Renewable Energy and Energy Efficiency in Africa: Carbon Finance Guide

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The Gold Standard
Premium quality carbon credits

How to Use this Guide: Contents

An overview of each section can be found in the text block at the start of each section. Readers without time to read the whole guide may benefit from reading these sections only, coming back to study those sections which are of interest to them.

1. The **Introduction and Objectives Section** gives an overview of this Carbon Finance Guide, explaining what it aims to achieve
2. Section One looks at **Financing a Renewable Energy (RE) or Energy Efficiency (EE) Project** and considers carbon finance as a component of the project's financing
3. Section Two provides an overview of the **Carbon Market**, including establishing the difference between compliance, voluntary and retail offset markets
4. Section Three looks at the **Sustainable Development Benefits of RE/EE Projects** and how these can be utilised to raise finance
5. Section Four considers the **Sale of Carbon Credits from a Project**, and discusses the key issues of Risk and Price
6. Section Five outlines a **Carbon Transaction Strategy** for project developers
7. The Conclusion provides a checklist for **Securing Project Finance** for your RE/EE project

Introduction and Objectives

This Guide is an introduction to the financing of renewable energy and energy efficiency (RE/EE) projects – projects which benefit the global community by reducing greenhouse gases which are causing climate change. It is designed to help private and corporate entrepreneurs and public officials, banks and financiers, as well as donor organizations to understand how that benefit has financial advantages in the form of new streams of revenue which can help the project get off the ground. This revenue is loosely referred to as ***carbon finance*** *or* ***carbon revenue****. In addition, these projects benefit their local communities through access to energy services and sustainable development benefits. These aspects of the projects can also enhance its ability to attract investment.*

Carbon revenue is derived from the sale of greenhouse gas ***emission reduction credits, or carbon credits.*** *Carbon credits refer to the amount of CO_2-equivalent emissions reduced (measured in tonnes). Sometimes these may be* ***certified emission reductions*** *(CERs), or* ***voluntary emission reductions*** *(VERs), depending on whether they are used to offset voluntary or obligatory emission reduction targets. Like all markets, both the compliance and offset carbon markets are fuelled by supply and demand. But the different perspectives of developers and financiers need to be understood in order to optimize the opportunities to benefit from this market, and to create possibilities for cooperation.*

<u>There are a few key areas that are vital for all parties to know:</u>

- *There are steps to be followed to gain access to carbon revenue*
- *These steps involve extra costs to the project, called* ***transaction costs***
- *The revenue that is available may or may not be sufficient to cover these costs*

  When carbon revenue is sufficient to cover the transaction costs in a project to make the additional steps worthwhile, the project will still require other finance to get off the ground – ***carbon revenue rarely covers the whole cost of the project*** *and in most cases should be regarded as an* ***additional potential revenue stream*** *to the project*
- ***Projects that generate large volumes of carbon credits are more likely to raise sufficient revenue*** *to cover the transaction costs*
- ***Small volume projects are more likely to offer better contributions to sustainable development*** *(economic, social and environmental) and this fact may be particularly desirable to certain carbon credit purchasers, and may attract a price premium*
- *How a project is structured in terms of financing and ownership, transaction and the sale of its carbon emission reductions, are important elements in benefiting from the carbon market*

Financing is often cited as a major barrier to renewable energy and energy efficiency (RE/EE) projects, which deliver carbon emission reductions and sustainable development benefits to LDCs in Africa. There are many components to this financial barrier[1]. Three form the focus of this guide:

- **Project developers lack capacity** in financing and the financial packaging of projects.
- **Revenue streams from carbon credits are new** to most of these players, and present largely unexplored challenges and opportunities.
- A large portion of the 'outputs' from these projects – the sustainable development characteristics – have a **value which is not usually recognized by financiers**. Linking these characteristics and the project's financing presents a significant opportunity.

Importantly, carbon finance is neither a quick fix nor the financial saviour of RE/EE development projects. Project developers need to be financially savvy and innovative in order to use carbon finance to leverage *other* funds and raise the profile of these projects for replication and political buy-in.

This guide is primarily intended for use by:

- **Developers of RE/EE development projects**. This group includes local and national governments, private sector entrepreneurs, multilateral organizations such as the UNDP, and donor organizations.
- **Local financiers** of these types of projects, including development finance institutions, commercial banks, donor funds and grant funds.

It is intended as a reference document, which can be used as a starting point for understanding the carbon market.

[1] See IISD's forthcoming paper 'Financing the Development Dividend'.

Section 1:
Financing a RE/EE Development Project

*Financing a project requires a clear understanding of all costs and revenues, as well as when these costs and revenues are likely to occur. To do this, a **discounted cash flow analysis**, will form part of any well thought out business plan for a project. In addition, a thorough **risk analysis** will show the potential advantages and threats and help determine whether the project is a feasible one for financiers to get involved in. In this process, it is useful to first assess the value of the project without anticipated carbon revenues, and then look at carbon revenue as an additional revenue source that is separate from the underlying project. Presenting the project to financiers is the first milestone for many projects: it entails a thorough assessment of the project's **investment profile**, including financial, risk, technical and market aspects. Whilst the type of investor will determine the kind of rewards and the kind of risks that they are prepared to take on, each project developer will also have different capacities and different priorities. Finding appropriate institutional support can fill gaps in a project developer's knowledge and capacity. Creating the right institutional organisation can also help emission reduction projects to benefit from public or donor sector opportunities.*

Project Financial Analysis: Starting Off

The starting point for financing a project is constructing a **discounted cash flow** to reflect all project costs and revenues and the timing of its financial requirements. Start by excluding flows related to carbon financing so that you have a good idea of what shape the underlying project is in. RE/EE development projects often have low volumes of emission reduction credits, therefore investors will be primarily interested in financing the traditional outputs of the project (eg energy, development benefits) and will see the carbon credits as a bonus, or useful as financial/political leverage. Whilst carbon finance opportunities should be considered simultaneously with the underlying project finance by the project developer, this section of the guide focuses on the underlying finance for clarity.

The table below provided a simplified template for a discounted cash flow analysis. This assessment of a project's feasibility should include *all* costs and benefits (income)

relevant to your project – the table below provides examples of costs and benefits. It should provide information regarding the amount of capital that will need to be raised for the project to go ahead. Under the CDM a project must *not* be financially viable without revenues from the sale of CERs – this is part of the concept known as **additionality**.

> ***ADDITIONALITY is a key concept in carbon financed projects. It refers to the eligibility requirement that CDM projects and their emission reductions would not have happened during business-as-usual, and emission reductions are therefore described as additional.***

Hence, it is important to start by establishing the project base case first (below), *then* look at the base case with CDM (we will look at a cash flow including CDM in Section 4).

Simple discounted cash flow analysis: Project Base Case

Years	**0**	**1**	**2**	**3…**	**10…**	**21**
Capital costs Planning and feasibility Technology Training and commissioning						
Sub-total						
Operating costs Energy and water Labour Maintenance Decommissioning						
Sub-total						
Income						
Sale of product						
Other income						
Sub-total						
Total						

Internal Rate of Return
Net Present Value
Nominal Payback Period

Is the Project Bankable?

