project for Capacity Development and Institutional Strengthening for GHG Mitigation in the Kingdom of Thailand

UNFCCC Structure and Negotiations 4: Overview of international negotiations by EU and the USA over post-2012 mechanisms *and* Carbon Trading 4: Overview of emission trading systems in the USA and future international trading system in post 2010

22nd June, 2010

Deputy Chief Advisor of JICA Expert Team
Kazuhito YAMADA

JICA Expert Team
Mariko FUJIMORI

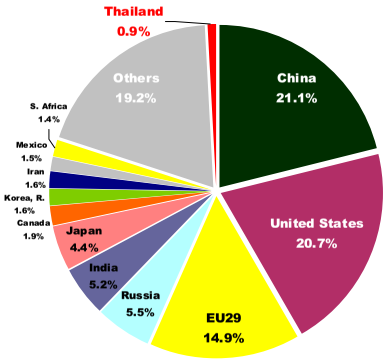
A1-77

Contents

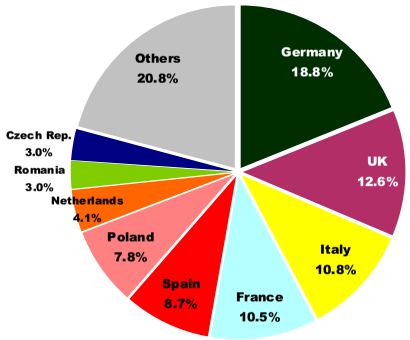
Important characteristics of EU-ETS GHG emissions

Remind, please.

World (212) CO_2 (2006)



EU-ETS (29) GHG (2007)



EU: Major institutions to reduce national GHG emission

Emission reduction target

- -20 – -30 % until 2020 compared to 1990

Examples of major institutions/activities to reduce GHG (legislative resolution);

- EU-ETS,
- Promotion of renewable energy utilization,
- Shared effort by communities,
- Promotion of energy efficiency,
- Development of CCS (carbon capture and storage),
- Emission reduction in transport sector (improvement of passenger cars efficiency, and fuel quality), and
- Utilization of international carbon credit

EU: Proposal/stance for post 2012

NAMA (Nationally Appropriate Mitigation Actions):

- Support NAMA as a mechanism to promote voluntary emission reduction by developing countries

SCM (Sector Crediting Mechanism):

- Propose introduction of SCM
- SCM by No-lose target, utilization of credit from SCM for the emission reduction target of developed (Annex 1) countries

Details of NAMA/SCM will be introduced next week.

USA: Major institutions to reduce national GHG emission

Emission reduction target

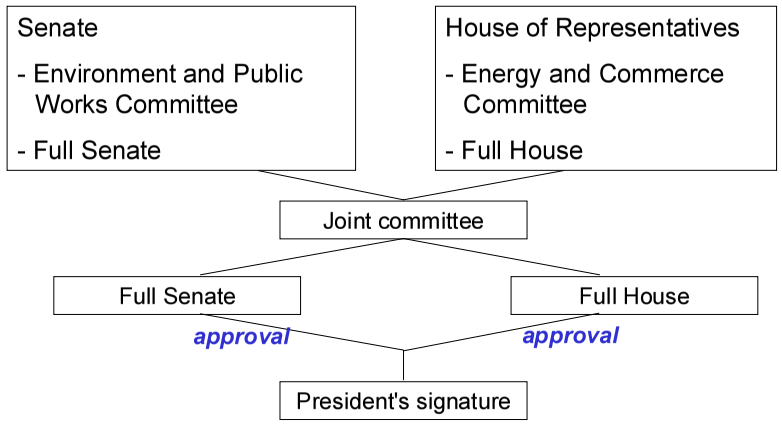
- -17 % until 2020 compared to 2005

State-of-the-union speech by President Obama (Jan. 2010)

- Create more clean energy jobs, more production, more efficiency, more incentives.
- Passing a comprehensive energy and climate bill with incentives that will finally make clean energy the profitable kind of energy in America.

USA: Process to pass a bill

(in case of recent climate related bills)



USA: Major institutions to reduce national GHG emission

US-EPA: Clean Air Act

- US Congress has decided to oblige GHG emitter (above a certain level) to report their emission amount,
- The new rule is enforced from 29th December 2009
- Emission amount from 1st January 2010 have to be reported until 31st March 2011,
- Covered entities: Emit 25,000t CO_2/year and above
- Covered GHGs: Kyoto 6 gases and fluorides

USA: Major institutions to reduce national GHG emission

American Power Act (Kerry-Lieberman)

- Achieve national pollution reduction target,
- Refunds the money raised right back to American consumers and businesses,
- Not a plan that enriches Wall Street speculators, nore to prow the government.
- Cap-and-trade scheme:
  - Power and industrial sectors: emission from fixed sources of 25,000 tCO_2 and above,
  - Household and transport sectors: emission from refined fuel utilization and natural gas,
  - Covers more than 85 % of total emission of the USA,
  - The scheme will enter into force from 2013, with 3 years delay for household and transport sectors.

USA: Major institutions to reduce national GHG emission

American Power Act (Kerry-Lieberman)

- Control of credit price
  - Upper limit: fixed price of 25 \$/tCO_2 in 2013, and the price will increase at +5 % per annum,
  - Lower limit: set the floor price for the auction.
- Offset credit program for domestic/international emission reduction
  - Allowed 2 billion per year,
  - 75 % for domestic credit and 25 % for international credit, and if the domestic credit comes short, international credit can be used up to 50 %.
  - International credit includes sector credit, credit issued by international organizations, and REDD.

USA is considering bilateral carbon crediting system...

- **Bilateral/multilateral Sectoral crediting system:**

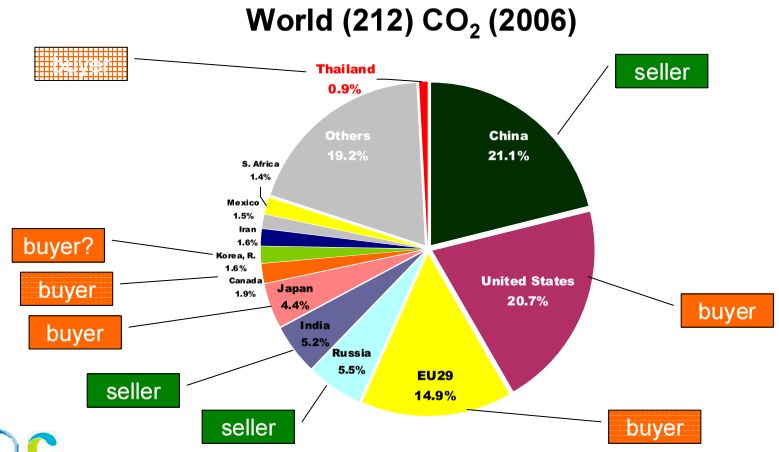
  Targets: Developing countries who agree to the system
  - not each company/factory but specified sector
  - competitive sectors with USA's industries

  MRV: Targeted DC has to develop MRV capacity

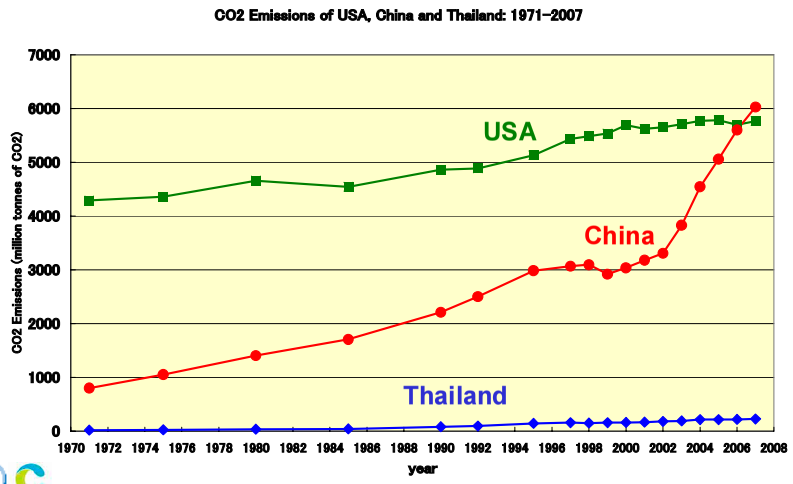
UNFCCC crediting system can survive if EPA administrator confirms their possibility to use the system.

Japan is also considering bilateral carbon crediting system.

Carbon credit until 2020 buyers and sellers



Carbon credit until 2020
NO.1 buyer and NO.1 seller



Carbon credit until 2020
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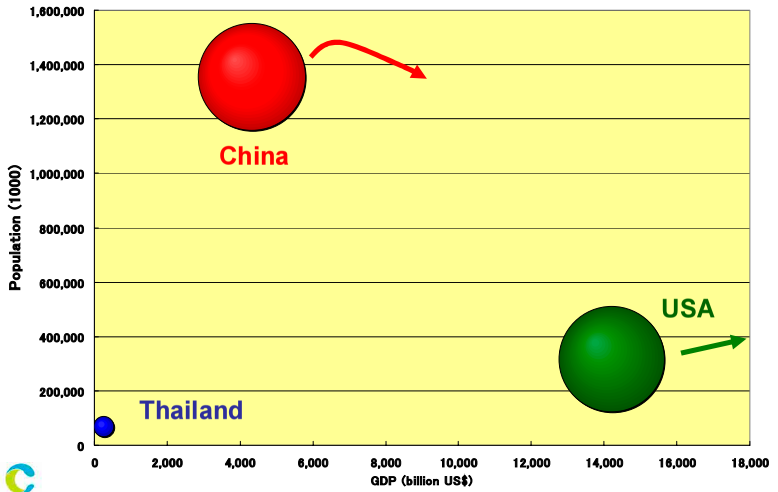
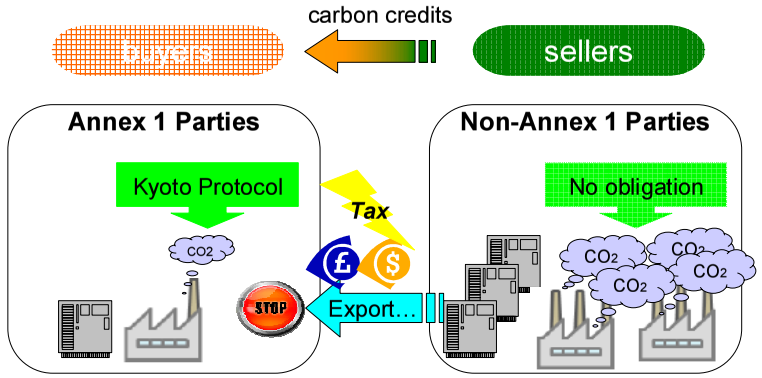


Border Measures - impact to other field
Remind, please. from climate change world

- Climate change and international trade



Discussion

- How does Thailand address future international trading system?
- What kind of GHG emission reduction projects should be developed in Thailand?
- Who are main partners to develop the projects and to sell carbon credits from them?
  - USA
  - EU
  - Japan
  - Canada etc.

Carbon Trading 4: Overview of Voluntary Emission Trading System in Japan - J-VER

29 June, 2010

Deputy Chief Advisor of JICA Expert Team
Kazuhito YAMADA

A1-81

Objectives of this section

Objectives of this section are:

To understand basic concept and latest situation of one of the Japanese Ministry of Environment's carbon offsetting activities called 'J-VER',

To discuss:

What are the possible 'T-VER' project candidates in Thailand?

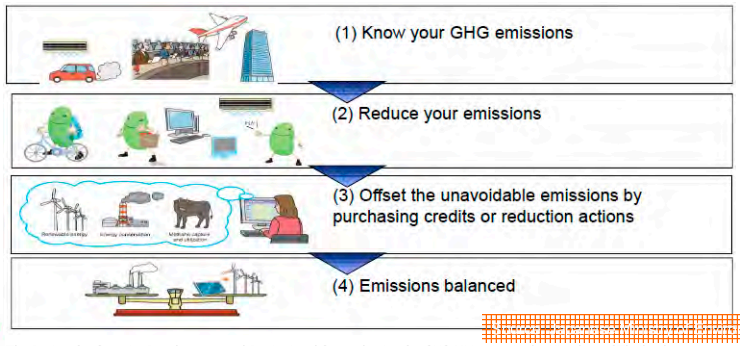
Carbon Trading 3: J-VER

- What is the 'Carbon offsetting'?
- What is the 'J-VER'?
- Structure of the J-VER
- Organization of the J-VER
- Related body of the J-VER
- Guidelines of the J-VER
- Positive lists of J-VER
- Application - Certification - Issuance of the J-VER
- Project examples
- Discussion

What is the 'Carbon offsetting'? (1)

Carbon offsetting is defined as:

(1) first knowing your GHG emissions, (2) then making efforts to reduce the emissions, (3) offsetting unavoidable emissions by purchasing GHG reduction credits or undertaking reduction activities.



What is the 'Carbon offsetting'? (2)

The benefit of carbon offsetting includes:

1. Promotion of proactive GHG reduction activities by companies and citizens;
2. Shifting the corporate activities and lifestyles towards low-carbon society by visualizing the cost of GHG emission;
3. Providing funds to GHG reduction/removal activities both domestically and abroad.

Source: Japanese Ministry of Environment

What is the 'Carbon offsetting'? (3)

Source: Japanese Ministry of Environment

Examples of Carbon offsetting:

As of the end of December 2009, there were over 750 offsetting products & services, events or other initiatives in the carbon offsetting business in Japan (according to the press).

What is the 'J-VER'? (1)

There is a need for an **official verification scheme** to ensure that credits used for carbon offset fulfill requirements. These requirements would ensure, for example, that emissions are actually reduced/removed and that the same emissions reduction/removal activities are not double-counted. "The guideline for carbon offset"

→ However, **no such official VER scheme existed in Japan**.
→ In response, MOEJ set up a review commission in March 2008 to look into VER (Verified Emission Reduction) certification standards.

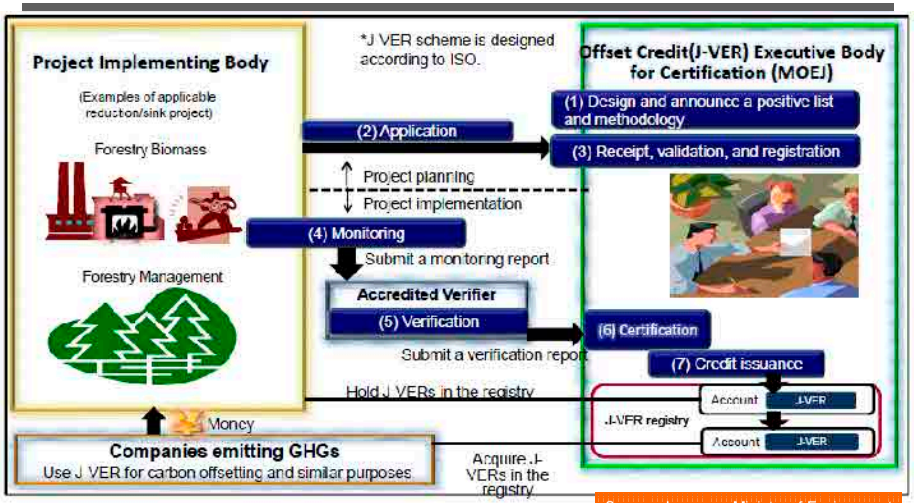
In November 2008, MOEJ set up the **Offset Credit (J-VER) Scheme**, a verification scheme for credits generated through the reduction/removal by sink of greenhouse gases carried out via domestic projects.

