



## Carbon Finance, Does it work?

Green House Gas Project Finance and Carbon Credits as source of funding and cash flows

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# Introduction

How carbon credits can result into relevant economics to Green House Gas projects...

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Returns from carbon credits related to greenhouse gas projects (GHG projects) is today usually a concern mainly of the project shareholders rather than the debt providers.

However, carbon credits can be used to raise cash and for the non recourse project finance mechanism as part of the cash flow model these returns could add relevant income and help improve the economic performance.

We will show how environmental projects currently are being financed and present some examples of how the pre sale of carbon credits can result into relevant income and cash flow streams to such projects.

# Introduction

## Definitions

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### **Carbon Finance:**

The general term is applied to investments in greenhouse gas (GHG) emission reduction projects and the creation (origination) of financial instruments (Carbon Credits) that are tradable on the carbon market.

### **Carbon Credits:**

Carbon credits is a generic term meaning that a value has been assigned to a reduction or offset of greenhouse gas emissions. One carbon credit is equal to one ton of carbon dioxide, or in some markets, carbon dioxide equivalent gases.

### **CDM:**

Clean Development Mechanism (CDM), is recognised through the Kyoto Protocol, allowing the offset of emissions in developed countries by the investment in emission reduction projects in developing countries like China, India or Latin America producing Certified Emission Reductions (CERs)

### **Joint Implementation:**

Joint Implementation is another mechanism, allowing investments in developed countries to generate emission credits (ERUs) for the same or another developed country

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# How GHG projects are financed

## Four ways to finance GHG projects...

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### Type of GHG projects

1. Corporations own resources / equity
2. Projects finance with recourse
3. Non recourse project finance (a future carbon flow often part of the project finance cash flow model, preferable fixed price contract)
4. Discounted value of future delivery of CERs

Parent guarantee is common, though developers & banks are gradually moving towards non-recourse project finance. Very few local banks have the capability to evaluate carbon cash flow

Dominant drivers for finance type are (I) type of project and (II) country

# How GHG projects are financed

The financial solutions varies between countries

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- China: Project finance with recourse
- India: Project finance with recourse, some non-recourse project finance, some discounting of CER flow
- Indonesia: Project finance with recourse, some discounting of CER flow
- Brazil: Equity, project finance with recourse
- Chile: Equity, some discounting of CER flow

# How GHG projects are financed

The financial solutions varies between different type of projects

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- HFC :carbon income very high but investment relatively small so mainly use project finance with recourse
- Windfarm : carbon income adds 2-3% IRR not used in debt sizing by banks , mostly project finance with recourse
- Large hydro : smaller projects need parent guarantees, larger can be non-recourse project finance, carbon income just an added benefit
- Methane capture: agri waste, household waste; carbon could be the only income , mainly equity financed

# How GHG projects are financed



## Conclusion

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- The equity holders have today the strongest interest in the carbon income
- The debt providers rarely take the carbon flow into consideration (can't analyse the risks) but this is changing.



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# Using carbon credits to finance projects

The future carbon flow can be used primarily for two contract types

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Discounted value of future deliveries of CERs

- Carbon is a dematerialised output ( CERs) from a process and to monetise this it is necessary to find an off take.
- Only buyers in Japan and Europe with the price driver being the EU ETS market..
- Paying upfront implies a fixed price, fixed volume assumption

Two main Contract Types

- Guaranteed volume /Fixed price = the risk is credit quality of seller, most common for
- Best effort volume/ Fixed price= project risk ( discounted volume to reflect project risk)

# Using carbon credits to finance projects

The key is the probability of receiving CERs

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What can go wrong:

- Rejection as a CDM project;
- Delay in registration
- Delay in issuance
- Regulatory environment post 2012 uncertain so there could be a cut off date

Also worth keeping in mind:

- PIN, PDD, validation, registration is a lengthy process
- Verification , issuance process also lengthy
- Cost not trivial; (i) registration process up to € 100,000. (ii) issuance process € 30,000 + SOP 2%.

