

General introduction to Clean Development Mechanism

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The CDM concept

Clean Development Mechanism (CDM) is established with the Kyoto Protocol in 1997

Allows developing countries to cover some of their greenhouse gas emission reductions with carbon credits generated by projects in developing countries

1 carbon credit = 1 ton of CO₂ equivalent

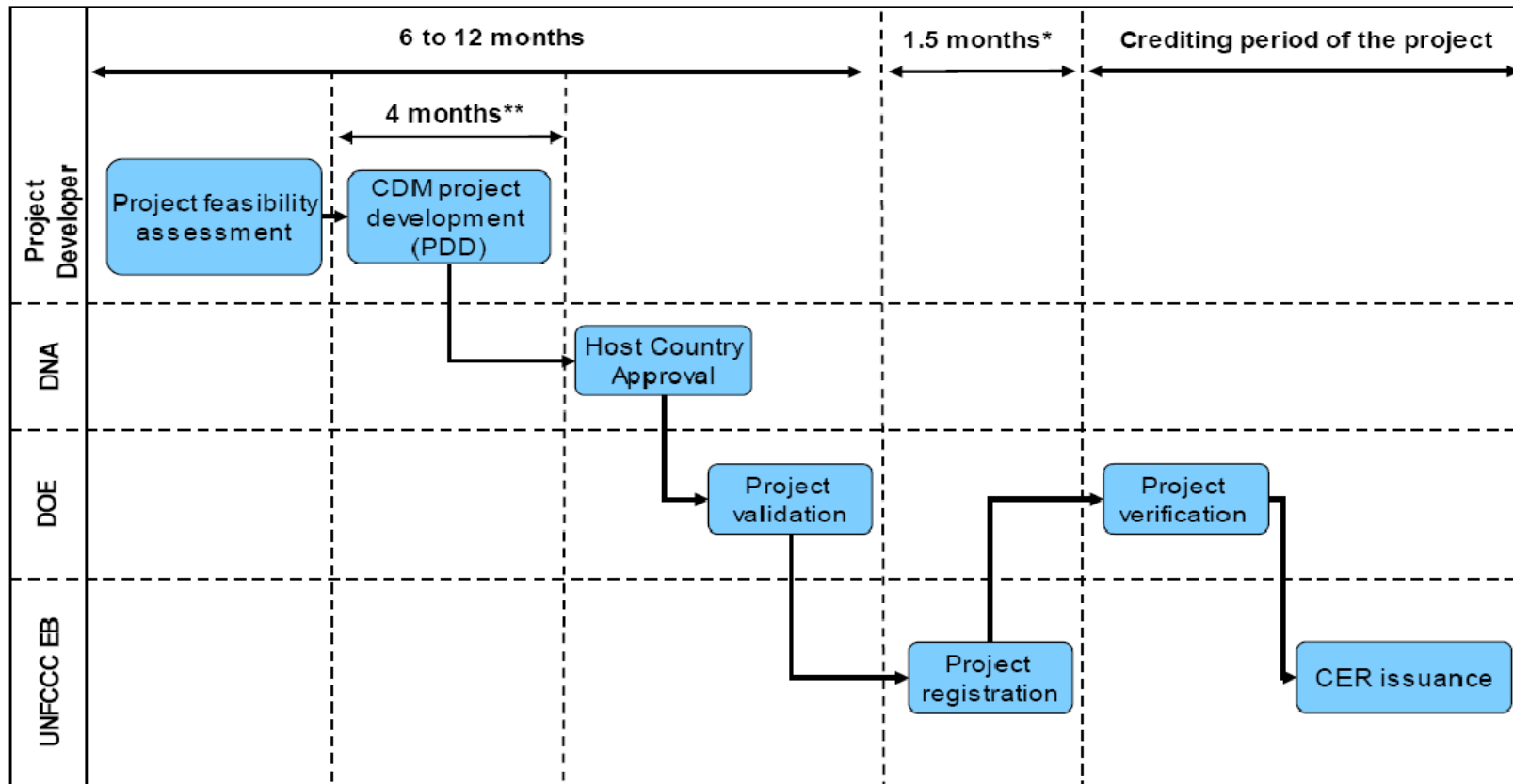
6 GHG under the Kyoto-Protocol

Gasses	Global Warming Potential* (GWP)	Sources
CO ₂	1	Fossil fuels
Methane	21	Animals, degradation and coal mines
N ₂ O	310	Farming, fertilizer
PCF	Ca. 7.850	Aluminium production
HFC	11.700	Refrigerator gasses
SF ₆	23.900	Magnesium, elec.