Source: Japanese Ministry of Environment

What is the 'J-VER'? (2)

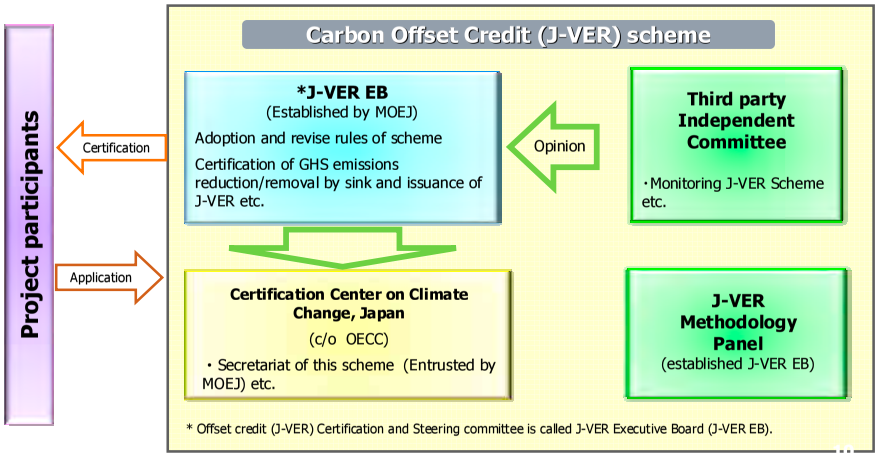
- J-VER Scheme is a **verification scheme** for credits generated through the reduction/removal by sinks of GHGs carried out via domestic projects.
- By utilizing the J-VER scheme, individuals, businesses, municipal governments and others can return funds for carbon offsetting (funds for purchasing J-VER) to domestic project planners in forest management or local industries.
- J-VER is a new mechanism to promote the domestic ***Green New Deal* program** through a global warming prevention campaign, expansion of job opportunities, and economic measures by using private-sector capital.

Structure of the J-VER



Source: Japanese Ministry of Environment

Organization of the J-VER



Source: Japanese Ministry of Environment

Related body of the J-VER

Related Bodies for Certification	Role
Offset credit (J-VER) Certification and Steering Committee (J-VER EB)	Establishment of a positive list, methodology etc. Decision on a project registration Decision on management of J-VER registry Discussion on a received complaint
Certification Center on Climate Change, Japan (4CJ)	Receipt of the application Support for J-VER EB Other activities under J-VER EB decision
Methodology Panel	Established by J-VER EB. Discussion on a positive list, methodology and other related technical issues.
The third party Independent Committee	Submission of opinion to the J-VER EB activities

Guidelines of the J-VER

Subject	Title
General Rule	Rules and Regulations for Offset Credit (J-VER) scheme
Monitoring and Calculation Rule	Monitoring guideline for Offset Credit (J-VER) scheme
Validation and Verification Rule	Validation and Verification guideline for Offset Credit (J-VER) scheme
List of Applicable Project	Positive List for guideline for Offset Credit (J-VER) scheme
Calculation of reduction amount of each project	Methodologies for calculation and monitoring for Offset Credit (J-VER)
Rule for J-VER EB	Management rules for J-VER EB

*The name of each guideline is a provisional translation.

Source: Japanese Ministry of Environment

Positive lists of J-VER (1)

Sector	No.	Project
Emission Reduction	E001	Fuel substitution from fossil fuel to forestry biomass fuel for a boiler
	E002	Fuel substitution from fossil fuel to biomass pellet for a boiler
	E003	Use of a pellet stove
	E004	Use of biodiesel fuels from waste food oil for a car
	E005	Fuel substitution from fossil fuel to biomass fuel made from sewerage sludge
	E006	Low-temperature waste heat recovery and utilization
	E007	Utilization of fuel wood by wood stove
	E008	Energy saving through transportation efficiency improvement by utilizing information and communication technology (ICT)
	E009	Energy saving through reducing the use of meter-checking vehicles by utilizing information and communication technology (IT)

Source: Japanese Ministry of Environment

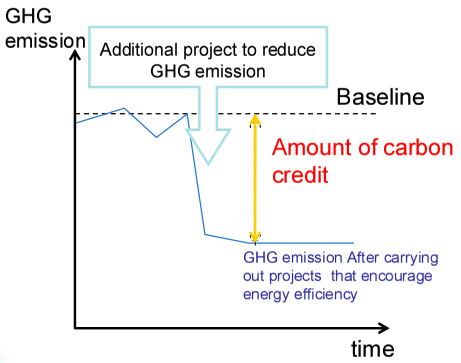
Positive lists of J-VER (2)

Sector	No.	Project
Sink	R001	Forest management (logging)
	R002	Forest management (logging, planting etc.)
	R003	Afforestation

Source: Japanese Ministry of Environment

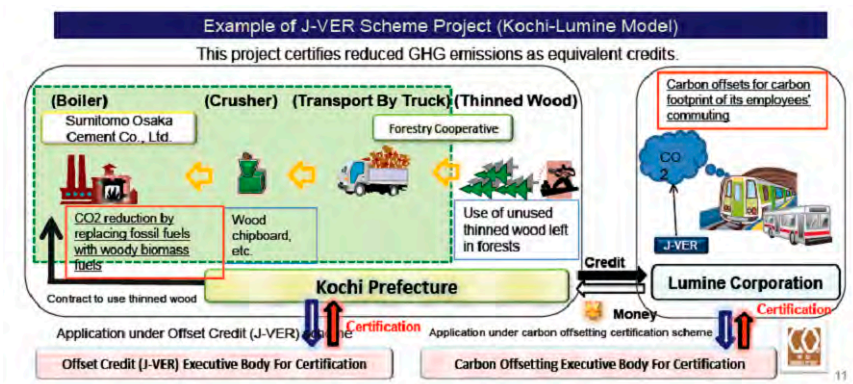
Application - Certification - Issuance of the J-VER

- similar to CDM
- Basically, according with ISO 14064-2
- Internal validation by 4CJ for cost cutting for project participants



Source: Japanese Ministry of Environment

Project examples (1)



This project certifies reduced GHG emissions as equivalent credits by replacing fossil fuels used in cement factory boilers with unused trees in the forest.
(Date of application: December 3, 2008, certified on March 10, 2009.
Estimated emissions reduction: 1,039t , from April to September 2008)

Source: Japanese Ministry of Environment

Project examples (2)

Use of biodiesel fuels of waste food oil for a car

Source: Japanese Ministry of Environment

Project examples (3)

Use of a pellet stove

Source: Japanese Ministry of Environment

Project examples (4)

Forest management (logging, planting etc.)

Source: Japanese Ministry of Environment

Discussion

- What are the possible 'T-VER' project candidates in Thailand?

Carbon Trading 5: Overview of national registry system

6 July, 2010

JICA Expert Team
Mariko FUJIMORI

Objectives of this section

Objectives of this section are:

To understand basic structure and function of registry systems under the Kyoto Protocol.

- CDM registry
- National registries

To understand an example of voluntary registry system.

- J-VER registry

Registry system under the Kyoto Protocol

- Governments of the 38 Annex B Parties are implementing national registries, containing accounts within which units are held in the name of the government or in the name of legal entities authorized by the government to hold and trade units.
- The UNFCCC secretariat, under the authority of the CDM Executive Board, has implemented the CDM registry for issuing CDM credits and distributing them to national registries. Accounts in the CDM registry are held only by CDM project participants, as the registry does not accept emissions trading between accounts

Source: http://unfccc.int/kyoto_protocol/registry_systems/items/2723.php

CDM registry

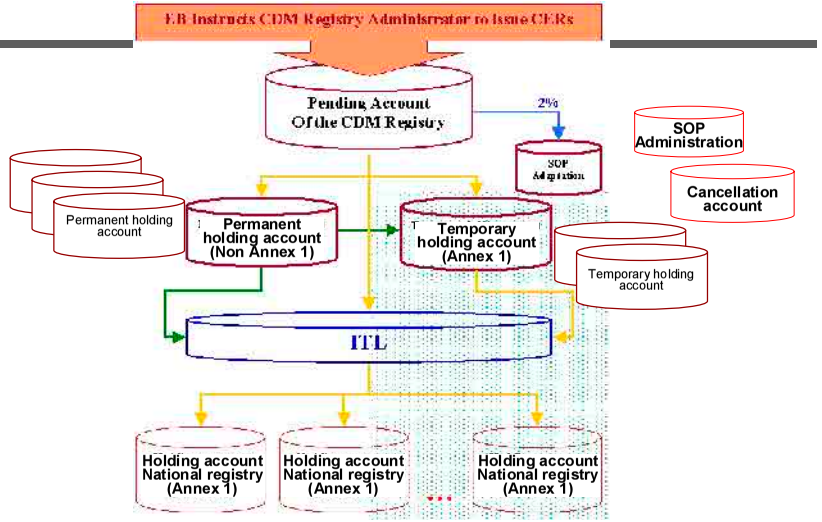
- Pending account for the Executive Board, into which CERs are issued before being transferred to other accounts,
- Holding accounts for each Non-Annex 1 Party hosting a CDM project activity or requesting an account,
- Cancellation accounts for the purpose of cancelling ERUs, CERs, AAUs and RMUs equal to excess CERs issued,
- Accounts for the share of proceeds to cover administrative expenses and to assist in meeting costs of adaptation.

Source: FCCC/KP/CMP/2005/8/Add.1

- Temporary holding accounts for project participants of Annex I Party wishing to receive CERs and whose national registry is not yet connected to the ITL.

Source: FCCC/CP/2004/2

Transaction types allowed in the CDM registry



Source: Modified from http://cdm.unfccc.int/Registry/transaction/index.html

National registry – Annex 1 Parties

Each national registry shall have the following accounts:

- Holding account(s) for the Party,
- Holding account(s) for entities authorized by the Party to hold ERUs, CERs, AAUs and/or RMUs,
- Cancellation account(s) for LULUCF activities,
- Cancellation account for non-compliance,
- Cancellation account(s) for other cancellations by the Parties,
- Retirement account for each commitment period,
- Replacement account for tCER,
- Replacement account for lCER.

Source: FCCC/KP/CMP/2005/8/Add.2

National registry – Registry status report

Each Annex 1 Party report the annual operation status.

Example: Japan, 2009

Account type	Unit type					
	AAUs	ERUs	RMUs	CERs	tCERs	lCERs
Holding accounts	6,002,914,428	673,835	0	46,597,828	0	0
Article 3.3/3.4 net source cancellation accounts	0	0	0	0		
Non-compliance cancellation accounts	0	0	0	0		
Other cancellation accounts	0	0	0	20,864	0	0
Retirement account	23,000,000	0	0	36,085,909	0	0
tCER replacement account for expiry	0	0	0	0	0	
lCER replacement account for expiry	0	0	0	0		
lCER replacement account for reversal in storage	0	0	0	0		0
lCER replacement account for non-submission of certification report	0	0	0	0		0
Total	6,025,914,428	673,835	0	82,704,601	0	0

National registry – Independent Assessment Report

Each registry is assessed to determine whether the appropriate requirements are met.

- Initial Independent Assessment Report
  - Test of national registry before connecting the ITL,
- Standard Independent Assessment Report
  - After the connection (to the ITL) and operation of the national registry.

National registry – Independent Assessment Report

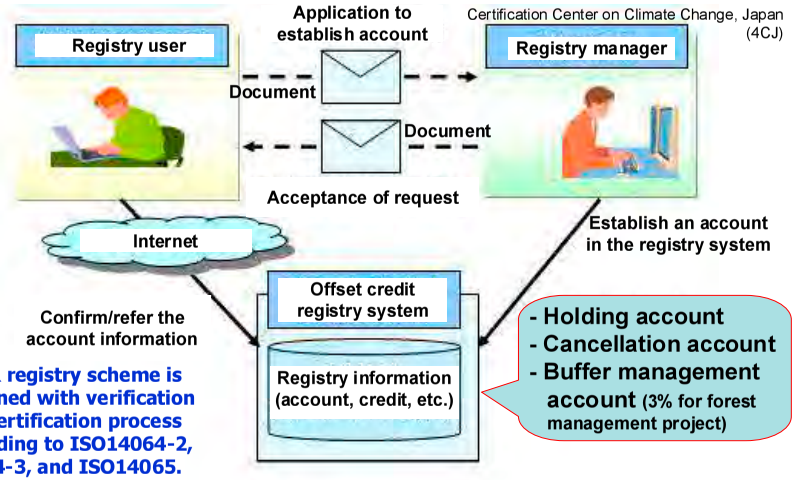
IAR SUMMARY					
General information	Registry Name	National registry of Japan			
	Date of report	9/7/07	Reporting period	N/A	
	IAR Type	Standard IAR ☐		Initial IAR ☒	
	Components	Initialization Required ☑		Operational Performance Required ☐	Public Availability of Information Required ☐
	Registry URL	http://www.registry.go.jp/			
	Consolidated system with other Parties?	Yes ☐	No ☒	Parties involved	
Overall Registry Assessment	Conclusion	Pass ☒	Fail ☐		
	Comments / recom-mendations	The registry has fulfilled all of its obligations regarding conformity with the Data Exchange Standards. These obligations include having adequate transaction procedures; adequate security measures to prevent and resolve unauthorized manipulations; and adequate measures for data storage and registry recovery. The registry is therefore deemed fully compliant with the registry requirements defined in decisions 13/CMP.1 and 5/CMP.1, noting that registries do not have obligations regarding Operational Performance or Public Availability of Information prior to the operational phase. Japan successfully completed on time (by 2 July 2007) all tests required by the Data Exchange Standards. However, technical issues outside Japan's control prevented the ITL Administrator from running a procedure to confirm the success of one of the tests. The procedure was eventually run on 6 July 2007 and confirmed the success of this remaining test. The resulting delay in the production of the IAR was thus in no way related to the state of readiness of the national registry of Japan.			
	Conclusion	Pass ☒	Fail ☐	N/A ☐	

International Transaction Log (ITL)

- The secretariat shall establish and maintain an ITL to verify the validity of transactions, including issuance, transfer and acquisition between registries, cancellation and retirement of ERUs, CERs, AAUs and RMUs and the carry-over of ERUs, CERs and AAUs.
- COP requested the secretariat to report annually to the CMP on organizational arrangements, activities and resource requirements and to make any necessary recommendations to enhance the operation of registry systems.
- CMP requested SBI to consider the annual reports, with a view to requesting the CMP to provide guidance, as necessary, in relation to the operation of registry systems.

