Carbon Finance: Business Perspective

Jung-Man Chung, Eco-Frontier

http://www.ecofrontier.com
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I. Carbon Market Overview

1. Introduction of Eco-Frontier
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3. CDM Business Opportunity
4. Dispersion of CDM Project
5. Who has CERs?
1. Introduction of Eco-Frontier

For Corporate Sustainability
- Energy & Environmental Industry
- Manufacturing Industry
- Engineering & Construction, etc.

For Sustainable Finance
- Sustainability Rating (AAA~CCC)
- Global Initiatives: UNEP FI, PRI, CDP, GRI, etc.
- Project Finance: Feasibility Study, Advisory

For Environmental Policy
- Government Sector of Environmental & Welfare

For Climate Change
- Climate Change Strategy
- Knowledge-based Business Development
- Existing Business Innovation
- CER transaction

Sustainability Solution Provider, Eco-Frontier
2. Growth of CDM Market

- CDM projects are majority in Project-based Transaction
- Volume of secondary CDM is highly increasing

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volume (MtCO₂e)</td>
<td>Value (MUS$)</td>
</tr>
<tr>
<td>Compliance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary CDM</td>
<td>537</td>
<td>5,804</td>
</tr>
<tr>
<td>Secondary CDM</td>
<td>25</td>
<td>445</td>
</tr>
<tr>
<td>JI</td>
<td>16</td>
<td>141</td>
</tr>
<tr>
<td>other</td>
<td>19</td>
<td>76</td>
</tr>
<tr>
<td>Voluntary market</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td>TOTAL</td>
<td>611</td>
<td>6,536</td>
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</tbody>
</table>

Annual Volumes and Values (2006-2007) for Project-based Transactions
3. CDM Business Opportunity

New opportunities in Biomass, LFG + waste, Hydro ...

1. Palm residue Biomass CHP Project
2. Plywood residue Biomass CHP Project
3. Wastewater CH4 digestion Project
4. Steam optimization project
5. Waste heat utilization project
6. Landfill gas power project
7. Coal Mine Methane Capture
## 4. Distribution of CDM Projects

UNFCCC Abroad CDM Status: Total Registered Project: **1,056** (2008.05.14)

<table>
<thead>
<tr>
<th>Country</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>214</td>
</tr>
<tr>
<td>Brazil</td>
<td>133</td>
</tr>
<tr>
<td>Mexico</td>
<td>105</td>
</tr>
<tr>
<td>Malaysia</td>
<td>28</td>
</tr>
<tr>
<td>India</td>
<td>337</td>
</tr>
</tbody>
</table>

**CDM Development Country Ranking**

1. India (337)
2. China (214)
3. Brazil (133)
4. Mexico (105)
5. Malaysia (28)
5. Who has CERs?

<table>
<thead>
<tr>
<th>Buyers</th>
<th>Nationality</th>
<th>Total Number of Projects</th>
</tr>
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<tbody>
<tr>
<td>EcoSecurities</td>
<td>UK</td>
<td>247</td>
</tr>
<tr>
<td>Carbon Asset Management Sweden</td>
<td>Sweden</td>
<td>111</td>
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<tr>
<td>EDF Trading</td>
<td>UK</td>
<td>83</td>
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<tr>
<td>IBRD</td>
<td>World Bank</td>
<td>78</td>
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<tr>
<td>Cargill International</td>
<td>Switzerland</td>
<td>64</td>
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<tr>
<td>RWE</td>
<td>Germany</td>
<td>59</td>
</tr>
<tr>
<td>ENEL</td>
<td>Italy</td>
<td>58</td>
</tr>
<tr>
<td>Trading Emissions</td>
<td>UK</td>
<td>57</td>
</tr>
<tr>
<td>Agrinergy</td>
<td>UK</td>
<td>55</td>
</tr>
<tr>
<td>AgCert</td>
<td>Ireland</td>
<td>51</td>
</tr>
<tr>
<td>Mitsubishi</td>
<td>Japan</td>
<td>51</td>
</tr>
<tr>
<td>Noble Carbon</td>
<td>Ireland</td>
<td>46</td>
</tr>
<tr>
<td>MGM Carbon Portfolio</td>
<td>Luxembourg</td>
<td>42</td>
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<tr>
<td>Carbon Resource Management</td>
<td>UK</td>
<td>39</td>
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<tr>
<td>Marubeni</td>
<td>Japan</td>
<td>39</td>
</tr>
<tr>
<td>CAMCO</td>
<td>UK</td>
<td>38</td>
</tr>
<tr>
<td>Climate Change Capital</td>
<td>UK</td>
<td>37</td>
</tr>
<tr>
<td>Kommunalkredit</td>
<td>Austria</td>
<td>36</td>
</tr>
<tr>
<td>Danish Ministry of Climate &amp; Energy</td>
<td>Denmark</td>
<td>35</td>
</tr>
<tr>
<td>Mitsubishi UFJ Securities</td>
<td>Japan</td>
<td>33</td>
</tr>
</tbody>
</table>