In order to secure financing for your project, and a carbon purchaser, you need to **ensure that your project is bankable**. This means that the project is financially viable and attractive to financiers, presenting the right combination of risk and reward to secure their interest. Different financiers will want different types of returns, and different levels/types of risk, depending on their objectives. For example, a government agency promoting new technologies will tolerate a high level of risk, with the associated high rewards should the technology take hold. The matrix below gives examples of some typical financier risk reward profiles.

Institutions	Risk Tolerance	Reward Expectations
Commercial Bank	Low	Low
Government technology agency	High	Medium
Export credit agency	Medium	Medium
Donor organisaton	Medium	High
Venture capitalist	High	High
Development Bank	Medium	Low
Foreign Direct Investor	Low	Medium

To ensure that your project is bankable, you need to develop a **Risk Mitigation Plan** that identifies all risks, evaluates their relative importance by their impact on the technology or project revenue, and outlines strategies for avoiding, mitigating, transferring and sharing risks and methods for monitoring risks as they change over the project life. Upfront finance providers need to be more risk tolerant than those who engage once the project is operational and producing outputs. Arriving at an optimum risk reward balance with financiers is a negotiated process. This balance is important for ensuring the smooth implementation and operation of the project.

RISK AREAS RELEVANT TO RE/EE DEVELOPMENT PROJECTS IN AFRICA
Regulatory risk: Are the regulations surrounding independent power producers developed and stable? Is the implementation of a new energy efficiency regulation likely?
Technical risk: RE/EE technologies are often new, or new to the location
Credit risk of parties to transaction: How likely is it that the financier will get their investment back should any aspect of the project fail or underperform?
Country / political risk: What is the likelihood of local government intervention in the project, or appropriation of profits or assets?
Demand and supply risk of outputs: How well has the market demand for outputs, or availability of supply of project inputs been tested?

Presenting your project to financiers and investors is an opportunity to improve your project's risk profile by showing a well thought through, comprehensive and financially detailed **Project Investment Profile**. This should include conservative **financial, technical and market feasibility analyses** and a **maintenance plan**. A maintenance plan outlines how the project will be maintained throughout its lifetime. This Investment Profile should be backed up by a detailed discussion of project risks, including sensitivity analyses of the most important variables impacting on your project, Cash Flow and your Risk Mitigation Plan.

Common Financial Issues relating to RE/EE Development Projects in Africa

RE/EE development projects are often championed by development or technology practitioners. Project developers are mostly donor, aid or government organizations, or smaller technology entrepreneurs. Large private sector players do sometimes operate in this area but they usually do so in partnership with smaller grassroots NGOs.

Utilities, normally supported by a host country government policy, tend to focus on a centralized approach to energy projects. Therefore large-scale energy policy government financing is often not forthcoming for decentralized RE/EE projects. Yet decentralized RE/EE projects often provide the highest sustainable development benefits. International donor or aid funding often provides anchor financing for these projects and it is important to seek the co-operation and participation of these public financing networks. Non-energy specific grants from government (ie development, housing or poverty alleviation funding) can also provide core funding for these projects.

Identifying the non-financial benefits of RE/EE projects provide useful indicators as to potential project investors and funders. Public sector financing has a mandate far

broader than just maximizing their return on investment. Linking specific benefits to the non-financial motivations of various financiers will increase the chances of your project finding an optimum risk reward balance, and achieving successful financial close.

REFERENCES

1. A useful guide to project finance is: Nevitt, P (1995), ***Project Financing***, Eurooney Books
2. Spalding Fletcher, R (Ed), (2002), **The CDM Guidebook**: A resource for Clean Development Mechanism Project Developers in Southern Africa. World Bank. www.green-markets.org/Downloads/CDM%20Guidebook%20-%20second%20electronic%20edition.pdf
3. **2E Carbon Access** provides information on how small scale project developers can access carbon finance. Their website is: http://www.2ecarbonaccess.com/dev.html
4. **REEEP** aims to accelerate and expand the global market for RE/EE technologies. Their website (www.reeep.org) contains information about innovative financing for RE/EE projects.

Section 2:
Overview of the Carbon Market

*The Introduction to this Guide refers to the **compliance** and **voluntary carbon markets,** and the **offset market** which is a niche market involving either compliance or voluntary credits. These markets serve different purposes, but together they contribute to emission reductions and help to make projects more viable through carbon finance. Understanding these markets is important because they have different requirements and support different project types.*

The 'carbon market' involves a diverse set of buyers and sellers who are interested in purchasing and trading carbon credits. Two types of carbon market exist: **compliance markets** and **voluntary markets**. Every scheme has different objectives, and its own name for the carbon credits traded and the different actors involved.

Compliance markets

In compliance markets, actors buy carbon credits in order to meet a mandatory – legally imposed – emission reduction target, which they cannot achieve through internal emissions reductions. Various financial intermediaries have emerged in these markets:

- **Brokers**: facilitate trades
- **Funds**: several buyers who are short of credits invest money with a fund which sources emission reduction credits on their behalf; reduce risk through a portfolio approach in combination with larger overall volumes
- **Financial investors and speculators**: buy credits intending to re-sell them at a profit at a later stage

Voluntary markets

Voluntary markets are based on voluntary efforts to reduce emissions. They are largely driven by the threat of governmental regulation and compliance targets, in non-Kyoto companies. For example, in anticipation of mandatory targets, companies in the US are learning how the carbon markets work by trading through voluntary schemes. These markets follow a similar pattern to compliance markets, but the framework for transactions and criteria for projects are completely defined by individual scheme or buyer.

Credits in voluntary markets are called Verified Emission Reductions (VERs). VERs

