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NGO activities in the Carbon Market – A developer's perspective in VN.

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NGO activities in the Carbon Market – A developer's perspective

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7. Current CDM market conditions in Vietnam
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i. Economics of Pollution

Benefits vs. Costs

- **Benefit – derived from demand curves – Consumer Surplus**
  - Total Benefit = Total demand
  - Average Demand = Average Benefit
  - Marginal benefit = Marginal Demand
- **Costs - derived from supply curves – Producer Surplus**
  - Total Cost = unit cost X total units
  - Average Cost = Average Supply
  - Marginal Cost = Marginal Supply

- **Economic Efficiency is where**

Marginal Cost (MC) = Marginal Benefit (MB)

i. Economics of Pollution

Cost of Pollution is a negative externality

Pollution has spill over costs

Pollution is a market failure

Where there is no enforceable regulation on pollution control the cost of pollution is not internalised and thus the environment being a public good is taken advantage of.

Private Cost ≠ Social Cost

Marginal Private Cost ≠ Marginal Social cost

MPC ≠ MSC

Greenhouse Gas Pollutants

- Pollution - is the introduction of contaminants into an environment that causes instability, disorder, harm or discomfort to the ecosystem i.e. physical systems or living organisms

- Point Source Pollution – is a single identifiable localized source of air, water, thermal, noise or light pollution. A point source has negligible extent, distinguishing it from other pollution source geometries

- The nature of these Greenhouse Gas pollutants is that unless they are in the form of sinks, where they are trapped and have an immediate measurable negative impact and thus cost, they disperse into the atmosphere in relatively even quantities.

- Greenhouse Gasses are usually produced by a point source while their impact has a Global Consequence – Climate Change

Greenhouse Gas Pollutants

UNFCCC classifies the following as gaseous pollutants affecting the environment through their dissipation in the environment leading to climate change

Gas	Formula	Increase since 1750	Relative Forcing	Relative Heat
Carbon dioxide	**(CO2)**	**87ppm**	**1,00**	**0.819**
Carbon Monoxide	**(CO)**	**46ppb**	**0.89**	**1.013**
Methane	**(CH4)**	**1,045ppb**	**0.48**	**2.191**
Nitrous oxide	**(N2O)**	**44ppb**	**0.15**	**0.88**
Tetrafluoromethane	**(CF4)**	**40ppt**	**0.003**	**0.33**
Hexafluoroethane	(C2F6)	3ppt	0.001	0.067
Sulfur hexafluoride	(SF6)	4.2ppt	0.002	0.074
HFC-23*	(CHF3)	14ppt	0.002	0.064
HFC-134a*	0.001(C2H2F4)	7.5ppt	0.001	0.007
HFC-152a*	(C2H4F2)	0.5ppt	0.000	0.04

Greenhouse Gas Pollutants

Carbon Dioxide

The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil and gas in power plants, automobiles, industrial facilities and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production and the use of petroleum-based products can also lead to CO_2 emissions. Carbon sequestration is the process by which growing trees and plants absorb or remove CO_2 from the atmosphere and turn it into biomass (e.g., wood, leaves, etc.). Deforestation, conversely, can lead to significant levels of CO_2 emissions in some countries. Carbon dioxide can be captured from power plants and industrial facilities before it is released into the atmosphere, and then injected deep underground.

Greenhouse Gas Pollutants

Carbon Monoxide

Unvented kerosene and gas space heaters; leaking chimneys and furnaces; back-drafting from furnaces, gas water heaters, wood stoves, and fireplaces; gas stoves; generators and other gasoline powered equipment; automobile exhaust from attached garages; and tobacco smoke. Incomplete oxidation during combustion in gas ranges and unvented gas or kerosene heaters may cause high concentrations of CO in indoor air. Worn or poorly adjusted and maintained combustion devices (e.g., boilers, furnaces) can be significant sources, or if the flue is improperly sized, blocked, disconnected, or is leaking. Auto, truck, or bus exhaust from attached garages, nearby roads, or parking areas can also be a source.

Greenhouse Gas Pollutants

Methane

Human-related activities include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. It is estimated that 60% of global methane emissions are related to human-related activities (IPCC, 2001c). Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires.

