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Carbon Finance – Implications for Long-Term Financing of Clean Energy Solutions

Asia Clean Energy Forum 2008

ADB, Manila

3-5 February, 2008

What is CDM?

- The Clean Development Mechanism (CDM) under the Kyoto Protocol enables project developers in emerging economies to capture value by reducing emissions
 - Utilisation of greenhouse gases (HFC, N₂O, CH₄, SF₆)
 - Improving energy efficiency (iron & steel, cement, petrochemical)
 - Use of renewable energy sources (wind, hydro, biomass)
 - Use of alternative fuels (bio-fuels)
 - Programmatic CDM – small scale project bundling (domestic energy efficiency)
- Generate certified emission reductions (CERs)
- Key drivers
 - Demonstrate additionality - not business as usual – new technology, process....
 - Considered CDM before proceeding with project – influenced decision
 - CER value generated within Kyoto compliance period (2008-2012)

Market is moving along the abatement curve – focus on energy efficiency



Carbon Finance – The CER Revenue Stream

- CER Pricing options:

Payment on delivery of CERs

- Fixed price
- Floating price – % share of CER Index; above NDRC floor price of €8.50
- Combination of fixed and floating

Payment on delivery plus a partial prepayment of % of CER revenues

- Provides up-front capital for project investment, alongside equity and loan funding
 - lenders can view advance payment as equity funding
 - reduces the need for equity funding – increases equity returns
 - advance/prepayment typically represents up to 20-40% of total project CER revenues
 - can represent up to 40% of project costs – methane projects (landfill, coal mine gas)



CER Prices


- No 'CER price' – there is a CER spread, linked to the forward prices quoted on Nordpool or European Climate Exchange (ECX) – the “CER Index”
 - Upper and lower limits of the CER spread relate to market – EU ETS/Japan
 - CER price depends on combination of factors:
 - Construction and implementation risk
 - Performance risk – technology, fuel supply, O&M
 - Stage of the CDM process – pre or post registration
 - CER Pricing option – prepayment lowers per CER unit price – capital at risk
- €8.50 + 20% prepayment is equivalent to €10.50
- Due-diligence is key – assess and manage risk
- CER price also depends on local country regulations – NDRC floor price in China

Carbon Finance – The Pros and Cons

PROS

- CER revenue stream backed by foreign buyer: **KEY is strong credit**
 - Mitigates revenue risks in core business – diversify earnings, source of forex
 - Provides additional collateral for lenders
 - Already understand project performance risk
 - Need to understand CDM delivery risk, pre-registration
 - Underpins value of CER revenue stream for sceptical investors
- CER buyers providing equity investment, alongside CER off-take
- Supports the transfer of technology and know-how – risk mitigation where policy mechanisms are insufficient to support technology application

CONS

- Complex process with changing rules – question eligibility, delay in CER flows
 - Relatively new market with limited track record of performance, delivery of CERs
 - Structuring and risk mitigation for advance payments can be challenging
 - Lack of clarity post-2012 is limiting investment decisions. Payback typically 5+ years
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Bio-diesel Development Company (Bio Devco)

Venture Capital Equity Investment + Carbon

Bio Devco is an agriculture focused service organization established in a rural environment and owns and operates decentralized biodiesel production units on farms

Role of Carbon Investor

- Finance initial expansion of the company, investing €5.0million in a Series A financing with rights to all CERs generated by projects @ €5-6/CER)
- Fund and develop new CDM methodology for biodiesel production
- Contribute to strategy and business development of business through its equity participation of 30 to 40%

Risks

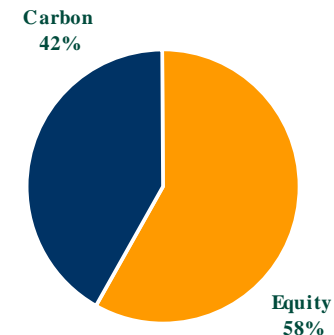
- Methodology and volumetric risk
- Farmers economics linked to fossil diesel prices and Biodiesel raw material prices
- Exit of investment arranged through a sale to a trade buyer or into the capital markets by end of 2012
- Ability to grow company at the required speed (i.e. HR & equipment procurement)