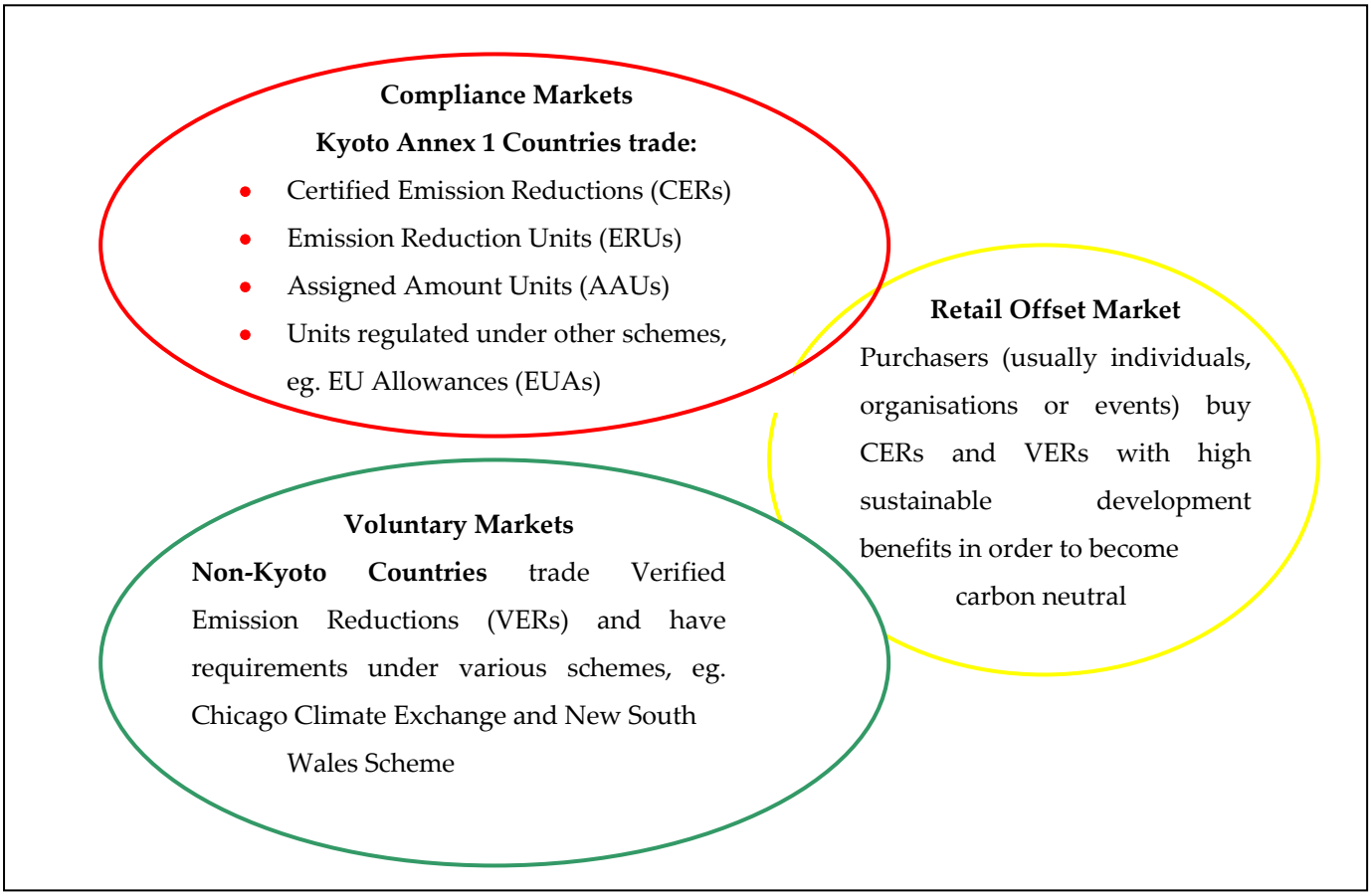
undergo a third-party check during validation and/or verification to increase their credibility.

Retail Offset markets

Retail offset purchasers are typically corporation, events or individuals, aiming to become carbon neutral. The activities in these markets aim at offsetting/compensating emissions from an activity by an investment in an emission reduction activity elsewhere.

In the retail offset market, secondary trades are rare unless from a project aggregator/retailer/broker to end-users of the credits. Credits sold to end users are removed from the market by retiring, which means that the credits are cancelled and can never be used again. In the retail offset market credits are mostly purchased for corporate image purposes or out of genuine concern for climate change, hence the quality in terms of environmental integrity and additional benefits is much more important than in the compliance market.

The diagram below shows how the compliance, voluntary and retail offset markets work and interact with one another.



The future of demand for RE/EE project credits in the Carbon Market

The Compliance Market

The EU ETS and Annex B governments are dependent on the CDM market in the short-to mid-term. The extent of this dependence is related to the price of EUAs – if this price is high, more cost-effective options may be found in CDM countries in the form of CERs.

The UNFCCC meeting in 2005 allowed for "project activities under a programme of activities" to be registered as a CDM project activity – this is known as programmatic CDM. Programmatic CDM methodologies have yet to be approved and implemented, but they should encourage credits from larger emission reduction programmes. Programmatic CDM should reduce transaction costs as well as providing an opportunity for CDM to contribute towards public sector development goals, for example producing energy efficient low-cost housing.

Compliance markets are still immature and dramatic shifts in prices of CERs may come about that would reflect a truer market value. This needs to be taken into account when negotiating prices for CERs as part of a CDM transaction. Other compliance markets may emerge in the future, for example in Canada and Japan.

Voluntary Markets

Voluntary markets are likely to grow as public awareness increases about the threat of climate change. Some standardisation with regards to procedures and criteria are likely to happen as the volume of traded VERs grows.

FURTHER INFORMATION

- Annual report on the **State of the Carbon Market** is available from the World Bank. The latest version can be downloaded from: http://carbonfinance.org/docs/StateoftheCarbonMarket2006.pdf
- The following sites provide up-to-date understanding of the carbon market and should be used as reference:
    - **Point Carbon** provides carbon price forecasts and analyses greenhouse gas emissions trading markets – www.pointcarbon.com
    - **Climate-L** is a list serve focusing on climate change policy and issues, more information and how to subscribe is available at:

http://www.iisd.ca/email/climate-L.htm

- The **World Bank's Carbon Finance Unit** has a useful website, with a section for project developers: http://carbonfinance.org/
- Subscribe to GTZ's **CDM Highlights** newsletter for information on the latest developments in the international negotiations on the CDM: http://www.gtz.de/en/themen/umwelt-infrastruktur/umweltpolitik/4837.htm

Section 3:
Realising the Sustainable Development Benefits of RE/EE Projects

RE/EE projects often have very high sustainable development benefits, which are not fully recognised by the main carbon markets. The retail offset markets do recognise this, and standards such as the Gold Standard have developed to capture this value, and establish a criteria for sustainable development benefits.

Although the main focus for project developers and stakeholders is realising the sustainable development benefits of their projects, this is not the primary focus of a typical carbon buyer. Buyers' main interests are normally the cost effective transfer of ownership of the generated emission reductions. Projects with high volume emission reductions are therefore generally more attractive to buyers – they allow fulfilment or partial fulfilment of an obligation towards reaching a target, at a low proportionate cost for the transaction.

The search for the largest volume at the lowest 'price' is driving the compliance market. However, this only fulfils one of the Kyoto Protocol's objectives for the CDM: that of helping to achieve cost-effective reductions. It neglects the second objective, that of the host country's sustainable development. The definition of 'sustainable development' is country-specific and defined by the host country. However, this means that the standards, and practical implementation of these standards, vary widely from country to country. Hence, for a buyer or stakeholder concerned about sustainable development, most often those operating through the offset market, every project's contribution to sustainable development needs to be assessed in a structured and transparent manner.

Currently, the offset market is very fragmented. Many intermediaries exist offering purchasers wishing to offset their emissions an opportunity to buy and retire credits. Most of these services are web based, accompanied by pictures and stories of the projects involved, and the methodologies used to calculate the emission reductions. However, there is no standardisation in the approaches of all these intermediaries, some of whom develop their own projects, and some of whom rely on external project developers.

The need for standardise this market has been recognised, in order to avoid false claims

of carbon reductions and sustainable benefits – a process known as *greenwashing*. A key issue is that of additionality, and the false crediting of non-additional activities (i.e. activities which would have happened anyway and therefore do not deserve the benefit of a "credit" for carbon reductions). Such standardisation efforts include the Gold Standard, which is focused on in this Guide. The references at the end of this section list several other standards in use in the offset market. Note that at the time of writing many weaknesses still remain in the market. So check carefully the approach you use, if it is not Gold Standard. Aspects to look out for include the existence of independent validation, a robust process for retiring credits, management of double counting issues, and different definitions of additionality.

