Economics of CDM Projects

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Economics of CDM Projects - Key Factors

- CDM projects produce both conventional project output and carbon benefits (CERs).
- The value of carbon benefits and its impact on project viability are influenced by several factors which include:
  - Viability/feasibility as CDM project (Technical/Financial)
  - Quantity of CERs generated by the project
  - Price of CER
  - Transaction costs involved in securing CERs
  - Risks involved
Financing CDM Projects - Basics

- Whether a potential CDM Project is feasible or viable?
  - Technologically feasible
  - Financially sound

- Different types of financing
  - Project financing – Grants/Loan/Equity
    Financing of investment and construction costs, operating and maintenance
  - Carbon Financing – CDM Costs & CER revenues
    - Transaction costs,
    - Revenue earned from the carbon credits- typically 5 to 15 % of total project costs
Carbon Financing is just an Icing on the Cake
Stakeholders involved in Project Financing

- Experts
- Other lenders
- Rating agencies
- Equities provider
- Lender
- Host government
- Supplier
- Project entity
- Buyer
- Constructor
- Operator
- Insurer

Relationships:
- Advisory contracts
- Loan agreement
- Purchase agreement
- Construction contract
- Supply contract
- Permits & licences
- Guarantees
- Insurance contract
- Operation & maintenance contract
- Shareholder agreement
- Ratings
Conventional & CDM Project Development

**Physical Project Development**

1. Project Idea
2. Feasibility Study
3. Financing
4. Construction
5. Operation

**CDM Development**

1. Make PDD
2. Validate
3. Register
4. Monitor
5. Verify
6. Issue CERs

- Use or make methodology
- Test additionality
- Stakeholder comments
- Letter of approval

**Commercial Development**

1. Prepare PIN and term sheet
2. Select buyer
3. Negotiate ERPA
4. Deliver CERs
5. Generate CERs
6. Select buyer
7. Sell and deliver
**Project Costs & Sources**

- **Total Project Cost Estimates**
  - Investment costs, including development costs, up to commissioning of project, Operation & maintenance

- **Sources of Finance** to be Sought or Already Identified
  - Critical to identify other debt and/or equity finance
  - Typical sources of funding: Multi-lateral/Bi-lateral, Financial Institutions

- **CDM contribution** = typically 5-15% of total project costs
Options for CDM Financing - ERPA

ERPA - Emission Reductions Purchase Agreement
Annex I investor agrees to buy CERs as they are generated by the project
Emission Reductions Purchase Agreement

- Can improve the *project IRR*
- Typically *forward contracts*
  - Payment upon *delivery* of verified ERs
  - *Upfront payments* are possible

- Helps secure *financing and reduce project risk*
  - Future ER payments as collateral for project loans
  - Can be paid into an escrow account, protecting lenders from currency convertibility and transfer risks
Options for CDM Financing - Carbon Funds

Carbon Funds

- Annex I investors contribute to a mutual fund
- Mutual fund agrees to buy CERs as they are generated by the project

Carbon Fund Examples:
- ADB – Asia Pacific Carbon Fund/Future Carbon Fund
- World Bank – Prototype Carbon Fund/Bio carbon Fund/Community development Carbon Fund
- European Carbon Fund
How Does a Carbon Fund Work?

Industrialized Governments and Companies

Technology

Finance

Carbon Fund

Developing Countries and Communities

CO₂ Equivalent

Emission Reductions

CO₂ Equivalent

Emission Reductions
Carbon Funds - Nature of Contract

- Investor
- Banks
- Equity
- Debt

Power Purchase Agreement

- $$
- Electricity

Carbon Credits

Emission Reduction Purchase Agreement
Options for CDM Financing - Equity or Debt

- Full or Partial Equity Financing
- Annex I Investor finances all or co-finances part of a CDM project in return for full or shared financial returns and CERs
- Local investors co-financing CDM projects in a host country may wish to have share in CERs so that they have the opportunity to sell the credits at a later time
- Debt Financing - Annex I Investor provides loan or lease financing at concessional rates in return for CERs
Transaction costs vary depending on the specific circumstances of the project and the service providers.

Project participants may absorb the costs by carrying out the task in-house (e.g. development of a PDD)

Typical Transaction costs can include:

- Project finding and assessment
- New methodology development and submission
- PDD development
- Validation
- Host country approval
- Contract negotiation and legal costs
- Monitoring
- Verification/Certification
Range of Transaction Costs

Project finding and assessment

Large scale Low: 3,000 - High: 29,000
Small scale Low: 3,000 - High: 21,000

PDD development

Large scale Low: 6,500 - High: 120,000
Small scale Low: 3,800 - High: 25,000

Approval by the Host and Investing Parties

Host and investing countries in most cases do not charge fees for granting approval. There may be actual expenses associated with obtaining an approval, e.g. travel costs in cases where DNAs require project participants to make a presentation.

Contract negotiation/legal costs

Large scale Low: 5,000 - High: 63,700
Small scale Low: 1,500 - High: 26,000

Validation

Large scale Low: 6,000 - High: 80,000
Small scale Low: 3,800 - High: 20,000
Range of Transaction Costs

Registration
Equal to the SOP-Admin for the expected average annual emission reduction for the project activity over its crediting period. (max. USD 350,000)

Verification and Certification
Large scale Low: 10,000 - High: 50,000
Small scale Low: 3,800 - High: 23,000

Issuance of CERs
- Share of proceeds to cover the cost of adaptation (SOP-Adaptation): 2% of issued CERs
- Share of proceeds to cover administrative expenses (SOP-Admin):
  (a) USD 0.10 per CER issued for the first 15,000 tonnes of CO₂ equivalent for which issuance is requested in a given calendar year
  (b) USD 0.20 per CER issued for any amount in excess of 15,000 tonnes of CO₂ equivalent for which issuance is requested in a given calendar year

(Unit: US dollar)

Economics of CDM Projects - Quantity of CERs

- Depends on the emission reductions achieved and crediting period selected.
- Grid-based or off-grid projects that displace more carbon intensive coal and diesel fuels generate more CERs than those that displace natural gas.
- Projects that capture methane and GHG’s other than CO₂ produce more CERs – GWP of methane and other gases are several times higher than that of carbon dioxide.
Key Determinants include:

- **Risk** allocation (Registration risk; Delivery risk)
- **Creditworthiness & experience** of project sponsor
- **Viability** of underlying project
- **Contract structure** (e.g. upfront payments incur discount, penalties for non-delivery, ability to pay penalties)
- **Emission reduction vintage**
- **Host country support & willingness** to cooperate
- **Additional Environmental and Social Benefits**
Economics of CDM Projects - Other Risks

- **Market/Price Risk**
  - Will there be a market for post 2012 CER’s?
  - Will contract price exceed market price?

- **Policy/Compliance Risk**
  - What if no Kyoto Protocol?
  - What if host country does not ratify or comply?
  - What if host country does not approve project?

- **Baseline Risks**
  - Baseline design--is the baseline robust?
  - Will its assumptions remain valid over time?
  - Performance--*actual* performance will determine level of ERs generated
THANK YOU