Major buyers of Primary CERs: Carbon Market & Financial Institutions

- Agriculture: 5%
- Carbon market: 67%
- Finance: 9%
- Public: 6%
- Utility: 4%
- General trading firm: 5%

CD4CDM, 2008
II. **CDM Business Development**

1. CDM Business Process & Risks
2. CDM Risks and CER Price
3. Types of CER Price Contract
4. POIC CHP CDM Case
1. CDM Business Process & Risks

**Conventional Project Cycle**
- Feasibility Risk
- Permit Risk
- Financing Risk
- Operating Risk
- Supply & Market Risk
- CER Issuance Risk
- Post-Kyoto Risk

**CDM Project Cycle**
- CDM Registration Risk

**High risk capital**
- CDM feasibility assessment
- Project evaluation
- Sale of Carbon Credits

**High to moderate capital**
- Host Country Approval
- Construction
- Install and test monitoring equipment
- Project

**Revenue**
- CER issuance
- Sale of Carbon Credits

**Sustainability Solution Provider, Eco-Frontier**
2. CDM Risks and CER Price

- CER Price
- DNA risk
- Validation risk
- Monitoring risk
- Verification risk
- Registration Risk
- EU ETS market price

Ecosecurities, 2006
3. Types of CER Price Contract

Four types of CER Price

Pay on Delivery

- Payment on CER Delivery
- High Price/Low Risk

Fixed Price

- Buyer takes all Risks
- Low Price

Floating Price

Link to EUA Price or CER Index

Combination: Complex Contract Structure
4. Case: POIC CDM Project

POIC CHP Project in Malaysia

- **Business Characteristics:** Biomass cogeneration and CDM business
- **Capacity:** Steam 110 ton/hr, Electricity 24 MW, CER 337,000 ton/y
- **Business Site:** POIC, Lahad Datu, Sabah, Malaysia
- **Total Investment:** approximately 119.0 million USD

Fuel: Biomass (Palm Oil Residue)

Power Plant: CHP

Production:
- Electricity
- Steam
- CER

Sales:
- Electric Power Grid
- Residents of POIC
- Carbon Market
4. Case: CDM Supply Chain

- **Buy or Make Decision**
- **Path to CDM Business**

**Biomass Suppliers**
- Biomass Brokers & Logistics
- Palm Oil Mills

**Developer Network**
- Business Developer
- Consulting Firms
- Investors
- Lenders
- Operations & Maintenance
- Technology Providers
- Engineering, Procurement, Construction

**Customers**
- CER Buyer & Trading
- Steam Buyer: Fertilizer company, Refinery, Biodiesel company, Oleochemical company
- Electricity Buyer: National Grid
- Lenders

**Infrastructure**
- Educational Institutions
- Government & Related Agencies
- Port Handlers / Operators
- Real Estate Companies

**POIC Biomass CHP Case**
4. Case: Role of the developer

Planning
- Feasibility Study

Structuring
- SPC Establishment
- EPC Contract
- Fuel Supply Contract
- O&M Contract

Financing
- Equity Financing
- Debt Financing

Application & Registration
- Authorization
- EIA
- Incentive Policy
- CDM Cycle Work

Offtake Contracting
- CER Contract (ERPA)
- Steam Contract
- Power Contract (PPA)

Developer

POIC Biomass CHP Case
4. Case: Investor’s Benefits

Strategic Investor

- EPC & Technology Provider
- O&M Company
- CDM Developer

Financial Investor

- CDM Advisory Business
- CER Transaction Business

Investor’s Benefits

- EPC Business
- O&M Business
- Supply Chain-related Business
- Post 2012 Counter-plan
- ROE +

POIC Biomass CHP Case
Case: Contribution of CER

Incremental IRR of CER Revenues: 3~5% with Strategic Opportunities

- Debt
- Equity
- Construction

Operating Revenues (Steam & Electricity) + CER Revenues

Sustainability Solution Provider, Eco-Frontier
III. Insights for Carbon Network

1. Insights for Developing CDM Business
2. Insights for Support System
3. Insights for Carbon Financing
1. Insights for Developing CDM Business

- **Speed**: The slower business development means the less CER to sell
- **Creativity**: Innovative business model development
- **Reputation**: Strong trust and relationship with partners
- **Global Perspective**: Development of global business opportunities and partnership
- **Professionalism**: Expertise in the climate change policies and CDM businesses
- **Entrepreneurship**: Trials and challenges to resolve complex problems
2. Insights for Support System

- Guaranteed CER purchase for businesses which can acquire CER
- Specialized export finance services for overseas CDM business
- Support for the liquidation of scheduled or issued CER
- Government’s supports throughout the CDM project life cycle
3. Insights for CDM Financing

- Risk-taking Attitude with Strategic objective
- Professional on Climate Change & Clean Technology
- Carbon-related Product and Business Development
Thank you very much.