The role of carbon finance in business plan for clean energy projects

CTI PFAN West Africa Forum for Clean Energy Financing (WAFCEF)
Lome, Togo, 4 July 2013

Chunyu Liang, Technical Officer
UNFCCC secretariat, Sustainable Development Mechanisms Programme
OVERVIEW

OUTLINE

• The Kyoto Protocol
• Market-based mechanisms
• CDM support structure and
• CDM project cycle
• Programme of Activities (PoA)
• CDM Regional Collaboration Centre Lome
KYOTO PROTOCOL

• Adopted in 1997; began in 2005

• Set legally binding targets for emissions of six major GHGs in industrialized countries

• With targets, emission reductions took on economic value

• Countries can meet reduction commitments through (3) market-based mechanisms
MARKET-BASED MECHANISMS

- **Emission Trading (ET):** exchanging emission allowances among KP Parties – Article 17

- **Clean Development Mechanism (CDM):** credits for emissions reduced/avoided through sustainable development projects in developing countries (non-Annex I countries) – Article 12

- **Joint Implementation (JI):** credits for emissions avoided through projects in Annex I countries – Article 6
CDM STATISTICS

CDM: GLOBAL REACH

6950+ registered projects in 88+ countries
9000+ projects in pipeline
1.3 billion CERs issued to date

>1.7 billion certified emission reductions expected by 2020
CDM: registered project overview

Number (%) of CDM projects in each category

- Renewables: 69%
- CH4 reduction & Cement & Coal mine/bed: 16%
- Supply-side EE: 7%
- Demand-side EE: 3%
- Afforestation & Reforestation: 0.8%
- Fuel switch: 2%
- HFCs, PFCs, SF& N2O reduction: 2%
- Transport: 0.4%
Available on CDM website:

About CDM

CDM Benefits

1. USD 215.4 billion investment in CDM projects spurred by end of 2012 in developing countries = foreign direct investment of Denmark, France & Germany combined (2007-2011)

2. USD 21.5 - 43 billion foreign investment as a result of CDM projects to date = half the new investment in renewable energy in all developing countries (2011)

3. USD 3.6 billion = compliance savings to Annex I Parties under the Kyoto Protocol (2008-2012)

4. USD 9.5 - 13.5 billion direct benefit to host countries from sale of CERs to date

5. Top 5 technology and “know-how” suppliers for CDM projects: Germany, USA, Denmark, Japan and China = CDM helps generate and support green growth programmes globally

6. CDM projects vs. similar non-CDM projects in developed countries:
   - CDM projects are 3-4 times larger in terms of power generation capacity (except solar thermal projects)
   - CDM projects are 15% (solar photovoltaic) to 50% (geothermal and solar thermal power) less capital intensive
   - CDM projects = more efficient use of capital invested

7. 110,000 MW of renewable electricity capacity from CDM projects over the last 10 years = current total power generation capacity of Africa

8. CDM has effectively designed a set of indicators for reporting on sustainable development in host countries

9. CDM facilitates the transfer of technology and knowledge to developing countries
CDM PROJECT CYCLE

Verification & Certification  
(DOE)

Registration  
(EB)

Monitoring  
(Project Participant)

CER Issuance  
(EB)

Validation  
(DOE)

Approval  
(DNA)

PDD Development  
(Project Participant)

CDM Prior Consideration Form
CDM PROJECT CYCLE – Project Design Document (CDM - PDD)

Get a glimpse of the 7 steps of the Project Cycle

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project Design - Project Participant</td>
</tr>
<tr>
<td>2</td>
<td>National approval - Designated National Authority</td>
</tr>
<tr>
<td>3</td>
<td>Validation - Designated Operational Entity</td>
</tr>
<tr>
<td>4</td>
<td>Registration - Executive Board</td>
</tr>
<tr>
<td>5</td>
<td>Monitoring - Project Participant</td>
</tr>
<tr>
<td>6</td>
<td>Verification - Designated Operational Entity</td>
</tr>
<tr>
<td>7</td>
<td>CER issuance - Executive Board</td>
</tr>
</tbody>
</table>

Project participant prepares project design document, making use of approved emissions baseline and monitoring methodology.

**PROJECT DESIGN STEP IN DETAIL**

- **Project Design Document (CDM-PDD):** The project design document form was developed by the Executive Board on the basis of Appendix B of the CDM modalities and procedures. Project participants shall submit information on their proposed CDM project using the CDM-PDD form.