The Gold Standard

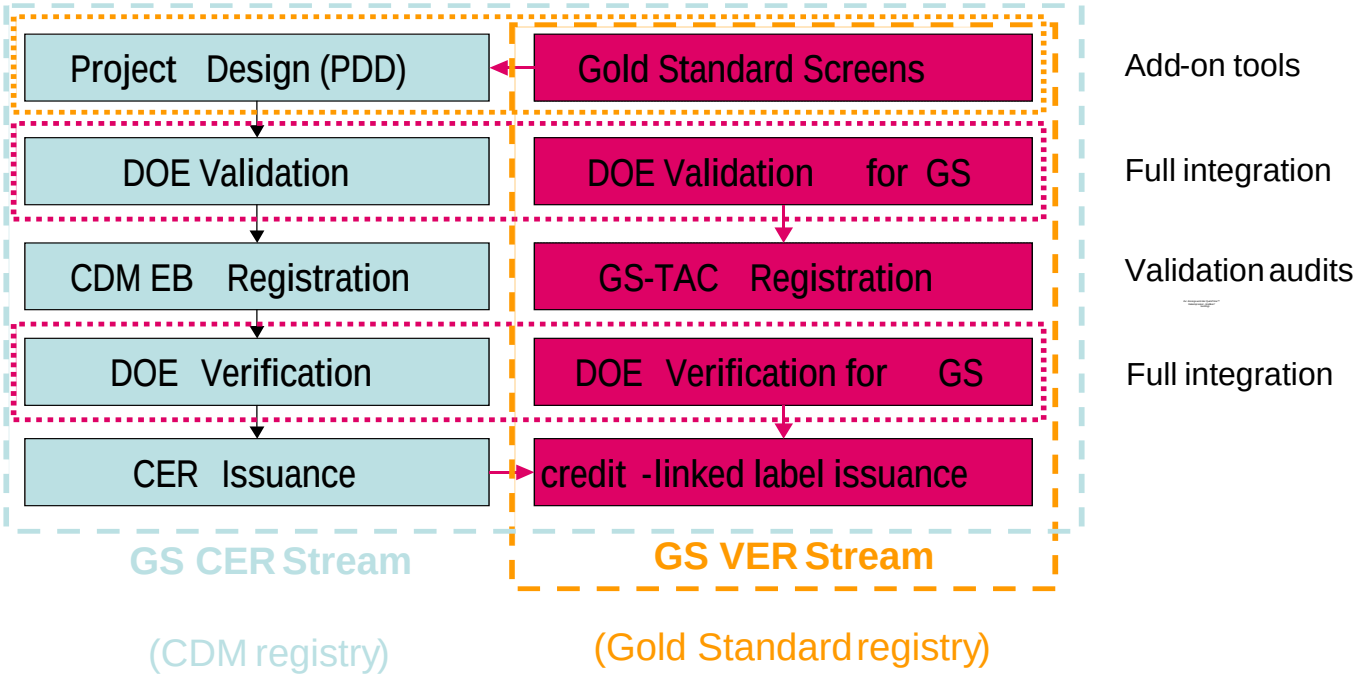
The Gold Standard is a credible and independently audited benchmark for projects with sustainable development benefits and thus represents premium quality carbon credits.

Currently, a group of over 40 NGOs has supported this standard, which includes a set of tools that enables the development of projects which show their special benefits (beyond their emission reductions) in a structured way, with contributions from relevant local stakeholders. This **Gold Standard** is complemented by additional requirements:

- **Projects must contribute to a long-term change in energy systems** – i.e. they must promote the use of non-fossil sources of energy (in practice, this means projects must use RE/EE technologies).
- **Projects must be truly and clearly additional** – i.e. help to keep the global emission of greenhouse gases neutral, by not crediting projects that would have happened anyway.

If these requirements are fulfilled then projects can be said to further sustainable development. The Gold Standard label is awarded to projects who can demonstrate these additional benefits. The award is based on clear and rigorous validation, registration and verification procedures (see figure below). The Gold Standard is open to projects aiming at the voluntary and as well as the compliance markets.

The diagram below shows the interaction between the CDM and the Gold Standard procedures. Note that the Gold Standard elements are all add-ons to the core CDM process.



The Gold Standard is, essentially, a series of simple tests that a project developer applies to the project. The tests are called "screens" and they check to make sure that the project is truly additional and that it helps assist the shift from a fossil-fuel based to a renewable energy based economy. The tests are rigorous, so a developer reduces his project risk by applying this additional quality-control into the project design.

The advantage of Gold Standard registration is a clear market differentiation and increased reputation among buyers looking for more than emission reductions. The formal support of over 40 NGOs helps insure against the risk of a negative image arising from supporting sub-standard projects. It also protects the reputation of project developers. Project developers are included in the project design process from the outset, which means projects are unlikely to be stalled by parties who feel ignored or overruled in the project development process. This element reduces delivery risk.

Risks to a purchaser's reputation are the primary risk in the voluntary market, as the buyer's engagement is based on their intention of increasing their reputation. As a result, Gold Standard projects are most sought after in this market, especially due to the fragmentation of the carbon market, which has resulted in their being no *one* standard procedure for developing a project, and no way of assuring a buyer it is buying true

reductions that do no harm.

Delivery risk is hard to quantify, but it is of major importance in the compliance market. Buyers here depend on a certain amount of credits being delivered on time in order to meet their obligations. Often projects with high sustainable development benefits are those with the greatest delivery risk because they involve multiple, small stakeholders, the public sector and new technologies. Gold Standard registration can reduce this risk by applying higher standards to the project development procedure, meaning that the Gold Standard is also attractive for compliance buyers. Note here how the Gold Standard comprises all the requirements of the CDM, but goes further. Hence it is completely compatible with the CDM process.

These additional benefits, plus a higher willingness to pay for projects with demonstrable sustainable development benefits, lead to more favourable conditions for transacting Gold Standard projects. Gold Standard registration, at minor additional cost, has been shown to lead to better returns. These higher returns can simply be a higher price being paid per carbon credit. Less obvious but all the more important for a typical Gold Standard project is the willingness of the project buyer to accept higher risks, because they are buying for the sustainable development benefits as much as for the carbon credits. In other words a buyer will be more willing to accept the risk that the carbon credits may not be delivered because they are also investing in the sustainable development benefits of the project. This can be in the form of up-front payments, payments for part of the project development or project validation/registration, better access to underlying project finance with local or international financial institutions, etc. In short, projects become more bankable, or they become bankable in the first place.

The benefits of the Gold Standard alone will not make a project happen, but they can in part provide the soft tools to attract the right amount of attention that is needed for project implementation – as well as hard benefits. The Gold Standard tools are universally applicable. They give host countries and project developers the freedom to define for themselves what a good project is. At the same time they can show the outside world the project's premium quality using the simple tool of the Gold Standard label.

