



# The International Carbon Reduction Market:

## Opportunities to Boost Renewable Energy in the Caribbean

# Overview of Presentation

---

- International Carbon Trading
- Kyoto & Clean Development Mechanism (CDM)
- CDM Eligibility Rules & Small-Scale Projects
- Carbon Markets Trends
- Benefits of Participation
- Conclusions



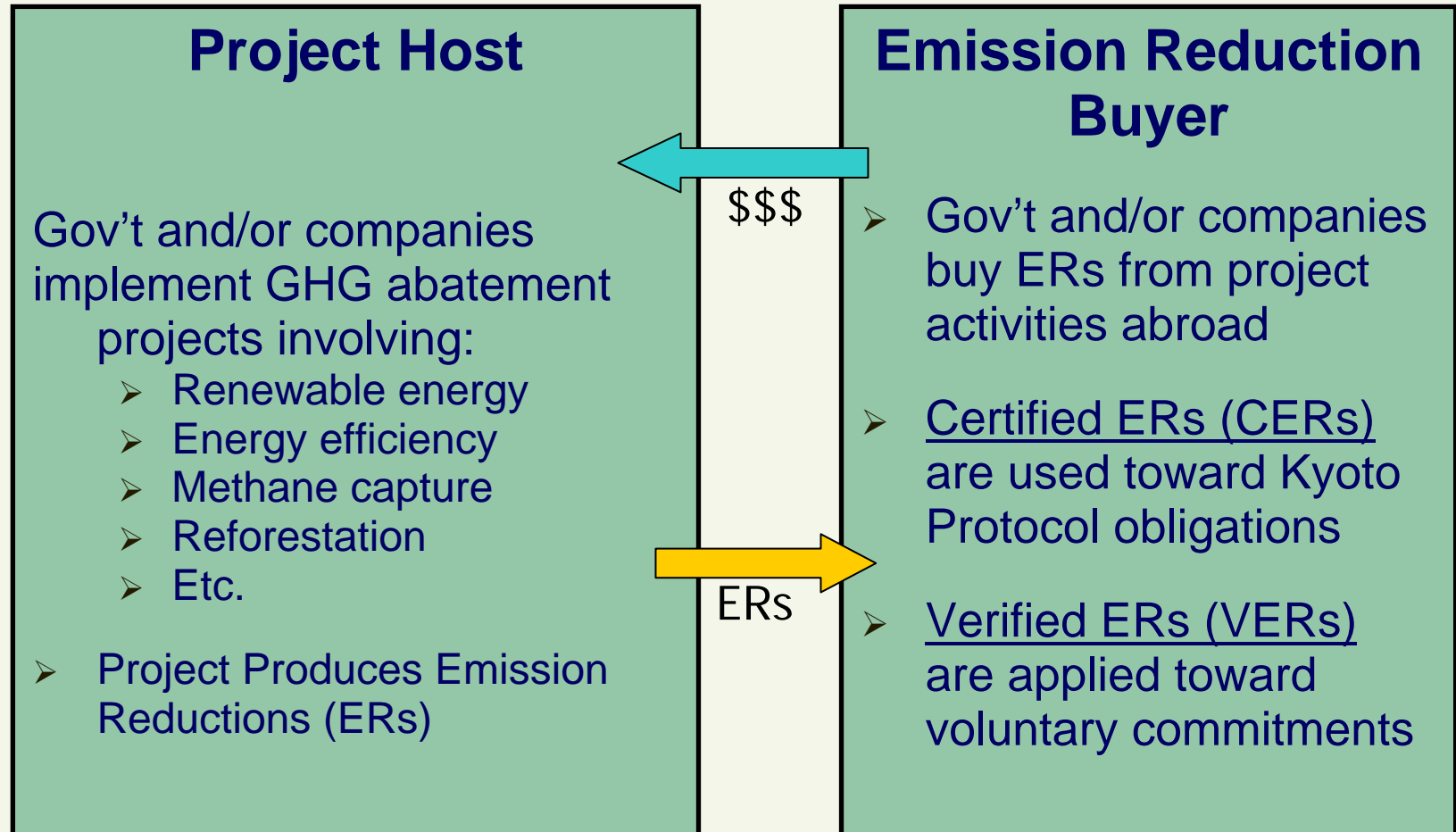
# International Carbon Markets

---

- International trade in greenhouse gas reductions is a large and rapidly growing market
- Motivated by requirements of the Kyoto Protocol and regional programs, and by voluntary commitments in some cases, governments and private companies in industrial countries have already committed billions dollars for emission reductions from projects outside their borders
- The international carbon market offers an important opportunity to help boost renewable energy activities in many parts of world



# Illustration of the Carbon Trading Concept



# The Kyoto Protocol

---

- The Kyoto Protocol, established in 1997, commits industrialized “Annex B” (or “Annex 1”\*), nations to legally binding greenhouse gas (GHG) emission reductions
- Annex I countries’ GHG reduction commitments average 5.2% below 1990 levels during a first “commitment period” from 2008-2012
- The Kyoto Protocol entered into force on February 16, 2005

\*Countries with emissions caps under the Kyoto Protocol are technically “Annex B” countries, though they are called here Annex 1 referring to Annex 1 of the UN Framework Convention on Climate Change. In practice, these terms are commonly used interchangeably.



# Carbon Trading under the Kyoto Protocol

---

Kyoto Protocol established three mechanisms for cross-border trading in greenhouse gas (GHG) emissions reductions:

- **International Emissions Trading (IET)**

Trading blocks of emissions credits between emissions-capped industrialized countries at the national level

- **Joint Implementation (JI)**

Project-based trading between Annex 1 countries

- **Clean Development Mechanism (CDM)**

Project-based trading between Annex 1 and non-Annex 1 countries