Nitrous Oxide

Nitrous oxide (N2O) is produced by both natural and human-related sources. Primary human-related sources of N2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. Nitrous oxide is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.

i. Economics of Pollution

- **Private Cost vs. Social Cost**
  - **Marginal Social Cost (MSC) and Marginal Private cost (MPC)**
  - **loss in Consumer Surplus**
  - **gain in Producer Surplus**
  - **Dead weight loss (DWL)**

- **The Costs (Supply) and Benefits (Demand) of Pollution**
  - **Marginal Costs of Pollution (MCP) –** This is the cost that one extra unit of pollution has on the environment. In reality, this is miniscule and definitely not calculable
  - **Marginal Abatement Cost (MAC) –** This 'cost' is seen as the benefit that environment and society receives from investing in reducing the amount of pollution. In reality it is very hard to calculate but for exemplary reasons can be constructed.

i. Economics of Pollution

Policy Instruments for pollution control

- **Harm based standards** – chemical quality and quantity standards
- **Design standards** – Best available technology control and other effluent standards
- **Subsidies** – for reduction of certain pollution or cleaning up of polluted entities
- **Taxes** – a per unit tax for any amount of a pollutant or a tax for quantities past a bench mark
- **Integrated Permitting** – Allows firms to devise their own mix of pollution reduction devises as long as they meet a standard
- **Liability** – require possible polluters to develop a fund of which money will be drawn from in the case of a disaster
- **Product Ban** – legislation enforcing the seizure of the manufacturing of a certain pollutant or chemical

Economics of Pollution

Policy Instruments for pollution control

- **Cap and Trade System**
- Assists in reaching required targets to stabilize climatic conditions

280 ppm	Pre industrial level; temperature 0C and sea level of 0m
280-300 ppm	Equates to 1.7 to 2.7C and possible sea level rise of 4-6m
350 ppm	Level suggested by climate scientist James Hansen for a safe climate future
380 ppm	2008 level, 2.7 to 3.7C global temperature rise possible, 15m to 35m possible sea level rise possible
450 ppm	Level targeted for international negotiations in 2008, but considered dangerous due to risk of exceeding 2 to 3C global temperature rise
550 ppm	Considered very dangerous due to likely global temperature rise of 4C or higher
650 ppm	Level predicted for 2050 based on current carbon emissions. Considered extremely dangerous. 5.7C or higher temperature rise possible. Possible sea level of 75m

  - Allows for a market mechanism to place a value on pollution
- Allows each country to allocate its credits accordingly – sovereignty rights
- Least cost solution to mitigating climate change.

i. Economics of Pollution

- **Cap and Trade** - Economic Model
  - Assumptions

    2 producers

    2 goods
  - Cap the level of pollution – constrain the market by setting a pollution target

  Economic Efficiency is where MC = MB

  - **Kyoto Protocol –** International Agreement to Reduce GHGs
  - Each Annex A country has to reach 1990 emission levels plus 5%
  - Carbon Credit
  - One tonne of Carbon Dioxide Equivalent
  - AAUs – Assigned Amount Unit
  - CERs – Carbon Emission Reduction
  - ERU - Emission Reduction Unit (JI projects)

ii. Voluntary Market vs. Compliance Market

Voluntary Market

- 1 VER ≠ 1 VER – heterogeneous good
- Price determined on a project by project basis and market conditions, currency of underlying asset and standard
- Many Standards
- Used for a company to meet their own CSR standards
- More spread in market prices
- Up to $80 USD per VER
- US will make up largest demand for VERs
- VCS is actively accrediting REDD projects and have had two methodologies apply for approval

Compliance Market

- 1 CER = 1 CER – homogeneous good
- Price determined by Primary and Secondary market (ECX index price)
- One Standard
- Used by Annex A countries to meet their legally binding pollution targets
- Only spread between AAUs and CERs
- Market at all time low been increasing over last week
- Traded at years end DEC09 value
- € 11.10 last Monday
- Europe makes up largest demand for AAUs, CERs, and ERUs