# Using carbon credits to finance projects



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The risk if rejection is limited but the risk of significant delay very high

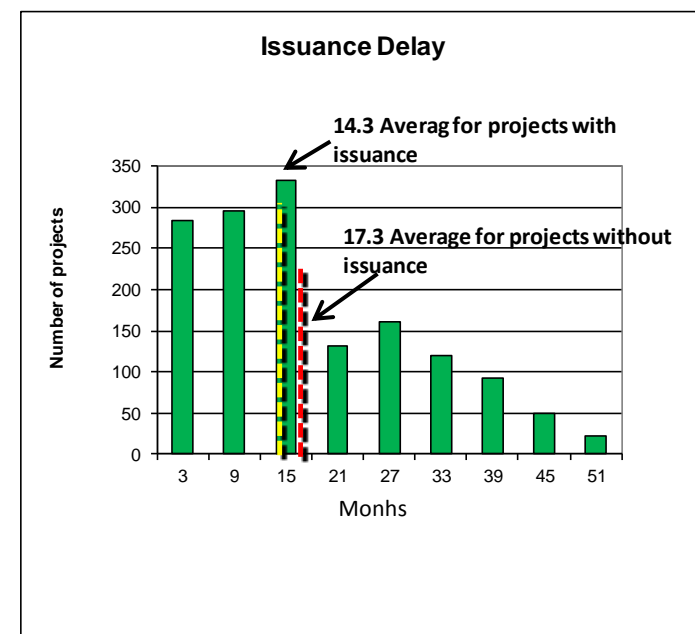
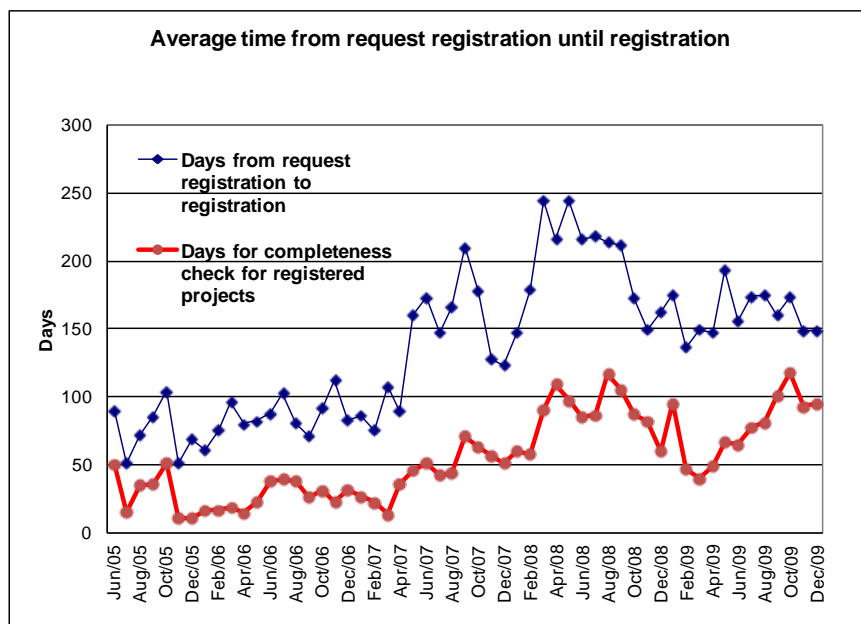
## Rejection of project

### DOEs

Validation negative by DOE	3%
Validation terminated by DOE	11%

## Delay of registration and issuance

EB Review history	Total	
Withdrawn	49	2%
Rejected	151	6%
Registered after corrections after review	264	11%
Registered after review	24	1%
Registered after corrections after request for review	444	18%
Registered after minor corrections	174	7%
Registered after request for review	87	4%
Registered automatically	1227	51%
	2420	100%



# Using carbon credits to finance projects

Paying upfront implies a fixed price, fixed volume assumption and notional size is important

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- The size of the notional value is often a problem: .
  - Smaller Projects:

The smaller projects often have a greater need for upfront and will be looking for €1-€10 mil. Given the resources required for the necessary extensive risk evaluation and associated contract negotiations, the potential returns for smaller upfront payment is often not enough to make such a transaction viable unless a simplified process can be used.
  - Larger projects:

Projects requiring € 10-€30 mil are attractive but not many of these projects around.
- But the structure of the transaction key.