The recent growth of the voluntary market and concern around neglect of the

sustainable development objective in the CDM, have increased market opportunities for Gold Standard projects – despite overall market volumes remaining low. Other important initiatives to select projects based on their sustainable development value generally come from multilateral institutions (e.g. UNDP, World Bank) or national governments (e.g. Austrian, Belgian JI/CDM tenders).

References and further information

- The Gold Standard website provides all information and documentation needed for applying the Gold Standard to a project, access to previously registered projects and a quarterly newsletter:
- http://www.cdmgoldstandard.org
- To contact the Gold Standard directly: info@cdmgoldstandard.org; ph. +41 61 283 09 16
- UNDP – UNDP Millenium Development Goals Carbon Facility – http://www.undp.org/mdgcarbonfacility/
- World Bank – Community Development Carbon Fund – http://carbonfinance.org/cdcf/home.cfm (minimum volume: 50'000 t CO_2e p.a.)
- Austrian JI/CDM programme – http://www.ji-cdm-austria.at
- Beligan JI/CDM tender – http://klimaat.be/jicdmtender/
- Climate Cent Foundation – http://www.stiftungklimarappen.ch – is a private Swiss institution with a government obligation and expressed interest in high sustainable development credits.

The following references are to other standards:

- www.climatecare.org
- www.myclimate.org
- www.climatefriendly.com
- www.climatefriendly.com
- www.amosfair.de
- http://co2mpensate.ch
- Plan Vivo is a system for managing the supply of VERs from rural communities in a way that promotes sustainable livelihoods. It has developed a manual setting out exactly how to do this, which is available at: http://www.planvivo.org/manual/manual.html.

Section 4:
Sale of Carbon Credits from a Project – Risk and Price

Timing the sale of your credits will be dependent on your financing needs, but ***the stage at which you sell may affect the price*** *– for instance a forward sale for a project that is not yet completed carries additional risks to the purchaser and this may lead to a lower price. Aspects such as insurance and penalty clauses become relevant. You will also need to guess at future price fluctuations in the market. The contract for a forward sale is called an* ***Emissions Reduction Purchasing Agreement (ERPA)*** *(see the Conclusion). Of course, some project developers will have a higher risk profile and this will affect the possibility and price for a forward sale. An important factor which affects the value from carbon credits is the cost of producing them or transaction costs. CDM projects involve more transaction costs and therefore greater risks.*

A carbon credit transaction occurs when the rights to carbon credits are transferred. These transactions occur along similar lines in both the compliance and voluntary markets, although with different emphasis in each.

Spot and Forward Sales

Spot market transactions occur when actual, existing, verified or certified credits are transferred. There is very little risk to the purchaser because the credits have been successfully generated and verified by a carbon auditing organisation. These transactions have the potential to command some of the highest prices. Spot transactions have only been possible in the CDM market since 2005, the same year the first CERs were issued. Voluntary market spot transactions may well have been occurring prior to this, as credits do not need to be certified. However, transparency in this market is very low, so it is difficult to be certain.

Forward sales are the most common transaction form. A forward sale is the promise to purchase credits once they are generated, at a specified price. Sometimes forward sales allow for a prepayment, enabling a project developer to secure some of their finances up front. There can be penalties for non-delivery of carbon credits. Forward sales are usually priced on the residual risk remaining in the project at the time of transaction. In the compliance market, the higher the risk that the credit won't be generated, the lower the price the purchaser will be willing to pay. This is because the purchaser may face

penalties if it doesn't hold the credits by a certain time. Price competition is less severe in the retail offset market, as purchaser's objectives are less time constrained and they often have a development objective too. Hence, the price/risk connection is less clear.

Forward Sales, Price and Risk

If you do not require carbon finance to *implement* your project, consider selling your credits over the spot market, as you could maximize your project revenue in this way. Importantly, first check that your project complies with additionality requirements.

Most RE/EE development projects need the security and financial collateral that an Emissions Reduction Purchasing Agreement (ERPA) provides and/or a portion of the carbon revenues upfront that can be gained from a forward transaction. In order to optimize the revenues secured under this contract, you need to understand the nature of the risks associated with a credit price, and expand on your project's Risk Mitigation Plan to incorporate carbon project specific risks which are discussed below. You also need to understand and consider market price fluctuations.

Risks associated with the underlying project are relevant to the credit price, because if your project fails or underperforms, the volume and timing of credits are affected. In addition, there are risks specific to developing the project as an emission reduction project. The extent of these depends on whether the project is being undertaken as a CDM or voluntary credit project.

- ✓ **CDM project:** requires the development or adaptation of a CDM registered methodology, development of a Project Design Document (PDD), validation, host country approval, registration, monitoring and verification.
- ✓ **Voluntary credit project:** requires validation of the methodology, monitoring and verification plus any other steps required by the purchaser.

At each stage in these processes the project could fail, resulting in failure to generate the emission reduction credits. For example, if the CDM project doesn't get approved by the host country DNA, then it won't generate carbon credits. If a voluntary project is not validated, neither will it be able to generate carbon credits. Each stage therefore represents a risk above any conventional project financing risks outlined in Section 2.

Whilst project credit prices are determined by the risk of the underlying project, they are also determined by the price of carbon. The most liquid and transparent carbon market

currently is the EU Emissions Trading Scheme (EU ETS). Therefore the price of carbon quoted is often this price. Other prices quoted are those paid for CDM transactions, or for voluntary transactions. The Kyoto market of Assigned Amount Units, the government Kyoto unit, is far less transparent, with transaction prices seldom being released into the public domain.

- **EU ETS price** is available through Point Carbon's daily newsbriefs (www.pointcarbon.com).
- **Voluntary carbon prices** can be implied by prices on the Chicago Climate Exchange (www.chicagoclimatex.com) and the prices retail offsets are being sold for on intermediary websites (see the reference list in Section 3).

A view on future prices is particularly difficult to ascertain. Remain on top of movements in the international markets by following the news sites referred to in this guide, building relationships with buyers, brokers, policy negotiators and those tracking the development of the market and the international climate change mitigation effort.

Non-Price Carbon Project Risk Mitigation

Apart from accepting a lower price due to your project containing residual risk associated with the generation of carbon credits, there are non-price mitigation options. These include insuring against residual risk through **carbon insurance** or generating developer portfolios (holding **a carbon credit reserve**). You can also share carbon finance with the community, using local content and labour to bring down approval risk, ensuring the project meets the country's sustainable development criteria. Sharing carbon finance with the community also promotes ownership and provides an incentive to the project.

Undertaking your project as a Gold Standard CDM or voluntary project is a valuable risk reduction strategy. If your project complies with the Gold Standard, a premium rating, it is highly likely to also comply with CDM or voluntary purchaser requirements. This 'pre-screening' reduces the risk of project failure at any stage of the project cycle.

Carbon Purchasers, Risk, Price

Carbon purchasers have different risk reward profiles, in the same way as different financiers. Government purchasers, funds and retail offset purchasers may be more willing to provide upfront financing for projects than private sector companies, or hedge funds. Multilateral financial institutions may be more willing to enter into forward sales

early in the project development cycle, although their prices are correspondingly low. Purchasers also differ in terms of credit volumes and prices. The key is to match the objectives of the project owner and the carbon purchaser in the carbon transaction.

