Carbon Financing Opportunities

16th September 2010

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Cause and Effect of Climate Change

Developed Nations

Effect of Climate Change

Developing Nations

Possible Solution

Renewable Energy
Carbon Markets and Regulatory Framework

Kyoto Protocol (enacted 1977)
- EUA (European Emissions Allocation)
- CDM (Clean Development Mechanism)
- CER (Certified Emissions Reduction)
- JI (Joint Implementation)
- ERU (Emissions Reduction Unit)
- VER (Voluntary Emissions Reduction)

Main Carbon Instruments
- EUA
- CER
- ERU
- VER

Carbon Demand
- Compliance Buyers
- Development Agencies
- Speculators
- Voluntary Market

Nedbank Capital Services
- Advisory
- Registration
- Carbon Purchase
- Sales & Distribution

CDM Exclusions
- Regulated Activities
- Nuclear
- Liquid Biofuels

Voluntary schemes include:
- REDD

CDM Projects Registered
- Worldwide: 2,303
- Africa: 39
- South Africa: 17

CER's requested to date
- Africa: 1.9 mil
- South Africa: 1.8 mil

CER's issued to date
- Africa: 1.9 mil
- South Africa: 1.8 mil

Approximate Value
- Euro 5763 mil
- Euro 25.2 mil
- Euro 23.4 mil
Carbon Markets and Regulatory Framework.... 2

**Carbon Project Development**

- Project Concept
- National approval (DNA)
- Develop physical project plan
- Plan and engage with financiers
- Select or develop project methodology
- Define project benefits
- Document project base-line
- Evaluate project for additionality
- Generate PDD & submit for approval to:
  - National sustainability & development criteria
  - Public comment
  - Validation (DOE)
  - Project acceptance/registration
- Complete physical project implementation
- Project commissioning

**Carbon Project Production Cycle**

- Project Owner
- Auditor
CDM Project Volume

Registered CDM Projects, by Host Country

Registered CDM Projects by Sectoral Scope
CDM CER Price

ECX CFI Futures contracts: Price and Volume

09-Jan-2009 to 08-Jan-2010

EUA 10  EUA Volume  CER 10

NEDBANK CAPITAL
# CDM CER Future Price?

## Prices in a post-2012 period

CMC Group views on a coming post-Kyoto period

<table>
<thead>
<tr>
<th>Average price range for a CER (or its equivalent) on the spot market between 2013 and 2020</th>
<th>Probability</th>
<th>Justification and Comments</th>
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| Euro 0 -10 | 15% | - Post-Kyoto regulations could fail or be delayed  
- Project based mechanisms (CDM) may be abandoned  
- Overflow of the market due to REDD  
- Linking of existing carbon markets into a globalized market could fail |
| Euro 10 – 20 | 10% | - Price range is not sufficient to have a real impact on main industrial decision makers.  
- If prices remain in this range, we would expect regulatory decisions from the UNFCCC in order to “rectify” the supply. |
| Euro 20 – 30 | 35% | - It is the most likely price range for CERs (or their equivalent) for 2013-2020  
- It would be a fair level to properly initiate a carbon-constraint economy, even if probably too low, especially if the prices of oil and gas start to increase again in the same period.  
- Regulators will probably try to stick to this price range, at least during the 2013-2016 period. |
| Euro 30 – 40 | 25% | - Probably the required price to significantly mitigate greenhouse gas emissions.  
- Regulators will probably try to stick to this price range, at least during the 2017-2020 period.  
- Such price range looks even more likely if Annex I countries (or their equivalent under Kyoto II) do not overly limit the use of CERs for target meeting |
| More than Euro 40 | 15% | - The market could turn out to be short, for instance if demand cannot be met if the adopted targets are too light.  
- Speculations on the carbon price could push CER price high  
- Risk of a negative impact on economic growth would be high, with lower expected greenhouse gas emission bringing carbon prices back to lower levels  
- As a last remedy, “hot air” (Ukraine and Russia essentially) could possibly be used to control carbon prices or allowances of future crediting years be auctioned |

What Carbon Projects do

1. Carbon Strategy, Sustainability and Policy
2. Carbon Advisory, Neutrality, Footprinting & Reporting
3. Clean Development Mechanism / Voluntary Emission Reduction / REDD
4. Energy Efficiency
Carbon Services Offered

Nedbank Carbon Asset Management

- **Carbon Development Mechanisms**
  - Evaluate CDM/VER opportunities.
  - Project manage Carbon projects.
  - Help clients implement Carbon projects.
  - Calculate total carbon footprint.
  - Procure CERs/VERs for the remainder of their carbon footprint.
  - Buy and sell CERs/VERs through trading partnerships.

- **Sustainability – Carbon Strategy & Policy**
  - Conduct initial energy audit.
  - Implement if feasible.