ii. Voluntary Market vs. Compliance Market

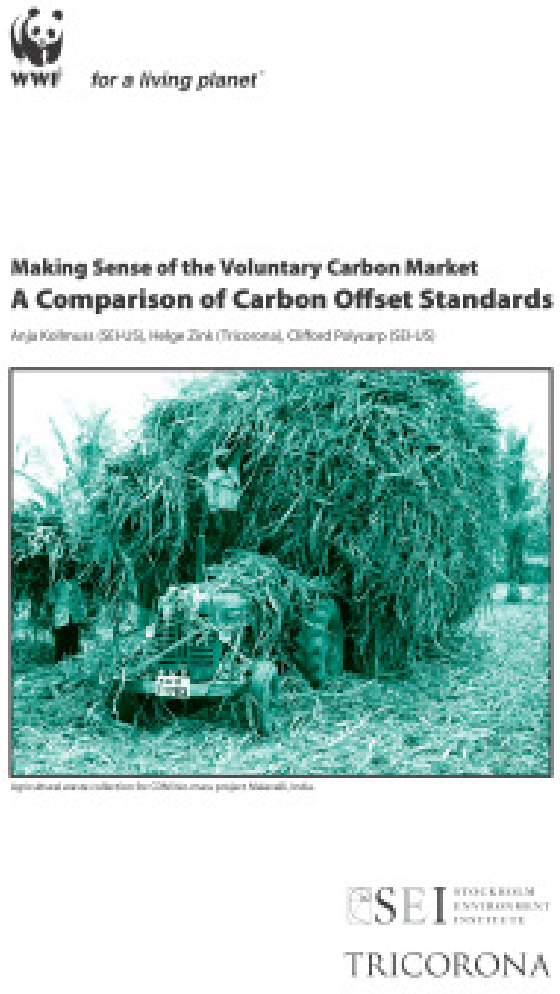
	Gold Standard	VER+	VCS
Organisation	Gold Standard Foundation	TÜV Süd	Climate Group, IETA, WBCSD
Coverage	High, „Highest Quality VER-Standard“	Globally well-known	High, developed in transatlantic stakeholder process
Basic Parameters	Strong focus on positive effects on the environment and sustainability benefits Only renewable energy and energy efficiency projects High reliance on CDM methodologies	Largely in line with UNFCCC requirements for JI / CDM projects Proof of eligibility, additionality, permanence, exclusivity, avoidance of double-counting High reliance on CDM methodologies	All types of emission reduction projects eligible Criteria: real, additional, measurable, permanent, independently verified Lower reliance on CDM methodologies

Other Standards endorsed by First Climate: Social Carbon Methodology, CCBA, CCAR

ii. Voluntary Market vs. Compliance Market

VER Standards - Crediting Limits	VCS 2007	
Standard Organisation	NGO founded by The Cimate Group, IETA, & WBCSD	
Publicity	High, developed through a two year process of transatlantic stakeholder consultation	
Reliance on CDM	In principle low; ISO 14064 as reference framework for new methodologies, validation & verification procedures. Uses different PDD format (PD) and templates for validation/verification. In Practice high; only CDM methodologies and DOEs approved under VCS at the moment. Open for linking with other VER standards subject to approval of gap-analysis by VCS steering commitee	
Extra Criteria	exclusion of double counting, demonstration of VER ownership	
More flexible that CDM	3x10 years, all project types available with out eligibale restrictions, Additionality; Project tests (legal additionality, barrier analysis, common practice). Vague requirements for validation. Approval of regional benchmark and positive listadditionalitiy tests by VCS board possible though double approval process. New methodologies/revisions can be approvd. New methodologies/revisions can be approved by VCS Board via double approval process. No env/social requirement beyond complainace with local law, no requirements for local stakeholder consultation. Non-DOE validator/verifiers can be accredited under VCS	
Earliest project start date	1 January 2002 (Exception: old VCS V.1 projects January 1st 2000)	
Defnition of start date	Date on which the project reached financial closure	
Earliest start of crediting period	28 March 2006 (Exception: old VCS V.1 projects - start date of existing VCS V.1 crediting period)	
Conditions for retroactive crediting	formally none, but ! VCS informally recommended validators to follow CDM - one project rejected by SGS because of lack of consideration in investment decision !	
Other conditions	VCS validations shall be completed within 2 years of the project start date (= financial closure), or within 1 year of 19 November 2007, whichever is later.	The VCS verifier must complete a validation of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template and attach the results of this validation as an addendum to the CDM validation report.
crediting period	3 x 10 yrs (AFOLU: A minimum of 20 years up to a maximum of 100 years.)	until CDM-reg.
Eligible project types	all, including non-kyoto Gases.	

ii. Voluntary Market vs. Compliance Market



http://assets.panda.org/downloads/vcm_report_final.pdf

iii. Conditions for CDM projects

CDM projects need to seek approval by the CDM Executive Board. A number of rules and conditions will apply;

1. Only areas that were not forest on 31st December 1989 are likely to meet the CDM definitions of afforestation or reforestation.
2. Projects must result in real, measurable and long-term emission reductions, as certified by a third party. The carbon stocks generated by the project need to be secure over the long term (a point referred to as 'permanence'), and any future emissions that might arise from these stocks need to be accounted for.
3. Emission reductions or sequestration must be additional to any that would occur without the project. They must result in a net storage of carbon and therefore a net removal of carbon dioxide from the atmosphere. This is called 'additionality' and is assessed by comparing the carbon stocks and flows of the project activities with those that would have occurred without the project (its 'baseline').
4. Projects must be in line with sustainable development objectives, as defined by the government that is hosting them.

