

# Opportunities for Business in the Clean Development Mechanism

12 February  
Lima, Peru

**Marc Stuart**

The logo for EcoSecurities is displayed within a dark blue rectangular banner. The word "ECO" is in white, uppercase, serif font on a light blue circular background. The word "SECURITIES" is in white, uppercase, serif font on the dark blue background.

ECO SECURITIES

# Outline of the Presentation

- The Emerging Emissions Dynamic
- Evaluating Climate Positive Assets
- Origination Market and Secondary Market
- Market Pricing Signals
- What To Do?

# The Emerging Emissions Dynamic

- The Kyoto Protocol -- when implemented - will dramatically impact global industry
  - Emission Reduction Requirements in industrial countries -- against current estimates of growth -- are somewhere between 500 million and 3 billion tonnes of CO<sub>2</sub> per year from 2008-2012
- Either end of the range is significant
- Enhanced use of renewable and higher energy efficiency is a certain outcome
  - This outcome is certainly helped by the improving technology and economics of many clean energy sources

# Clean Development Mechanism

- Only in developing countries
- Creates new “allowances”
- Banking of Certified Emission Reductions (CERs) from 2000
- Higher risk, due to developing countries, but often seemingly lower cost
- Project finance driven
- Huge range of potential projects

# What makes up a CDM Project?

- A project which demonstrably lowers relative GHG emissions compared to “normal”; creating an environmental credit (CER)
- A project in which capital, or expertise is sourced from a country outside the country in which the project is occurring
- A Project which has the direct regulatory approval of the host country and either investor country or -- ultimately – an international CDM Executive Board

# What is the CDM process?

- CDM projects require upfront investment in the additional aspects of project analysis to realise downstream CER earnings
- Design features to account for projects' greenhouse gas benefits **should** be considered at prefeasibility stage,
- **Must** be incorporated before project implementation

# Evaluating Assets under Emissions Trading

## ➤ What is the asset?

- Emissions Profile of the Asset
  - **Most renewable energy is zero**

## ➤ Where is the Asset?

- What is the emissions baseline of the sector in this place?
  - E.g. China is better than Brazil for electricity
- What is the attitude of the government towards transferring allowances or earning/exporting credits (**carbon units**)
  - E.g. Costa Rica is better than China

## ➤ Can performance be readily certified?

- Projects need to go through multiple levels of regulatory due diligence, involving host government, 3rd party evaluation and potentially the CDM Executive Board
- Is greenhouse performance quantifiable with standardized data available?

# New components in the process

- Trading Assets require investment in additional aspects of analysis
- Accounting for projects' greenhouse gas benefits **should** be considered at pre-feasibility stage,
- **Must** be incorporated before project implementation
- Relevant documentation, verification requirements and transaction negotiations all require specialised services
- For many parties, outsourcing will be the answer

# What Pricing are we seeing? What can we Expect?

## ➤ Academic research

- A Unit of CO<sub>2</sub> should be worth US\$5.00 to US\$25.00 per tonne in 2008
- Large range is due to policy uncertainty regarding the restraints on trading, the rate of technology diffusion

## ➤ Current bilateral spot market

- **US\$1-3**, depending on the acceptance or decline of delivery risk

## ➤ World Bank Prototype Carbon Fund

- US\$3-5 per tonne, but with a fairly obtuse delivery structure and fairly high barriers to entry for assets

# The Process of Developing Emission Reduction Projects

# CHRONOLOGY of a CDM PROJECT: from CONCEPT to IMPLEMENTATION

*Pre-Feasibility Assessment -  
how to capture GHG benefits?*

*Final Project Design -  
full management plan*

Initial  
Project  
Concept

Project  
Implementation

*Feasibility Assessment -  
is project viable?*

*Certification,  
Registration,  
Approval*

# PRE-FEASIBILITY ASSESSMENT - Overview

## *'Carbon' Considerations*

- Project Timeframe
- Baseline & Additionality
- Leakage
- Net Carbon Benefits
- Potential CERs

## *'Non-Carbon' Considerations*

- Environmental Externalities
- Other Externalities
- Sustainable Development
- Policy Acceptability
- Implementation Capacity

# Important Emission Terminology

- **Baseline Scenario** - What would have happened without the project
- **Project Scenario** - A prediction at the outset of the environmental performance of the project
- **Leakage** - Additional Emissions that occur outside the project, but that are directly or indirectly caused by the project
- **Verification** - An external emissions audit

# The Baseline Scenario

- A counterfactual ‘business-as-usual’ scenario of greenhouse gas emissions
- Requires understanding local and international dynamics in the relevant sector
- Is Compared against the **project scenario** to assess greenhouse gas additionality, and calculate *net* emission reductions due to project activities

# Developing a baseline

- Static vs. dynamic projections
- **Static** -- assume that the current situation can be claimed as the constant in the future (different for energy and forestry)
- **Dynamic** -- attempt to predict or simulate future sectoral change based on underlying drivers
  - Dynamic baselines seem more appropriate for land use sector, while static may be more appropriate for energy projects
- Also uses simple predictive models for emissions, but with a growing emphasis on dynamic

# The Project Scenario

- Understanding future production of CERs requires comparison of project and baseline scenarios to calculating net emission reductions or sequestration
- The **Project Scenario** is the advance profile of emissions or sequestration under the envisaged project management regime
- Generally based on default data, of varying detail
- Increasing use of simple predictive models, e.g., EcoSecurities ECO<sub>2</sub> Forestry and ECO<sub>2</sub> Energy

# Emissions “Leakage”

- Greenhouse gas externalities, not accounted for in baseline
- The loss of estimated greenhouse gas benefits resulting from additional effects of project activities, often outside the project’s geographical boundaries
- Different types:
  - *activity shifting to other areas outside boundaries*
  - *outsourcing of emissions intensive processes*
  - *market effects*
  - *lifecycle emissions*

# Auditing/Verification and Certification

- Actual performance is checked external parties throughout the project lifetime
- Done by an accredited external agency, having independently evaluated the internal data and undertaken sufficient external controls to validate that data.
- Certification is a value-added function
- There is some transfer of liability/responsibility at this point, from the project to the certifier.

