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CDM in Transport Sector

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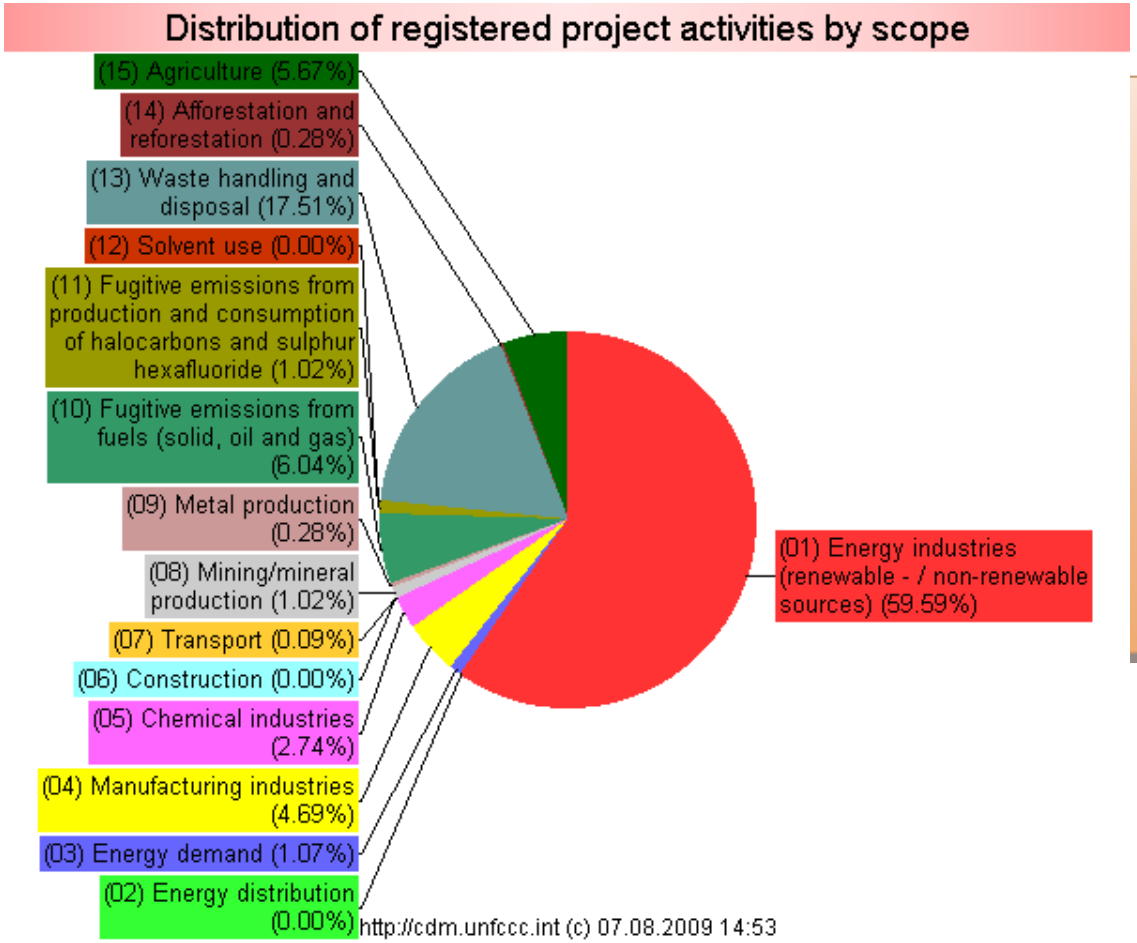
CDM Status

Registered CDM projects



Total:

1,755 projects

Transport sector:

2 projects

(Only 0.1% of total CDM projects)

CDM Status - Registered transport CDM project -

Registered transport CDM projects	Emission reductions (tCO_2/year)	
	Ex-ante Estimation	Actual monitored reduction
BRT Bogotá, Colombia: TransMilenio Phase II to IV	246,563	59,020 (Year 2006) 69,885 (Year 2007)
Installation of Low Green House Gases (GHG) emitting rolling stock cars in metro system	41,160	3,269 (29 Dec 2007 - 31 Jan 2008)