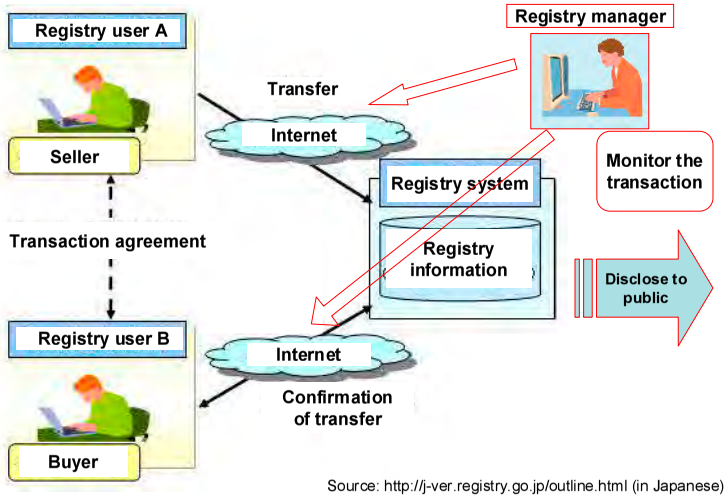
Source: FCCC/KP/CMP/2009/19

J-VER Registry system - Account



Source: http://j-ver.registry.go.jp/outline.html (in Japanese)

J-VER Registry system - transaction



Source: http://j-ver.registry.go.jp/outline.html (in Japanese)

J-VER Registry

2 accounts

60 Private entities accounts (for selling and buying)

GHG 06
Japan's Voluntary Emissions Trading Scheme (JVETS)

10th, May, 2011

Deputy chief advisor of JICA Expert Team
Kazuhito YAMADA

Today's Agenda

- What is JVETS?
- JVETS overview
- Key features of JVETS
- JVETS operation infrastructure
- Three core systems of JVETS
- Key guidelines in JVETS
- JVETS third-party verifiers
- Main participant list in JVETS (1st to 4th phases)
- JVETS Phase 4
- Chronological Table of Carbon Emission Trading in Japan

What is JVETS? (1)

- **JVETS =**

  Japan's Voluntary Emission Trading Scheme

- Ministry of the Environment, Japan (MOEJ) has started JVETS to accumulate knowledge and experience about emissions trading in Japan and to support CO_2 emissions reduction activities by Japanese private entities.

What is JVETS? (2)

Scheme Overview

- The scheme aims to support voluntary CO_2 reduction activities by private entities and to ensure their target achievement in a cost-effective way using (1) a **subsidy** to facilities which contribute CO_2 emissions reduction, (2) participants' **commitments** to reduce CO_2 emissions below their base year emissions, and (3) **emissions trading**.

What is JVETS? (3)

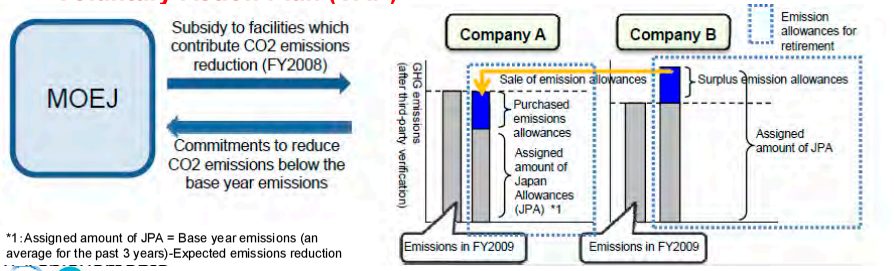
Merits for scheme participants

- **Subsidy** to facilities which contribute CO_2 emissions reduction (eg. energy saving facilities)
- Opportunity to take third-party **verifications** of their CO_2 emissions
- **Sales** revenues from their **surplus** emission allowances
- Acquisition of **know-how** on **domestic emissions trading**
- Acquisition of **know-how** on the established CO_2 emissions **calculation system**
- Reduction of **energy costs** for JVETS participants

JVETS overview (1)

Scheme outline:

- Launched by MOEJ in 2005.
- Participants of JVETS are counted as participants of **Japanese Experimental Emissions Trading Scheme**.
- Candidates should be factories and offices which are **NOT** included in **Voluntary Action Plan (VAP)**



*1:Assigned amount of JPA = Base year emissions (an average for the past 3 years)-Expected emissions reduction

JVETS overview (2)

Achievements:

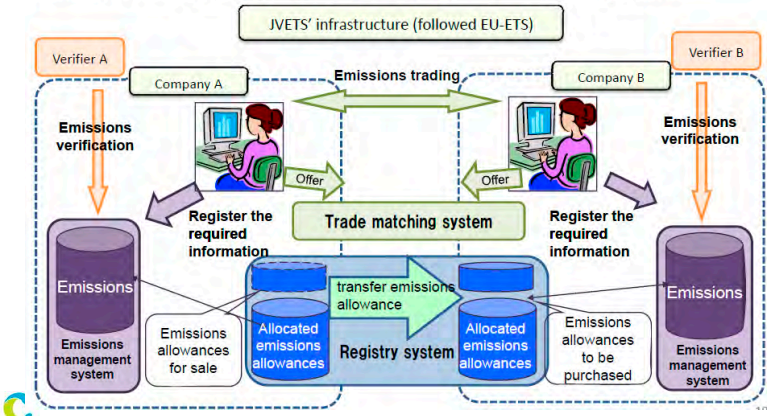
- Total participants: 232 companies
- Emissions reduction in FY2007 by 2nd phase (FY 2006) participants: **280,192t-CO_2** (25% of the total emissions in the base year emissions) cf. their original emissions reduction plan: 19% of the total emissions in the base year emissions
- Total transactions in the 2nd phase: 51 transactions (**54,643t-CO_2** in total) with the average price of **¥1,250/t-CO_2**.
- Development of infrastructure for emissions trading: Emissions **monitoring**, **reporting** and **verification** guidelines, the registry for emissions trading, and the emissions management system.

Key features of JVETS

- **First carbon pricing and emissions trading in Japan**
  - Transactions are available on request for10am-6pm (JST) on business days
  - Settlement is completed by emissions allowance transaction
- **Development of infrastructure for emissions trading**
  - IT system: the registry system, emissions management system, and trade matching system
  - Guidelines: the monitoring and reporting guidelines, emissions verification guidelines
  - Form of documents for a transaction contract
  - Proposals for accounting treatment of emissions allowances in emissions trading
- **Introduction of third-party emissions verification**
  - Third-party verifiers conduct emissions verification for participants' base year emissions and their reduced emissions
  - Third-party verification ensures credibility of emissions allowances as " merchandise"

JVETS Operation Infrastructure

One of the big contributions of JVETS is that it has established basic infrastructure (the emission monitoring, reporting and verification guidelines, registry system, and emissions management system etc.) which is required for smooth operation.

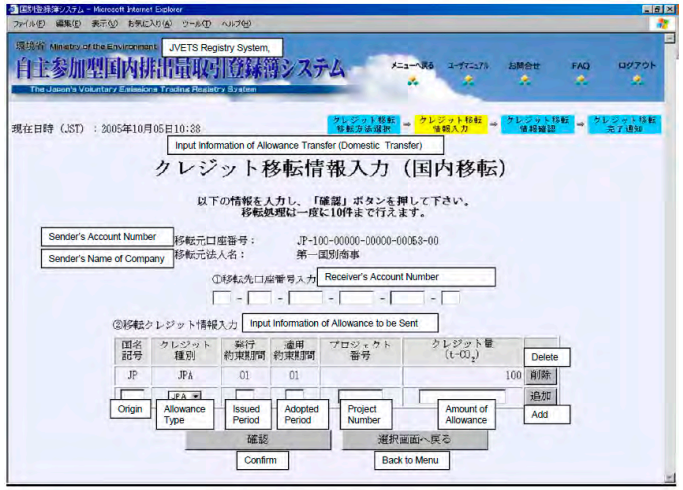


Three core systems of JVETS

System	System overview	Contribution
Registry system	- Manages the initial allocations (JPAs), emissions allowance transactions (trading) and retirement - Manages all accepted allowances and credits in JVETS (JPAs and jCER) - Emission allowance transaction time: 10am-6pm (JST) on business days	- No double counting and the same security level of allowance retirement as the national registry in Kyoto Protocol - Open access to the web-based registry system for all participants
Emissions management system	- Based on the emissions monitoring and reporting guidelines, all participants' emissions base years and their actual emissions amounts in their commitment periods are stored under the system. - The data will be used for third party verification. - Adopts existed monitoring methods (mainly energy purchasing bill) - EU-ETS verifiers voluntarily use similar management systems	- Integrated emissions calculation method - Streamlined emissions calculation and verification processes - Database of all stakeholder information
Trade matching system ("GHG-trade.com")	- Encourages emission allowance transactions among the participants. - Requires pre contacts before sales of allowances. - Updates allowance prices and amounts for participants' transactions on the notice board. (After confirmation of the contract details, participants should pay to their clients' bank accounts and apply for allowance transactions in the registry system.)	- Opportunities for the participants to find their trading counterparts through the Internet

Registry System of JVETS

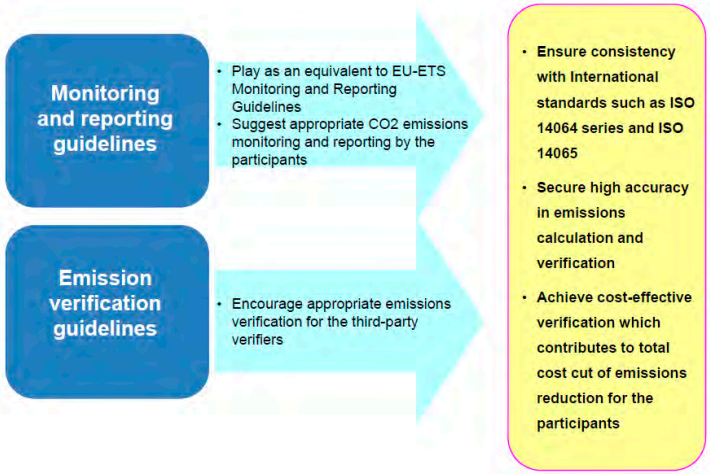
Image (1)



Three core systems of JVETS

Image (2)

Key guidelines in JVETS



JVETS third-party verifiers

- KPMG AZSA & Co.
- SGS Japan Inc.
- PricewaterhouseCoopers Arata Sustainability Certification Co., Ltd.
- Deloitte Tohmatsu Evaluation and Certification Organization Co., Ltd.
- Ernst & Young ShinNihon Sustainability Institute Co., Ltd.
- JACO CDM Ltd.
- Japan Quality Assurance Org.
- Japan Management Assn.
- Japan Consulting Inst., JCI CDM center
- Det Norske Veritas AS
- TÜV SÜD Japan Ltd.
- TÜV Rheinland Japan Ltd.
- Nippon Kaiji Kentei Quality Assurance Ltd.
- JIC Quality Assurance Ltd.
- BSI Management Systems Japan K.K.
- Bureau Veritas Japan Co., Ltd.
- Lloyd's Register Quality Assurance Ltd.
- Development Mechanism Inc
- Perry Johnson Registrars Clean Mechanism, Inc.
- Japan Smart Energy Co., Ltd.
- Environment & Quality Assurance International Certification Center

Main participant list in JVETS (1st to 4th phases)

1st phase (2005-2007)

Nippon Electric Glass Co., Ltd.	Nissan Shatai Co., Ltd.
Mitsubishi Gas Chemical Co., Inc.	Kitasenjyu branch, LUMINE Co., Ltd.
Asahi Fiber Glass Co., Ltd.	The SEIYU Co, Ltd.
Teijin Techno Products Ltd.	INAX Co.
Yamazaki Baking Co., Ltd.	Panasonic Electric Works Gumma Co., Ltd. etc.

2nd phase (2006-2008)

Rengo Co., Ltd.	INAX Co.
Tokai Senko K.K.	Victor Company of Japan, Ltd.
TOTO Ltd.	Suntory Ltd.
Suntory Shokuhin Kogyo Ltd.	Calpis Co., Ltd.
House Foods Co.	Meiji Dairies Co. etc.

3rd phase (2007-2009)

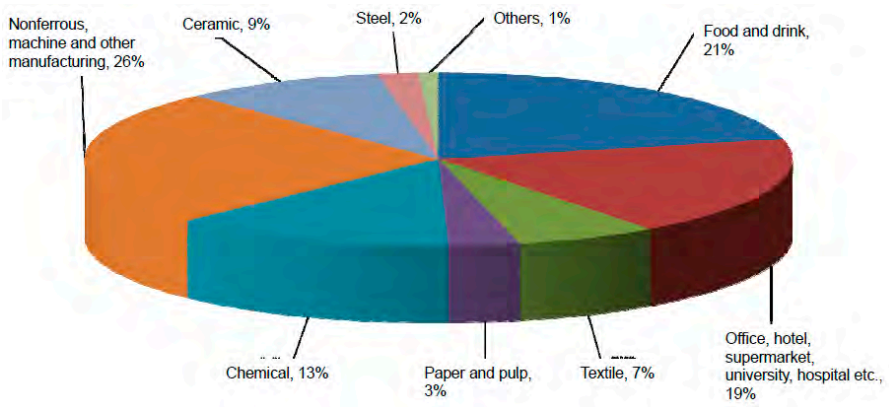
Toyo Kohan Co., Ltd.	Hitachi Seisen Ltd.
Teijin Fibers Ltd.	Sumitomo Rubber Industries Ltd.
Daiwa House Industry Co., Ltd.	Kikkoman Co.
Mitsubishi Plastics Inc.	Nippon Milk Community Co., Ltd. etc.

4th phase (2005-2007)

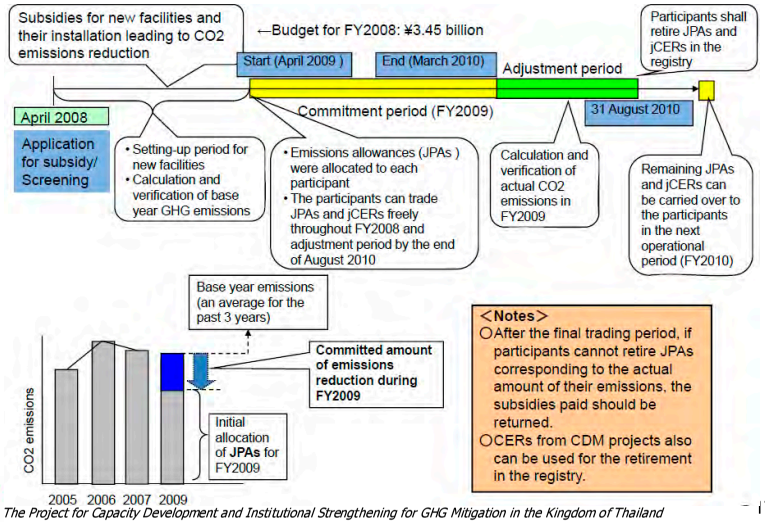
Takeda Pharmaceutical Co., Ltd.	Isuzu Motors Ltd.
TOYOBO Co., Ltd	Epson Imaging Devices Co.
Showa Denko K.K.	New Otani Co., Ltd.
Sumitomo Light Metal Industries Ltd.	Family Mart Co., Ltd. etc.

