

# **Renewable Energy Certificates and Carbon Certificates: Can One Project Sell Both? A case study of low income housing energy upgrade projects in South Africa**

Emily Tyler, SouthSouthNorth Project Africa

January 2007

## **Abstract**

Developers of projects which deliver environmental benefits have an increasing number of options regarding the types and number of crediting schemes they can access in order to monetise these benefits. These schemes overlap with regard to the benefits they recognise, and although some individual schemes have set rules pertaining to double counting, at the time of writing there is no internationally recognised organisational framework in place to rigorously ensure against this.

Whilst this situation presents a danger to the integrity of trading schemes for environmental goods, this is likely to be overcome in time as these schemes mature. However, in the interim there is therefore an implicit responsibility on project developers to guard against the monetary devaluation of the environmental benefits their projects deliver by ensuring the integrity of their sales strategy. Whilst issuing a single 'currency' of environmental credit is the safest and simplest solution, dual currencies from one project are possible, although have to be carefully managed in transaction contracts and all communications surrounding the project and its involvement in trading and crediting schemes. The project developer's perspective has implications for both purchasers concerned about the integrity of their purchase, and for scheme designers and policy makers. The carbon market and renewable energy certificate trading offers the clearest example of this issue, and low income housing projects in south Africa are used in this paper to illustrate the project developer's perspective.

## **Keywords**

Environmental benefits; renewable energy certificates; carbon credits; project developer; double counting; project finance; Gold Standard; emissions trading schemes.

### ***1. Introduction and Background: Why is this question important?***

Increasingly, policymakers are using market mechanisms to address environmental issues. Having demonstrated huge success in the NO<sub>x</sub> and SO<sub>x</sub> markets in North America in the 1990s, the concept of emissions trading has been placed at the heart of the Kyoto Protocol, the international treaty on climate change.

Whilst carbon trading represents the most formalised and widespread use of market mechanisms in combating environmental issues, markets for other types of environmental and social good are starting to emerge. Renewable Energy Certificates (RECs) are one of the most prominent. Energy efficiency crediting is now being considered in Europe, and markets for ecosystem services have localised application worldwide, encompassing payment for maintaining water catchment areas, biodiversity hotspots and forests.

Markets for environmental goods can be divided into those which are governed by a 'cap and trade' scheme, such as the targets of Annex 1 parties to the Kyoto Protocol, and those which are subject to the rules of 'baseline and credit', such as the Kyoto Protocol's Clean Development Mechanism (CDM). Cap and trade implies that all sources emissions within a certain defined category have to reduce to a certain target level. Baseline and credit means that a baseline is established assuming the absence of the project, and then credits emission reductions below this level. Most REC schemes are voluntary, and therefore conform to a baseline and credit model. Others, such as the UK's Renewable Obligation is closer aligned to a cap and trade scheme.

An individual project, developed outside any cap and trade scheme and which generates environmental 'goods', can essentially decide which scheme or schemes it wishes to sell these 'goods' into. For example, a project involve switching from coal to biomass as a boiler fuel in a non-Annex 1 country could gain either RECs under a voluntary scheme, or carbon credits under the CDM or offset market. A natural vegetation protection project may gain credits from a PES (Payment for Ecosystem Services) scheme for sustaining a catchment area, or credits from a carbon offset project for avoided deforestation.

Many of these markets ascribe premiums to certificates having attributes which are above those strictly required in the market. The CDM Gold Standard (GS) operates in the Kyoto project market to identify credits from energy projects which adhere to strict sustainable development criteria. RECs from new renewable capacity command higher prices than those from existing renewable energy generating plant.

The nature of the emerging credit types are such that their characteristics start to overlap. A CDM GS credit incorporates employment generation aspects which are also attributes of value in a REC. A carbon forestry offset may receive a premium related to the project's sustainable development attributes also credited under a PES system.

These developments pose a set of interesting questions: can a project sell credits into more than one scheme? What are the implications for 'ownership' of specific project characteristics once a premium has been paid for these?