Transport Projects - Can be CDM projects? -

Categories	Sub-categories	Projects
Fuel Switching	Fuel Switching from high to low carbon fuels	Bioethanol, Biodiesel, Plant Oil, CNG, LPG, etc
Improve Fuel Efficiency per vehicle	Reducing emissions per kilometer: Technology/vehicle replacements or upgrades	Hybrid, Electricity, High (fuel) efficiency vehicle, Retrofitting of engine, etc
	Behavioral changes including improvements in operations and administration of vehicles	Stop Idling Equipment, Eco-driving system, Vehicle Inspection/ Maintenance Program, etc
Improve Traffic Efficiency	Public transport projects	Subway, BRT, LRT, etc
	Reducing emissions per unit transported e.g., ton-kilometer: mode switch, usage of larger units, improved occupation rates	Freight mode switch, Bicycle Lane, Improve Occupation Rate, etc
	Traffic management measures	Park & Ride, Road/Area pricing, Plate Number Ban, Intelligent traffic signals, etc
	Infrastructure	Fly-over, Bridges, Tunnels, etc

Benefits of Transport Projects

Environmental aspects

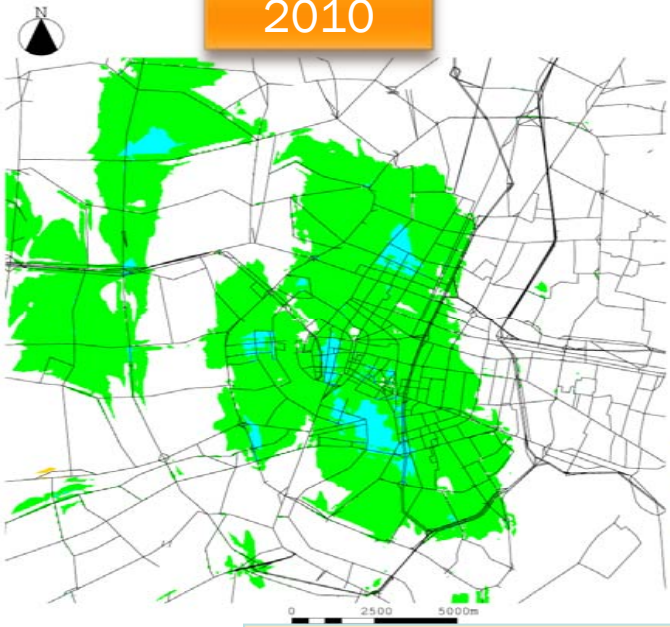
- GHG mitigations
- Improve local environment
  - ✧ Air quality, i.e. CO, PM, NOx, SOx
  - ✧ Noise, etc

Social & economical aspects

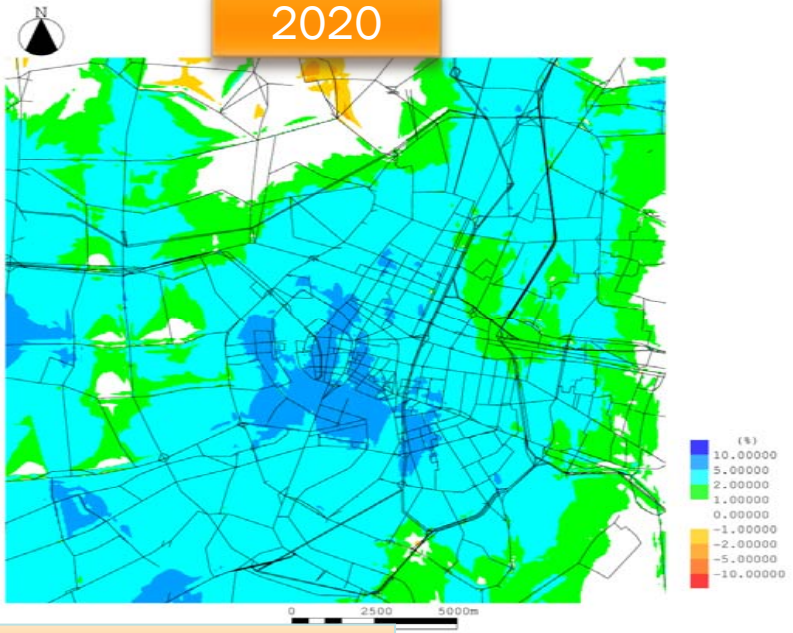
- Improve transport system
- Reduce congestion
- Creating jobs
- Reduce traffic accidents, etc