# Clean Development Mechanism (CDM)

---

- Under the CDM, eligible projects in developing nations can qualify to generate Certified Emission Reductions (CERs)
- CERs can be used by Annex 1 nations to meet their reduction commitments during 2008-2012
- CDM projects can begin to generate CERs prior to 2008
- CDM project emission reductions can be credited for fixed a 10 yr. period, or a 7 yr. period renewable up to 2 times for a maximum of 21 yrs.



# CDM Eligibility Requirements

---

## CDM Projects Must:

- Be implemented in a non-Annex 1 country that is a party to the Kyoto Protocol
- Be additional to what would occur in the absence of the project activity
- Support sustainable development in the host country
- Obtain approval of host country's Designated National Authority for the CDM
- Result in real, measurable, long-term climate change benefits

## CDM Projects Must Not

- Divert Official Development Assistance (ODA)
- Involve nuclear power



# Kyoto Protocol Status of Caribbean Jurisdictions

---

<b>Jurisdiction</b>	<b>Kyoto Protocol Status</b>	<b>Kyoto Mechanism Eligibility</b>
Independent States (A)	Nearly All Are Parties	CDM
Dutch Territories (B)	Not Parties on Their Own*	Not Eligible
French Departments (C)	Parties through France	Potentially JI
UK Territories (D)	Could Join via UK	Potentially JI
US Territories	Not Parties	Not Eligible

*Sources:*

*A - UNFCCC Secretariat*

*B –\*Not covered under Netherlands Kyoto commitment; SenterNovem*

*C - French Ministry of Environment*

*D - UK Dept. of Environment, Food, And Rural Affairs – Global Atmosphere Division*



# Regulatory Versus Voluntary Carbon Markets

---

## Market Characteristics

<b>Market Programs</b>	<b>Relative Market Size</b>	<b>Participation Requirements / Transaction Costs</b>	<b>Caribbean Jurisdiction Eligibility</b>
Kyoto Compliance Market (CDM, JI)	Large	Rigorous / High	Yes for some but not all Caribbean Jurisdictions
Voluntary Carbon Market	Small	Variable / Less than regulatory market programs	Yes for all Caribbean Jurisdictions

