



The Role of Carbon Finance in Biomass Projects

EU-China CDM and Bioenergy Business
Facilitation Conference

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Climate Change  **Capital**



Climate Change Capital

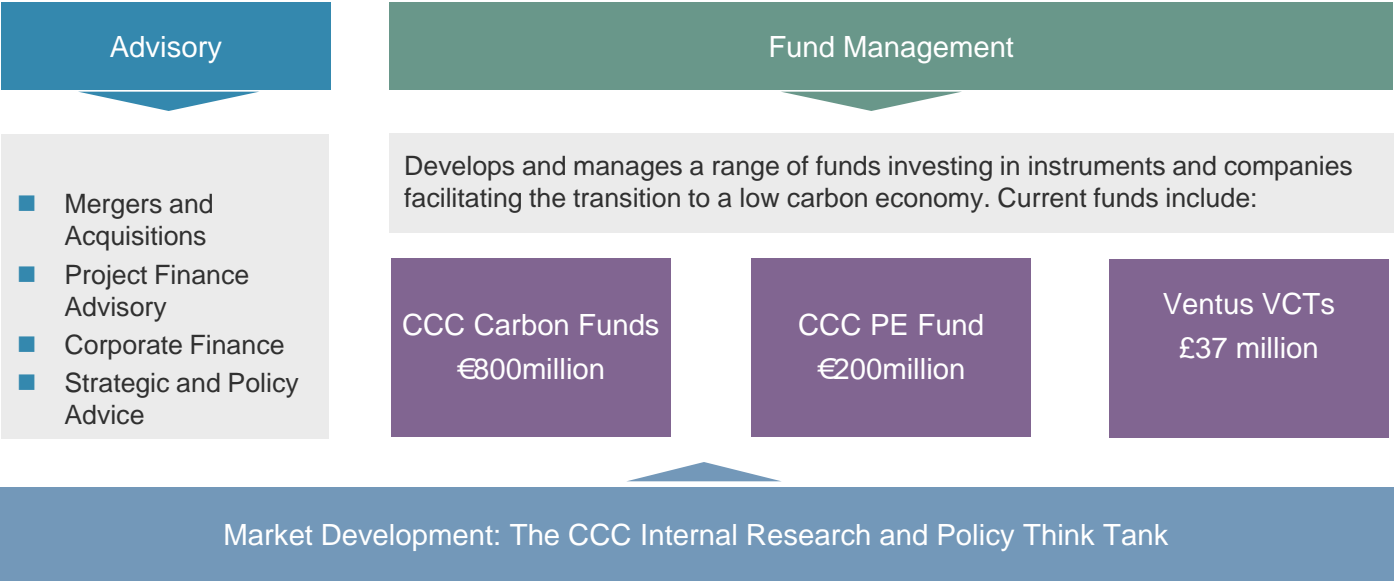
Climate Change Capital 

Climate Change Capital

Climate Change Capital (“CCC”) is a leading Investment banking group specialising in the investment opportunities created by a low carbon economy. CCC advises and invests in companies who recognise that combating global warming is both a necessity and an economic opportunity.

CCC is the leader in the provision of financial and market-related policy advisory services and financing for clean power, clean technology, clean fuels and carbon markets. With 125 employees, CCC is headquartered in London with dedicated teams focusing on China, Spain, North America, India and Latin America.

Through the combined talents of advisors, finance professionals, environmentalists and access to a significant capital base, CCC is perfectly placed to help its clients adapt to, and profit from, a vast new energy economy.



CCC: The Specialist Investment Banking Group

Sector Focus	Climate change mitigation/adaptation and energy security	<ul style="list-style-type: none"> ■ Clean energy, clean fuels, waste and water management, carbon finance ■ Energy companies, financial institutions, governments ■ Global reach in Europe, Latin America, China, India, South East Asia and Africa
Research Depth	Fundamental understanding of key policies	<ul style="list-style-type: none"> ■ Comprehensive appreciation of international and EU energy policies ■ Fundamental research enables forecasting of economic values ■ Providing policy and market research for company business lines and external clients
Integrated Approach	Extensive company knowledge base	<ul style="list-style-type: none"> ■ Clear understanding of value drivers across markets impacted by carbon ■ Strong information flow throughout the company ■ Effective utilisation of diverse but complementary skills across the group
Management Team	Expertise grouping for financing carbon related transactions	<ul style="list-style-type: none"> ■ Investment bankers, project finance professionals and policy makers ■ Ability to attract and retain high quality industry professionals ■ An engaged Advisory Board