iii. Conditions for CDM projects

5. Projects must contribute to biodiversity conservation and sustainable use of natural resources.
6. Only projects starting from the year 2000 onwards will be eligible.
7. Two percent of the carbon credits awarded to a CDM project will be allocated to a fund to help cover the costs of adaptation in countries severely affected by climate change (the 'adaptation levy'). This adaptation fund may provide support for land use activities that are not presently eligible under the CDM, for example conservation of existing forest resources. SOP-adaptation
8. Some of the proceeds from carbon credit sales from all CDM projects will be used to cover administrative expenses of the CDM (a proportion still to be decided). SOP-admin
9. Projects need to select a crediting period for activities, either a maximum of seven years that can be renewed at most two times, or a maximum of ten years with no renewal option.
10. The funding for CDM projects must not come from a diversion of official development assistance (ODA) funds.

iii. Conditions for CDM projects

11. Each CDM project's management plan must address and account for potential leakage. Leakage is the unplanned, indirect emission of CO2, resulting from the project activities.

iv. CDM Project Cycle and Project Participants

Project Identification	Project Owner / Project Developer
Project Idea Note (PIN)	Project Developer
Project Concept Note (PCN)	Project Developer
Government Endorsement - LoA	DNA (MoEF)
Project Design Document (PDD)	Project Developer
Validation	DOE (Validator)
Registration	Executive Board (EB)
Monitoring	DOE
Verification	DOE
Certification	DOE
Issuance of CERs	EB

v. CDM legal documentation

1. Non-Disclosure Agreement
2. Term Sheet – Binding and Non Binding
3. ERPA – Emission Reduction Purchase Agreement
4. MOU – Memorandum of Understanding
5. SA – Service Agreement

Vii. Types of projects NGOs will develop and parameters to projects

- **The Nature of CDM activities for the poor**
  - small volume of credits per participants
  - Scattered project reciepiants
  - large number of participants
  - Environmental benefits
  - Social Benefits

- **Options for CDM and Carbon Credit projects**
  - Small Scale CDM
  - Programmatic Activities
  - Bundling or Grouping CDM activities
  - Payments for Environmental Services

Vii. Types of projects NGOs will develop and parameters to projects

Project types	Small-scale CDM project activity categories	Number
Type I: Renewable energy projects <15 MW	A. Electricity generation by the user	30
	B. Mechanical energy for the user	4
	C. Thermal energy for the user	286
	D. Renewable electricity generation for a grid	1293
	E. Switch from Non-Renewable Biomass for Thermal Applications by the User	5
Type II: Energy efficiency improvement projects <60 GWh savings	A. Supply side energy efficiency improvements - transmission and distribution	1
	B. Supply side energy efficiency improvements - generation	21
	C. Demand-side energy efficiency programmes for specific technologies	22
	D. Energy efficiency and fuel switching measures for industrial facilities	136
	E. Energy efficiency and fuel switching measures for buildings	22
	F. Energy efficiency and fuel switching measures for agricultural facilities and activities	3
	G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass	1
	H. Energy efficiency measures through centralization of utility provisions of an industrial facility Technology	4
	I. Efficient utilization of waste energy in industrial facilities	0
	J. Demand-side activities for efficient lighting technologies (deemed savings)	1