- **Proposal of a new baseline and/or monitoring methodology:** The proposed new baseline methodology shall be submitted by the designated operational entity to the Executive Board for review and approval, prior to validation and submission for registration of the project.

- **Use of an approved methodology:** An approved methodology is a methodology previously approved by the Executive Board and made publicly available along with any relevant guidance. When an approved methodology is used, the designated operational entity may proceed with the validation of the CDM project activity and submit the CDM-PDD with a request for registration.

http://cdm.unfccc.int/Projects/diagram.htm
CDM PROJECT CYCLE – National Approval

1. **Project Design**  
   - Project Participant

2. **National approval**  
   - Designated National Authority

- Project participant secures letter of approval from Party.

- The Designated National Authority (DNA) of a Party involved in a proposed CDM project activity shall submit a letter indicating the following:
  - That the country has ratified the Kyoto Protocol.
  - That participation is voluntary.
  - And, from host parties, a statement that the proposed CDM project activity contributes to sustainable development (EB 16, Annex 6, paragraph 1).

3. **Validation**  
   - Designated Operational Entity

4. **Registration**  
   - Executive Board

5. **Monitoring**  
   - Project Participant

6. **Verification**  
   - Designated Operational Entity

7. **CER issuance**  
   - Executive Board

http://cdm.unfccc.int/Projects/diagram.htm
Get a glimpse of the 7 steps of the Project Cycle

1. **Project Design**  
   - Project Participant

2. **National approval**  
   - Designated National Authority

3. **Validation**  
   - Designated Operational Entity

4. **Registration**  
   - Executive Board

5. **Monitoring**  
   - Project Participant

6. **Verification**  
   - Designated Operational Entity

7. **CER issuance**  
   - Executive Board

Project design document is validated by accredited designated operational entity, private third-party certifier.

Validation is the process of independent evaluation of a project activity by a designated operational entity against the requirements of the CDM as set out in CDM modalities and procedures and relevant decisions of the Kyoto Protocol Parties and the CDM Executive Board, on the basis of the project design document.

http://cdm.unfccc.int/Projects/diagram.htm
Get a glimpse of the 7 steps of the Project Cycle

1. **Project Design**
   - Project Participant

2. **National Approval**
   - Designated National Authority

3. **Validation**
   - Designated Operational Entity

4. **Registration**
   - Executive Board

5. **Monitoring**
   - Project Participant

6. **Verification**
   - Designated Operational Entity

7. **CER Issuance**
   - Executive Board

**Valid project submitted by DGE to CDM Executive Board with request for registration.**

Registration is the formal acceptance by the Executive Board of a validated project as a CDM project activity. Registration is the prerequisite for the verification, certification and issuance of CERs related to that project activity.

**REGISTRATION STEP IN DETAIL**

- Completeness check by secretariat
- Vetting by secretariat
- Vetting by Executive Board
- If a Party or three members of Executive Board request review, project undergoes review, otherwise proceeds to registration
CDM PROJECT CYCLE - Monitoring

1. Project Design
   - Project Participant

2. National approval
   - Designated National Authority

3. Validation
   - Designated Operational Entity

4. Registration
   - Executive Board

5. Monitoring
   - Project Participant

6. Verification
   - Designated Operational Entity

7. CER issuance
   - Executive Board

Project participant responsible for monitoring actual emissions according to approved methodology.

Keep the data and records
Follow the monitoring plan strictly
Records = credits!

http://cdm.unfccc.int/Projects/diagram.htm
Designated operational entity verifies that emission reductions took place, in the amount claimed, according to approved monitoring plan.

**Verification** is the independent review and ex post determination by the designated operational entity of the monitored reductions in anthropogenic emissions by sources of greenhouse gases that have occurred as a result of a registered CDM project activity during the verification period.

**Certification** is the written assurance by the designated operational entity that, during the specified period, the project activity achieved the emission reductions as verified.
CDM PROJECT CYCLE – Issuance of CERs

Get a glimpse of the 7 steps of the Project Cycle

1. **Project Design**
   - Project Participant

2. **National approval**
   - Designated National Authority

3. **Validation**
   - Designated Operational Entity

4. **Registration**
   - Executive Board

5. **Monitoring**
   - Project Participant

6. **Verification**
   - Designated Operational Entity

7. **CER issuance**
   - Executive Board

Designated operational entity submits verification report with request for issuance to CDM Executive Board.

**CER ISSUANCE STEP IN DETAIL**

- Completeness check by secretariat
- Vetting by secretariat
- Vetting by Executive Board
- If a Party or three members of Executive Board request review, issuance request undergoes review, otherwise issued.

http://cdm.unfccc.int/Projects/diagram.htm
How to integrate carbon finance into your business plan?