* Over 100 year

The CDM project cycle

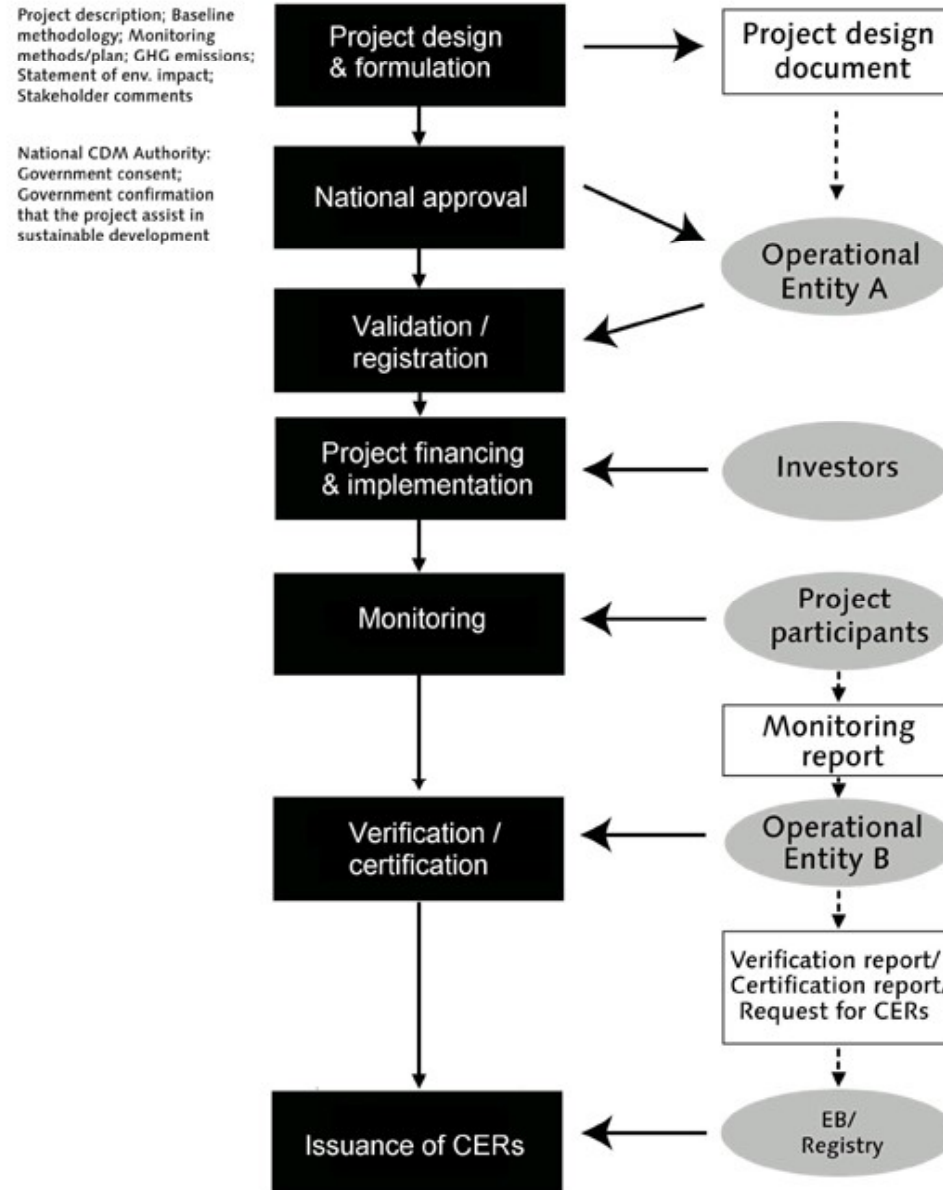
Figure 2: The CDM project cycle



* can be extended depending on the **EB** decision

** for each submission and additional to normal process

Project cycle for the CDM



Legends:

Activity

Report

Institution

CDM regulation

CDM is regulated by United Nations

Under the established body
'CDM Executive Board'

All necessarily rules and guidelines are
issued by CDM EB

Who also register projects and issue the credits

The CDM methodologies

All CDM projects must apply one of the CDM methodologies approved by the CDM Executive Board