Vii. Types of projects NGOs will develop and parameters to projects

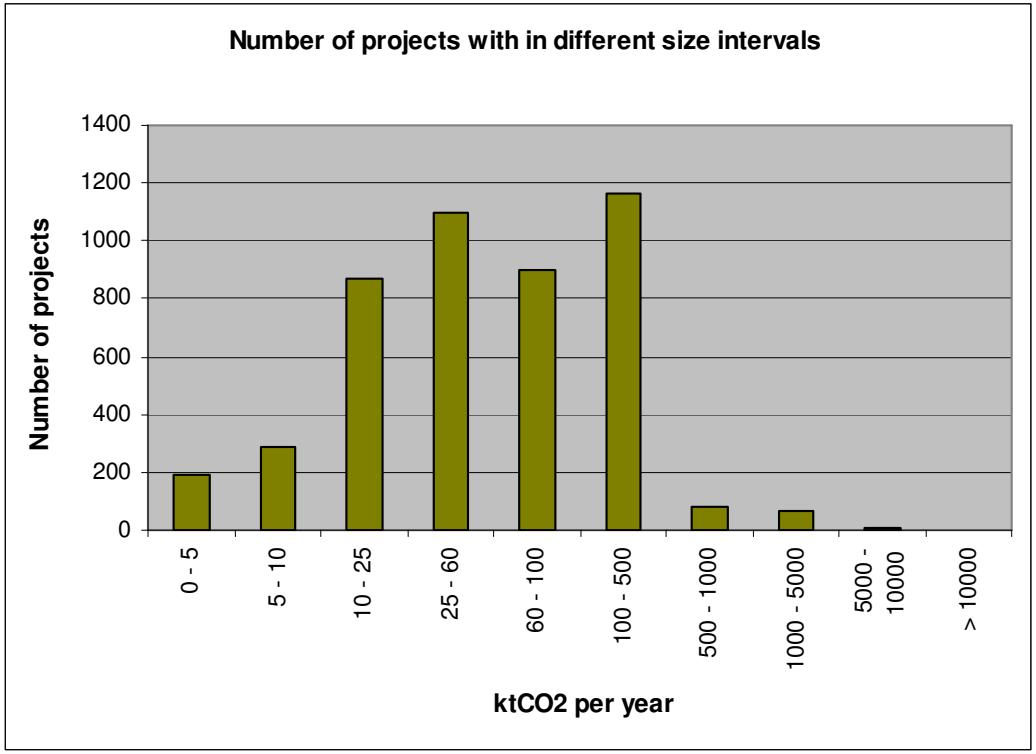
Project types	Small-scale CDM project activity categories	Number
Type III:	A. Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing cropland	0
	B. Switching fossil fuels	59
EB27:	C. Emission reductions by low-greenhouse emission vehicles	4
<60 ktCO2	D. Methane recovery in animal manure managements systems	237
reduction	E. Avoidance of methane production from biomass decay through controlled combustion	61
	F. Avoidance of methane production from biomass decay through composting	64
	G. Landfill methane recovery	22
	H. Methane recovery in wastewater treatment	164
	I. Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems	9
	J. Avoidance of fossil fuel combustion for carbon dioxide production to be used as raw material for industrial processes	1
	K. Avoidance of methane release from charcoal production by shifting from pit method to mechanized charcoaling process	2
	L. Avoidance of methane production from biomass decay through controlled pyrolysis	0

Vii. Types of projects NGOs will develop and parameters to projects

Project types	Small-scale CDM project activity categories	Number
Type III:	M. Reduction in consumption of electricity by recovering soda from paper manufacturing process	3
	N. Avoidance of HFC emissions in rigid Poly Urethane Foam (PUF) manufacturing	3
EB27:	O. Hydrogen production using methane extracted from biogas	1
<60 ktCO2	P. Recovery and utilization of waste gas in refinery facilities	5
reduction	Q. Waste gas based energy systems	57
	R. Methane recovery in agricultural activities at household/small farm level	3
	S. Introduction of low-emission vehicles to commercial vehicle fleets	0
	T. Plant oil production and use for transport applications	1
	U. Cable Cars for Mass Rapid Transit System (MRTS)	1
	V. Decrease of coke consumption in blast furnace by installing dust/sludge recycling system in steel works	0
	W. Methane capture and destruction in non-hydrocarbon mining activities	0
	X. Energy efficiency and HFC-134a recovery in residential refrigerators	0
	Y. Methane avoidance through separation of solids from wastewater or manure treatment systems	0

Vii. Types of projects NGOs will develop and parameters to projects

Size in ktCO2/yr	Number of projects	
	number	in %
0 - 5	191	4,1%
5 - 10	284	6,1%
10 - 25	871	18,7%
25 - 60	1095	23,5%
60 - 100	902	19,4%
100 - 500	1166	25,0%
500 - 1000	79	1,7%
1000 - 5000	64	1,4%
5000 - 10000	5	0,1%
> 10000	3	0,1%
Total	4660	100,0%



Viii. Current CDM market conditions in Vietnam

- 3 out of 58 projects have reached registration in Vietnam
- 35 out of 58 are hydro projects (60%)
- 49 out of 58 are at validation stage (84.5%)

- What does this mean?
  - Somebody has to become responsible for a Baseline Emission Factor
  - The DNA are getting LoAs issued
  - There could most possibly be a lack of quality in PDD writing
  - There could most possible be a lack of care in preparation by Project Owners to maintain measurement equipment

Vii. Factors driving the Carbon Market

1. The Global Economic Crisis
2. Market Risk – Post Kyoto unknown

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