- Consider CDM transaction costs, CER sales revenue in the financial model
- Consider CDM design requirements (additionality, baseline, etc.)
- Consider CDM monitoring requirements
- Organization: consider CDM management structure
- Submit “CDM Prior Consideration Form” today!
Programmes of Activities (PoAs)

- Africa accounts for 22%+ of registered PoAs
- 102+ PoAs in the pipeline
- High co-benefits for local populations
## Programme of Activities - Design

### What are the main differences?

<table>
<thead>
<tr>
<th></th>
<th>Single Project</th>
<th>Bundle of projects</th>
<th>PoA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single location</td>
<td>Multiple locations within a country</td>
<td>Multiple locations, across countries</td>
<td></td>
</tr>
<tr>
<td>Single PP</td>
<td>Multiple PP</td>
<td>Multiple PP</td>
<td></td>
</tr>
<tr>
<td>1 project at a time</td>
<td>A number of activities submitted as 1 project activity at a time</td>
<td>Activities submitted over the life-time of the POA</td>
<td></td>
</tr>
<tr>
<td>One crediting period</td>
<td>One crediting period for all activities</td>
<td>Each activity has own crediting period</td>
<td></td>
</tr>
<tr>
<td>PP known ex-ante</td>
<td>All PP known ex-ante</td>
<td>At least one PP known ex-ante, rest join later</td>
<td></td>
</tr>
</tbody>
</table>
Programme of Activities

How can a PoA be structured?

- No fixed rules.
- There are no specified size limits or criteria for CPA:
  a) CPA can be geographic (e.g. a certain city/province),
  b) CPA can be timebound (e.g. activities commencing in a certain year).
- Coordinating/managing entity (CME) is not restricted or defined, but is directly involved in the implementation of the PoA and distribution of CERs.
Programme of Activities

The basic outline

- Unlimited number of similar CDM project activities (CPA) can be administered under a single programme umbrella.
- Seen as an important means to scale up and extend the reach of the CDM, especially in underrepresented regions.