Improvement of local air quality by Blueline extension

2010



2020

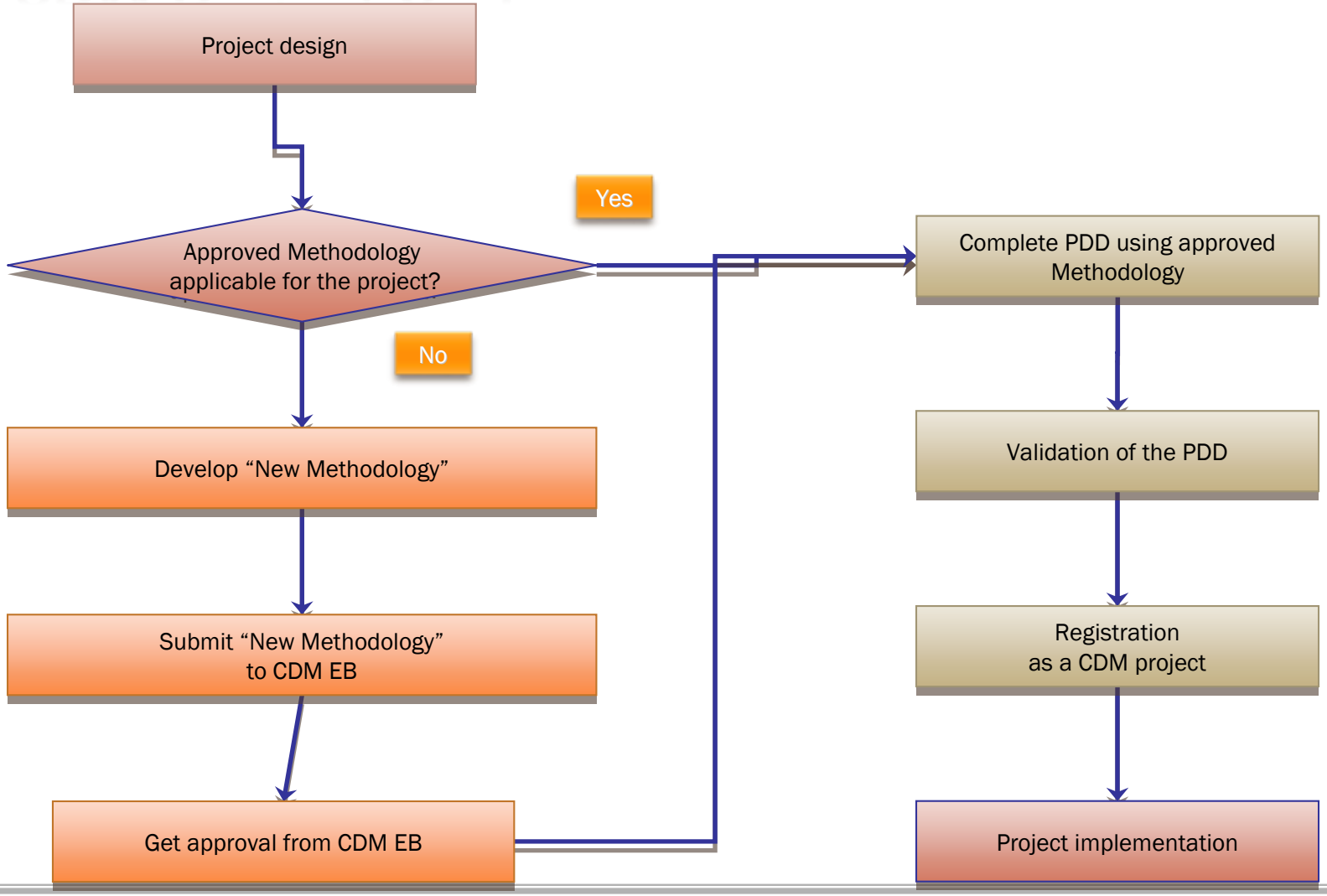


NOx concentration reduction rate

NOx Emissions (kg/day)	
2010 Base case	245,096
2010 Project case	243,317
Emission reductions in 2010 (Base case - Project case)	1,779
2020 Base case	319,046
2020 Project case	314,552
Emission reductions in 2020 (Base case - Project case)	4,494

Source: OTP study, 2008

CDM Project Cycle



CDM Methodology

- A document which describes “How to calculate and monitor GHG emission reductions for a CDM project”.
- Before implementing CDM project, project participants have to complete Project Design Document (PDD) based on a methodology approved by the CDM Executive Board.
- If there is no approved methodology applicable for the project, project participants have to develop and propose a “New Methodology” and get approval from the CDM EB.

CDM Methodologies for Transport Projects

Approved methodologies		
Large scale CDM		
AM0031	Baseline methodology for bus rapid transit projects	BRT
AM0047	Production of biodiesel based on waste oils and/or waste fats from biogenic origin for use as fuel	Biodiesel (waste oil/fat)
Small scale CDM		
AMS III.C.	Emission reductions by low-greenhouse gas emitting vehicles	LEV (Low emission vehicles)
AMS III.S.	Introduction of low-emission vehicles to commercial vehicle fleets	LEV
AMS III.T.	Plant oil production and use for transport applications	Plant Oil
AMS III.U.	Cable cars for mass rapid transit system (MRTS)	Cable cars
AMS III.AA.	Transportation Energy Efficiency Activities using Retrofit Technologies	Engine retrofit

CDM Methodologies for Transport Projects

Proposed methodologies under consideration by Meth Panel		
NM0258	Methodology for Bus Lanes	Bus lane
NM0266	Methodology for Rail Based Urban Mass Rapid Transit Systems (MRTS)	Rail-based Mass Rapid Transit System

CDM Methodologies for Transport Projects - Rejected -