# Selected Carbon Market Programs

---

<b>Carbon Market Program</b>	<b>Voluntary vs. Regulatory</b>	<b>Notes</b>
Clean Development Mechanism (CDM)	Regulatory	CERs can be used for compliance with Kyoto commitments
European Union Emission Trading System (EU ETS)	Regulatory	Regulates emissions from power generation and other industries in the EU
Voluntary Markets	Voluntary	Companies, individuals, and events buy verified emission reductions (VERs) to reduce their carbon footprint

# Example Project Types

---

Renewable energy ➤ Grid Connected ➤ Off grid	➤ Geothermal power plants ➤ PV home lighting systems
Energy efficiency ➤ Supply-side ➤ Demand side	➤ High efficiency turbines ➤ Compact florescent lamps
Fuel switching	Diesel to Bio-fuel
Industrial processes	Cement manufacturing innovations
Methane destruction	Landfill gas to energy
Reforestation	Community forestry



# Small-Scale Projects in the CDM

---

To reduce transaction costs, which can be proportionally much higher for small-scale projects, Parties to the climate convention instructed the CDM Executive Board to develop simplified modalities & procedures, including:

- Simplified Project Design Document
- Simplified baseline setting & monitoring methodologies
- Same Designated Operational Entity can validate and verify & certify emissions reductions for a specific SSC project
- Lowered project registration fees

**Under the CDM rules, small-scale projects are defined as:**

- Renewable energy systems with less than 15 MW capacity
- Energy efficiency projects less than 15 GWh/year
- Other projects emitting less than 15 kilotonnes CO<sub>2</sub>/year

# Approved Small-Scale Activities Categories\*

<b>Project Type</b>	<b>Project Activity Category</b>
<b>I. TYPE I: RENEWABLE ENERGY PROJECTS</b>	I.A. Electricity generation by the user I.B. Mechanical energy for the user I.C. Thermal energy for the user I.D. Renewable electricity generation for a grid
<b>II. TYPE II: ENERGY EFFICIENCY IMPROVEMENT PROJECTS</b>	II.A. Supply side energy efficiency improvements – transmission and distribution II. B. Supply side energy efficiency improvements – generation II.C. Demand-side energy efficiency programmes for specific technologies II.D. Energy efficiency and fuel switching measures for industrial facilities II.E. Energy efficiency and fuel switching measures for buildings II.F. Energy efficiency and fuel switching measures for agricultural facilities and activities
<b>III. TYPE III: OTHER PROJECT ACTIVITIES</b>	III. A. Agriculture III. B. Switching fossil fuels III. C. Emission reductions by low-greenhouse gas emitting vehicles III. D. Methane recovery III. E. Avoidance of methane production from biomass decay through controlled combustion

***\*As of January 1, 2006***



# CDM Participation & Transaction Costs

Cost Item:	Estimated Cost - \$US	
	Full Scale CDM Project	Small Scale CDM Project
Project Identification, Project Idea Note Development	20,000	15,000
Project Design Document Preparation	45,000	25,000
Stakeholder Consultation & Host Country Approval	10,000	5,000
Validation by an Operating Entity	30,000	12,500
Registration Fee	30,000	5,000
Transaction Negotiation & Contracting	20,000	15,000
Project Monitoring (Periodic)	varies	varies
Initial Verification by Operating Entity & Certification	15,000	7,500
Periodic Verification (Cost Per Verification Report)	10,000	5,000
<b>Approximate Total:</b>	<b>&gt;180,000</b>	<b>&gt;90,000</b>