Returns to Carbon Investor

Carbon Investor Cashflows

	2006	2007	2008	2009	2010	2011	2012
CER Volume	0	0	56,090	151,678	250,032	300,196	300,196
Price	13.00	13.00	13.00	13.00	13.00	13.00	13.00
Revenue	0	0	729,164	1,971,814	3,250,416	3,902,548	3,902,548
COGS (€5.5/CER)	0	0	(308,492)	(834,229)	(1,375,176)	(1,651,078)	(1,651,078)
Opex	(100,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)
Income	(100,000)	(25,000)	395,671	1,112,585	1,850,240	2,226,470	2,226,470
Capex/Divest.	(5,000,000)	0	0	0	0	0	14,012,410
Cash Flow	(5,100,000)	(25,000)	395,671	1,112,585	1,850,240	2,226,470	16,238,880

Value Carbon vs Equity



Bio-gas Development Company

Project Financing

Water Environmental Services (“WES”) provides technology for the treatment of wastewater that generates biogas for use in power, heat and steam production in agribusiness industries. WES is a technology leader, providing solutions that maximize performance and production of CERs, but has competitors that compete on cost with inferior technologies

Role of Carbon Investor

- Provide an equity finance facility to be drawn on as required by CDM projects, permitting faster growth
- Use of finance facility will enable WES to offer their leading technology at a more competitive pricing level
- to apply WES’s technology to additional markets, for the company’s expansion

Risks

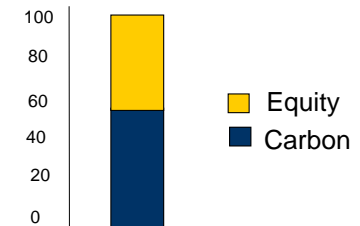
- WES has a history of volatile revenue, but has strong growth targets
- The projects in the pipeline have no validation of carbon assets as yet, hence regulatory risk is high
- The company is primarily focused in a country where the DNA has yet to develop

Returns to Carbon Investor

Carbon Investor Cashflows

	2007	2008	2009	2010	2011	2012	2013
CER volume	0	127,610	255,220	510,440	510,440	510,440	510,440
Price €	13	13	13	13	13	13	13
Revenue	0	1,658,930	3,317,860	6,635,720	6,635,720	6,635,720	6,635,720
COGS (€/CER)	0	0	(544,037)	(1,437,307)	(3,573,080)	(3,573,080)	(3,573,080)
Operating expenditure	(360,000)	(420,000)	(840,000)	(240,000)	(240,000)	(240,000)	(240,000)
Income	(360,000)	1,238,930	1,933,823	4,958,413	2,822,640	2,822,640	2,822,640
Capex	(1,067,887)	(1,067,887)	(2,135,773)	0	0	0	0
Cashflow	(1,427,887)	171,043	(201,950)	4,958,413	2,822,640	2,822,640	2,822,640
Cumulative no. of projects	3	6	12	12	12	12	12

Value Carbon vs Equity



Evolution of carbon finance is likely and essential

- The first CDM projects were undisputedly additional as they provided the necessary financing for the abatement of waste gases, i.e. simple end-of-pipe solutions
 - ▶ Sustainable development value?
 - ▶ Need to move up the abatement curve faster and avoid windfall profits
 - ▶ Regulation or another mechanism will be needed to ensure these stay abated (e.g. HFC's, PFC's, N₂O, etc.)

- Carbon financing is moving into more challenging abatement opportunities
 - ▶ Moving upstream - equity investment instead of simple carbon off-take contracts
 - technology and know how transfer
 - building sustainable businesses, not one-off projects
 - ▶ Regulation of CDM needs to evolve as we move along the abatement curve



Carbon Finance – The Challenges towards 2012

- Balance between use of carbon finance and policy – need financial carrot to balance policy stick
 - policy to follow on from CDM success – effective regulation
 - use carbon finance to provide financial incentive for change

- Greater clarity on carbon value opportunity – eligibility + certainty
 - benchmarking in industries – better definition than business as usual
 - establish dynamic baselines – ACM013 is a start
 - build greater confidence in the process

- Carbon finance will be required to promote abatement only solutions – e.g. ventilation air methane (VAM), carbon capture and storage (CCS), etc.

- Innovation in the use of carbon finance to augment traditional project finance
 - building awareness
 - risk mitigation tools, to improve take up – IFC facilities
 - insurance products to mitigate CER delivery risks



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