This issue is important for a number of reasons:

- There is a real concern about double counting environmental 'goods', and therefore reducing the environmental integrity of projects and the schemes which they sell their credits into. "Without a better understanding of the roles, limitations, and interactions of these markets and, specifically, renewable energy credits (RECs) and carbon credits (CCs) – the two policy tools they employ – the larger environmental and economic societal goals that these markets and tools are meant to achieve may not be fully realized". (US DoE research, undated)
- There is a need for consistency of rule application as the REC and carbon markets expand, in order to give these markets integrity. This discussion therefore has implications for the policymakers designing these schemes
- In particular, there is a need for clarity in the retail offset carbon market and voluntary REC market, as both of these markets are driven by market integrity and the intangible nature of the good being sold
- A project owner may unknowingly devalue their project by selling credits into both markets. There is a lack of information about this for project developers

- Similarly, purchasers face potential credit devaluation if two types of credits are sold from the project they have bought from. This consideration needs to be incorporated into credit transaction contracts.

This paper will focus on the case study of the Kuyasa Energy Upgrade Housing Project in Cape Town, South Africa to explore the issue of double crediting in specifically the voluntary carbon and renewable energy markets further. It will also argue that a project developer should be very cautious when considering selling credits into multiple schemes.

## **2. Description of REC systems and markets**

A REC is a generic term for a financial instrument reflecting the attributes of renewable energy independently of the actual electrons. RECs go by the names of Tradeable Renewable Energy Certificates (TRECs), Renewable Obligation Certificates (ROCs), Tradeable Renewable Certificates (TRCs), Green Tags and Green Certificates. The certificate is either a physical paper one, or more commonly an electronic certificate.

The standard unit used internationally is a MWh, and each REC has an identifying number linking it back to the actual generating device. The generation of RECs is driven by either mandatory or voluntary targets. Examples of mandatory REC schemes include: *The Australian Scheme* [www.rec-registry.com](http://www.rec-registry.com), the *UK ROC scheme* [www.dti.gov.uk/energy/sources/renewables/policy/renewables-obligation](http://www.dti.gov.uk/energy/sources/renewables/policy/renewables-obligation), the Netherlands ecotax waiver; and US schemes (nearly half of US states are implementing Renewable Portfolio Standards, plus there is a robust market for voluntary renewable certificates).

There have been very few international REC transactions to date. Greenmarkets (2005) describes a transfer of Guatemalan hydro RECs to the Netherlands, a symbolic REC contribution to WSSD from ENEL and a sale from a wind farm in Cost Rica and geothermal plant in Italy. There have also been a growing number of voluntary transactions within North America. The development of REC systems in developing countries are currently under discussion through a REEEP funded project.

The REC market therefore remains fragmented, with little standardisation between schemes. The South African voluntary REC market is in its infancy, with few trades having been conducted to date

### ***3. Description of Carbon Certificate systems and markets***

A carbon certificate, a generic term, demonstrates that the generation of one tonne of CO<sub>2</sub>e has been avoided. The measurement of this tonne differs slightly from scheme to scheme. Certificates originate under both cap and trade schemes and baseline and credit schemes. Many such schemes exist, not all are driven by the Kyoto Protocol, and not all are mandatory. The current focal point of the Kyoto driven carbon market is the European Union Emissions Trading Scheme (EU ETS). This is the world's largest mandatory scheme, instigated by the European Union in an effort to assist the EU to meet its Kyoto Targets

In the non-Kyoto world, emission reduction credits are also being sought after, but for different reasons. As non-Kyoto countries (primarily the US and Australia) do not have to comply with targets, they do not tend to be interested in Kyoto units. However, many multinational corporations operating in these countries realise the value of undertaking voluntary targets. The largest scheme administering voluntary emission reduction units is the Chicago Climate Exchange in the US. Companies, local governments and NGOs have signed up to targets and are actively purchasing emission reduction credits to comply with these. These credits are termed Voluntary Emission Reductions (VERs). A number of standards are emerging to standardize emission reduction units in this market.

A small but growing 'niche' in the international carbon market is what is coming to be termed the retail offset market. This market caters for the numerous companies, institutions, government departments, individuals and NGOs that wish to offset the carbon emissions that they cannot reduce themselves. This group typically offsets conferences, travel or lifestyle emissions by purchasing and retiring offset credits, either CERs or VERs. Credits which are attractive as offset credits are those from projects which have high sustainable development characteristics, and a good 'marketing story'. GS emission reduction credits are sought after by retail offset purchasers, and others wishing to demonstrate a commitment to sustainable development and the highest

standard of environmental and social integrity. The GS can be applied to either CERs or VERs. Whilst the compliance markets (Kyoto-driven) are highly standardized and regulated, the retail offset market is far less so. This market is 'regulated' by the need for integrity of the buyers. It is largely up to the purchaser to ensure that offset projects deliver all that they claim to in terms of both emission reductions and sustainable development benefits.