Methodologies covers both setting of baseline and monitoring

The content of methodologies

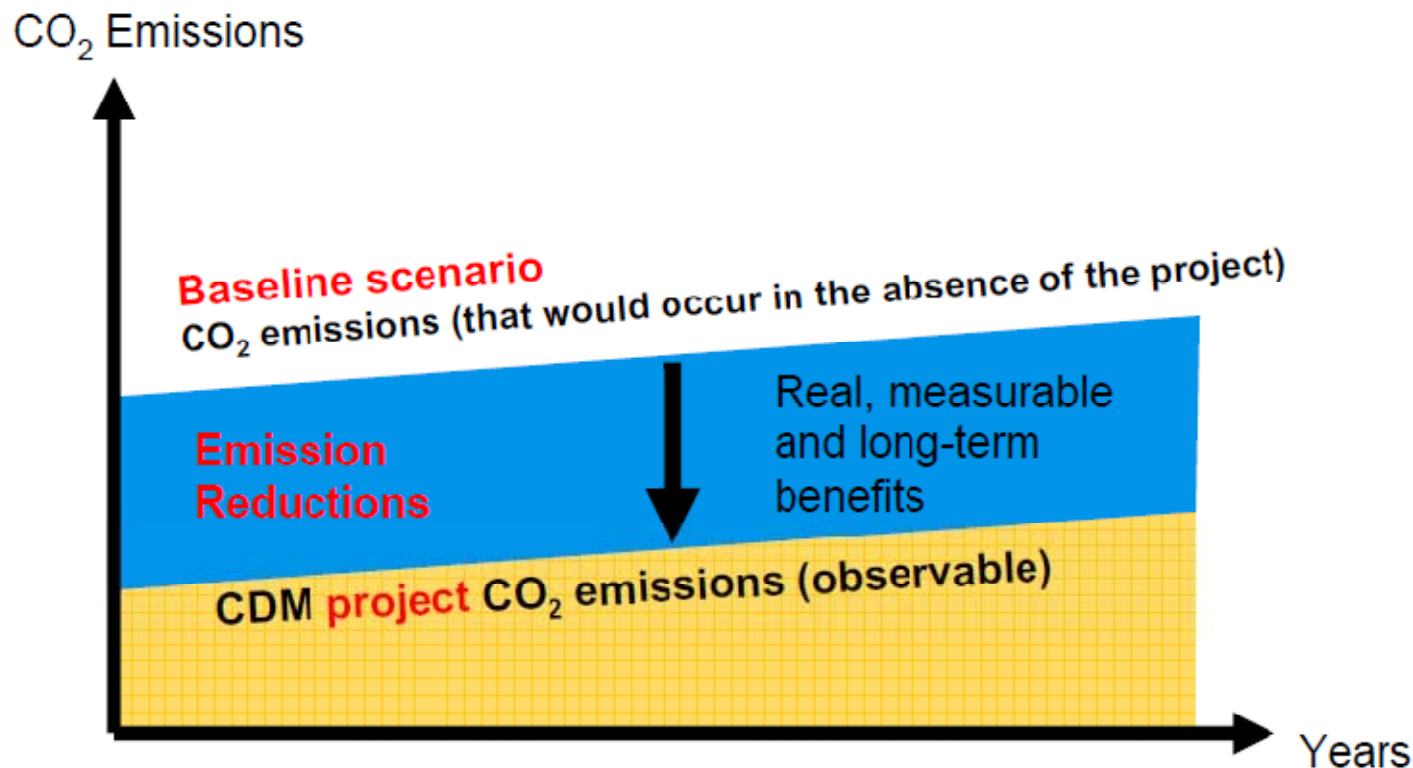
- Methodologies (principles of transparency and conservativeness).
- Baseline principle (actual, historic and estimated)
- Monitoring
- Project boundary
- Leakage
- Additionality
- Local / national regulation versus CDM

Baseline setting

Kyoto Protocol Art. 12:

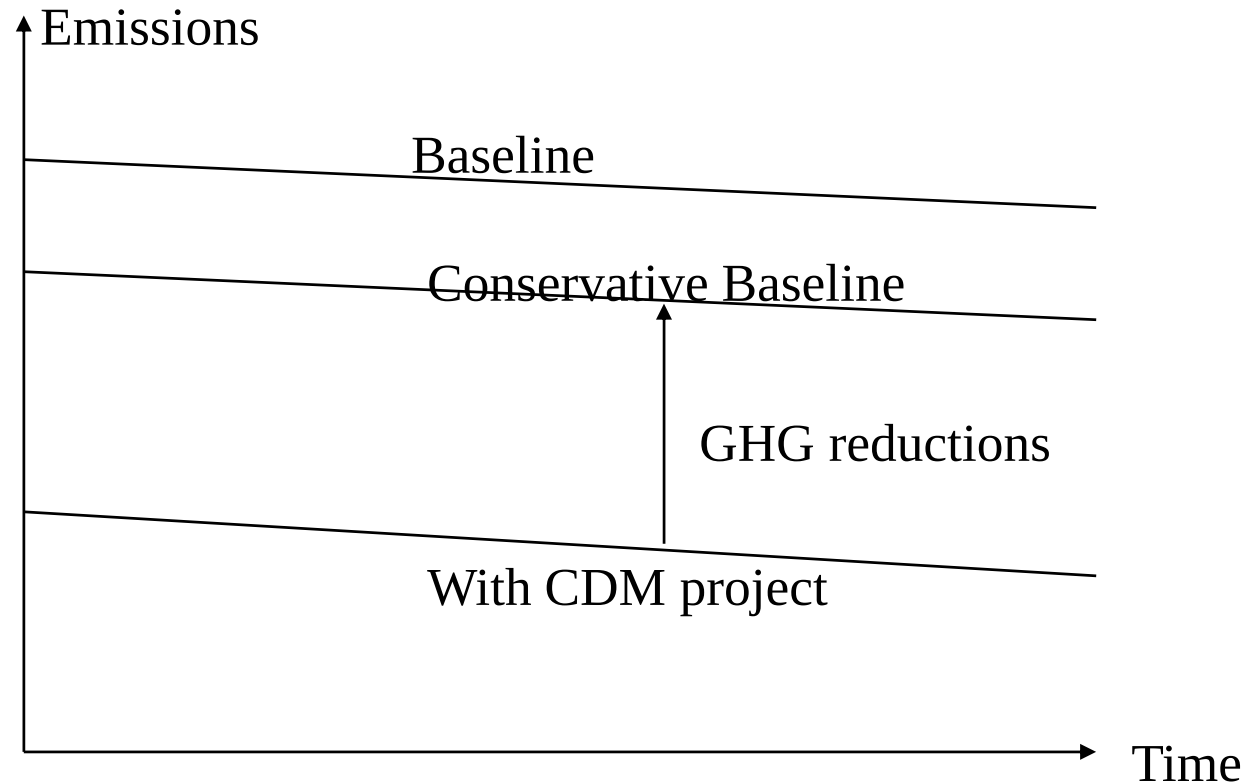
Emission Reductions (ERs) must:

- create **real, measurable**, and **long-term** benefits related to the mitigation of climate change. (Art. 12.5b KP)
- be **additional** to any that would occur in the *absence* of the certified project activity. (Art. 12.5c KP)



Baselines

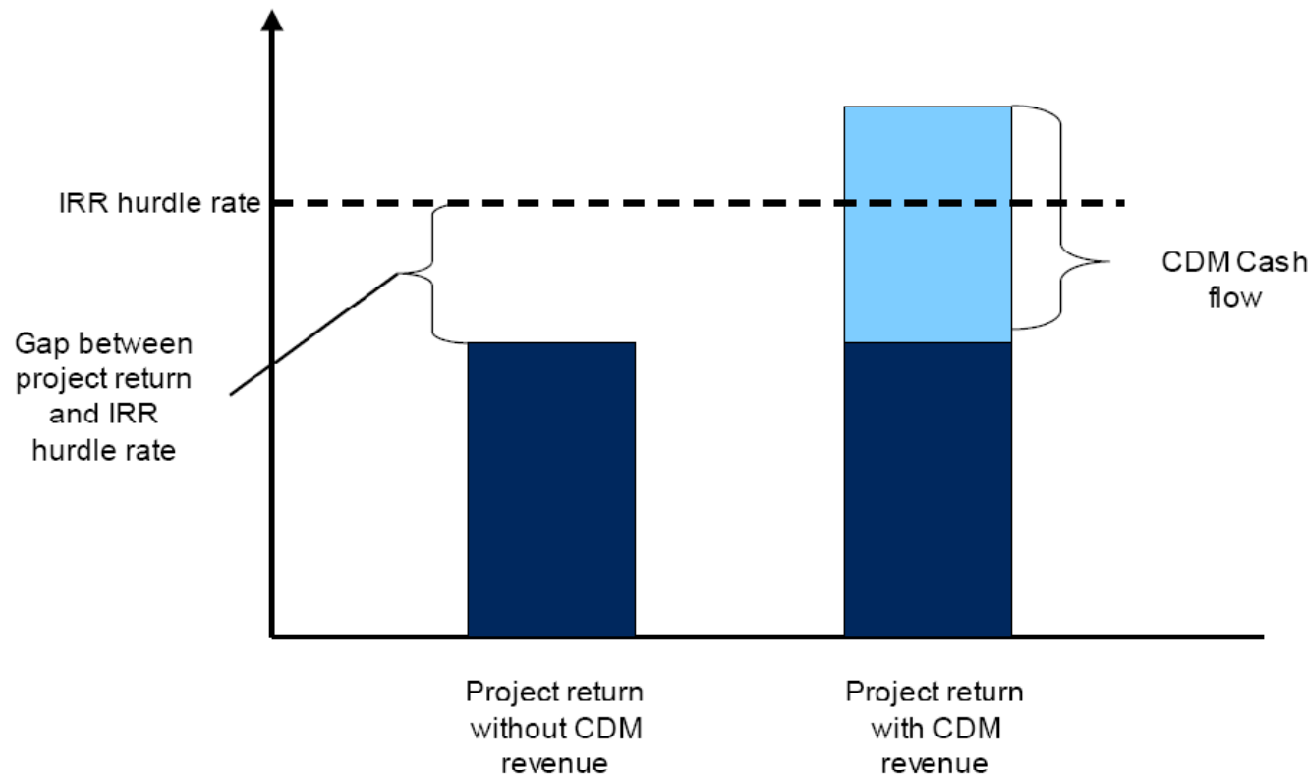
A baseline should be conservative and transparent