Transaction costs

Both CDM and voluntary projects incur costs that are additional to normal project costs. These costs, which are termed **transaction costs**, are associated with demonstrating that emission reduction credits have occurred and with securing a carbon sale. **Transaction costs** occur at various stages of the project cycle – see the table below. They include pre-registration and post-registration costs[2]. Pre-registration costs refer to: developing the project concept and design, validating and registering the project, and gaining host country approval. Post-registration costs include monitoring and verification costs. Transaction costs vary between project types, sizes and whether CERs or VERs are generated.

For large CDM projects transaction costs are usually between $60,000-200,000. Some may be as much as $300,000. Small scale projects usually incur costs 20-40% lower, in the range $45,000-90,000. Importantly, using an existing CDM methodology for a project reduces transaction costs. The cost of developing a new methodology if no approved methodology is available can be considerable. Note too that CDM transaction costs can be as much as double the transaction costs associated with developing a voluntary project – see table below for a comparison. Furthermore, projects generating low volumes of carbon credits have proportionately higher costs than large volume projects.

[2] For the latest figures, see UNDP's forthcoming publication, 'An Assessment of Progress with Establishing the Clean Development Mechanism', UNDP, March 2006

The table below shows the transaction costs for various mechanisms and at different stages in the project cycle.

CDM ACTIVITY ELEMENT[3]	CDM	VOLUNTARY MARKET	Non- CDM GOLD STANDARD	CDM GOLD STANDARD
PDD development	√	√ (Less costly)	√	√
Securing carbon purchasers	√	√	√	√
Public Process	√	Depends on scheme	√	√
Validation	√	√ (Less costly, DOE not necessarily required)	√	√
Approval	√	n/a	√	√
Registration	√	n/a	√ Internal GS registration	√
Share of Proceeds Admin Charge	√	n/a	n/a	√ (depends on the scheme)
Adaptation levy	√	n/a	n/a	√
Monitoring	√	√ (Less costly, DOE not necessarily required)	√	√
Verification/issuance	√	√ (Less costly, DOE not necessarily required)	√	√
Broker commission	If broker is used			
Legal and Contractual arrangements	√	√ (Less onerous, voluntary project)	√	√
Revenues for Sustainable Development	√	√√	√√	√√
Specific government taxes on credits	Potentially	Less likely	Less likely	

[3] Adapted from SSN CDM Toolkit and Ecosecurities, 2002, PCF presentation, COP 8, Side Event, New Delhi, 24/10/02

Cash flow analysis

The cash flow analysis that was discussed in Section 1 can now be revisited. You will need to assess whether your project is financially feasible once CDM costs and benefits – or the costs and benefits of a voluntary scheme – are included. The table below gives an example of what your cash flow would look like if CDM costs and benefits are included.

Discounted cash flow analysis: Base Case with CDM						
Years	**0**	**1**	**2**	**3…**	**10…**	**21**
Capital costs Planning and feasibility Technology Training and commissioning **CDM transaction costs** **Sub-total**						
Operating costs Energy and water Labour Maintenance Decommissioning						
Sub-total						
Income						
Sale of product						
Other income						
CER Revenues **[Annual CER revenue = $tCO_{2\,e}$ reduced per year * $x/$tCO_{2\,e}$]** **Tonnes of CERs** **Expected price of CERs**						
Sub-total						
Total						
Internal Rate of Return **Net Present Value** **Nominal Payback Period**						

REFERENCES

- **Point Carbon** provides carbon price forecasts and analyses greenhouse gas emissions trading markets – www.pointcarbon.com
- Subscribe to **GTZ's CDM Highlights** newsletter for information on the latest developments in the international negotiations on the CDM: http://www.gtz.de/en/themen/umwelt-infrastruktur/umweltpolitik/4837.htm
- The **International Emissions Trading Association (IETA)** helps with draft contracts: www.ieta.org

- The **World Bank Carbon Finance Unit** issues information and guides on the carbon market, which can be accessed at http://carbonfinance.org.
- The UNFCCC Executive Board provides details of approved methodologies and other processes under the CDM. See http://cdm.unfccc.int/
- For policy developments and the outworkings of MOP decisions at UNFCCC meetings, look up: http://www.iisd.ca/process/climate_atm.htm
- 'CDM for small, sustainable projects: where is the value added?' Emily Tyler, SSN Feb 2006. This can be accessed at Ecosystems Marketplace http://ecosystemmarketplace.com
- The Climate Group is dedicated to advancing business and government leadership on climate change. It offers news and views on the state of the carbon market and can be accessed at: www.theclimategroup.org.

Section 5:
A Carbon Transaction Strategy

Developing a strategy for transaction of the carbon credits of a project, will require careful consideration of various aspects of the project and the carbon market. These may change from time to time up to the point at which a sale contract is concluded. The ***type of project****, whether it is CDM or intended for transaction in the voluntary market will impact on this strategy, affecting the transaction costs and the price of the credits. Whether the project achieves Gold Standard, and the extent of the contribution of the project to furthering sustainable development, will impact on this strategy too. These aspects will in turn affect the* ***type of purchaser*** *that is involved in the transaction. It is also important to consider where the purchaser offers expertise, technology, or reputation that may be important for attracting additional finance to the project. The* ***timing of the sale*** *is important for cash-flow reasons, but delaying the sale may lead to a higher price.* ***Reducing project risk*** *is a major concern and impacts upon the transaction strategy. Project partners with a negative profile may increase project risks. Finally, the* ***type of pricing mechanism*** *could vary from up-front sales at a fixed price to a future sale at a price determined according to a pricing index. The owner's risk appetite will be influential in this choice.*

The previous sections have discussed many of the financial issues and considerations involved when developing a RE/EE development project as a carbon mitigation project. These can be summarized under a number of categories, which are outlined in the remainder of this section. Through addressing each category you will develop a **carbon transaction strategy** enabling you to optimize the benefits that carbon revenues can bring. Note that the sequence is not determined. Developing a carbon transaction strategy is an iterative process that only ends once the project is transacted.

Carbon Project Type

Carbon credits can be generated through a number of different project forms. In Africa, these include CDM, Gold Standard CDM and voluntary market projects which may or may not comply with any standards.

Your choice of project type will determine the transaction costs of the project, the price of the credits, what type of buyer is interested in your credits (compliance or offset) and will impact on the project's carbon risk profile.

The price of project carbon credits is generally affected by:

- The risk of credit delivery
- The validity and standardization of the methodologies used to measure and verify the emissions reductions
- The sustainable development benefits of the project
- The prevailing carbon market price movements

Therefore delivery risk and market prices being equal, Gold Standard CERs command the highest prices, then CERs or Gold Standard VERs, then VERs. Transaction costs are analogous to price, Gold Standard CERs are highest, then CERs, then Gold Standard VERs, then VERs. In addition, small credit volume projects incur the highest transaction costs per credit price. As a rule of thumb, large scale CDM projects generating less than 20,000 credits per annum run the risk of transaction costs being greater than credit revenues, and small scale projects below 8,000, the same[4]. **Bundling**[5] a number of smaller projects together as one bigger project is one way of reducing transaction costs.