Source: http://www.env.go.jp/earth/ondanka/det/koubo-result.html

Industrial classification of JVETS participants (1st to 4th phases)



JVETS Phase 4



Chronological Table of Carbon Emission Trading in Japan

2005:

- Establishment of **JVETS** by MOE

Lehman Brothers Shock in 2008!

2008:

- Establishment of **Domestic CDM** by METI
- Establishment of **J-VER** by MOE
- Establishment of "**Pilot Operation of Unified Domestic Emissions Trading Market**"
- "Approach to Japanese Emission Trading Scheme Interim Report" Released

2010:

- The cabinet decided on the new Japanese bill of the "Basic Act on Global Warming Countermeasures" including the establishment of domestic emission trading scheme in March.
- The committee of ministers related to climate change decided that "domestic emission trading scheme should be considered deliberately" in December.

Earthquake & Tsunami in March 2011!

UNFCCC Structure and Negotiations 1: Overview of UNFCCC and international negotiations: from establishment to present

April, 2010

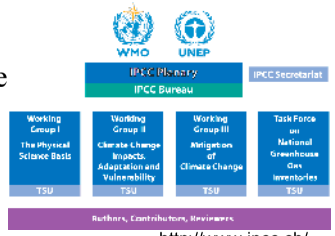
JICA Expert Team
Mariko FUJIMORI

A1-95

Contents

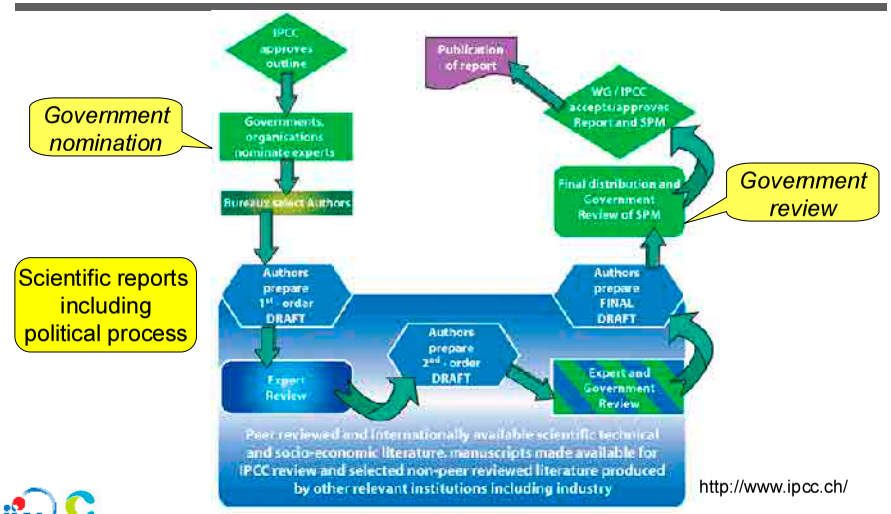
IPCC (1989)

- Establishment of IPCC (UNEP and WMO), by the UN General Assembly Resolution in 1988
- Reviewing scientific papers of all the countries of the world → Putting together latest research developments → making them public after approval by the governments of all the countries of the world,
- Three WGs (WG I: The Physical Science Basis, WG II: Impacts, Adaptation and Vulnerability, WG III: Mitigation of Climate Change) and Task Force on National Greenhouse Gas Inventories (TFI)
- Climate Gate (emails of 10 years ago.... 'gray' scientific papers in the field of impacts, adaptation and vulnerability)



http://www.ipcc.ch/

How to develop IPCC reports



http://www.ipcc.ch/

History of IPCC reports

- FAR (1990) : We are certain of the following:

  - there is a natural greenhouse effect which already keeps the Earth warmer than it would otherwise be.

  - emissions resulting from human activities are substantially increasing the atmospheric concentration of the GHGs. These increase will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface.
- SAR (1995) : Increase in GHGs concentrations since pre-industrial times (i.e., since about 1750) have led to a positive radiative forcing of climate, tending to warm the surface and to produce other changes of climate.

History of IPCC reports

- TAR (2001) :Emissions of GHGs and aerosols due to human activities continue to alter the atmosphere in ways that are expected to affect the climate
- AR4 (2007) : Warming of the climate system is unequivocal./Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations.
- AR5 (2013-2014): ?????

- Upcoming Special Reports; on "Renewable energy sources and climate change mitigation", and "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation", both in 2011.

UNCED and UNFCCC (1992)

- United Nations Conference on Environment and Development (UNCED) was held in Brazil in 1992,
- "Common but Differentiated Responsibility": Rio Declaration on Environment and Development and Agenda 21,
- Three conventions, UNFCCC, UNCBD and UNCCD were adopted at the UNCED,
- Why 'Framework'?
- Relationship among three conventions,
- Present status of UNFCCC (COP15 in Mexico), UNCCD (COP10 in Japan), and UNCBD (COP10 in Korea).

UNCED and UNFCCC (1992)

Quantified Emission Limitation and Reduction Objectives: (QUELROs)

- USA was opposed to EU that insisted challenging QUELROs.
- Other developed countries including Japan considered that EU' recommendation was unrealistic while recognized the necessity of ambitious QUELROs.
- Russia and EITs such as eastern European countries were opposed to accept same level of QUELROs.

→International negotiation was stagnant and they could not find compromise resolution.

'I agree with the plan in general, but will not compromise on details.'

UNCED and UNFCCC (1992)

Participation of developing countries:

- Developed countries:

  In order to solve global warming, developing countries should have QUELROs because their GHG emissions will increase more than developed countries in the near future.
- Developing countries:

  Global warming issue has to be solved only by the effort of developed countries because it is sure that present accelerated greenhouse effect is caused by GHG emissions of developed countries.

From Berlin Mandate (1995: COP1) to Kyoto Protocol (1997: COP3)

Berlin Mandate:

- One of the Decisions was made in COP 1 held at Berlin in 1995.
- The Decision stipulated that the protocol including QUELROs , policy and measures of developed countries shall be adopted in COP 3.
- In COP1, it was reconfirmed that developing countries did not have any QUELROs.
- Based on the output of COP1, Ad-hoc Group for Berlin Mandate was established in order to figure out nature and characteristics of the protocol until COP 3.

From Berlin Mandate (1995: COP1) to Kyoto Protocol (1997: COP3)

Kyoto Protocol (KP):

- KP was adopted in COP3 held at Kyoto in 1997.
- KP has a provision stipulated the QUELROs of developed countries.
- Targeted GHG: CO_2, CH_4, N_2O, HFC, PFC, SF_6,
- Base Year: 1990 (HFC, PFC, SF_6:1995),
- Flexibility mechanisms: CDM, JI, ET,
- USA: withdraw in 2001,
- KP came into force in 2005 after the ratification of Russia in 2004.

Marrakesh Accord (2001,COP7)

- After COP 3, before COP 6
- Main negotiation points in COP6
- What happened in COP6-bis?
- Main negotiation points in COP7

Marrakesh Accord (2001,COP7)

Main discussion points:

- Kyoto Mechanisms:
  - Supplementality of CER/ERU/AAU,
  - Diversion of ODA,
  - Negative list: refrain from nuclear related activities,
- Carbon Sink
- Adaptation
- National Communication, IPCC-TAR

From effectuation of Kyoto Protocol to First commitment period

- KP came into force in 2005
- Starting year of KP: 2008
- Various criticisms to KP
  - Developed countries（EU, USA, Japan）,
  - Developing countries（BRICS, oil producing countries, vulnerable LDC）,
  - Business communities in developed countries,
  - Business communities in developing countries,
  - Scientists,
  - NGOs

From effectuation of Kyoto Protocol to First commitment period

- What kind of activities did they do for their criticisms?
  - Developed countries（EU, USA, Japan）,
  - Developing countries（BRICS, oil producing countries, vulnerable LDC）,
  - Business communities in developed countries,
  - Business communities in developing countries,
  - Scientists,
  - NGOs

From effectuation of Kyoto Protocol to First commitment period

Major issues after Marrakesh Accord

COP8 2002: Delhi: Ratify the Kyoto Protocol in a timely manner; Details of CDM M&P, etc.

COP9 2003: Milan: Strong support for its immediate entry into force, importance of the CDM as an instrument for capacity-building and a means to forge partnerships, prompt implementation of the CDM, etc.

COP10 2004: Buenos Aires: Effectuation of KP, Buenos Aires programme of work on adaptation, accreditation of DOEs, small scale AR-CDM, etc.

COP11 2005：Montreal: Dialogue on long-term cooperative action, consideration of commitments for subsequent periods for Annex I Parties (AWG, start from 2006), establishment of JISC, etc.

From effectuation of Kyoto Protocol to First commitment period

Major issues after Marrakesh Accord

COP12 2006: Nairobi: AWG2: Necessary to engage major emitters of GHGs in a common long-term effort, regional balance of CDM projects, etc.

COP13 2007: Bali: Bali Road Map, AWG-LCA, REDD, Adaptation Fund, AWG-KP; "the AWG recognized that the contribution of WGIII to the AR4 indicates that …… potential damage limitation would require Annex I Parties as a group to reduce emissions in a range of 25-40 % below 1990 levels by 2020," etc.

COP14 2008: Poznan: Confirmation of necessary emission reduction (25-40%), sectoral approach, technology transfer (Poznan strategic programme), Adaptation Fund (not from JI and ET), etc.

Copenhagen Accord

- Recognize the scientific view that the increase in global temperature should be below 2 degrees Celsius, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change,
- Annex I Parties commit to implement individually or jointly the quantified economy-wide emissions targets for 2020, to be submitted in the format given in Appendix I by Annex I Parties to the secretariat by 31 January 2010. Annex I Parties that are Party to the Kyoto Protocol will thereby further strengthen the emissions reductions initiated by the Kyoto Protocol.
- Non-Annex I Parties to the Convention will implement mitigation actions, including those to be submitted to the secretariat by non-Annex I Parties in the format given in Appendix II by 31 January 2010.
- Mitigation actions taken by Non-Annex I Parties will be subject to their domestic **M**easurement, **R**eporting and **V**erification the result of which will be reported through their national communications **every two years**.

Copenhagen Accord

- Nationally appropriate mitigation actions seeking international support will be recorded in a registry along with relevant technology, finance and capacity building support. ..... These supported nationally appropriate mitigation actions will be subject to international **M**easurement, **R**eporting and **V**erification in accordance with guidelines adopted by the Conference of the Parties.
- To provide new and additional resources, including forestry and investments through international institutions, approaching USD 30 billion for the period 2010 - 2012 with balanced allocation between adaptation and mitigation. In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries.
- Call for an assessment of the implementation of this Accord to be completed by 2015.....This would include consideration of strengthening the long-term goal referencing various matters presented by the science, including in relation to temperature rises of 1.5 degrees Celsius.

Copenhagen Accord

Annex I Parties: Emissions reduction targets for 2020

Country	Emissions reduction in 2020	Base year
Australia	-5% up to -15% or -25%	2000
Belarus	-5-10%	1990
Canada	17%	2005
Croatia	-5%	1990
EU	20%/30%	1990
Iceland	30%	1990
Japan	25%	1990
Kazakhstan	15%	1992
Liechtenstein	20%/30%	1990
Monaco	30%	1990
New Zealand	10-20%	1990
Norway	30-40%	1990
Russia	15-25 %	1990
Switzerland	20% / 30%	1990
USA	17%	2005

http://unfccc.int/home/items/5264.php

Copenhagen Accord

Non-Annex I Parties: Nationally appropriate mitigation actions for 2020

(Abstract: Countries with numerical target)

Non-Annex I Parties	Actions
Brazil	Expected reduction of 36.1% to 38.9% Including reduction in Amazon deforestation, "Cerrado" deforestation, energy efficiency, etc.
China	40-45% by 2020 compared to the 2005 level Including increase the share of non-fossil fuels in primary energy consumption, and increase forest coverage.
India	20-25% compared to 2005
Indonesia	26% Including sustainable peat land management, 3. development of carbon sequestration projects in forestry and agriculture, etc.
Israel	20% compared to BaU
Maldives	Achieve carbon neutrality as a country by 2020
Marshall Islands	40% compared to 2009
Mexico	30%, 51 million tons of CO2e by 2012
Papua New Guinea	At least 50% by 2050, Carbon neutral before 2050
Republic of Korea	30% compared to BaU
Republic of Moldova	25% compared to 1990
Sierra Leone	40% compared to 1990
Singapore	16% compared to BaU
South Africa	34% by 2020, 42% by 2025 compared to BaU
Thailand	???

http://unfccc.int/home/items/5265.php

Copenhagen Accord : key points

(1) Increase in global temperature

- Recognize the scientific view of IPCC-AR4 that increase in global temperature should be below 2℃,
- IPCC-AR4-WG2 describes "It is very likely
- that all regions will experience either declines in net benefits or increases in net costs for increases in temperature greater than about 2-3℃.
- Countries including EU insist that the increase in global temperature should be below 2℃, or below 1.5℃.

A1-100

Copenhagen Accord : key points

(2) Measurement, Reporting and Verification (MRV)

- Confirm the "real" emission reduction,
- Copenhagen Accord distinguish necessary MRVs for "domestic" and "internationally supported" mitigation actions.
- COP15 encountered severe negotiations among Annex 1 Parties, Non-Annex 1 Parties with large amount of GHGs emissions (such as BASIC), and NA1 Parties with less emissions of GHGs but high vulnerabilities to the impact of climate change (such as small island countries).
- Guidelines for MRV will be adopted by the COP, and the details for implementation are future issues.

Copenhagen Accord : key points

(3) Resources to support developing countries

- 2010 – 2012: US$ 30 billion: for adaptation and mitigation
- by 2020: US$ 100 billion dollars a year: meaningful mitigation actions
- "Copenhagen Green Climate Fund" will be established to flow these funding.
- However, the rules of "How to raise , manage, and allocate the fund" are future issues to be negotiated and defined through COP.

UNFCCC Structure and Negotiations 2: UNFCCC and key international negotiations after COP3

27th April, 2010

JICA Expert Team
Mariko FUJIMORI

A1-101

Contents

- What were the **biggest changes** before and after COP3?
- **Key players** of COP negotiations,
- Why COP6 was suspended and **COP6-bis** was required?
- Key points (milestones) until the Copenhagen Accord.
- What is the **difference** between "Copenhagen Accord?" and "Marrakesh Accord"?

What were the biggest changes before and after COP3?

- Emission reduction target to Annex 1 Parties,
- Target GHGs
- Removals by land use change and forestry
- Base year (1990) and target year (2008-2012) ?
- No obligation to Non-Annex 1 Parties
- Kyoto Mechanisms (*Low hanging fruits*) ?

→ However, details were not decided until COP7 (2001); Marrakesh Accord.