A baseline is a scenario that represents the GHG emissions in the absence of the CDM project

Financial Additionality

Figure 3: Demonstrating financial additionality



Types of CDM methodologies

Small scale: threshold on

- max 15 MW installed electricity (45 MW thermal)
- max 60 GWh reductions / year
- max 60.000 tons of CO₂e reduction / year

Large scale

- unlimited

Programmatic CDM (so far 8 projects)

- A framework for many smaller and dispersed activities often in multiple sites. Open ended so more can be added along the way (typical EE and renewable projects – or transport)

Afforestation / reforestation

Overview of methodologies

90 Large scale (incl. 11 forests)

40 small scale

+ 35 still awaiting approval

CDM Executive Board will check unapplied methodologies within this year

Industrial CDM projects

1. General industrial (EE and optimization)
2. Cement and ceramics
3. Chemicals and fertilizers
4. Iron and steel

Overall industrial CDM projects

Methodological overview - 1

Methodology	Name	Number of projects	Example
ACM12	GHG reductions for waste gas or waste heat or waste pressure based energy system	164 (non reg. So far)	- 61 in iron / steel - 12 in chemicals - 36 in cement - 41 in coke oven
AM36	Fuel switch from fossil fuels to biomass residues in boilers for heat generation	10 (3 reg.)	Incauca project in Colombia where waste from sugar canes are replacing use of coal in sugar mill. Registered in October 2008. Reduces ca. 35.000 tons CO₂ per year.
AM18	Baseline methodology for steam optimization systems	16 (10 reg.)	Steam Optimization in Cooking Process in Paper Plant in India Installation of a continuous digester system which will save up to 63% steam per ton of pulp compared to conventional system. Registered April 2008 Reduces 34.000 tons CO₂e per year

Overall industrial CDM projects

Methodological overview - 2

Methodology	Name	Number	Example
ACM9	Industrial fuel switching from Coal or petroleum fuels to natural gas	11 (4. reg.)	Egyptian brick factory GHG reduction Project Status??
AM49	Gas based energy generation in an industrial facility	2 (0 reg.)	Karbochem in South Africa Replace coal fired boilers with cogeneration (steam and gas turbines) including energy efficiency improvements Under validation Reduces 235.000 tons CO2e per year
AM14	Natural gas-based package Cogeneration	40 (2. reg.)	Al-Sindian 13 MW Natural Gas based Cogeneration Package Project in Egypt Recover waste heat At validation

Overall industrial CDM projects

Methodological – small scale

Methodology	Name	Number	Examples
AMS.I.C (renewable energy)	Thermal energy for the user	286	--
AMS.II.D (Energy Efficiency)	Energy efficiency and fuel switching measures for industrial facilities	136	--
AMS.III.Q (Greenhouse gas reductions)	Waste gas based energy systems	57	Waste heat recovery based Cogeneration project at Abu Zaabal Fertilizers and Chemicals Company In Egypt At validation submitted Sep 2008 EE Own generation within chemicals

Cement and ceramics CDM projects

Methodology	Name	Number	Examples
ACM5	Increasing the blend in cement production	39 (14 registered)	Indocement Blended Cements project Registered Oct. 06 Lime stone, fly ash and pozzolan From 90% => 82% clinker In total 470.000 Credits / year
ACM3	Emission reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture	22 (12 reg.)	Partial substitution of fossil fuels with biomass in cements manufacture in Egypt Registred Aug.07 CERs issued 3000-14.000 tons biomass / year 10.000 credits
ACM15	Alternativ raw material	For former meth. (AM33) 6 projects	Nanning Shizuo Non-Carbonated Raw Material for Cement Production Renovation Project

Ceramics CDM projects

Methodo-logy	Project name	Status
AMS.I.C	"Switching fossil fuel in an industrial facility" by Kerala Ceramics Ltd, Kerala	Validation
AMS.I.D	3 MW Wind Power Project by Jalaram Ceramics at Bhachau in Kutch, Gujarat	Validation
AMS.III.E (avoidance of methane from biomass waste)	Sao Judas Tadeu Ceramic Switching Fuel Project	Validation

Chemical and fertilizer CDM projects #1

Methodology	Name	Number	Example
AM50	Feed switch in integrated Ammonia-urea manufacturing industry	2	Feed switchover from Naphtha to Natural Gas at Phulpur plant of IFFCO at Phulpur Allahabad, Uttar Pradesh by M/s Indian Farmers Fertiliser Cooperative At validation
AM37	Flare reduction and gas utilization at oil and gas processing facilities	6 (2. reg)	Recovery of flash gases from the acid gas removal processes in Island for productive use as fuel gas in SRU Incinerators United Arab Emirates (petrochemicals) Validation
AM21	Decomposition of N ₂ O from existing adipic acid production plants	4 (all reg.)	