Carbon credits are retired once used to demonstrate compliance with a scheme, and so cannot be 'used twice'. In the case of offsets, these credits are retired by the organisation wishing to demonstrate carbon neutrality.

Carbon credits are used by project developers as an additional revenue flow to the project. They also have value as collateral for loan finance, or to strengthen the financial structure of a project through sale to investment grade carbon purchasers.

There has recently been the start of a consumer awakening, particularly in the UK regarding climate change. Market mechanisms are often viewed with some suspicion by consumers struggling to understand the economics of emissions trading, and driven by their desire to ensure a definite environmental benefit is realised. It is therefore imperative that the developing offset market maintains the highest levels of integrity, and that information is consistently and accurately communicated to consumers. Perception is all important to the ability of this market to flourish and channel funding to projects with high sustainable development attributes.

#### ***4. Low Income Housing Energy Upgrade Projects – The Kuyasa Case Study***

The Kuyasa Energy Upgrade project in Cape Town, South Africa involves the retrofitting of 2300 low income houses with solar water heaters (SWHs), energy efficient lighting and insulated ceilings. The project was the first CDM project registered in Africa, and also the first Gold Standard registered CDM project. The project reduces 2.8 tonnes of carbon per annum per household over a 21 year crediting period. The Gold Standard identifies premium CDM projects in terms of their design and contribution to sustainable development. Gold Standard CDM projects command a premium credit price in the carbon market, resulting in a greater inflow of carbon finance revenues. The project has been showcased internationally as a best practise CDM and sustainable energy project.

Benefits of the project include:

- Significantly reduced CO<sub>2</sub> emissions over a 21 year period, through the avoidance of electricity or alternative fossil fuel use by the households
- A predicted saving in the cost of energy services of approximately R685 per household per annum
- Health benefits (specifically in terms of respiratory illnesses) through a reduction in household dust due to the installation of insulated ceilings
- Improved ambient temperature due to ceilings reduces the need for paraffin stoves and other heat sources which hold fire-related dangers and negative respiratory health impacts
- Contributes to human and institutional capacity (including empowerment, education, involvement, gender)
- Implementation of the project will contribute to local and regional employment – local plumbers, electricians and builders will learn to install and maintain renewable and efficient technologies

This project has widespread appeal amongst both CDM, retail carbon offset and REC purchasers. It has been inundated with proposals from purchasers, and is able to command a premium price based on its GS status.

The project owner, the Cape Town City Council, needs to maximise the revenue from the carbon credits to this project, as it experiences a funding shortfall due to its public nature. The following points have arisen of relevance to this paper:

- Does a sale of GS CERs a priori preclude a sale of RECs from the same project?
- If the project sold GS CERs, does this preclude it from selling conventional CERs plus RECs in the future?
- If the seller sold 50% of the emission reductions as CERs, could it sell the remainder as RECs?
- Geographically, the carbon credits can be sold throughout the world and most likely retired in the US or the UK. However, should the project sell SWH RECs too, this would most likely be to a local buyer. Is there a difference then in the nature of the sustainable development characteristics being sold to a foreign versus local purchaser?

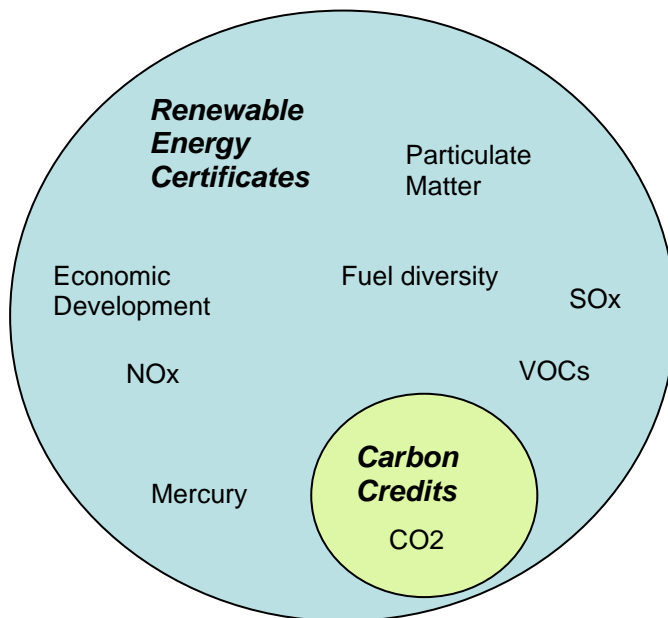
- The transaction costs of obtaining funding from a SWH REC (based on the Australian scheme) would be much lower than that of the CDM, should this have bearings on which type of credits are developed?
- Should the project developer define exactly the nature of the credits being sold and keep a registry of the project characteristics to avoid double counting?