> ***BUNDLING***
> ***A number of projects of the same type can be bundled together to reduce transaction costs. Importantly, these projects should be in the same geographic area and should be at a similar development stage. They should also be aggregated by an institution.***

In deciding which is the most appropriate type for your project, consider not only the financial implications, but also the implications for the project's reputation, its ability to leverage other financial parties to commit to funding the project, the type of credits parent companies or major investors in the project may require, and the use of the project in policy lobbying.

Type of Carbon Purchaser

The type of carbon purchaser that you wish to negotiate with will be determined by all the other elements of your carbon transaction strategy. However, it is worth noting that the counterparty to your carbon sale can be important in terms of forging relationships

[4] De Gouvello and Coto (2003) as cited in AfricaPractise Carbon Finance for Africa, an Investor's Guide (2006)

[5] See http://www.unido.org/file-storage/download/?file_id=1856 for a full definition of bundling.

or partnership links for the provision of needed technologies. From the financial side, the purchaser's credit standing is important, since it can improve your project finance structure and reduce your project's risk.

Timing of Transaction

The timing of a transaction is closely related to the project's financing needs, the level of risk in the project, and the owner's objectives and confidence in the carbon market.

Financing a project involves financial costs, even if it is financed on the owner's balance sheet. As is the case with all sources of finance, one needs to compare costs and financing terms. Transacting your project early will help to secure up-front financing but will mean sacrificing the opportunity of receiving an increased credit price that would later be possible. Credits that are ready for hand over and which therefore pose no risk to the purchase will attract higher prices through the spot market. However, if your project cannot attract any cheaper financing, or any finance at all early on, then an advance sale may be the best option. The project owner's appetite for risk is also important here. Consider too that you may have additional objectives in the carbon sale: A secure carbon contract can act as collateral for investors or debt providers for the underlying project; it may also indicate confidence in the project or serve to show that a company or government is proactively tackling the issue of climate change.

Risk Mitigation

Risk mitigation will be a constant challenge until your ERPA is signed and your project financing secured. You will need to be on the lookout for risk mitigation opportunities, and avoid partners, financial or others, that worsen your project's risk profile. Conversely, you may wish to secure good quality financial partners through the carbon transaction.

Types of Pricing Mechanisms

How you price your credits in your ERPA will depend on your risk appetite, view of the carbon market, and total project financial structure. The price agreed upon can vary between a fixed total upfront payment to a price payable on delivery that is fixed to an index price in a stated market such as the EU ETS; or to a combination of anything in between. As the carbon market matures, so increasingly sophisticated pricing mechanisms will become possible. Pricing mitigates risk and requires that you are up to speed on current market developments.

References:

- The **SSN Toolkit Guide**, available at www.cdmguide.org, is a useful introduction to the Clean Development Mechanism.
- **UNIDO – CDM's** Francophone Project Country Reports are available at: www.unido.org/doc/45989.
- **Africa Practice's** *Carbon Finance for Africa – an Investor's Guide* can be found at: http://www.africapractice.com/uploads/CarbonReport.pdf
- See IISD's Development Dividend Taskforce Paper 'Financing the Development Dividend' (forthcoming)
- **UNDP MDG Carbon Facility** has developed a guide called Mobilizing Carbon Finance for the Millennium Development Goals. This is available for download at: http://www.energyandenvironment.undp.org/undp/index.cfm?module=Library&page=Document&DocumentID=5662. More general information about the UNDP MDG Carbon Facility is at: http://www.undp.org/mdgcarbonfacility/.
- 'CDM for small, sustainable projects: where is the value added?' Emily Tyler, SSN Feb 2006. This can be accessed at Ecosystems Marketplace: http://ecosystemmarketplace.com
- The **Institute for Global Environmental Strategies (IGES)** has CDM country guides for Asia, which are useful for reference and which can be downloaded at: http://www.iges.or.jp/en/news/topic/0512cdm.html.
- Nevitt, P (1995) *Project Financing 6th ed* Euromoney Books

Conclusion:
Securing Project Finance

Finding the proper balance between price, risk, partners, and timing in the market, will all depend on planning and negotiation processes. Each of these requires consideration of the needs of the potential financier and purchaser, and of the project's needs. To help develop an understanding of these elements, and to help in the negotiation process, proper documentation should be developed.

CHECKLIST:

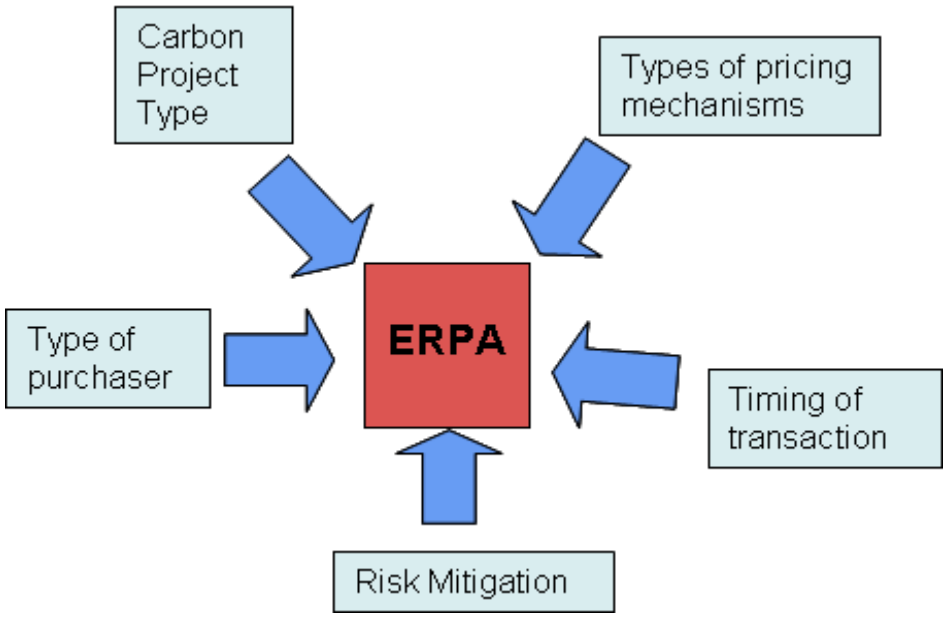
- ***Discounted Cash Flow Analysis – see Sections 1 and 5***
- ***Financial, Technical & Market Feasibility Analyses – Mentioned in Section 1***
- ***A Maintenance Plan – Mentioned in Section 1***
- ***Risk And Sensitivity Analysis And Risk Mitigation Plan – see Section 1***
- ***Investor Analysis – see Section 1***
- ***A Detailed Carbon Transaction Strategy – see Section 5***

Having understood your project from the perspective of a financier, and developed Cash Flows, Investor Profiles and Risk Mitigation documentation, together with a Carbon Transaction strategy, you are now in a position to conclude your project financial structure and transaction.

This is an iterative process, based on ongoing negotiations with all potential financial institutions and funding providers, in order to arrive at an optimal financial structure, where the risk reward balance is reflected in appropriate compensation for those best placed to hold each risk type.