Chemical and fertilizer CDM projects #2

Methodology	Name	Number	Example
AM28	Catalytic N ₂ O destruction in the tail gas of nitric acid or caprolactam production plants	17 (ca. 10 reg.)	Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co. Registered Oct. 07 CERs issued
AM34	Catalytic reduction of N ₂ O inside the ammonia burner of nitric acid plants	52 (26 reg.)	N ₂ O abatement project at nitric acid plant No. 11 at African Explosives Ltd. (AEL), Registered feb.98 South Africa 265.000 tons / year
AMS.III.Q	Avoidance of HFC emissions in rigid Poly Urethane Foam (PUF) manufacturing	3	--
Other small scale	Waste gas or steam optimization within chemical industry	++	Incl. in Egypt Waste heat recovery based Cogeneration project at Abu Zaabal Fertilizers and Chemicals Company

Iron and steel CDM projects

Methodology	Name	Number	Example
AM66	GHG emission reduction through waste heat utilization for pre-heating of raw material in sponge iron manu-facturing process	1 !!	Indian project in Validation
ACM12 (Replacing ACM4 with 192 project many Iron / Steel	GHG reductions for waste gas or waste heat or waste pressure based energy system	164 (out of which 63 is within iron / steel industry)	Blast furnace waste gas. Hebei Yuhua Steel 6 MW project India At validation 36.000 tons per year
AMS.II.D	Energy efficiency and fuel switching measures for industrial facilities	136	Energy Efficiency Improvement in Electric Arc Furnace at Indian Seamless Metal Tube Limited (ISMT), Jejuri, Maharashtra India , Registered Dec.06 7.000 tons per year

Status of CDM

Status of CDM projects	Number
At validation	2815
Request for registration	57
Request for review	57
Correction requested	144
Under review	44
Total in the process of registration	302
Withdrawn	27
Rejected by EB	92
Registered, no issuance of CERs	951
Registered. CER issued	473
Total registered	1424
Total number of projects (incl. rejected & withdrawn)	4660

Source: UNEP Risoe CDM Pipeline March 2009

Status of CDM 2

CDM Projects in more than 75 countries

Generating up to 1.5 billion credits by 2012

261.756.000 carbon credits issued by CDM
Executive Board so far

To more than 473 projects

Source: UNEP Risoe CDM Pipeline Mar09

Type	Projects	Credits (ktons CO2e)
Afforestation / Reforestation	39	2205
Agriculture	231	8650
Biogas	288	14293
Biomass energy	688	42990
Cement	39	6970
Coal bed/mine methane	66	28685
Energy efficiency other	486	78117
EE industry	181	5991
Fossil fuel switch	140	44408
Fugitive	30	10876
Geothermal	15	3433
HFCs	23	83066
Hydro	1195	122465
Landfill gas	336	50519
N2O	66	48320
PFCs	8	1142
Solar	29	742
Transport	9	981
Wind	661	57020
Total	4530	610874

Carbon market

Carbon market worth more than 40 billion Euros in 2007

Out of which CDM credits are ca. 12 billion Euros (equal to 947 million credits)

Trading scheme established in EU

Schemes comming in Australian, New Zealand and perhaps USA and Canada

Our role as CDM project developers

Danish Energy Management are familiar with the industrial processes but not experts