Fund Management

CCC's Fund Management group raises and manages funds that invest in companies, projects and financial institutions that facilitate the transition to the low carbon economy

Carbon Finance



CCC has over €800 million under management for investment in companies and projects that generate emission reduction credits. Investors in the CCC funds include amongst others two of the world's largest pension funds, a leading UK utility company and a global emerging markets bank.

Private Equity



CCC has €200 million under management through the Climate Change Capital Private Equity Fund (CPE). CPE targets the high growth clean technology areas of clean power, clean transport, energy efficiency, waste recovery and water across Europe. CPE invests its funds in expansion and later stage companies including buyouts. The investment team is able to leverage CCC's specialist industry and market knowledge, policy insights and international network of contacts to the benefit of the portfolio companies.

Specialist VCTs



The Ventus funds are specialist venture capital trusts focused on investing in companies that develop, construct and operate small to medium sized on-shore UK renewable energy projects. With over £37 million of capital, the Ventus funds are one of the largest groups of funds specifically targeted at the UK renewable energy sector.

The Climate Change Capital Carbon Funds

CCC manages the world's largest private sector carbon fund and has over €300 million under management for investment in companies and projects that generate emission reduction credits. Investors in the CCC funds include two of the world's largest pension funds, a leading UK utility company and a global emerging markets bank.

- The funds act as long term partners with host countries to ensure the financed projects meet the development needs and priorities of those countries; making sure projects achieve the underlying technology transfer rational of the Clean Development Mechanism
- The funds work with proven technology providers to develop carbon assets from a range of methodologies including landfill gas; energy efficiency, destruction of industrial gases, agricultural waste, renewable energy and agricultural waste.
- CCC has built a substantial portfolio of emission reduction credits in areas including landfill methane gas capture, coal mine methane utilisation, industrial gas destruction, renewable energy, waste heat recovery and industrial energy efficiency.
- CCC has operated in the Chinese market since 2005 and led the largest private sector carbon finance transaction in 2006. Working with a Chinese chemical company. CCC structured a deal to destroy several tens of millions of tonnes of carbon dioxide equivalent over a six year period.
- In today's ever changing financial markets, CCC's carbon fund represents strong credit and a dedicated long-term investor in developing clean energy solutions for the Chinese market

The Climate Change Capital Carbon Funds: Investments in China



€450 million already invested:

- Coal mine methane
- Hydro-power generation
- Waste gas power generation in steel
- Landfill gas power generation
- Waste heat power generation in cement
- Biomass power generation
- Wind power generation
- HFC-23 Abatement





What is Carbon Finance?

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- Projects qualifying under the Clean Development Mechanism (CDM) can generate CER. CERs are then purchased by carbon investors or sold unilaterally by the project owner, through the international markets:
 - EU Emissions Trading Scheme (EU ETS)
 - National Governments
 - Japanese industries
 - other emerging markets (Australia/New Zealand, etc)
- Sale of CERs can be based upon fixed prices, floating prices (typically linked to the market prices in the EU ETS) or a combination
 - Focus on floating prices, given depressed CER prices in EU ETS
 - Reference or floor price often set by the NDRC
- Carbon finance is provided through
 - Cashflow – proceeds of the sale of CERs each year to carbon investor/unilateral sales
 - Carbon investor prepays for CERs, typically 10-20% in advance – project funding
- Carbon investor could provide equity and/or debt financing alongside carbon finance
- Commercial banks, leasing companies and other debt providers can use CER revenues as security for project loans



What do Carbon Financiers look for?

What do Carbon Financiers look for?