*Note: Estimated costs vary considerably depending on various factors.*



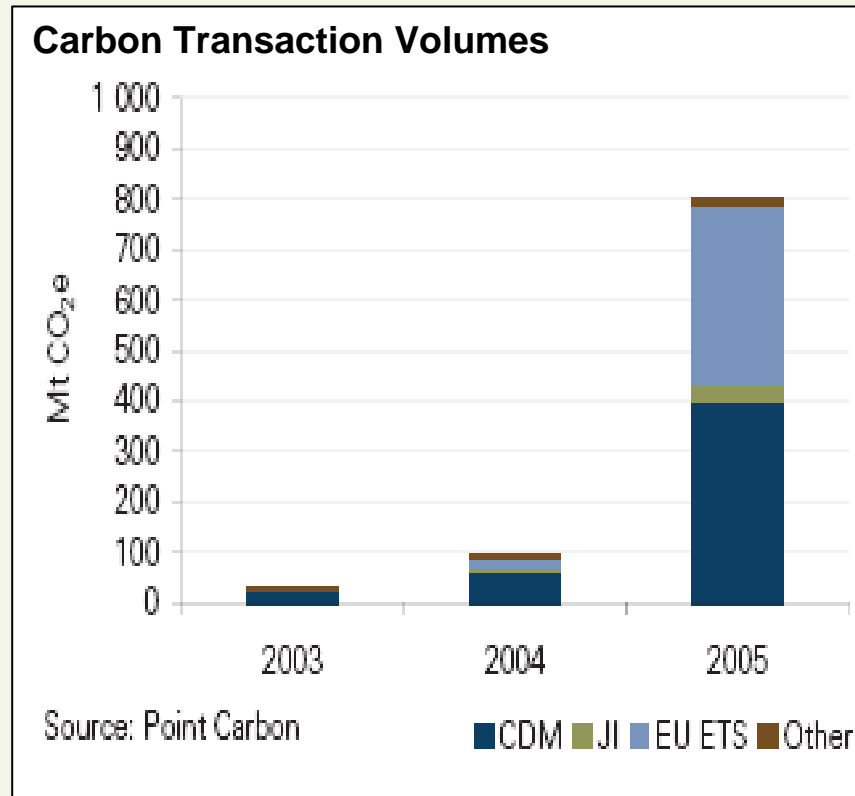
# Carbon Trading Prices

---

<b>Carbon Market Program</b>	<b>Approx. US\$/TonCO<sub>2</sub>e (Early 2006)</b>
Clean Development Mechanism (CDM)	\$6 to \$17
European Union Emission Trading System (EU ETS)	\$26 to \$32
Voluntary Markets	\$5 to \$20

# Carbon Market Trends

---



# Carbon Market Benefits for Project Developers

---

Carbon market participation can provide new resources to overcome financial and other barriers by:

- Supplying additional revenue
- Improving project economics (increasing IRR)
- Enhancing project viability in other ways (e.g., emission reduction purchase commitment from creditworthy buyer can increase investor confidence)



# Carbon Revenue Estimates for Example Activities

---

<b>Example Technology Application</b>	<b>System Capacity</b>	<b>Example System Cost</b>	<b>Example tCO2 Reduced/Yr.</b>	<b>Carbon sales % of system cost</b>
Solar Water Heating	2.4 kWth	\$1,850	2.5	17%
Wind Power	10 MW	\$12,500,000	21,000	21%
Hydro Power	1.5 MW	\$2,000,000	6,000	38%

*Assumptions: \$12.50/tCO2 emission reduction; undiscounted 10 yr crediting; 0.8 tCO2/MWh grid emission factor; SWH performance based on RETScreen; wind capacity factor 30%; hydro capacity factor 55%. Actual figures will vary depending on local conditions.*



# Opportunities for Utility CDM Participation

---

- Government and private electric utilities can benefit from CDM participation
- Various project types are possible:
  - Demand Side Energy Efficiency
  - Supply Side Energy Efficiency
  - Renewable energy
  - Landfill gas
  - Etc.

# Conclusions

---

- The international greenhouse gas reduction market is large and growing rapidly.
- Emission reduction prices have been increasing substantially.
- Renewable energy & energy efficiency activities in the Caribbean can generate substantial revenue due to the comparatively high carbon baseline for electricity generation across most of the region.
- Carbon market participation can provide a significant boost to sustainable energy activities in the Caribbean.





**Thank You!**

**Green Markets International, Inc.  
691 Massachusetts Ave., Suite 7  
Arlington, MA 02476 USA  
[www.green-markets.org](http://www.green-markets.org)**