CME – coordinating or managing entity
CPA – CDM programme activity
<table>
<thead>
<tr>
<th>Title</th>
<th>Host country</th>
<th>Coordinating Entity</th>
<th>PoA-Type</th>
<th>CPA-Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion of Energy-Efficient lighting using Compact Fluorescent Light Bulbs in rural areas in Senegal</td>
<td>Senegal</td>
<td>Agence Senegalaise d’Electrification Rurale</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Solar Water Heater Programme in Tunisia</td>
<td>Tunisia</td>
<td>Agence Nationale pour la Maîtrise de l’Energie (ANME)</td>
<td>Solar</td>
<td>Solar</td>
</tr>
<tr>
<td>Landfills’ gas capture, flaring and use program in Morocco</td>
<td>Morocco</td>
<td>Fonds d’Equipement Communal (FEC)</td>
<td>Landfill gas</td>
<td>Landfill gas</td>
</tr>
<tr>
<td>Distribution of fuel-efficient improved cooking stoves in Nigeria</td>
<td>Nigeria</td>
<td>C-Quest Capital</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Improved Cooking Stoves for Nigeria Programme of Activities</td>
<td>Nigeria</td>
<td>Developmental Association for Renewable Energies</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Promoting Efficient Stove Dissemination and Use in West Africa</td>
<td>Togo</td>
<td>E+Carbon</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Côte d’Ivoire and Cameroon Efficient Cookstoves Program</td>
<td>Côte d’Ivoire</td>
<td>Envirofit International</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>African Improved Cooking Stoves Programme of Activities</td>
<td>Ghana</td>
<td>Envirofit International</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Côte d’Ivoire and Cameroon Efficient Cookstoves Program</td>
<td>Côte d’Ivoire</td>
<td>Envirofit International</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Promoting Efficient Stove Dissemination and Use in West Africa</td>
<td>Togo</td>
<td>E+Carbon</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Distribution of Improved Cook Stoves in Sub-Saharan Africa</td>
<td>Senegal</td>
<td>C-Quest Capital Malaysia Global Stoves Limited</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Standard Bank MSW Composting Programme</td>
<td>Ghana</td>
<td>Standard Bank</td>
<td>Methane avoidance</td>
<td>Methane avoidance</td>
</tr>
<tr>
<td>Energy Efficiency of Nigeria’s Residential Lighting Stock by Distributing up to 40 Million Compact Fluorescent Lamps (CFLs) to Residential Households Connected to the National Grid</td>
<td>Nigeria</td>
<td>Icimi</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Oando Low Cost LPG Cook Stove Initiative Nigeria</td>
<td>Nigeria</td>
<td>Oando Marketing PLC</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Clean Cook Stoves in Sub-Saharan Africa by ClimateCare Limited</td>
<td>Ghana</td>
<td>ClimateCare Limited</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>BioGas Programme in Central Mexico 01</td>
<td>Mexico</td>
<td>Islan Group</td>
<td>Methane avoidance</td>
<td>Methane avoidance</td>
</tr>
<tr>
<td>PoA for fuel switching at micro and small-sized enterprises in Egypt</td>
<td>Egypt</td>
<td>CDM-APU/EEAA</td>
<td>Fossil fuel switch</td>
<td>Fossil fuel switch</td>
</tr>
<tr>
<td>Fuel switching at two bakeries in EL-Zawya El-Hamra</td>
<td>Egypt</td>
<td>CDM-APU/EEAA</td>
<td>Fossil fuel switch</td>
<td>Fossil fuel switch</td>
</tr>
<tr>
<td>PoA for small scale renewable energy development in Egypt</td>
<td>Egypt</td>
<td>CDM Awareness &amp; Promotion Unit</td>
<td>Mixed renewables</td>
<td>Mixed renewables</td>
</tr>
<tr>
<td>Installing PV panels at the New Basaisa Village Guest House</td>
<td>Egypt</td>
<td>CDM Awareness &amp; Promotion Unit</td>
<td>Solar</td>
<td>Solar</td>
</tr>
<tr>
<td>ONE Wind Program of Activity, Morocco</td>
<td>Morocco</td>
<td>Office National de l’Electricité</td>
<td>Wind</td>
<td>Wind</td>
</tr>
<tr>
<td>Tarfaya Wind Farm Project (300 MW)</td>
<td>Morocco</td>
<td>Office National de l’Electricité</td>
<td>Wind</td>
<td>Wind</td>
</tr>
<tr>
<td>PoA for Water Pumping Efficiency Improvement and Rehabilitation for Egyptian Pumping Stations</td>
<td>Egypt</td>
<td>CDM Awareness and Promotion Unit</td>
<td>EE service</td>
<td>EE service</td>
</tr>
<tr>
<td>Nasr 5 Irrigation Station</td>
<td>Egypt</td>
<td>CDM Awareness and Promotion Unit</td>
<td>EE service</td>
<td>EE service</td>
</tr>
<tr>
<td>Promoting Efficient Stove Dissemination and Use in West Africa</td>
<td>Burkina Faso</td>
<td>E+Carbon</td>
<td>EE households</td>
<td>EE households</td>
</tr>
<tr>
<td>Tunisian cogeneration development programme (PoA)</td>
<td>Tunisia</td>
<td>Tunisian National Agency for Energy Conservation</td>
<td>EE supply side</td>
<td>EE supply side</td>
</tr>
<tr>
<td>Cartonnerie Tunisienne cogeneration project</td>
<td>Tunisia</td>
<td>Tunisian National Agency for Energy Conservation</td>
<td>EE supply side</td>
<td>EE supply side</td>
</tr>
<tr>
<td>Programme of Activities for the development of solar water heating systems in the tertiary sector in Tunisia - PROSOL tertiary</td>
<td>Tunisia</td>
<td>Tunisian National Agency for Energy Conservation</td>
<td>Solar</td>
<td>Solar</td>
</tr>
<tr>
<td>Man and Man Enterprise Improved Cooking Stoves Programme in Togo</td>
<td>Togo</td>
<td>Man &amp; Man Enterprise</td>
<td>EE households</td>
<td>EE households</td>
</tr>
</tbody>
</table>
CDM Key Challenges in Africa

- Carbon Market
- Implementation difficulties
- Financing difficulties
- Complex process
- Lack of capacity, information and data
- Lack of awareness
- Post-2012 challenge
• Partner with West Africa Development Bank (BOAD)
• Support 30 West and French-speaking African countries
• Identification and direct support for CDM project development
• Identification and direct support for standardized baseline development – for instance, grid emission factor
• Assist in addressing any serious issues arising from Project Design Document writing
• Direct support during validation process
FURTHER INFORMATION:
http://cdm.unfccc.int

THANK YOU!

Contact:
Mr. Chunyu Liang
cliang@unfccc.int, rcclome@unfccc.int

@UN_CarbonMechs /UNCarbonMechs