Key players of COP negotiations

Early stage, key players were relatively simple:

- EU, USA, Japan, NA-1, Russia and EIT

Recently, situation is more complicated:

- EU: Drive KP, integrating climate change issues into their growth strategies (renewable energy, ET, etc.).
  - Expansion of EU (from 15 to 27) brought both power and difficulties. ?
- USA: Prefer market mechanisms - withdraw - return
- Japan: Host of COP3, coordinating role, challenging target (-25%).

Key players of COP negotiations

- Non-Annex 1 Parties: diversified
  - BASIC (Brazil, South Africa, India, China),
  - Countries with less emission than BASIC countries,
  - Most vulnerable countries including small island states.

?

- NGOs have also been diversified.
  - Environment
  - Research/Science
  - Private entities
  - More and more……

Why COP6 was suspended and COP6-bis was required?

- 2002: Rio + 10 → Target year to make KP enter into force → *Rules should be defined until 2001!!*
- Required ratification:
  - More than 55 Parties,
  - More than 55% of emission from Annex I Parties.
- Difference among EU, Umbrella (Iceland, USA, Ukraine, Australia, Canada, New Zealand, Norway, Russia, Japan), Non-Annex I Parties, and within the groups.
- Most difficult issues: land use (removal)

?

→ COP6 was suspended.

Why COP6 was suspended and COP6-bis was required?

- January 2001: Change of USA government → withdrew from the KP in March 2001
  - No obligation to Non-Annex 1 Parties
  - Too severe target: adverse effect to their economy,

?

Their basic ideas are not different now.

- Severe criticisms to the USA
- USA Proposed to provide another Protocol until COP6-bis, but it was not developed in time (because of domestic difficulties).
- Key players at COP6-bis: Japan, Canada, EU, Russia, and USA (silence)
- Key issues: LUCF, financial mechanisms

?

What are the differences between "Copenhagen Accord?" and "Marrakesh Accord"?

- Copenhagen Accord includes very important point for Non-Annex 1 Parties; **MRV**
  - Who?
  - Where?
  - How much?

GHG emission

?

- Correct and organized data is essential to know emission.
- It requires many types of technologies;
  - How to measure?
  - How to monitor? (continuous measurement, data storage, etc.)

?

- Then we can identify who, when should take what kind of mitigation measures.

What are the differences between "Copenhagen Accord?" and "Marrakesh Accord"?

- Mitigation measures include various types of ideas, technologies and institutions, such as CCS and REDD.
- However, most important points for REAL reduction are who and how to introduce best available technologies in timely manner.
- MRV is most important for such activities.

Registration << Issuance

?

What are the differences between Copenhagen Accord and Marrakesh Accord?

How Copenhagen Accord relates to Thailand?

UNFCCC Structure and Negotiations 3: Overview of international negotiations over post-2012 mechanisms

25th May, 2010

JICA Expert Team
Mariko FUJIMORI

Contents

- Major issues in international negotiations
- Schedule of negotiations until COP16/CMP6
- Important points of Copenhagen Accord
- Targets/NAMAs for 2020
- Importance of Key Players
- Border Measures – impact to other field from climate change world

Major issues in international negotiations

- Mitigation
  - How can we assure fair, transparent and practical scheme?
  - Legal obligation, emission reduction target/NAMA, MRV.
- Key players
  - USA, China, EU…..

- Adaptation
  - Urgent to most vulnerable countries but also important for all other countries.
- Funding mechanism
  - Copenhagen Green Climate Fund, 30 and 100 bil $.
- Technology transfer

Major issues in international negotiations

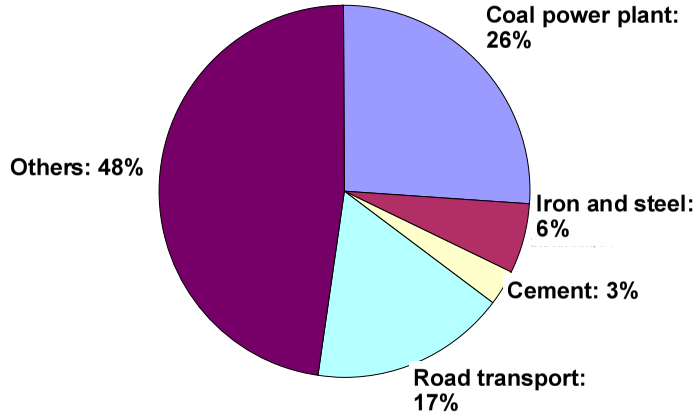
- Mitigation
  - How can we assure fair, transparent and practical scheme?
  - We should learn from the experience concerning the Kyoto Protocol.

  →***What are the ultimate objectives?***

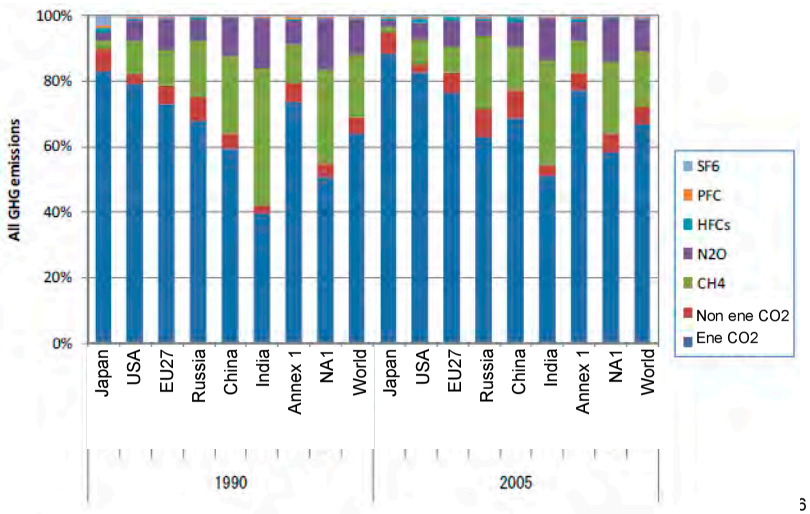
  - Legal obligation: Who should reduce GHG emission? Where, when, how?
  - Will the emission reduction targets and mitigation actions be enough?
  - Why and how the MRV of mitigation actions are important?

Major issues in international negotiations

- CO2 emissions from fuel combustion: 27 billion tCO2



Major issues in international negotiations



Schedule of negotiations until COP16/CMP6

- April 9-11: AWG-LCA 9 and AWG-KP 11 (Bonn)
- May 31 – June 11: SB32 (Bonn)
- June: G8 Summit, Muskoka, Canada
- June: G20 finance ministers' meeting, Toronto, Canada
  - 19 countries and EU --- (Argentina, Australia, Brazil, Canada, China, France, Germany, India,Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, Korea, Turkey, UK, USA), and IMF and Worldbank
- September: UN General Assembly, USA
- November: G20 Summit, Korea
- 29 November – 10 December: COP16/CMP6, Mexico

Important points of Copenhagen Accord *(Remind, please.)*

- Copenhagen Accord includes very important point for Non-Annex 1 Parties; **MRV**
  - Who?
  - Where?
  - How much?
- Correct and organized data is essential to know emission.
- It requires many types of technologies;
  - How to measure?
  - How to monitor? (continuous measurement, data storage, etc.)
- Then we can identify who, when should take what kind of mitigation measures.

Targets/NAMAs for 2020
(Remind, please.)

Annex I Parties: Emissions reduction targets for 2020

Country	Base year	Emissions reduction in	from 1990	from 2005
Australia	2000	-5 - -25%	+13 - -11%	-10 - -29%
Canada	2005	-17%	+3%	-17%
EU	1990	-20%/-30%	-20%/-30%	-13%/-24%
Japan	1990	-25%	-25%	-30%
New Zealand	1990	-10 - -20%	-10 - -20%	-28 - -36%
Russia	1990	-15 - -25%	-15 - -25%	-18 - -33%
USA	2005	-17%	-4%	-17%

Targets/NAMAs for 2020
(Remind, please.)

Non-Annex I Parties: Nationally appropriate mitigation actions for 2020
(Abstract: Countries with numerical target)

Non-Annex I Parties	Actions	from 2005
Brazil	Expected reduction of 36.1% to 38.9% (from BaU) Including reduction in Amazon deforestation, "Cerrado" deforestation, energy efficiency, etc.	-23%
China	40-45% by 2020 compared to the 2005 level Including increase the share of non-fossil fuels in primary energy consumption, and increase forest coverage.	8% growth until 2020: emission: 1.9 times
India	20-25% compared to 2005	7% growth until 2015, 6% growth from 2015 emission: 2.1 times
Indonesia	26% Including sustainable peat land management, 3. development of carbon sequestration projects in forestry and agriculture, etc.	
Israel	20% compared to BaU	
Maldives	Achieve carbon neutrality as a country by 2020	
Marshall Islands	40% compared to 2009	
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Singapore	16% compared to BaU	
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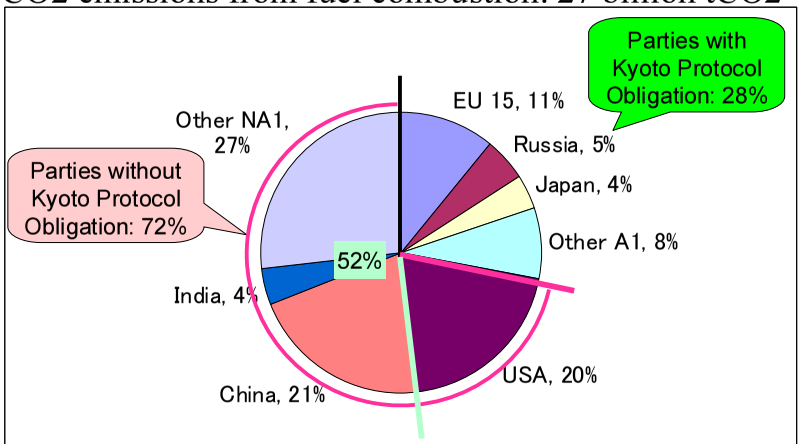
Thailand	???	

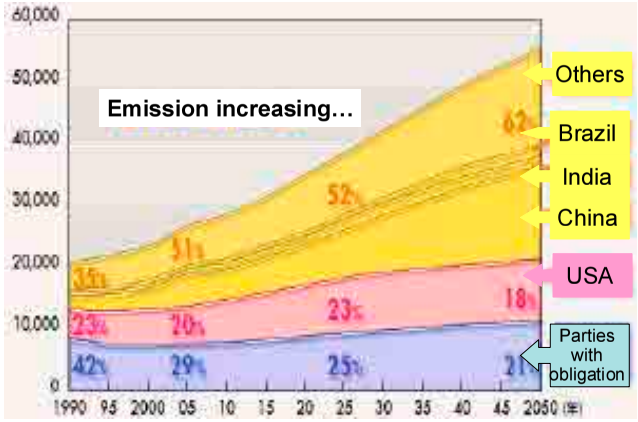
Importance of Key Players

- CO2 emissions from fuel combustion: 27 billion tCO2



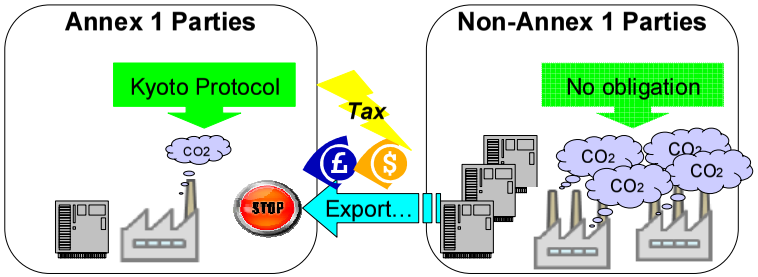
Importance of Key Players

- Key players



Border Measures - impact to other field from climate change world

- Climate change and international trade



Border Measures - References

UNFCCC, Article 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.

Border Measures - References

GATT (The General Agreement on Tariffs and Trade),

Article XX, General Exceptions

Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:

(b) necessary to protect human, animal or plant life or health;

(g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption;

The Project for Capacity Development and Institutional Strengthening for GHG Mitigation in the Kingdom of Thailand

UNFCCC Structure and Negotiations 4: Overview of international negotiations by EU and the USA over post-2012 mechanisms *and* Carbon Trading 3: Overview of emission trading systems in the USA and future international trading system in post 2010

22nd June, 2010

Deputy Chief Advisor of JICA Expert Team
Kazuhito YAMADA

JICA Expert Team
Mariko FUJIMORI

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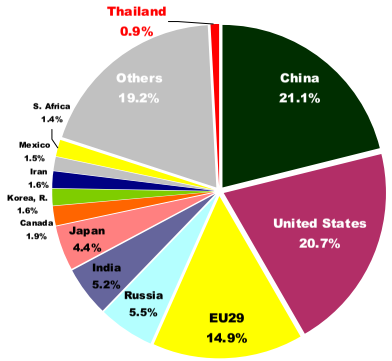
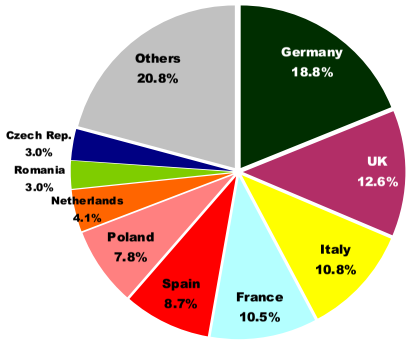
Important characteristics of EU-ETS GHG emissions

Remind, please.

World (212) CO_2 (2006)



EU-ETS (29) GHG (2007)



EU: Major institutions to reduce national GHG emission

Emission reduction target

- -20 – -30 % until 2020 compared to 1990

Examples of major institutions/activities to reduce GHG (legislative resolution);

- EU-ETS,
- Promotion of renewable energy utilization,
- Shared effort by communities,
- Promotion of energy efficiency,
- Development of CCS (carbon capture and storage),
- Emission reduction in transport sector (improvement of passenger cars efficiency, and fuel quality), and
- Utilization of international carbon credit

EU: Proposal/stance for post 2012

NAMA (Nationally Appropriate Mitigation Actions):

- Support NAMA as a mechanism to promote voluntary emission reduction by developing countries

SCM (Sector Crediting Mechanism):

- Propose introduction of SCM
- SCM by No-lose target, utilization of credit from SCM for the emission reduction target of developed (Annex 1) countries

Details of NAMA/SCM will be introduced next week.