In a strong partnership with EcoConServ

We are experts in CDM projects and to develop projects

Can hire all the needed experts to whatever industrial project

Can help get finance and trade the carbon credits

Thanks

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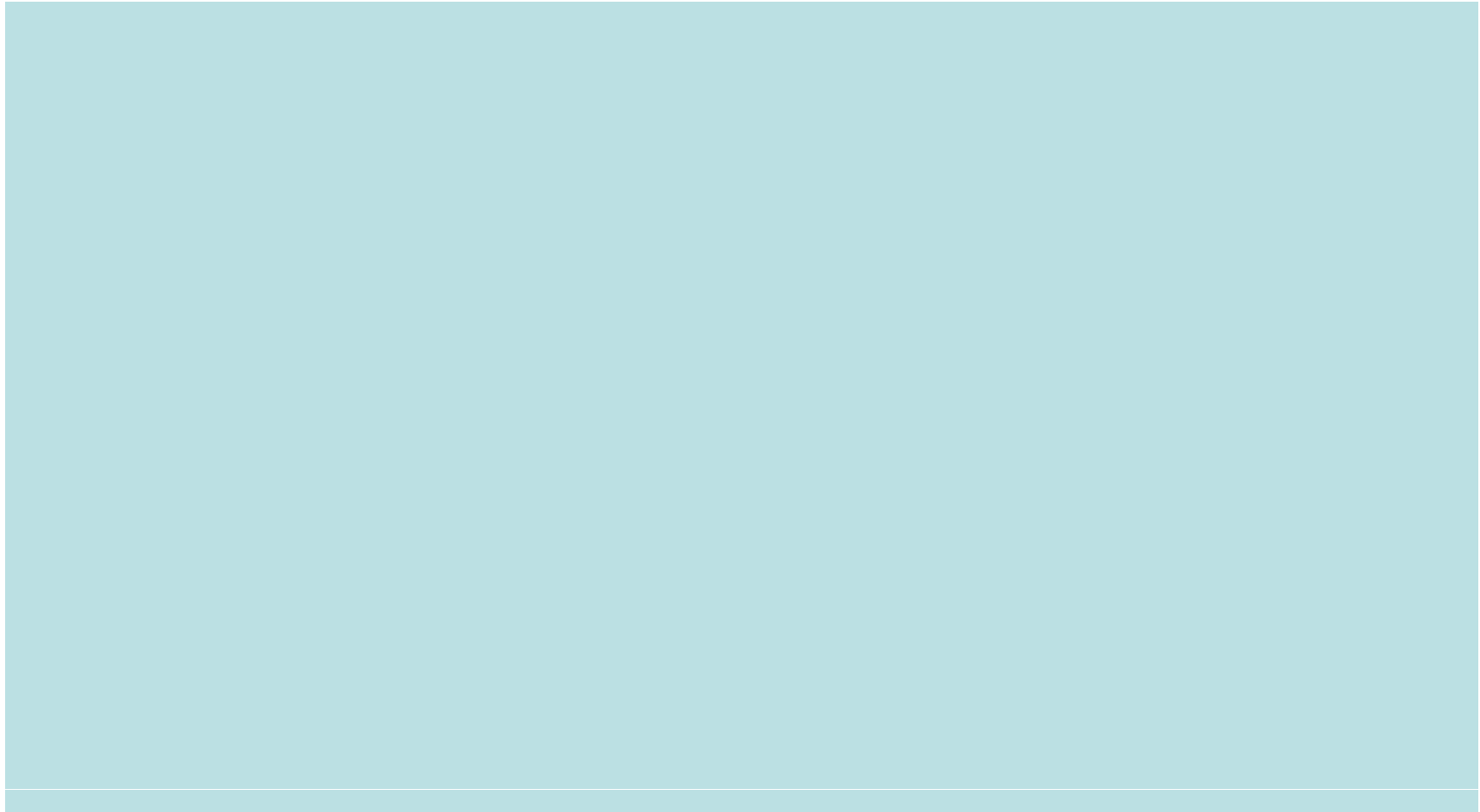
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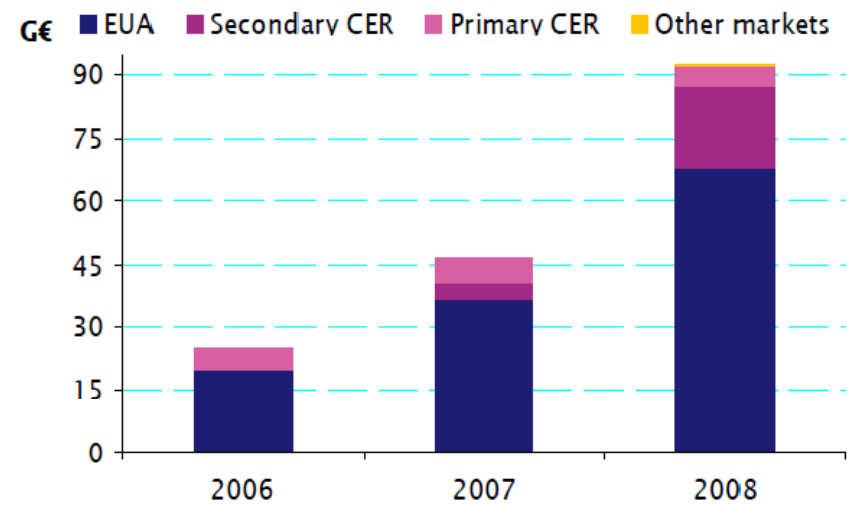
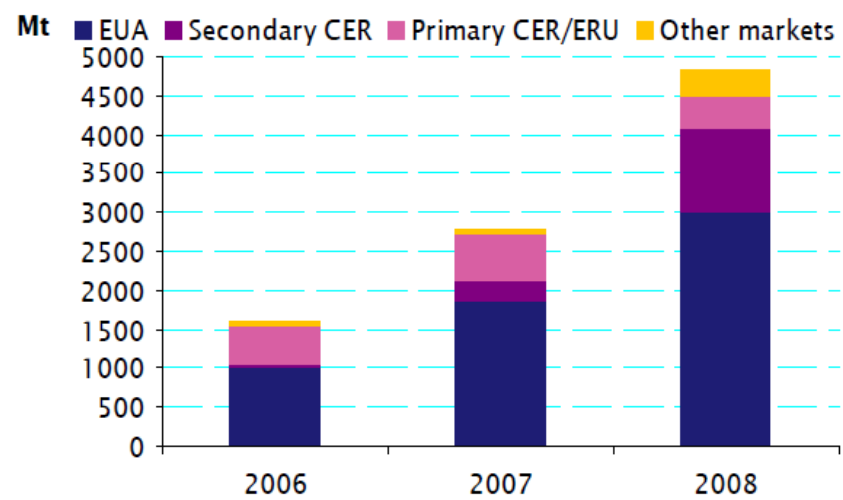
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Status of CDM in Egypt