The following section explores these issues from both a theoretical and practical perspective.

#### ***4. Conceptual Issues Associated with Crediting both Carbon and Renewable Energy***

##### 4.1 Credit Definitions

At the heart of the issue lies the definition of what a carbon credit represents, and what a renewable energy certificate represents. The following figure is adapted from the US Department of Energy's Research division:



*Figure 1: The overlapping characteristics of RECs and carbon credits (adapted from US DOE Research)*

The larger blue circle represents all the environmental and social benefits represented in a REC. The smaller green circle shows carbon credits as embodying a small sub-set of this, just the carbon dioxide emission reductions.

In the case of a GS carbon credit, this overlap is arguably much more comprehensive, as demonstrated in figure 2 below.

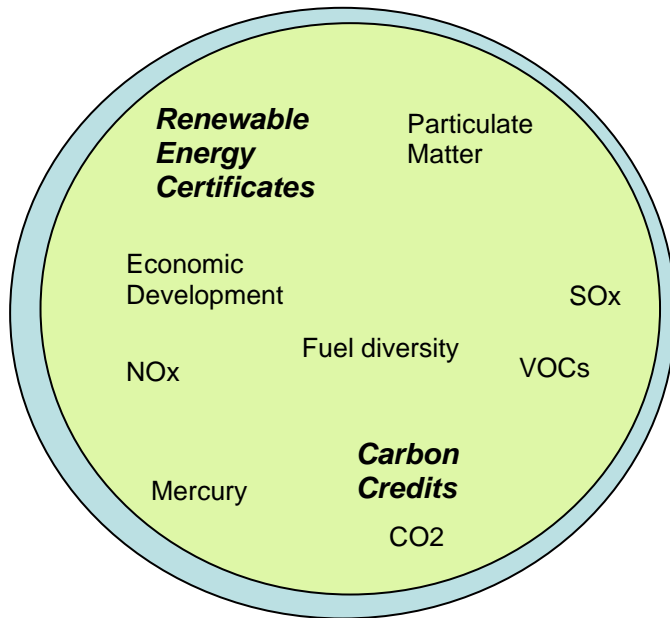


Figure 2: The overlapping characteristics of RECs and GS carbon credits (adapted from US DOE Research)

GS projects must pass a sustainability indicators test, scoring on environmental, social and economic sustainable development indicators. Hence a positive contribution to reducing local air pollution, a countries fuel diversity and economic development all form part of what the GS purchaser pays a premium for. These are the same characteristics that a REC purchaser will pay for, and implies double counting if the project sells these benefits as both carbon credits and RECs.

RECs and carbon credits are not rigorously defined, with many derivations from the most common interpretations in use. Some definitions of RECs and carbon credits are listed below by means of demonstration:

- *Chicago Climate Exchange*: "RECs (also known as Tradable Renewable Certificates or TRCs) generally represent the environmental attributes associated with the production of one megawatt-hour of renewable energy. A CCX GHG emission offset from renewable energy represents the displacement of GHGs that would be emitted by the equivalent amount of non-renewable electricity."

- *Terrapass voluntary automobile offset definition*: “A REC represents the environmental attributes associated with a unit of renewable electricity. For every unit of renewable electricity generated, an equivalent amount of RECs are created. The purchase of RECs supports renewable electricity generation, which helps offset conventional electricity in the region where the renewable generator is located” “A Carbon Credit Offset represents the reduction of one unit of carbon (typically a metric ton) from a baseline scenario or regulatory requirement by an emitting entity.”
- *US DoE Research*: The value of a REC can include emissions reductions, regulatory compliance value, and the right to claim that you’re generating or purchasing renewable energy.(US DoE research) In the US there is currently no consensus on what attributes a REC should include. States are redefining what a REC is as the carbon schemes are maturing.
- *Greenex, South Africa*: “TRECs attributes include avoided CO<sub>2</sub>e emissions; avoided SO<sub>2</sub>, NO<sub>2</sub>; ash; water saving; distributed generation benefit; enhanced employment;and protection against future uncertainty (Steyn, undated)
- *Trexler (2006)* argues that a REC and a carbon credit are conceptually different. A REC is a tool to help promote renewable energy. A carbon credit ‘represents an action that prevents the emission of (or causes the sequestration of) one tCO<sub>2</sub>e, a direct environmental benefit. A REC can be directly measured by measuring the electricity whereas a carbon credit can’t, as it’s the product of a baseline, and hence of additionality.