USA: Major institutions to reduce national GHG emission

Emission reduction target

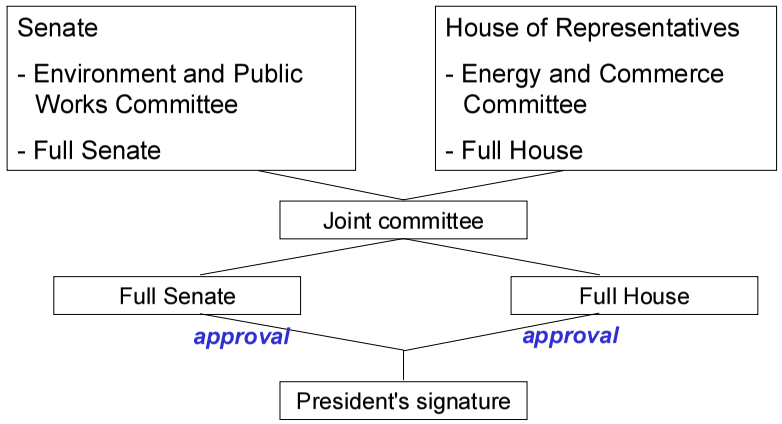
- -17 % until 2020 compared to 2005

State-of-the-union speech by President Obama (Jan. 2010)

- Create more clean energy jobs, more production, more efficiency, more incentives.
- Passing a comprehensive energy and climate bill with incentives that will finally make clean energy the profitable kind of energy in America.

USA: Process to pass a bill

(in case of recent climate related bills)



USA: Major institutions to reduce national GHG emission

US-EPA: Clean Air Act

- US Congress has decided to oblige GHG emitter (above a certain level) to report their emission amount,
- The new rule is enforced from 29th December 2009
- Emission amount from 1st January 2010 have to be reported until 31st March 2011,
- Covered entities: Emit 25,000t CO_2/year and above
- Covered GHGs: Kyoto 6 gases and fluorides

USA: Major institutions to reduce national GHG emission

American Power Act (Kerry-Lieberman)

- Achieve national pollution reduction target,
- Refunds the money raised right back to American consumers and businesses,
- Not a plan that enriches Wall Street speculators, nore to prow the government.
- Cap-and-trade scheme:
  - Power and industrial sectors: emission from fixed sources of 25,000 tCO_2 and above,
  - Household and transport sectors: emission from refined fuel utilization and natural gas,
  - Covers more than 85 % of total emission of the USA,
  - The scheme will enter into force from 2013, with 3 years delay for household and transport sectors.

USA: Major institutions to reduce national GHG emission

American Power Act (Kerry-Lieberman)

- Control of credit price
  - Upper limit: fixed price of 25 \$/tCO_2 in 2013, and the price will increase at +5 % per annum,
  - Lower limit: set the floor price for the auction.
- Offset credit program for domestic/international emission reduction
  - Allowed 2 billion per year,
  - 75 % for domestic credit and 25 % for international credit, and if the domestic credit comes short, international credit can be used up to 50 %.
  - International credit includes sector credit, credit issued by international organizations, and REDD.

USA is considering bilateral carbon crediting system...

- **Bilateral/multilateral Sectoral crediting system:**

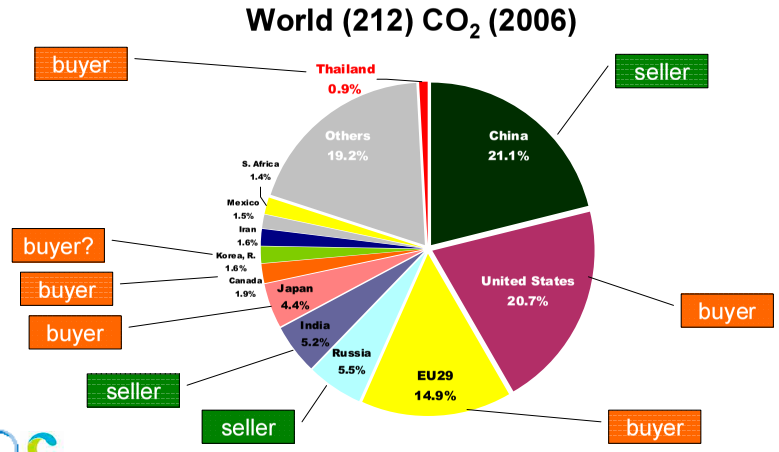
  Targets: Developing countries who agree to the system
  - not each company/factory but specified sector
  - competitive sectors with USA's industries

  MRV: Targeted DC has to develop MRV capacity

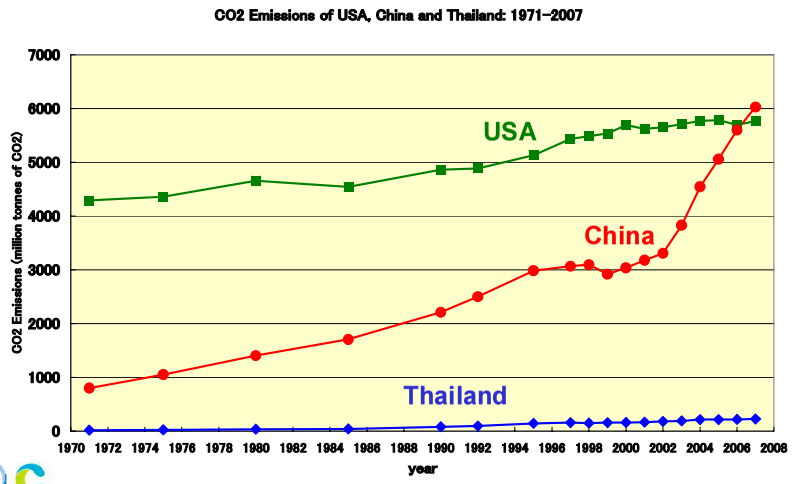
UNFCCC crediting system can survive if EPA administrator confirms their possibility to use the system.

Japan is also considering bilateral carbon crediting system.

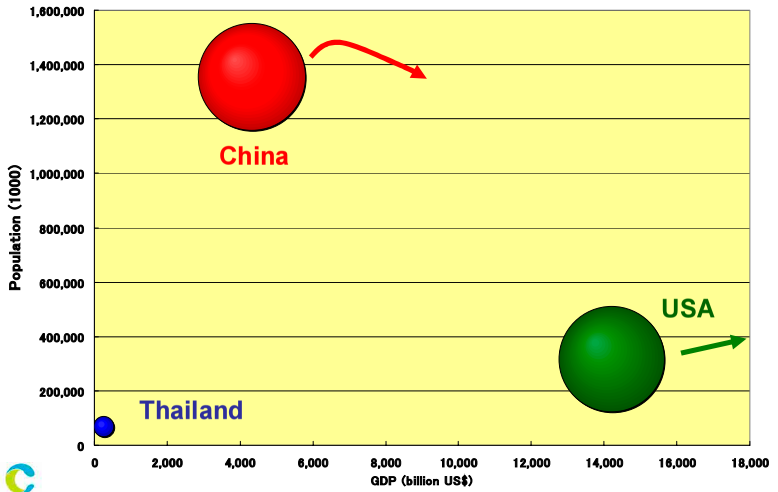
Carbon credit until 2020 buyers and sellers



Carbon credit until 2020
NO.1 buyer and NO.1 seller



Carbon credit until 2020
NO.1 buyer and NO.1 seller



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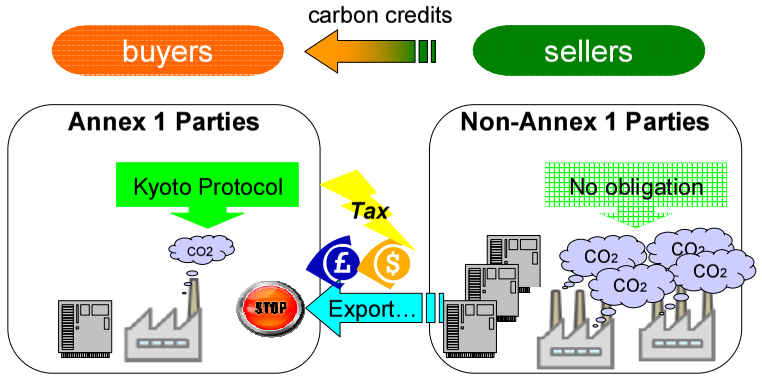
Border Measures - impact to other field
Remind, please. from climate change world

- Climate change and international trade



Discussion

- How does Thailand address future international trading system?
- What kind of GHG emission reduction projects should be developed in Thailand?
- Who are main partners to develop the projects and to sell carbon credits from them?
  - USA
  - EU
  - Japan
  - Canada etc.

UNFCCC Structure and Negotiations 5 and 6: MRV, NAMA, SCM

29th June, 2010

JICA Expert Team

Mariko FUJIMORI

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Objectives of this section

- To understand:

  Basic concept and latest situation of NAMA, MRV and SCM,

- To discuss:

  Feasibility, possibility and difficulty of MRV about example NAMA projects (assumption) in certain sectors.

What is NAMA?
Bali Action Plan (COP13, 2007)

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

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

(i) Measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives, by all **developed** country Parties, while ensuring the comparability of efforts among them, taking into account differences in their national circumstances;

What is NAMA?
Bali Action Plan (COP13, 2007)

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

(iv) Cooperative sectoral approaches and sector-specific actions, in order to enhance implementation of Article 4, paragraph 1(c), of the Convention;

(v) Various approaches, including opportunities for using markets, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries;

What is NAMA?

Latest negotiation text at AWG-LCA

- Developing country Parties, in the context of sustainable development, **will undertake nationally appropriate mitigation actions**, enabled and supported by finance, technology and capacity building.
- The extent to which these Parties will implement mitigation actions will depend on effective provision of finance, technology and capacity-building support as embodied in Article 4.7 of the Convention.

Source: Advanced draft of FCCC/AWGLCA/2010/8

Reference: UNFCCC

Article 4.7 of the Convention

- The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

What is NAMA?

Latest negotiation text at AWG-LCA (cont.)

- Developing country Parties will also undertake **domestically funded mitigation actions** in accordance with their respective capacities.
- LDC Parties and small island developing states may undertake nationally appropriate mitigation action at their discretion.
- Mitigation actions (…by developing countries…) will aim at achieving in aggregate a substantial deviation in emissions relative to the business as usual emissions in 2020.

Source: Advanced draft of FCCC/AWGLCA/2010/8

What is MRV?

- Measurable, reportable and verifiable
- Measurement, reporting and verification

→of mitigation actions

How, and who?

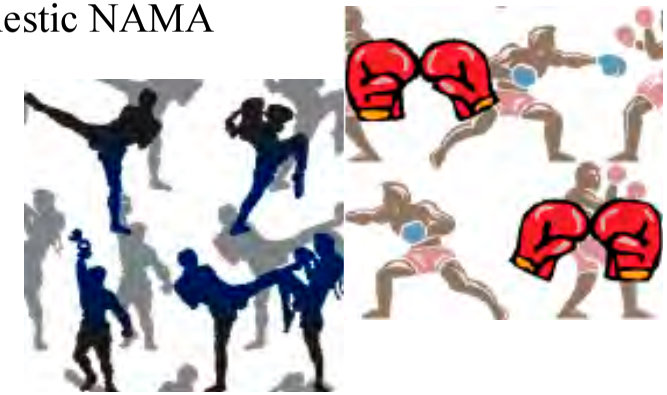
What is MRV?

Definitions of "Measure":

- The terms "measure" and "measurability" do not have any agreed definition in international environmental law or in international law more generally.
- Quantifiable attributes: e.g., volume, mass, distance, area, time, temperature, amount of GHG emission, etc.
- Virtual/semi-quantifiable attributes: e.g., levels of earthquake, assessment of performance (excellent, good, fair, poor), etc.

NAMA and MRV: examples

- Supported NAMA
- Domestic NAMA



What kind of MRV is required?

- International support NAMA: finance, technology and capacity building

  → Recorded in a ***mechanism*** – under negotiation…

  – Incremental costs, indication of type of support, mitigation benefits, time frame, technical analysis(?), etc…

  → MRV: subject to the international level guidelines, to be adopted at COP XX.

Source: Advanced draft of FCCC/AWGLCA/2010/8
FCCC/AWGLCA/2010/6

What kind of MRV is required?

- Domestically-funded NAMA

  → MRV: subject to the domestic MRV

- NAMA covered by carbon market mechanisms

  → MRV: apply rules of relevant carbon market mechanisms

Source: Advanced draft of FCCC/AWGLCA/2010/8

Requirement to developing country Parties

- Prepare national communications every 6 years
- Prepare biennially (from 20XX):
  - National GHG inventories,
  - Status of implementation of NAMA and estimated emission reductions by the NAMA,
  - Methodologies and assumptions to quantify the reductions,
  - Information of receipt of finance, technology and capacity building support,
  - Result of domestic verification of domestic NAMA

Source: Advanced draft of FCCC/AWGLCA/2010/8

Requirement to developing country Parties

- International consultation and analysis (ICA) shall apply to the national communications and above mentioned biennial submissions such as national GHG inventories,
- Guiding principle: respects national sovereignty, based on technical expertise, spirit of mutual respect.
- Analysis will be undertaken by an independent panel of experts, representing all regions for consideration of the SBI, under auspices of the SBI.

Source: Advanced draft of FCCC/AWGLCA/2010/8

Other issues related to NAMA

- Developing country Parties will prepare low-emission development plans. These plans will **not** be a precondition for support for NAMAs.
- LDC Parties and small island developing states may prepare low-emission development plans at their discretion.

Source: Advanced draft of FCCC/AWGLCA/2010/8)

Targets/NAMAs for 2020
(Remind, please.)

Non-Annex I Parties: Nationally appropriate mitigation actions for 2020

(Abstract: Countries with numerical target)

Non-Annex I Parties	Actions	from 2005
Brazil	Expected reduction of 36.1% to 38.9% (from BaU) Including reduction in Amazon deforestation, "Cerrado" deforestation, energy efficiency, etc.	−23%
China	40-45% by 2020 compared to the 2005 level Including increase the share of non-fossil fuels in primary energy consumption, and increase forest coverage.	8% grouwth until 2020: emission: 1.9 times
India	20-25% compared to 2005	7% growth until 2015, 6% growth from 2015 emission: 2.1 times
Indonesia	26% Including sustainable peat land management, 3. development of carbon sequestration projects in forestry and agriculture, etc.	
Israel	20% compared to BaU	
Maldives	Achieve carbon neutrality as	
Marshall Islands	40% compared to 2009	
Mexico	30%, 51 million tons of CO2	
Papua New Guinea	At least 50% by 2050, Carbo	
Republic of Korea	30% compared to BaU	
Republic of Moldova	25% compared to 1990	
Sierra Leone	40% compared to 1990	
Singapore	16% compared to BaU	
South Africa	34% by 2020, 42% by 2025 compared to BaU	
Thailand	???	

Please refer to the appendix.

What is SCM?

- Cooperative sectoral approaches and sector-specific actions, in order to enhance implementation of Article 4, paragraph 1(c), of the Convention;

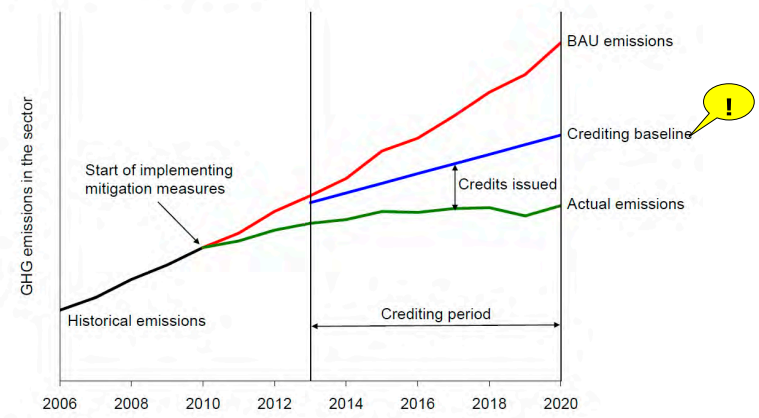
Source: Advanced draft of FCCC/AWGLCA/2010/8)

Reference: Article 4, para (1) of the Convention

Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;

What is SCM?