# Annex 1

## Representative Projects and Financing Structures from EcoSecurities Portfolio

# Types of Projects

- **Power Plant repowering**
  - **Renewable energy and fuel switching**
  - **Transportation Upgrades**
  - **Energy Distribution (pipelines)**
  - **Forestry**
  - **Landfills and Coalmine methane recovery**
  - **General Energy Efficiency (both production and end-use)**
- **All of the following are taken from the EcoSecurities project development portfolio**

# Photovoltaics In El Salvador

- **Development Situation:** Approximately 1.8 Million Salvadorans (32% of the population) do not have access to electricity. The developer has installed about 500 PV systems on a cash basis. The plan is to scale up to 6000 systems on both a cash and credit basis.
- **Baseline** The baseline scenario for this project is the displacement of car batteries, kerosene, candles, oil lamps, from households over its 15 year lifetime. Each SHS will displace 0.3 tonnes CO<sub>2</sub> per year
- **Project CER flows:** 27,000 tonnes of CO<sub>2</sub> over the 15 year lifetime of the project, based on implementation of 6000 units
- **Financial Situation:** For the developer, the project has a projected IRR of 9% without carbon credits, over 20% with the inclusion of carbon at US\$3 per tonne CO<sub>2</sub>
- **Difficulties** – Scale is small, transaction costs high, seller must contractually retain rights to CO<sub>2</sub> to reap economic benefits

## Fuel Switching –Palm Oil for Transportation (Malaysia)

- **Development Situation:** A substantial glut of palm oil production is making alternative uses potentially profitable and useful for the industry
- **Project:** Using patented technology, establishment a series of “palm to diesel” reactors to create a biomass derived transportation fuel. In Y2, projected delivery of 250M liters
- **Emission reductions :** Approximately 1 tonne CO<sub>2</sub> per 350 liters delivered (preliminary calculations). Based upon the sustainability change in the overall diesel supply mix **Financial Structure:** Conventional project finance by management, who is considering the packaging fuel as “carbon neutral” to western buyers, or stripping carbon value out, Depends on relative value and needs for fuel marketing
- **Regulatory Status:** Preliminary approval from Malaysia

# Guatemala 40 MW hydro plant

- **Development Situation:** Country with substantial energy needs currently using diesel for peaking power
- **Project CER flows:** Displacement of fossil fuels, avoids the emissions of 2.7M tonnes of CO<sub>2</sub> over a 20 year life time.
- **Financial Structure** US\$ 50 M, financed through debt and equity mechanisms.
  - Projected pre-tax IRR = > 20%, albeit with high country risk, but without CER values
  - Rights to CERs may be transferred to a Special Purpose Company, to be floated to carbon investors with returned to core investors
- **Regulatory status:** Approved by Guatemala and USIJI with promised support for CDM

# Brazil 35 MW Biomass Energy Plant

- **Development Situation:** Large Wood processing region currently has massive pollution and logistics problems with saw waste from several hundred small producers
- **Project CER flows:** a centralized 35MW wood waste biomass electricity plant will displace plans for diesel, avoiding the emissions of up to 4.2M tonnes CO2 over a 20-year life time
- **Financial structure:** currently working with project developer to capture emission reductions -- and maximize the value of them -- in the offered project financing package.
- **Regulatory status:** Not yet submitted for approval

# Landfill Methane Project in South America

- **Development Situation:** Huge urban landfill is currently a hazard, due to leakages of methane, fires and groundwater leachate
- **Project CER flows:** A landfill gas recovery plant will capture sufficient energy to power an 18 MW electricity generation facility for 20 years and achieve 12M tonnes of CO<sub>2</sub> reductions via methane to CO<sub>2</sub> conversion in first 10 years
- **Financial structure:** Formally Separating the gas recovery facility (GasCo) from the generation facility (GenCo)
  - **GasCo:** US\$3M investment, 90% of the CERs, 10% of the conventional value. Can generate CERs without the GasCo
  - **GenCo:** US\$ 20M investment, 10% of the CERs, 90% of the conventional value. Cannot do anything without the GasCo
- **Regulatory status:** Not yet submitted for approval

# 180 MW Power Plant Upgrade in Colombia

- **Development Situation:** Colombia power demands are increasing. Taking an existing 300 MW gas fired power plant and making it a combined cycle plant of 480 MW, utilizing existing waste heat as the fuel source
- **Project CER flows:** 240,000 tonnes of CO2 per year
- **Financial structure:** currently working with the lead bank on the project to quantify capture emission reductions -- and maximize the value of them -- in the project financing package.
- **Regulatory status:** Approved by Colombia and currently under review by US government (USIJI).