- **Carbon Advisory & Footprinting**
  - Construct carbon footprint models.
  - Establish emission reduction opportunities.
  - Present carbon footprint report.

- **Energy Efficiency**
  - Conduct initial energy audit.
  - Implement if feasible.

- **Carbon Neutrality**
  - Calculate total carbon footprint.
  - Procure CERs/VERs for the remainder of their carbon footprint.
  - Buy and sell CERs/VERs through trading partnerships.

**Carbon Finance**
The carbon finance team currently has 6 dedicated professionals, reporting to Nedbank Capital, Treasury.
## Carbon Project Services (1)

**Integrated project financial and carbon service**

1. **Project Concept**
2. National approval (DNA)
3. Develop physical project plan
4. Plan and engage with financiers
5. Select or develop project methodology
6. Define project benefits
7. Document project baseline
8. Evaluate project for additionality
9. Generate PDD & submit for approval to:
   - National sustainability & development criteria
   - Public comment
   - Validation (DOE)
   - Project acceptance/registration
10. Complete physical project implementation
11. Project commissioning

### Desktop project review:
- Financial evaluation
- Carbon project potential assessment
- Technology introduction

### Subject to Client Mandate (and approvals):
- Site visit and due diligence
- DNA & UNFCCC engagement
  - PIN / notice of prior intent lodgement
  - Advice for financial planning
- PDD development, validation & registration
  (Nedbank risk against future CER allocation)

### Subject to Client Mandate (and approvals):
- Project finance:
  - Lead for commercial lending
  - Debt funding
  - Asset-backed finance
- Emission Reduction Purchase Agreement (ERPA):
  - Pre- and post 2012
  - Nedbank or third party buyer
  - Cash on delivery (floor & market up-side share)
  - Pre-payment
Carbon Project Services (2)

**Carbon asset management:**
- Current & future CERs treated as traditional asset
- Asset manager authorised to buy/sell for client to maximise value
- Service fee plus market out-performance fee

**CER Issuance (according to ERPA / Mandate):**
- Payment against CER delivery
- Carbon credit sales (brokerage)

**Monitoring report to Issuance:**
- DOE engagement
- UNFCCC engagement

**Project Concept**
- National approval (DNA)
- Develop physical project plan
- Plan and engage with financiers
- Select or develop project methodology
- Define project benefits
- Document project baseline
- Evaluate project for additionality

**Annual Report**
- Submitted for verification

**Project Performance**
- Measure & Monitor

**Carbon Production Cycle**
- CER's Issued & allocated in accordance with ERPA
- Submitted for Carbon Issuance
- Audited

**Synopsis:**
- Complete physical project implementation
- Project commissioning
- Carbon sales, income realised
- Administered
Nedbank does not normally provide:

- Finance for pre-feasibility / feasibility studies
- Equity or start-up funding
- Technology development funding
- Environmental impact assessment (finance or services)

Although these services may be available on a case-by-case basis.
Why does Nedbank offer carbon services?

Why is this business valuable to Nedbank?
• Enables improved client service offering (integrated service offering)
• Attracts new clients and new business opportunities
• Provides for the development of environmentally responsible business initiatives
• Enables the introduction of leading technological solutions
• Supports Nedbank’s Green credentials
• Generates non-interest revenue

How does the Client benefit:
• Integrated project carbon and financial service reducing counterparty relationships and risks
• Access to experienced carbon advisory services
• Carbon project development and registration available at Nedbank risk
• ERPA terms available to:
  • leverage future carbon income to provide innovative financing solutions
  • limit market risks (carbon volume, pricing floor and market up-side share)
  • benefit from established carbon credit sales and distribution channels
Example 1 – Coal to Charcoal Fuel Switch

- Small-scale fuel-switch project
  - Fuel (Coal) saving
  - Reducing emissions by using non-fossilised renewable solid biofuel (charcoal) in place of coal
- CDM project development and registration on-risk by Nedbank Capital
- Emissions Reduction Purchase Agreement (ERPA) signed providing:
  - Advance payment against forward purchase of CER’s for guaranteed future delivery
  - Additional carbon purchase at floor plus share in market up-side, payable on delivery
- Additional project finance provided
- CDM registration pending

Firing by Clamp

One of the oldest methods of firing is by clamp. A clamp is a temporary construction of unfired or green bricks which is dismantled after firing and could be erected near the clay source.

Brick clamps vary from yard to yard but there are general rules which most followed:

- The floor should be level and is normally made of burnt brick.
- Channels are often made in the floor and filled with fuel, usually breeze (crushed coke).
- Next are three or four layers of green bricks, placed on edge and then another layer of fuel is added.

After this, green bricks are packed closely together to a height of 14 or 15 feet.