Figure 1: Illustration of a SCM



Source: A framework for a sectoral crediting mechanism in a post-2012 climate regime (Oko-Institute, 2009)

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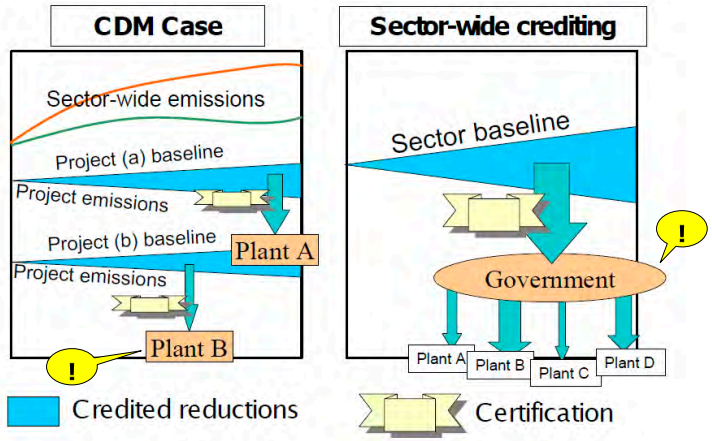
What is SCM?

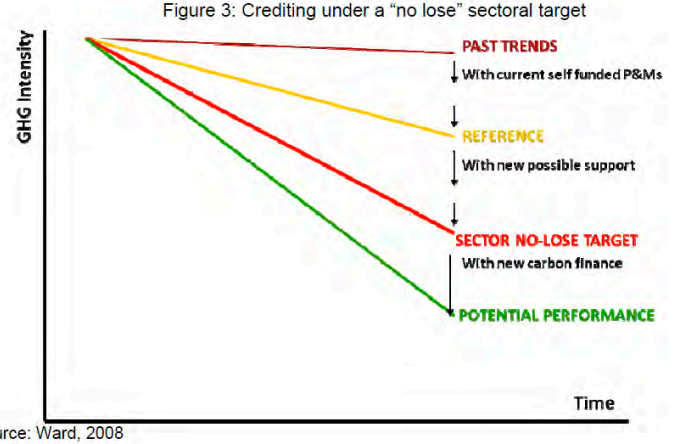
Figure 1: Sectoral crediting versus the Clean Development Mechanism



Source: Sectoral Approaches to GHG Mitigation: Scenarios for Integration (OECD/IEA, 2006)

What is SCM?

Figure 3: Crediting under a "no lose" sectoral target



Source: Ward, 2008

Source: Sectoral Crediting Approaches and the Carbon Markets (OECD, 2009)

Issues of SCM baseline setting

- Intensity goal
  - Use GHG emission per unit of production of the sector (e.g., tCO2/kWh、tCO2/t-cement、tCO2/t-crude steel), set emission factor of each sector (sub-sector) and apply it as baseline of the sector.
- Fixed sectoral targets
  - Apply the total amount target as baseline of the sector. It is useful to upper limit allowance to the sector, but on the other hand, it will not be flexible to change/adjust the allowance when the sector activity increased rapidly within short period.

Issues of SCM baseline setting

- Technology-based approaches
  - Set “technical goal” of introducing technologies to each sector.
  - Developing countries can set each target in accordance with their own condition, and the monitoring of technology introduction itself will not be very difficult,
  - However, it will be difficult to quantify the GHG emission reduction by the introduced technology, including monitoring of the reduction,
  - Distribution of credit will be difficult.

Discussion

- Please discuss the feasibility, possibility and difficulty of MRV, concerning following NAMA/SCM project examples.
- PJ-A: Reforestation projects in rural areas
- PJ-B: Municipal solid waste management projects in urban areas

Discussion

PJ-A: Reforestation projects in rural areas

- Small areas in remote communities,
- Planting local tree species,
- Including both humid and semi arid regions,
- Contributing employment opportunities for the communities.

Discussion

PJ-B: Municipal solid waste management projects in urban areas

- Dumping sites locate urban areas, collecting wastes from small and medium towns,
- Majority of the waste component is organic matters (50 – 60 %),
- Contributing environment improvement of the community (odor and water pollution).

Appendix: Submission of NAMAs according to the Copenhagen Accord (extract)

Country	Emission reduction	Mitigation actions with numerical targets	Mitigation actions without numerical targets
Brazil	36.1% to 38.9% by 2020 ***No definition of base year***	- Reduction in Amazon deforestation (564 mil tCO2e) - Reduction in "Cerrado" deforestation (104 mil tCO2e) - Restoration of grazing land (83 to 104 mil tCO2e) - Integrated crop-livestock system (18 to 22 mil tCO2e) - No-till farming (16 to 20 mil tCO2e) - Biological N2 fixation (16 to 20 mil tCO2e) - Energy efficiency (12 to 15 mil tCO2e) - Increase the use of biofuels (48 to 60 mil tCO2e) - Increase in energy supply by hydroelectric power plants (79 to 99 mil tCO2e) - Alternative energy sources (26 to 33 mil tCO2e) - Iron & steel (replace coal from deforestation with coal from planted forests, 8 to 10 mil tCO2e)	
China	40-45%: per unit of GDP by 2020 compared to the 2005 level	- Lower CO2 emissions per unit of GDP by 40-45% by 2020 compared to the 2005 level, - Increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020, and - Increase forest coverage by 40 million ha and forest stock volume by 1.3 billion m3 by 2020 from the 2005 levels.	
Ethiopia	NA	**1. Electricity Generation from Renewable Energy for the Grid System** 1.1. Hydro Power 1.1.1. Beles Project, with 460 MW electric power generation capacity; to be completed in 2010 1.1.2. Gibe III Project, with 1870 MW electric power generation capacity; to be completed in 2013 ~~~ [10 projects] 1.2. Hydro Power Projects under Study 1.2.1. Tekeze Project, with 450 MW electric power generation capacity; the study to be completed in 2012 1.2.2. Beko Abo Project, with 1600 MW electric power generation capacity; the study to be completed in 2010 ~~~ [11 projects] 1.3. Wind Projects ~~~ [7 projects] 1.4. Geothermal Projects ~~~ [6 projects] **2. Bio-fuel Development for Road Transport and for household use** 2.1. Project to produce 63.36 million litters of ethanol starting from 2010 up to 2015 2.2. Project to produce 621.6 million litters of biodiesel starting from 2010 up to 2015 **3. Electricity Generation from Renewable Energy for Off-grid Use and Direct Use of Renewable Energy** 3.1. Project to install 150000 solar home systems starting from 2010 up to 2015 3.2. Project to construct 65000 small hydro electric power generation facilities starting from 2010 up to 2015 ~~~ [12 projects] **4. Transport** Railway Projects with Trains to Run with Electricity Generated from Renewable Energy 4.1. Route 1 (Addis Ababa-Modjo-Awash); 656 Km, to be completed in 2015 4.2. Route 2 (Modjo - Shashemene - Awassa – Konso – Woyito – including Konso – Moyale); 903 km, date of completion to be determined ~~~ [9 projects] **5. Forestry/forests** 5.1. enhanced district level reforestation actions for the increment of vegetation cover of 214440 square kilometres of degraded lands, lands affected by gullies and slopes including through the management of community areas closed off to grazing 5.2. 28736.70 square kilometres of natural high forest area sustainably managed in order to reduce GHG emissions from deforestation and forest degradation ~~~ [7 projects] **6. Agriculture** 6.1. application of compost on 80000 square kilometers of agricultural land of rural local communities for increased carbon retention by the soil 6.2. implementation of agroforestry practices and systems on 261840 square kilometers of agricultural land for livelihood improvement and carbon sequestration **7. Waste management** 7.1. Repi-Addis Abeba project to reduce the generation of methane from 14.56 million cubic meters of deposited urban waste 7.2. Addis Abeba project to reduce the generation of methane from 1 million cubic meters of urban waste with a growth rate 2.3%/year	
India	20-25%: per unit of GDP by 2020 compared to the 2005 level	*agricultural sector will not be a part of the emission intensity	
Indonesia	26% by 2020 ***No definition of base year***		1. Sustainable peat land management 2. Reduction in Rate of deforestation and land degradation 3. Development of carbon sequestration projects in forestry and agriculture 4. Promotion of energy efficiency

Source: http://unfccc.int/home/items/5265.php (as of 27th June 2010)

<table>
<tr><th>Country</th><th>Emission reduction</th><th>Mitigation actions
with numerical targets</th><th>Mitigation actions
without numerical targets</th></tr>
<tr><td></td><td></td><td></td><td>5. Development of alternative and renewable energy sources
6. Reduction in solid and liquid waste
7. Shifting to low emission transportation mode</td></tr>
<tr><td>Islarel</td><td>20%:
by 2020 compared to BaU</td><td>Main actions for achieving reduction target include:
- 10% renewable energy in electricity generation by 2020
- 20% reduction of electricity consumption by 2020</td><td>Significant areas: energy efficiency, renewable energies, green building; and transportation.</td></tr>
<tr><td>Korea</td><td>30%
by 2020</td><td>To reduce national GHG emissions by 30% from the business-as-usual emissions by 2020.</td><td></td></tr>
<tr><td>Maldives</td><td>(100%)
Carbon neutrality as a country by 2020.</td><td>The Government is presently undertaking detailed work on implementation of this action and will register a request for technological, financial and capacity building support for implementation.</td><td></td></tr>
<tr><td>Marshall Islands</td><td>40%:
below 2009 level</td><td>- Pursuant to the 2009 National Energy Policy and Energy Action Plan, and with subject to the provision of adequate international support.</td><td></td></tr>
<tr><td>Mexico</td><td>30%:
with respect to the BaU by 2020</td><td>- Reduction in total annual emissions of 51 mill tCO2e by 2012</td><td></td></tr>
<tr><td>Moldova</td><td>25%:
compared to 1990</td><td></td><td>Through implementation of global economical mechanisms focused on the climate change mitigation, in accordance with the Convention’s principles and provisions.</td></tr>
<tr><td>Papua New Guinea</td><td>50%:
by 2030,
Carbon neutral: (100%) by 2050</td><td>1. Increase GDP per capita more than 3 times by 2030;
2. Decrease GHG emissions at least 50% before 2030 while becoming carbon neutral before 2050;
3. Increase adaptation investments per annum by $80 - $90 million to reduce expected losses by $230 - $250 million.

Appropriate mitigation actions (51-73%)
Forestry 26-32%, Agriculture 15-27%, Oil and gas 5.1-7.3%, Transportation 2.8-3.8%, Power generation 0.2-0.8%, Mining and fire 2.5%

<table>
<tr><th colspan="4">Preliminary Climate Compatible Development Plan: Actions and Objectives</th></tr>
<tr><th>High-Level Policy Objectives</th><th>Est. 2010*</th><th>BAU 2030*</th><th>Objectives of Policy or Action</th></tr>
<tr><td>1. Sustainable Growth</td><td>$,1000</td><td>$3,000</td><td>Increase GDP / capita by more than 3 times by 2030</td></tr>
<tr><td>2. Emissions Reductions</td><td>82 – 99</td><td>99 - 141</td><td>Decrease GHG emissions by at least 50% by 2030 (75% technically possible subject to enabling finance)
Carbon Neutral before 2050</td></tr>
<tr><td>3. Adaptation Investments</td><td></td><td></td><td>$80-90m investment required to reduce expected loss by $230-250m</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Appropriate Mitigation Actions</td><td></td><td></td><td></td></tr>
<tr><td>1. Forestry</td><td>50 – 52</td><td>53 - 64</td><td>26 – 32</td></tr>
<tr><td>2. Agriculture</td><td>25 – 38</td><td>31 - 58</td><td>15 – 27</td></tr>
<tr><td>3. Oil and Gas</td><td>0.4 – 0.6</td><td>5.3 – 7.5</td><td>5.1 – 7.3</td></tr>
<tr><td>4. Transportation</td><td>1.6 – 2.4</td><td>3.3 – 4.5</td><td>2.8 – 3.8</td></tr>
<tr><td>5. Power Generation</td><td>0.3 – 0.5</td><td>1.4 – 2.0</td><td>0.2 – 0.8</td></tr>
<tr><td>6. Mining & Fire</td><td>5</td><td>5</td><td>2.5</td></tr>
<tr><td>Total</td><td>82 – 99</td><td>99 - 141</td><td>51 – 73</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Adaptation Investments</td><td>Expected annual loss</td><td></td><td>Costs and benefits of counter-measures</td></tr>
<tr><td>1. Coastal Sea Level Rise</td><td>$20m</td><td>$90-100m</td><td>$35-40m p.a. to reduce expected loss by $80m</td></tr>
<tr><td>2. Inland Flooding</td><td>$10-15m</td><td>Tbd</td><td>Tbd</td></tr>
<tr><td>3. Malaria</td><td>$130m</td><td>$210-250m</td><td>$45-50m p.a. to reduce expected loss by $150-170m</td></tr>
<tr><td>4. Agricultural Yield Change</td><td>N.a.</td><td>Tbd**</td><td>Tbd</td></tr>
<tr><td>5. Coral Reef Damage</td><td>N.a.</td><td>Tbd***</td><td>Tbd</td></tr>
</table></td><td>Adaptation investments
1. Coastal sea level rise
2. inland flooding
3. malaria
4. agricultural yield change
5. coral reef damage</td></tr>
<tr><td>Sierra Leone</td><td>40%:
compared to 1990</td><td>4. Improve forest governance to maintain the proportion of land area covered by forests to at least 3.4 million ha by 2015,</td><td>1. Establishment of the National Secretariat for Climate Change (NSCC)
2. Institutional strengthening and capacity building.
3. Increase conservation efforts in Sierra Leone,
5. Setting/developing air, water and soil quality pollution standards,
6. Introducing conservation farming and promoting the use of other sustainable agricultural practices,
7. Development of an Integrated Natural Resources and Environmental Management programme for Sierra Leone,
8. Expanding clean energy utilization,
9. Development of energy efficiency programmes,
10. Development of alternative energy sources such as biofuels,
11. Developing agricultural and urban waste incineration programmes for energy production,
12. Improved waste management through composting and recycling of waste,
13. Development and enforcement of regulations on regular Maintenance of vehicles.</td></tr>
<tr><td>Singapore</td><td>16%:
below BAU in 2020</td><td></td><td>- Although a legally binding agreement has yet to be achieved, Singapore will nonetheless begin to implement the mitigation and energy efficiency measures announced under the Sustainable Singapore Blueprint in April 2009.
- When a legally binding global agreement on climate change is reached, Singapore will implement additional measures to achieve the full 16% reduction below BAU in 2020.</td></tr>
<tr><td>South Africa</td><td>34%:
by 2020 compared to BaU
42%:
by 2025 compared to BaU</td><td></td><td></td></tr>
</table>

Source: http://unfccc.int/home/items/5265.php (as of 27th June 2010)

UNFCCC Structure & Negotiations 7 & 8: REDD/ Carbon Sink

6 July, 2010

Deputy Chief Advisor of JICA Expert Team
Kazuhito YAMADA

A1-121

Objectives of this section

Objectives of this section are:

To understand basic concept and major issues of 'Reduced Emission by Deforestation and forest Degradation: REDD',

To discuss:

What are the possible 'REDD' project candidates in Thailand?