- Focus on proven technology
 - Relatively low appetite for technology risk – proven solutions (wind, hydro, waste heat recovery, etc.)
 - Clear understanding of construction, implementation and operating risks
 - Established CDM Methodology

BUT the market is maturing and some investors continue to innovate – adopt new technologies and promote new Methodologies
- Key project approvals in place – approval of feasibility study and EIA, grid connection, land use rights, etc.
- Financial strength of the project owner
 - Project is fully funded – equity and loans – apart from carbon finance
 - Project has strong cashflow - manage risks/market volatility
 - Project owner has strong balance sheet to support the project
- CDM risk management
 - Clear evidence of the consideration of CDM and a project's additionality
 - Established CDM Methodology - track record of projects being registered, or at least in the advanced stages of validation

Investors carry out due-diligence on all of the above – risk assessment influences CER pricing

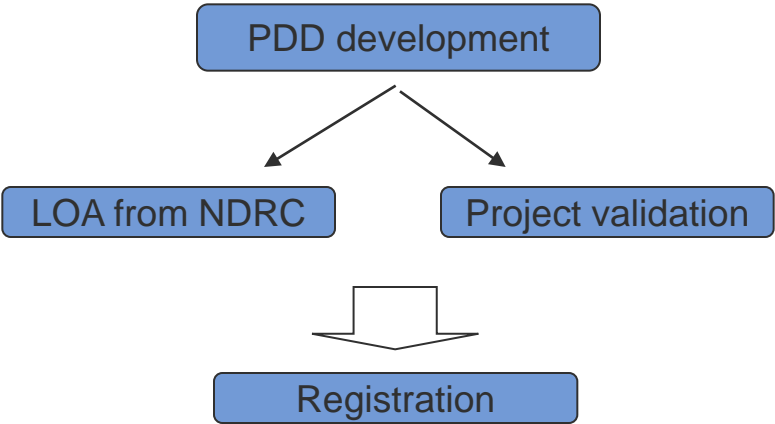
CDM Process

Project process

CDM development process

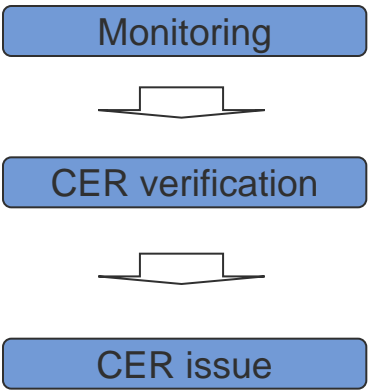
Entity

Project preparation



- Consulting firm
- NDRC/DOE
- CDM EB

Project operation



- Project owner
- DOE
- CDM EB

Key areas of CDM Risk Management

What makes a good CDM development partner?

- PDD Development:
 - Experienced PDD developers, supported by technology specialists
 - DOE review pre-validation – identify key issues
 - CDM partner has in-depth knowledge of CDM rules and its methodologies

- NDRC Approval:
 - Strong working relationship with NDRC
 - Pre-review of PDD by experts from NDRC

- Validation and Registration:
 - Experience of validation and verification of CDM projects
 - Relationships with DOEs
 - Relationships with key UN bodies and the CDM Executive Board (EB)

- Monitoring and Verification:
 - Advising projects on monitoring plans and technology selection
 - Strong relationships with technology providers and DOE's

- Payment risk – Need a partner with strong credit, to purchase CERs

Evolution of Carbon Finance

- Move to new carbon solutions
 - Maturity of CDM market has encouraged some carbon investors to take more Methodolgy risk, where no/limited track record in CDM
 - Ultra-Super Critical coal
 - Refuse derived fuels/energy crops
 - Bio-fuels
 - Challenge of business as usual, e.g. waste heat recovery in cement industry
 - Continued development of new methodologies – seeking out new opportunities even though the window to 2012 is closing.... Assessing post-2012 value is key
- Increased Methodology risk is often matched by higher project risks (construction/implementation/operation)
 - CER price needs to reflect higher project/CDM risks
 - Need for risk sharing – carbon investor and project owner – equity JV?
- Post-2012
 - Post 2012 market is still uncertain, but strong global commitment – even in the US!
 - Value will be available for certain types of project – strong CSR, demand side
 - Voluntary (VER) opportunities exist, but market prices are low, cUSD2-3/VER. Gold Standard/Voluntary Carbon Standard branding could secure higher prices