Around 20 methodologies had been rejected, followings are selected from these.

Number	Title	Major reasons
NM0108	Baseline methodology for biodiesel production and switching fossil fuels from petro-diesel to biodiesel in transportation sector	Important emission sources in the biodiesel production process are neglected such as decreases of carbon pools in land use change process
NM0185	Baseline methodology for the production of sugar cane based anhydrous bio-ethanol for transportation using LCA	The methodology does not differentiate between bio-ethanol produced from surplus molasses or from sugarcane specifically grown for the purpose of producing bio-ethanol
NM0128	Baseline methodology for modal shifting in industry for product/feedstock	Necessary to demonstrate that the service level in terms of the total volume of goods transported will not decline in the project activity
NM0237	GHG reductions through improved occupation rate of public transport units	It is not clear how the impacts on occupation rates can be attributed to the project and isolated from other external factors like urban development, changes in bus sizes, other regulatory policies in place, etc.

CDM Methodologies for Transport Projects - by types of projects -

Categories	Sub-categories	Projects	Methodology
Fuel Switching	Fuel Switching from high to low carbon fuels	Bioethanol	N.A.
		Biodiesel	AM0047
		Plant Oil	AMS III.T.
		Compressed Natural Gas (CNG)	AMS III.C. or III.S.
		Liquefied Petroleum Gas (LPG)	AMS III.C. or III.S.
Improve Fuel Efficiency per vehicle	Reducing emissions per kilometer: Technology/vehicle replacements or upgrades	Hybrid	AMS III.C. or III.S.
		Electricity	AMS III.C. or III.S.
		High (fuel) efficiency vehicle	AMS III.C. or III.S.
		Retrofitting of engine	AMS III.AA.
	Behavioral changes including improvements in operations and administration of vehicles	Stop Idling Equipment	N.A.
		Eco-driving system	N.A.
		Vehicle Inspection/ Maintenance Program	N.A.