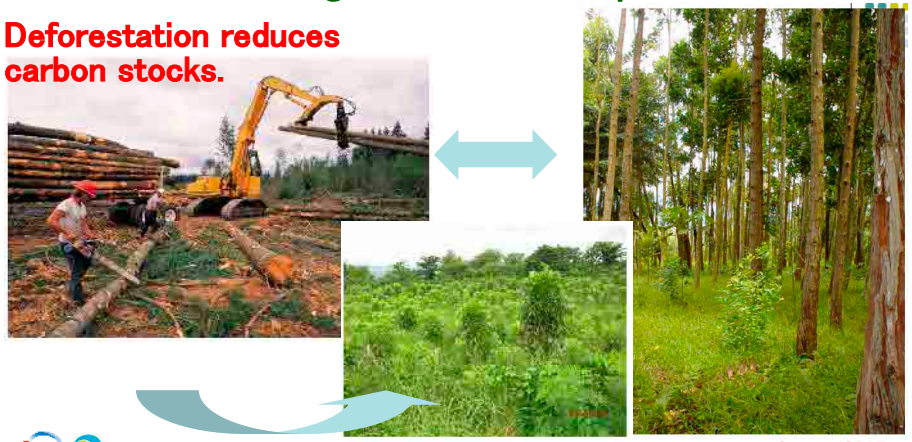
UNFCCC Structure & Negotiations: REDD

- Deforestation and forest degradation
- What is 'RED' and 'REDD' ?
- Presentation by the expert of forestry sector in Thailand
- Main causes of deforestation and forest degradation
  - General, Amazon, Cameroon, Kalimantan -
- Critical issues to be discussed in UNFCCC negotiation
- Introduction of 'Payment for Environmental Service: PES'
- UN-REDD Programme
- Group Discussion

Deforestation and forest degradation (1)

Avoiding deforestation keeps carbon stocks.

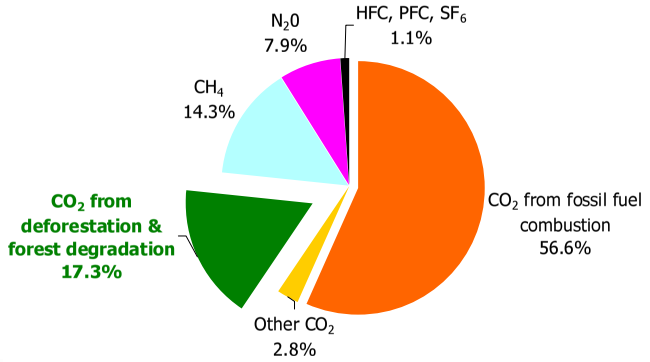
Deforestation reduces carbon stocks.



Source: ICRAF

Deforestation and forest degradation (2)

CO_2 from deforestation and forest degradation is one of important anthropogenic GHG sources.



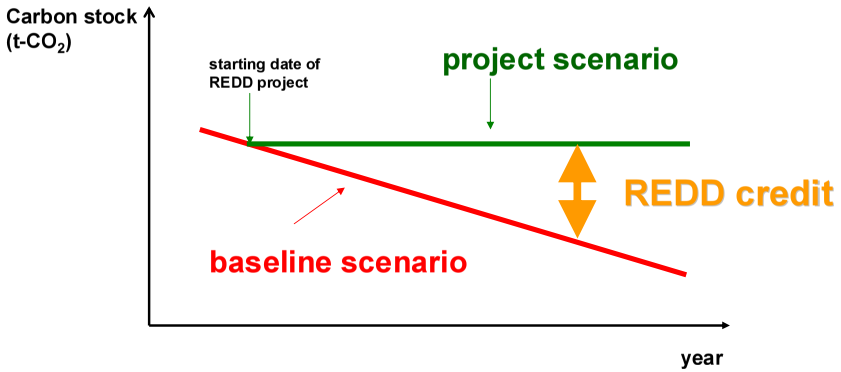
What is the 'REDD' ? (1)

REDD is referred as:

- Policy approaches and positive incentives on issues relating to **R**educed **E**mission by **D**eforestation and forest **D**egradation in developing countries

What is the 'REDD' ? (2)

Basic concept of crediting to REDD



What is the 'REDD' ? (3)

REDD+ is referred in the UNFCCC text as:

- Policy approaches and positive incentives on issues relating to REDD in developing countries;

PLUS

- the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

What is the 'REDD' ? (4)

IISD (2009) described REDD and others as:

- RED = Reducing emissions from (gross) deforestation: only changes from "forest" to "non-forest" land cover types are included, and details very much depend on the operational definition of "forest";
- REDD = as above, plus (forest) degradation, or the shifts to lower carbon-stock densities within the forest; details very much depend on the operational definition of "forest";

What is the 'REDD' ? (5)

(continued)

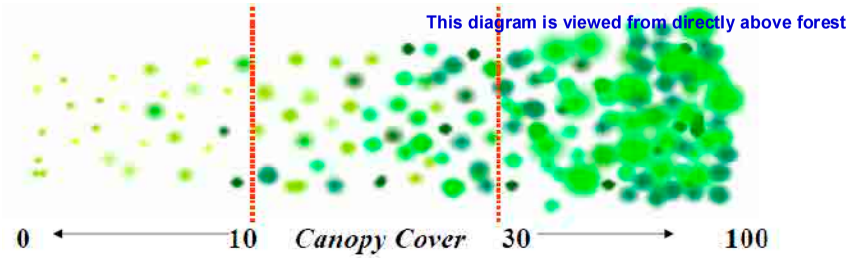
- REDD+ = as REDD, plus restocking within and towards "forest"; in some versions REDD+ will also include peatlands, regardless of their forest status; details still depend on the operational definition of "forest"; and
- REDD++ = as above plus all transitions in land cover that affect carbon storage, whether peatland or mineral soil, trees-outside-forest, agroforest, plantations or natural forest. It does not depend on the operational definition of "forest."

What is the 'REDD' ? (6)

Definition of 'forest'

Each country can define a forest within the following guidelines:

- Minimum tree crown cover between 10 and 30%
- Minimum tree height between 2 and 5 m
- Minimum land area between 0.05 and 1.0 ha



Presentation by the expert of forestry sector in Thailand

The presentation includes:

1. History of forest cover in Thailand
2. Main causes of forest deforestation and forest degradation in Thailand
3. Present countermeasures against forest deforestation and forest degradation in Thailand

Main causes of deforestation and forest degradation (1)

General:

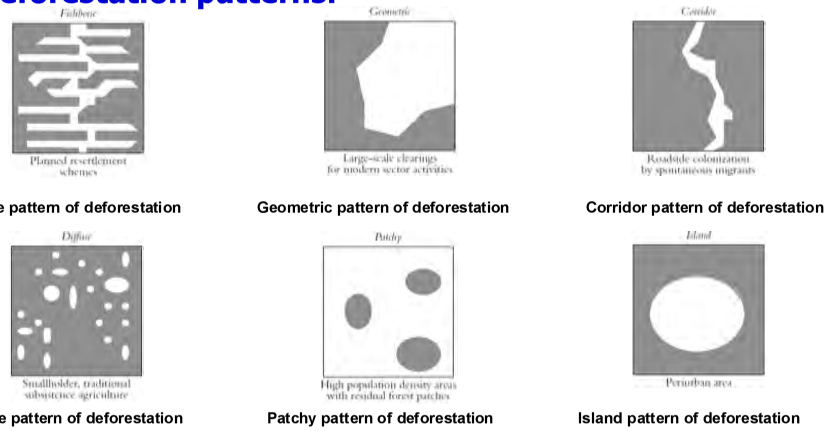
1. Population increase
2. Agricultural expansion by disordered 'slash and burn'
3. Road construction
4. Wood extraction
5. Interactive effect of above mentioned causes....

However, there is no united explanation of main causes of deforestation and forest degradation.

It may depend on the characteristics of the 'site'.

Main causes of deforestation and forest degradation (2)

Deforestation patterns:



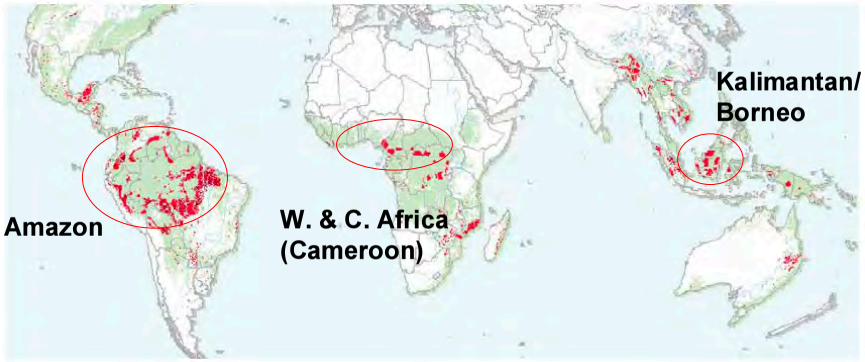
Fishbone pattern of deforestation | Geometric pattern of deforestation | Corridor pattern of deforestation

Diffuse pattern of deforestation | Patchy pattern of deforestation | Island pattern of deforestation

Source: Helmut J. Geist & Eric F. Lambin、2001

Main causes of deforestation and forest degradation (3)

Major deforested area



Source: ICRAF

Main causes of deforestation and forest degradation (4)

Amazon

Main direct causes:

1. Road construction
2. Ranching
3. Soy bean production

Main indirect causes:

1. Economic development policy based on road construction in 1970s
2. Preferential policy for large scale ranching by the govt.
3. Price increase of crops including soy bean

Main causes of deforestation and forest degradation (5)

Amazon

- Deforestation caused by ranching have been induced by road construction

Main causes of deforestation and forest degradation (6)

Cameroon:

Main direct causes:

1. Accelerated export of timber as an important source of foreign exchange
2. Agricultural expansion by rural people

Main indirect causes:

1. Fall in the value of coffee and cocoa
2. Migration of people from city to rural area because of the recession

Main causes of deforestation and forest degradation (7)

Kalimantan:

Main direct causes:

1. Unregulated woodcutting under the concession by the govt.
2. Expansion of oil palm plantation

Main indirect causes:

1. Weak management ability of decentralized local govt.
2. Increasing price of palm oil

Main causes of deforestation and forest degradation (7)

Kalimantan:

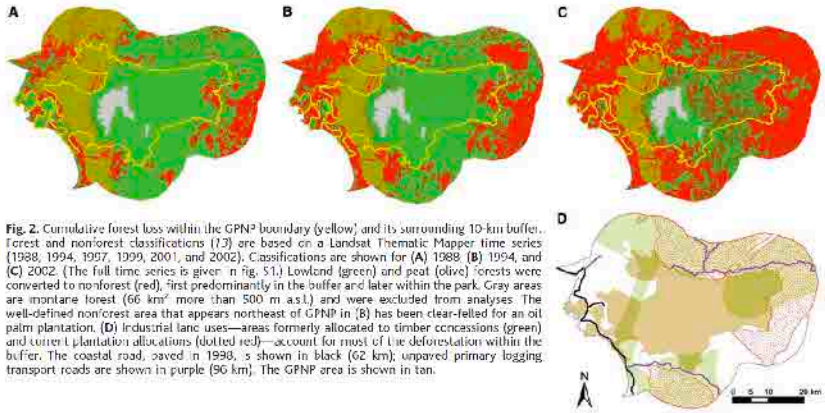


Fig. 2. Cumulative forest loss within the GPNP boundary (yellow) and its surrounding 10-km buffer. Forest and nonforest classifications (13) are based on a Landsat Thematic Mapper time series (1988, 1994, 1997, 1999, 2001, and 2002). Classifications are shown for (A) 1988, (B) 1994, and (C) 2002. (The full time series is given in fig. S1.) Lowland (green) and peat (olive) forests were converted to nonforest (red), first predominantly in the buffer and later within the park. Gray areas are montane forest (66 km² more than 500 m a.s.l.) and were excluded from analyses. The well-defined nonforest area that appears northeast of GPNP in (B) has been clear-felled for an oil palm plantation. (D) Industrial land uses—areas formerly allocated to timber concessions (green) and current plantation allocations (dotted red)—account for most of the deforestation within the buffer. The coastal road, paved in 1998, is shown in black (62 km); unpaved primary logging transport roads are shown in purple (96 km). The GPNP area is shown in tan.

Critical issues to be discussed in UNFCCC negotiation

Critical issues:

- How to define baseline scenario?
  - possible alternative land use (ranching, cash crop, oil palm, etc.)
  - probable value of these land use (How much money can these land use produce?)
- How do we treat 'additionality'?
- How to monitor 'avoided CO2 emissions' from REDD project?
- How to design a modality and procedure of REDD?

*The most important thing is that the credit of REDD need to have substantial positive effect to 'real causer' of deforestation and forest degradation!

Introduction of 'Payment for Environmental Service: PES'

- 'Payment for Environmental service' can be used for quantifying possible monetary value of baseline land use scenario.
- Using this method, you can estimate necessary monetary value of carbon credit of REDD project.
- Estimated necessary costs of carbon credit of REDD project vary from low price (3-10 US$/t-$CO_2$) to very high cost (more than 50 US$/t-$CO_2$??)

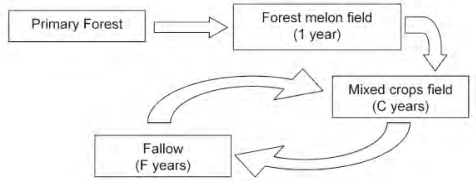


Fig. 1– The process of shifting cultivation (based on Brown's description).

UN-REDD Programme (1)

UN-REDD Programme:

- The UN-REDD Programme assists developing countries to prepare and implement national REDD+ strategies.
- Designed collaboratively by a broad range of stakeholders, national UN-REDD Programmes are informed by the technical expertise of FAO, UNDP and UNEP.
- Priority is given to developing sustainable national approaches that promote equitable outcomes and ensure that countries use reliable methodologies to assess emission reductions.

UN-REDD Programme (2)

UN-REDD Programme: Pilot Countries

- Bolivia
- Democratic Republic of Congo
- Indonesia
- Panama
- Papua New Guinea
- Paraguay
- Tanzania
- Viet Nam
- Zambia

Discussion

- What are the possible project candidates of REDD in Thailand?