The definition of what each credit type encompasses may become an important component of credit transactions in the future, in order to ascertain ‘ownership’ over the components, and the right to the marketing, reputation or ‘feel good’ value that payment for these provide.

#### 4.2 Additionality and the nature of the CO<sub>2</sub> reduction component of RECs and Carbon Credits

The issue of additionality is key to the consideration of the comparability of a REC and a carbon credit. RECs are non-additional in the carbon sense of the word, as they don’t refer to a baseline. For example, a REC could displace nuclear energy which is carbon free. However, the REC market differentiates according to the nature of the generating

plant: credits from new builds achieve a higher premium. There are some similarities between carbon credits from CDM projects and RECS from new build renewable plants, but this analogy is not complete as new build renewables would not necessarily qualify under the CDM. To say that RECs from existing renewables are similar to offset carbon credits may be correct in that offset projects haven't had to demonstrate additionality, however, the reasons for the projects not registering as CDM may be to avoid the bureaucracy involved, as opposed to the project not being additional.

The basic structure of the two markets differs fundamentally therefore, reducing the comparability of the carbon reductions (the CO<sub>2</sub> component of the diagrams in the section above) of the two instruments. The lack of equality between the CO<sub>2</sub> reduction component of a REC and that of a carbon credit motivates for careful screening of any proposed fungibility between the two. There are also implications for the value of the various markets. Selling RECs into the voluntary carbon offset market could devalue this market (Trexler, 2006), as the CO<sub>2</sub> value of the carbon credit is higher than that of the REC. Trexler argues for a complete separation between the two market types. Of relevance to this paper is that the CO<sub>2</sub> component of a REC and carbon credit is arguably different, and therein lies grounds for its recognition, in part or in whole, in multiple markets. However, further work is required to clearly define and communicate the emissions reduction associated with a REC, and that associated with a carbon credit. Within the generic carbon credit category, further categorisation is required to distinguish between voluntary and Kyoto credits.

#### 4.4 Trading Scheme Level Definitions and Rulings

Most of the thinking on the issue of the overlap and interaction between different credit types has been done from the scheme or purchaser perspective in the compliance and more formal voluntary markets. Very little has been undertaken from the project developer perspective, or from the perspective of an offset purchaser.

Some of the thinking amongst voluntary schemes is informative:

*EU REC market* Some rigorous thinking has been done on this issue with reference to the interaction between white (energy efficiency) and green certificates in the EU (Langniss, 2005). Preliminary findings suggest that a relative green certificate target (ie baseline and credit) may have to be adjusted when a white certificate scheme is

introduced as well. Double counting of eligible sources should be forbidden, and the two markets should be kept completely separate, with no fungibility of credits between them.

*The Chicago Climate Exchange (CCX):* The CCX is a voluntary, legally binding, rules based, multi-sectoral carbon emissions trading scheme in North America. Projects are eligible for carbon crediting only if energy being sold by the renewable energy system is not being sold as green (ie with RECs). Any RECs being generated by qualifying renewable energy systems must be surrendered to, and retired by CCX prior to carbon certificates being issued (CCX, 2006). Also, project developers must ensure that they don't allow other entities to make the claim that energy from the project is green (ie buyers).

*ROCs and the UK ETS* A ROC can be converted into a UK allowance at a set exchange rate of 1 MWh = 0.43 tonnes of CO<sub>2</sub> equivalent. However, UK carbon allowances cannot be converted into ROCs. One of the reasons for this is that a ROC encompasses all the additional benefits of renewable energy which the pure CO<sub>2</sub> reductions of the UK ETS don't.

*EU ETS and RECs* Renewables are not eligible as emission reductions under the EU ETS, there is no fungibility between the two instruments (Sorrel, 2003).

#### 4.4 The Project Developer's Perspective

As projects are able to sell their credits into many, and very different schemes internationally, the issue of generating credits for different schemes from one project is important to consider from a project perspective.