Carbon Finance for Bioenergy businesses

Carbon Finance and Bioenergy – The Opportunities

- Provides valuable financial support to improve the viability of bioenergy projects
 - Methane based businesses benefit most - GWP of methane is 21x that of CO₂
 - landfill gas utilisation
 - bio-gas capture and utilisation – waste water treatment, animal waste treatment, etc
 - Municipal solid waste to energy
 - ➔ 40%+ of annual revenues can come from carbon finance or prepayment of CDM revenues can provide 20-40% of initial capital investment
 - Biomass combustion businesses benefit from c10% extra revenues
 - Bio-fuel businesses can use carbon finance
- Limited focus on biomass co-firing in large coal power plants, which is proven in the EU
 - Viewed in EU as the lowest cost form of renewable energy
 - CDM can help but also need tariff support, to encourage investors to install infrastructure and accept higher fuel prices
 - BUT... requires development of biomass pelletising industry, at scale – key for all biomass combustion businesses
 - potential for wider scale, long term use of agricultural waste, wood waste, etc. and development of the rural environment

Carbon Finance and Bioenergy – The Challenges

- Main focus has been on use of agricultural waste residues
 - Biomass fired power plants, mainly for electricity and to a limited extent in co-generation
 - Focus should be co-gen – high thermal efficiency BUT poor heat infrastructure
 - Lack of certainty over availability of feedstock – increased competition for resource
 - Feedstock prices have increased substantially, pushing projects into loss
 - Many projects are over producing compared to PDD, which creates potential risk at verification – need to review project additionality (EB 47/48)
 - Increasing interest in coal to biomass fuel switching, as small coal fired power plants are decommissioned BUT these are big projects (50MW+)
 - Issues are baselines and additionality - financial IRR is high
- Very few, if any, bio-fuel projects have been developed under CDM
 - Restrictive methodology – single point off-take for monitoring
- Bio-gas
 - Many small projects – how to scale up the business? Interconnection issues - tariffs
 - Landfill regulation has potentially increased baselines and reduced/destroyed CDM value
- Post-2012 uncertainty – value available for developers of projects pre-2012 – viability of projects?

Value Drivers Post-2012

- Post 2012 uncertainty in CDM is proving a barrier to continued investment
 - Lack of clarity on carbon value opportunity – investment payback
 - Pricing post-2012
 - Will be lower - needs to reflect higher risks
 - Risk sharing is key – floating prices, regulatory risk – equity risks
 - Ability to secure and LoA for full term of first crediting period (7-10 years)
 - Abatement solutions suffer most – no alternative revenue streams
- Focus on Equity JV's and unilateral projects, with LoA's post-2012 could provide an answer – sharing of post 2012 equity risks and rewards, including carbon value
- Regulation could play a role, creating a market pull where lack of clarity on CDM post-2012 is inhibiting investment
 - regulation becomes key as clean technologies are adopted and become business as usual

Bio-diesel Development Company (Bio Devco)

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

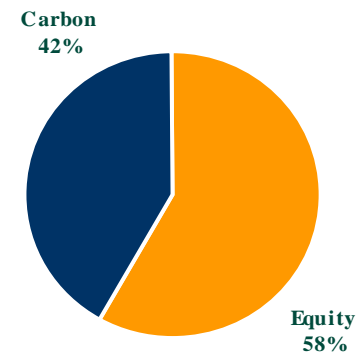
Role of Carbon Investor

- Finance initial expansion of the company, investing €5.0million with rights to all CERs generated by projects
- Fund and develop new CDM methodology for biodiesel production
- Contribute to strategy and business development of business through its equity participation

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)

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

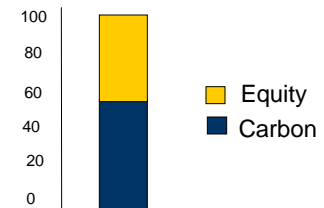
Role of Carbon Investor

- 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
- Receive convertible debt instruments in the company

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

Value Carbon vs Equity





Conclusions

Conclusions

- Carbon finance can provide substantial value for bioenergy businesses and support the development of new waste processing technologies
- Need good risk management – carbon is a volatile commodity, CDM development risk needs to be carefully understood and managed – value of an experienced (carbon) partner
- Opportunities Post 2012..... but value is less certain. Move to share risks and benefits — business owners and carbon investors working to grow corporate earnings and manage risk
- Need to strike a balance between development in regulations and securing support for the development of new technology solutions in bioenergy

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