CDM Methodologies for Transport Projects - by types of projects -

Categories	Sub-categories	Projects	Methodology
Improve Traffic Efficiency	Public transport projects	Subway	NM0266
		Bus Rapid Transit	AM0031
		LRT	NM0266
		Cable car	AMS III.U.
	Reducing emissions per unit transported e.g., ton-kilometer: mode switch, usage of larger units, improved occupation rates	Freight mode switch	N.A.
		Bicycle Lane	N.A.
		Improve Occupation Rate	N.A.
	Traffic management measures	Park & Ride	N.A.
		Road/Area pricing	N.A.
		Plate Number Ban	N.A.
	Infrastructure	Fly-over	N.A.
		Bridges, tunnels	N.A.
		Intelligent traffic signals	N.A.

Difficulties and Issues in realizing transport CDM projects

Methodological issues:

- Limited number of approved methodology (only 7)
- Most of the proposed methodologies were rejected by MP (around 20)
- Emission reduction (ER) calculations and monitoring are complicated and difficult than other sector's CDM projects
- EB requires transparent and convincible way of ER calculations and monitoring -> Can not use simulation models ??
- Calculation of ER:
  - Ambiguous project boundary, rebound effect, etc
  - How to isolate the effect of the CDM project itself ?
- Monitoring:
  - Many parameters to be monitored -> Need significant cost
  - Necessary to implement interview survey to isolate the effect of the CDM project ?

Difficulties and Issues (cont.)

Categories	Major methodological issues pointed out by Meth Panel
Fuel switching: Biofuel	• LCA approach is needed, including direct and indirect land use changes • Double counting of emission reductions by users and providers should be avoided • Export to Annex I countries should be deducted
Behavioral changes: i.e. Eco-drive	• Behavioral changes can not be considered as CDM project activities F-CDM-SSCwg ver 01 SSC_041: "The Executive Board (EB) has clarified that the transfer of know-how and training as such cannot be considered as a CDM project activity. The EB also decided that the eligibility of such project activities should be based on measurable emission reductions which are directly attributable to these project activities."
Freight mode switch	• Necessary to demonstrate that the service level in terms of the total volume of goods transported will not decline in the project activity • In calculating baseline emissions and project emissions, it is necessary to take into account round trips of freight transportation • Emissions associated with the operation of old baseline vehicles somewhere outside the boundary should be considered
Traffic management measures	• Necessary to separate project-induced emission reductions from other changes occurring simultaneously and attributable to other measures or project, and to isolate the effect of the CDM project itself.

Difficulties and Issues (cont.)

Financial benefit:

- (Initial cost of transport projects) >> (Additional revenue by selling CERs)
  Financial benefit from CDM is relatively low compared to initial cost.
  Initial cost: i.e. purchasing LEV, construct and introduce BRT or railway
- Monitoring may need significant cost

Additionality:

- LEV projects
  (Cost savings through fuel savings) >> (Additional revenue from CERs)
  -> Thus, difficult to demonstrate additionality in terms of financial barrier
- Public transportation projects
  Would be implemented without applying CDM
  -> Thus, not easy to demonstrate additionality

Possible Transport CDM projects in Thailand

Possible project	Methodology	Comments
Low emission vehicle projects	AMS III.C. or S.	-
Retrofit or replacement of engines of i.e. private buses or canal vessels	AMS III.AA.	-
Biodiesel projects (waste cooking oil)	AM0047	-
Biodiesel projects (virgin oil)	AM0047 ver3	Wait for approval by CDM EB
BRT projects	AM0031	Necessary to revise AM0031
Subway projects	NM0266	Wait for approval by MP
Bioethanol projects	N.A.	Have to develop New Methodology
Modal shifting from trucks to ship or railways	N.A.	Have to develop New Methodology
Park & Ride	N.A.	Have to develop New Methodology

Thank you for your attention