# Using carbon credits to finance projects

**Guaranteed Volume Fixed Price structure is the most common structure**

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The risk is credit quality of seller and market risk (often hedged), most common form for upfront

- Follow the same credit process as for normal lending with clients credit quality the driver:
  - Financial+ non-financial ratios = credit rating=solvency requirements= minimum return requirements on upfront
- Key aspects in the ERPA; (i) Make Good-if non delivery (ii) Force Majeure
- Transaction often hedged and fixed price settled and upfront consideration transferred at the time of ERPA conclusion
- If the bank is the buyer of the CERs the only discount is present value
- If the bank is not the buyer, discounted at local lending rates

[For Guaranteed Volume /Floating Price there is an extra cost of hedging the market price which has to be added to the transaction which can be illustrated with the cost of buying a put at the time of trading (100% of notional= €3.0, 75% of notional=€1.50, 50% of notional= €0.50)]

# Using carbon credits to finance projects

## Best Effort Volume Fixed Price; for a Single Project

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- Condition Precedent : Project registration ( ideally also first issuance)
- Client credit quality important but more significant the clients likelihood to honour the contract (local knowledge key)
- Analyse projected CER output scenarios and discount the volume to “safe” level
- The upfront consideration will then assume a fixed volume and price
- If buyer of CERs, discounted for present value
- If not a buyer, discounted at local lending rates

# Using carbon credits to finance projects

**Best Effort Volume Fixed Price; a portfolio of future streams of CERs can be used**

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- Project risk: discounted volume to reflect project risk but a portfolio structure can help to mitigate this risk
  
- Portfolio
  - Placed in a SPV
  - Establish a risk adjusted carbon flow of portfolio, right of substitution
  - First priority delivery, waterfall structure of a larger portfolio
  
- The upfront consideration will then assume a fixed volume and price
  
  
- Structured product solutions can be used to seek finance from financial investors



# Using carbon credits to finance projects



## Conclusion

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- A future stream of CERs can be used in the form of an upfront payment to finance carbon projects, but it is necessary to analyse and manage :
  - Credit Risk
  - Market Risk
  - Project Risk
  
- It is however important to have a critical size of the volume of the future stream of CERs to make it economically feasible



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# Using the existing portfolio inventory to raise funding



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It is possible to use both EUAs and CERs to raise funding

## EUAs

17/06/2010

Daily Future	15.57
Dez 10	15.71
Dez 11	16.06
Dez 12	16.63
Dez 13	17.68
Dez 14	18.66

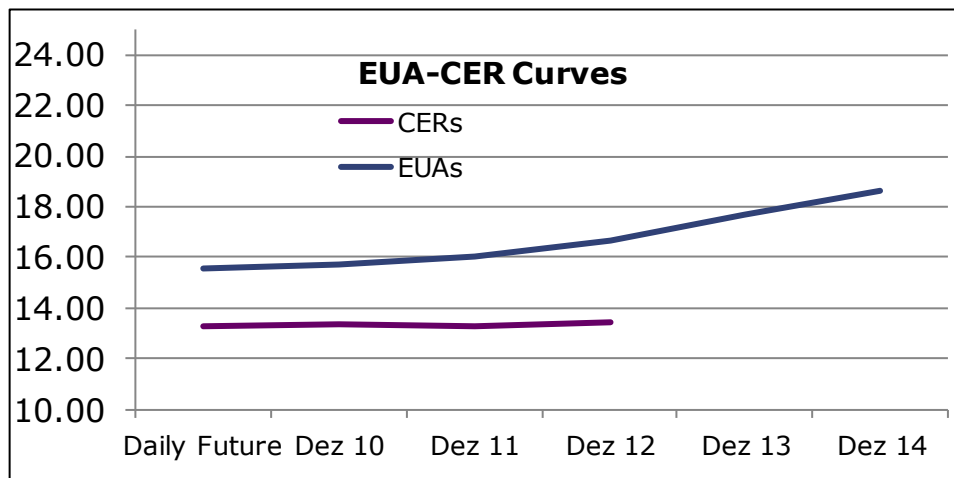
Spread	Euros	Carry
Spot - Dec10	0.14	1.80%
Spot - Dec11	0.49	2.10%
Spot - Dec12	1.06	2.72%