- The bricks are 'dished' or tilted inward to prevent injury to workmen during firing.
- Sometimes the outside is sealed with wet pug. Most clamp bricks have a small percentage of breeze added to the clay during manufacture. This helps to 'self fire' them and ensured that a good temperature is reached.
Example 2 – Wastewater treatment plant refurbishment

- Existing municipal wastewater treatment plant using biodigesters venting into the atmosphere
  - Refurbishment of biodigesters and bio-gas collection
  - Installation of new bio-gas electricity generators and gas flaring
  - Emissions reduction from methane avoidance & renewable energy generation
- CDM project development and registration on-risk by Nedbank Capital
- Emissions Reduction Purchase Agreement (ERPA) under negotiation providing:
  - Advance payment (funding) against forward purchase of CER’s for guaranteed future delivery
  - Additional carbon purchase at floor plus share in market up-side, payable on delivery
- DNA issued letter of no objection (PIN submitted to DNA)

Anaerobic digestion:

is a series of processes in which microorganisms break down biodegradable material in the absence of oxygen, used for industrial or domestic purposes to manage waste and/or to release energy.

It is widely used as part of the process to treat wastewater[1]. As part of an integrated waste management system, anaerobic digestion reduces the emission of landfill gas into the atmosphere.

Anaerobic digestion is widely used as a renewable energy source because the process produces a methane and carbon dioxide rich biogas suitable for energy production, helping to replace fossil fuels. The nutrient-rich digestate which is also produced can be used as fertilizer.

http://en.wikipedia.org/wiki/Aoerobic_digestion

Photograph of anaerobic digesters at the Lübeck Waste Treatment Facility a mechanical biological treatment plant.

Example 3 – REDD in Kenya

- Reduced Emissions from Deforestation and Degradation (REDD) project in SE Kenya
- CCB Accreditation December 2009, followed by Voluntary Carbon Standard (VCS) REDD AUFDD (Avoiding unplanned frontier deforestation and degradation) registration latest December 2010
- Community support initiatives collectively form the basis of the carbon offset leakage avoidance strategy
  - Ecofactory
    - organic clothing factory employed over 150 people from the community in the construction phase
  - Ecotourism
    - an ecotourism provider operates a camp which provides employment for local wildlife rangers and safari guides and other service jobs, as well as a market for local produce
  - Organic greenhouse and nursery program
    - grow citrus trees for sale at a discount to local farmers so that they can plant a tree for shade that will also earn them income
  - Dryland farming scheme
    - working with the Kenyan Agricultural Research Institute (KARI) to explore the potential of growing jojoba as a dryland cash crop
  - School Construction and Bursary Scheme
- Estimated avoided emissions over 20 years - approximately 170,000 metric tonnes of CO$_2$e (VER’s) per year including before taking into account buffer credits
- **Nedbank purchased 2006-2009 vintage Carbon Credits and agreed preferential rights to additional carbon – November 2009**
Thank You
Appendix 1: Some Key Carbon Terms

- **Climate change** is a change in the statistical distribution of weather over periods of time that range from decades to millions of years. It can be a change in the average weather or a change in the distribution of weather events around an average (for example, greater or fewer extreme weather events). Climate change may be limited to a specific region, or may occur across the whole Earth.

- **Carbon Dioxide Equivalent or CO2e** means the amount of a Greenhouse Gas that would have the equivalent atmospheric warming potential as one metric ton of Carbon Dioxide, measured in increments of one metric ton.

- “**CER**” or “**Emission Reduction**” means a certified emission reduction unit (“**CER**”) issued by the CDM Executive Board pursuant to Article 12 of the Kyoto Protocol (and the requirements there under) as well as all other relevant International Rules and is equal to 1 (one) metric tonne of carbon dioxide equivalent;

- **Clean Development Mechanism** or **CDM** has the meaning given to it by Article 12 of the Kyoto Protocol and the International Rules.

- **Designated National Authority** or **DNA** means a national CDM authority that has been formally designated and registered by a signatory to the UNFCCC with the Secretariat as is required by the International Rules;

- **Greenhouse Gas** means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, and any other emissions included as a greenhouse gas in an Applicable program.

- **Greenhouse Gas Reduction** means the physical reduction of Greenhouse Gases by a Project by: (i) direct reduction of emissions of Greenhouse Gases from an Emission Source; (ii) removal and sequestration of Greenhouse Gases; (iii) indirect reduction or avoidance of emissions of Greenhouse Gases, in each case measured in CO2e.

- **Kyoto Protocol** means the protocol to the UNFCCC adopted at the Third Conference of the Parties to the UNFCCC in Kyoto, Japan on 11th December 1997 as may be amended.

- **UNFCCC** means the United Nations Framework Convention for Climate Change.

- **VER** means Voluntary Emissions Reduction: (“**VER**”) issued by a recognized voluntary carbon standard.