Importantly, an **Emissions Reduction Purchase Agreement (ERPA)** needs to be drawn up, which governs the sale and purchase of emission reduction credits and incorporates all the elements shown in the diagram below. An ERPA is simply a contract that documents the sale of carbon credits in the same way as any other purchase agreement. ERPAs tend to be written with the purchaser in mind, and should be critically assessed. A carefully constructed, legally sound ERPA should ensure that risk is allocated fairly between the buyer and the seller of carbon credits. For examples, see the templates provided by IETA (http://www.ieta.org/ieta/www/pages/getfile.php?docID=450).

The diagram below shows the components that are needed in order to draw up an ERPA that is beneficial to both the buyer and seller of carbon credits.



Glossary of Terms

Additionality	The eligibility requirement that CDM projects would not have happened in the ordinary course of business, but for the CDM.
Annex B	One of the developed countries, party to the Kyoto Protocol, which have commitments for reducing emissions under the first commitment period of the Kyoto Protocol (Note that Annex B and Annex 1 are often used interchangeably)
Annex 1 country	One of the developed countries which are listed as being parties to the UNFCCC (qv) (Note that Annex B and Annex 1 are often used interchangeably)
Assigned Amount Unit (AAU)	The unit of greenhouse gas emissions assigned to Annex B (qv) countries to cover their target under the Kyoto Protocol
Baseline	The scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases (GHG) that would occur in the absence of a proposed CDM project activity.
Business-As-Usual (BAU)	The baseline (qv) scenario in the absence of the project activity
Carbon Credits	This term is used in the context of this guide to refer to all units which recognize that greenhouse gas emissions have been reduced, captured or avoided, including those recognized under both formal and informal crediting systems.
Carbon Finance	This term is used in the context of this guide to refer to the revenue and costs associated with the generation and sale of emission reduction credits
Certified Emission Reduction (CER)	A certified emission reduction or CER is a unit issued pursuant to Article 12 of the Kyoto Protocol and is equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials, qv.
Clean Development	One of the flexible market mechanisms created by the Kyoto Protocol in terms of which emission reduction

Mechanism (CDM)	activities occur in non-Annex B (qv) countries but benefit Annex B countries in helping to meet their targets under the Kyoto Protocol.
CO2e	CO2 equivalent
Commitment	An obligation by an Annex B country to reduce its greenhouse gas emissions by a set amount within a set period.
Compliance Period	A period within which Annex B countries have to demonstrate compliance with their commitments (qv) under the Kyoto Protocol.
COP/MOP	Term used to describe the gathering of the parties to the Kyoto Protocol since it came into force in 2005.
Counterparty	The other party in a financial contract.
Designated National Authority (DNA)	The national focal authority set up in a non-Annex 1 country which is tasked with approving projects on the basis that they contribute to the sustainable development of the host country.
Designated Operational Entity (DOE)	An entity designated by the COP/MOP, based on the recommendation by the Executive Board, as qualified to validate proposed CDM project activities as well as verify and certify reductions in anthropogenic emissions by sources of greenhouse gases (GHG).
Emission Reduction Purchase Agreement (ERPA)	Contracts governing the sale and purchase of emission reduction credits.
Emissions Trading	Transactions between companies, countries, individuals and other entities of emission reductions, such as the sale of CERs or AAUs.
European Union Allowance (EUA)	The carbon currency of the EU ETS.
European Union Emissions Trading Scheme	A trading scheme established by the EU to help it to comply with its targets under the Kyoto Protocol. This scheme was operational in 2005, and trades EUAs.
Executive Board	The chief operating body representing the CDM of the

(EB)	Kyoto Protocol
Gold Standard	A standard established to identify carbon projects with high sustainable development benefits.
Greenhouse gas (GHG)	One of the gases that trap the infrared radiation emitted by the earth's surface thus warming the surface and the atmosphere. These gases include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydro-fluorocarbons (HFC), per-fluorocarbons (PFC) and sulphur hexafluoride (SF6). Since 1750, the atmospheric concentrations have increased by 30%, 145% and 15% for the first three gases.
Host country	A Party not included in Annex I to the Convention on whose territory the CDM project activity is physically located.
Joint Implementation (JI)	A mechanism of the Kyoto Protocol whereby emission reduction projects are undertaken by an Annex B party in another Annex B party country.
Kyoto Protocol	The amendment to the UNFCCC which sets down targets by which developed countries should reduce GHG emissions.
Marrakech Accord	An agreement of the 7th Conference of Parties held in Marrakech in 2001 which sets out the Modalities and Procedures for CDM projects activities.
MOP	Meeting of Parties (under the Kyoto Protocol)
National Allocation Plan	The plan of each EU member state outlining the allocation of emission reduction units to that state's eligible installations under the EU ETS.
Non-Annex 1 country	A developing country not included in the Annex 1 list of countries which therefore does not have commitments under the first commitment period of the Kyoto Protocol.
NGO	Non Governmental Organisation
Offset Market	The subset of the carbon market representing buyers who wish to buy emission reduction credits to retire in order to 'offset' emissions from a conference, company's operations or event.
Party	A country that is signatory to the UNFCCC or the Kyoto

	Protocol
Project activity	A project activity is a measure, operation or action that aims at reducing greenhouse gases (GHG) emissions.
Project boundary	The project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases (GHG) under the control of the project participants that are significant and reasonably attributable to the CDM project activity.
Project Design Document (PDD)	The formal set of documents which are required which must set out the details of the project. The PDD must be validated by a DOE before the project can be registered as a CDM project.
Project Idea/ Information/ Identification Note (PIN)	An informal set of documents which sets out the details of the CDM project. This may be used either internally by the project proponent before going ahead with a project or may be used to assist the process of finding investors or other transacting partners. There are various formats of PINs available, depending on their use.
Project Design or Development Team (PDT)	The informal name for a team which the project proponent selects to design the CDM project and test its feasibility.
RE/EE Development Projects	This term has been developed for this guide to identify projects which have strong sustainable development characteristics, involve renewable energy or energy efficiency, and reduce greenhouse gas emissions.
REEEP	The Renewable Energy and Energy Efficiency Partnership, a private-public partnership launched at the 2002 Johannesburg World Summit on Sustainable Development.
Registration	Registration is the formal acceptance by the Executive Board of a validated project activity as a CDM project activity. Registration is the prerequisite for the verification, certification and issuance of CERs related to that project activity.
Retail Offset Credits	Carbon credits purchased and retired to offset the emissions from an event or set of activities.

SouthSouthNorth (SSN)	The SSN network of organisations and institutions working to alleviate poverty through the lens of climate change
Stakeholder	Stakeholders mean the public, any individual or organisation, including government, affected, or likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity.
Target	A set amount by which an Annex 1 country will reduce its GHGS emissions. This is the same as commitment (see Commitment).
United Nations Framework Convention on Climate Change (UNFCCC)	The International agreement under which the Kyoto Protocol was prepared.
Validation	Validation is the process of independent evaluation of a project activity by a designated operational entity against the requirements of the CDM.
Verification	Verification is the periodic independent review and ex post determination by a designated operational entity of monitored reductions in anthropogenic emissions by sources of greenhouse gases (GHG) that have occurred as a result of a registered CDM project activity during the verification period.
VERs	Emissions reductions which have not been certified by the UN CDM Executive Board, but which have been approved by a Validator.