Mandatory and formalised voluntary schemes, such as the CCX, the EU ETS and the UK ETS have closely defined the rules pertaining to the eligibility of credits. Project developers, such as the Cape Town City Council are recommended to research these requirements prior to concluding a sale of credits as, for example, a transaction of green energy would preclude a developer from selling carbon credits into the CCX. Given that different credit types have very different prices, the credit type and quality (a GS CER has the potential to be priced higher than conventional CER) should be considered up front by the developer in order to maximise the returns to their projects.

Less formal voluntary markets, and in particular the retail offset market are not regulated as the CCX and compliance markets are. These markets are driven by corporate

reputation and the desire to 'do the right thing'. The integrity of the product is therefore paramount. In addition, as the credits are virtual products, the marketing and branding aspects of these are important (Steyn, 2006). Should the purchaser or potential purchaser suspect that the credits have been subject to double counting, there is a risk that current and future credits from the project may lose value. In these markets the sustainable development attributes of the project are as important as the technical definitions of additionality and the types of CO<sub>2</sub> reductions. There the integrity of the project must be beyond question.

A space does potentially exist for generating a portfolio of certificates from the same project. For example, the Kuyasa project could generate CERs representing the carbon reduction, and then a range of sustainable development credits such as employment generation credits, improved air quality credits and energy poverty alleviation credits. Alternatively these attributes could be bundled into a green energy credit. These certificates would be carefully defined to cover specific aspects of the project's benefits. However, this system presupposes a central body to ensure that these certificates are not double counted, and that the integrity of their definitions is maintained. Given the current state of environmental and social markets, this is an ambitious and onerous task, yet perhaps one which should be set as a goal for the future. There are other concerns associated with this approach, not least that of commodifying environmental and social benefits which should be undertaken as business as usual in all new projects. Also, the complexity of defining and monitoring all these aspects may outweigh the benefits.

## ***6. Conclusions and Future Work***

This paper has discussed the issue of double counting of environmental goods from the perspective of the project developer outside a cap and trade scheme. It has argued that there are significant reasons why renewable energy and energy efficiency projects such as the Kuyasa Energy Upgrade Project should not generate credits for sale into more than one scheme. Whilst regulations and rules have been developed from the scheme perspective to handle potential double counting and overlap, these are yet to emerge for less formal markets like the offset carbon markets and the voluntary REC markets in developing countries. These markets are predicated on the integrity of the product being transacted, and hence run the risk of collapse or re-adjustment should substantial double counting occur.

As such, project developers and credit purchasers are advised to consider issues of double counting carefully prior to concluding carbon or renewable energy transactions. Credit contracts such as Emission Reduction Purchase Agreements should include detailed definitions of the attributes being transacted, with clauses covering any future sale of related credits from a similar project. Given the potential for devaluation of a project such as Kuyasa, a 21 year 'carbon asset' of the City of Cape Town, and the negative publicity for a purchaser of these credits, this is a risk for both buyer and seller.

## **7. References**

1. CCX GHG Offsets from Renewable Energy Systems Information Note 8 June 2006, [www.chicagoclimateexchange.com](http://www.chicagoclimateexchange.com)
2. National Renewable Energy Laboratory (US DoE, office of energy efficiency and renewable energy): The interaction between carbon markets and renewable energy markets (undated)
3. Trexler, M, (2006) Are renewable energy credits (RECs) and carbon offsets exchanged in totally different markets, with little crossover potential for project developers and investors? [Http://www.climatebiz.com/sections/asktheclimateexpert](http://www.climatebiz.com/sections/asktheclimateexpert)
4. Terrapass Scheme (A carbon offset product for vehicles) <http://www.terrapass.com> accessed December 2006.
5. Green Markets International (2005) Innovative Financing for SWH: Carbon and Renewable Energy Certificate Trading
6. Langniss, O (2005) Interaction between white and green certificate systems, preliminary findings, Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW), Stuttgart
7. Steyn, J. (undated). Powerpoint presentations. Tradeable Renewable Energy Certificates, Greenex
8. Steyn, J. (2006). Ex- Greenex. Personal Communication
9. Vrolijk, C. (2003). Powerpoint presentation. Renewables and GHG in the UK,, IT power.
10. Sorrel, S. (2003). Back to the Drawing Board? Implications of the EU Emissions Trading Scheme for UK Climate Policy. Environment and Energy Programme, SPRU.