## CERs

17/06/2010

Daily Future	13.31
Dez 10	13.32
Dez 11	13.25
Dez 12	13.42

Spread	Euros	Carry
Spot - Dec10	0.01	0.15%
Spot - Dec11	-0.06	0.00%
Spot - Dec12	0.11	0.00%

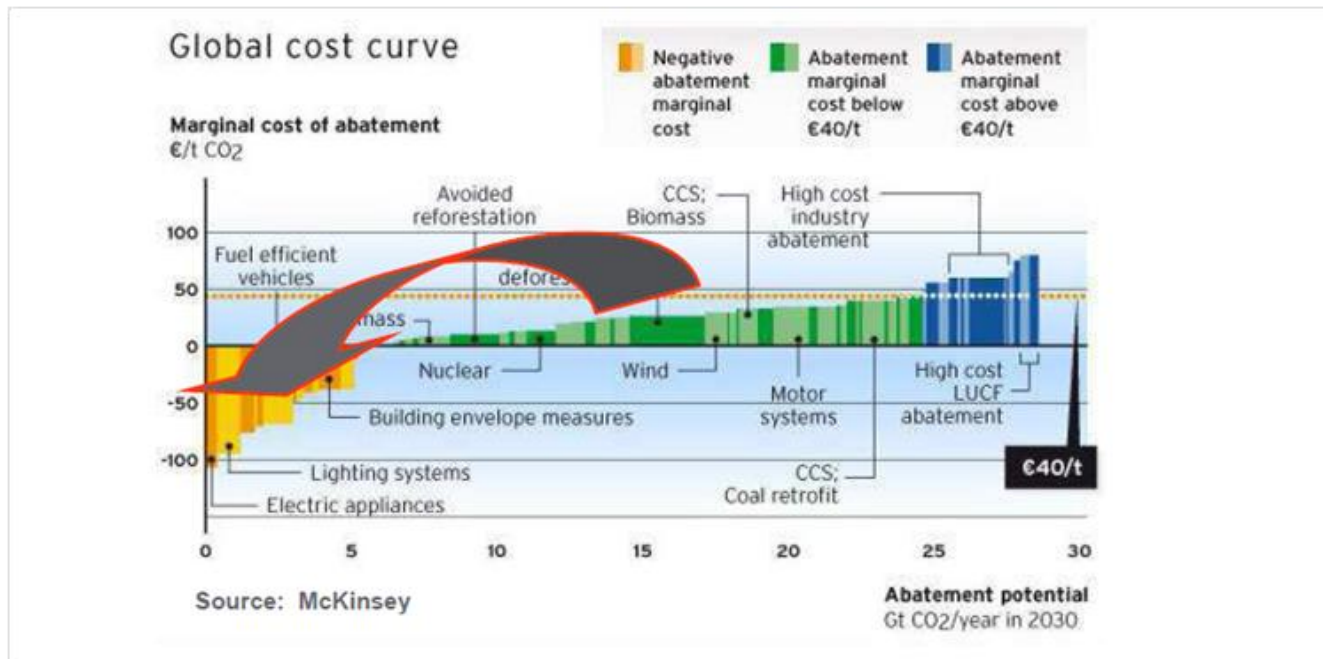


Financial traders use the EUA curve to arbitrage their own funding rate

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# The future

With energy efficiency taking centre stage the dynamics for finance will change



The dynamics will change as the marginal abatement cost moves from positive to negative as energy efficiency takes centre stage