Activity	Cost, thousand USD	Type of Cost
PIN	5 - 30	Consultancy or internal
PDD	15 - 100	Consultancy or internal
New Methodology, if required	20 -100	Consultancy or internal
Validation	8 - 30	DOE fee
SOP-Admin (incl registration fee)	0,1 -0,2 per CER	CDM Executive Board
UN Adaptation Fund	2% of CERs	CDM Executive Board
On-going Verification	5 – 25	DOE fee

Projects under the Kyoto-Protocol

The so-called flexible mechanisms

- **Article 6:** Joint Implementation
- **Article 12:** Clean Development Mechanism (to help both annex 1 and NA-1 countries)
- **Article 17:** Emissions Trading (supplement to domestic actions)

Institutions of the CDM

- **CDM Executive Board**
 - Accreditation of DOEs (for validation and verification + diff. scopes)
 - review of validation reports and PDDs
 - approval of new baseline and monitoring methodologies
 - registration of projects (and reviews)
 - issuance of CERs
 - (+ develop some methodologies like non-renewable biomass)
 - + support a more fair distribution of CDM projects
 - + create a CDM Bazaar)
 - Consists of 10 + 10 and meet 6 – 8 times a year.
 - Historical development;
- **Designated National Authority (DNA)**
 - Approve contribution to national sustainable development + voluntary
- **Designated Operational Entity (DOE)**
 - Independent third party validation & verification

Sectoral Scopes for CDM

No.	Scope
1	Energy industries (renewable - / non-renewable sources)
2	Energy distribution
3	Energy demand
4	Manufacturing industries
5	Chemical industry
6	Construction
7	Transport
8	Mining/Mineral production
9	Metal production
10	Fugitive emissions from fuels (solid, oil and gas)
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
12	Solvents use
13	Waste handling and disposal
14	Afforestation and reforestation
15	Agriculture

Registration

- Small scale projects = 4 weeks
- Large scale projects = 8 weeks
- Request for review in case of 3 members of CDM Executive Board demands that
 - Share of project requested review: 24%
 - Share of projects with a review: 20%
 - Rejected after review: 10%

Regional distribution of CDM projects

Total in the CDM Pipeline	Number		kCERs	2012 kCERs	
Latin America	837	19,2%	80159	427801	14,9%
Asia & Pacific	3339	76,5%	484977	2299604	79,9%
Europe and Central Asia	43	1,0%	4077	18992	0,7%
Africa	90	2,1%	18894	92511	3,2%
Middle-East	55	1,3%	8366	38003	1,3%
Less developed World	4364	100%	596473	2876911	100%

CDM projects in Egypt

Type	Number	Registered
Biomass energy	1	0
Energy efficiency – own generation	2	1
Energy efficiency – supply side	1	0
Fossil fuel switch	1	(correction)
Hydro	1	0
Landfill	2	1
N2O	1	1
Wind	3	1
Total	12	4 (+ correction)

Status of Egyptian CDM projects in pipeline

- In total 12 CDM projects in Egypt (in the UNFCCC)
- Total 0.3% of all CDM projects
- Total 3198 ktons CO₂e per year until 2012 (0.6% of total).
- Projects that have been approved by DNA >12

	Number
Validation	7
Request for reg.	1
Registered	5

Carbon market challenges

The Kyoto-Protocol is running out in 2012 but will most likely be replaced by a Copenhagen agreement in December 2009

The price of credits is declining due to low Oil price and general economic slow down

- But due to decrease in number of projects and carbon credits price also rise