

**City of Johannesburg**

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**Carbon Finance Guideline**

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**Final Draft**

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## Contact Details

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## List of Abbreviations

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CDM	Clean Development Mechanism
CER	Certified Emission Reduction
JCCC	Johannesburg Climate Change Committee
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EE	Energy Efficiency
ERPA	Emissions Reduction Purchase Agreement
EIA	Environmental Impact Assessment
GHG	Green House Gases
JI	Joint Implementation
LoA	Letter of Approval
MFMA	Municipal Finance Management Act
MSA	Municipal Systems Act
ODA	Official Development Assistance
PDD	Project Design Document
PoA	Programme of Activities
RE	Renewable Energy
UNFCCC	United Nations Framework Convention on Climate Change
VER	Voluntary Emissions Reduction

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# Introduction

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The City of Johannesburg (CoJ) is in a position to reduce greenhouse gas emissions and to realise revenue from such reductions. This revenue can be realised through a number of “carbon finance” mechanisms under which the CoJ can sell carbon reductions generated by projects undertaken by the City. The specific mechanisms for generating this finance are the Clean Development Mechanism (CDM) under the Kyoto Protocol, also referred to as the mandatory market, and Voluntary Emission Reductions (VERs). VERs refers to carbon credits sold outside the Kyoto Protocol compliance regime and are also referred to as the voluntary market.

The CDM is an international project-based carbon trading system established under the Kyoto Protocol. The CDM allows industrialized countries with emission reduction commitments under the Protocol to meet part of their commitments by investing in projects that reduce emissions in developing countries (also referred to as non-Annex I parties). South Africa is a non-Annex 1 country. These projects must support sustainable development in the host countries and must lead to emission reductions that are real, measurable and long term.

The current phase of the CDM ends in 2012 – which is the end of the first commitment period of the Kyoto Protocol. However, international discussions at the recent 2008 Bali Convention have provided strong indications that the CDM will be extended into a second commitment period of the Kyoto Protocol. This will be confirmed once the international negotiations under the so-called “Bali Roadmap” are complete at the end of 2009.

Carbon finance projects provide the possibility of accessing financial resources for greenhouse gas (GHG) reduction activities which meet either the requirements of the CDM or the parallel voluntary carbon market. There are many such projects that are possible at the local government level, such as building energy efficiency or landfill gas reduction projects. The use of carbon finance offers a means of making projects viable that otherwise would be difficult for the municipality to fund and implement. These projects can serve multiple goals including local environmental improvements, improved service delivery and GHG reduction. Carbon reduction projects can be financially lucrative, though in many cases the revenue from carbon credit sales will simply be enough to allow a project to break-even financially. Their objective is to provide an additional revenue stream to carbon offset projects thereby making them economically more attractive.

On the downside, carbon finance projects can be complex to implement. There are a range of activities to be carried out by the project developers. These activities include the standard components of any infrastructure project development as well as additional components related to ensuring compliance with the rules of the CDM or the voluntary market. Projects will also have to comply with domestic regulations. Three key areas of CDM project development are therefore:

1. Project identification, feasibility and design
2. Meeting institutional and regulatory requirements
3. The process of implementing the CDM project cycle

It is important to note that some of these activities are required in terms of local legislation while others are required in terms of the international rules and procedures of the carbon markets.

## Purpose of this Guideline

This guideline is not intended to provide detailed instructions on the rules and procedures of the CDM and on the international CDM project cycle. There are many excellent guidelines covering the CDM project development processes which municipalities can easily access (see *Annex 2: CDM Information Sources* towards the end of this report). This guideline is rather intended to do two things. First, to outline the elements of a broad framework or strategy for the City of Johannesburg to engage with carbon finance projects. Second, to provide more detailed guidance on how City officials should manage the carbon finance elements of a project within the constraints of municipal operations and also guidance on certain carbon finance decisions that will be typically required during the project cycle.

This report therefore is divided into two closely related outputs, namely:

1. Proposed **carbon strategy** for the CoJ which will consider:
  - i. Strategic objectives
  - ii. Legal mandate
  - iii. Project ownership options
  - iv. Management arrangements
  - v. Timing
  - vi. Sales of credits
2. Carbon finance **operations guideline** for the CoJ which will include:
  - i. Project identification
  - ii. Managing projects through the carbon finance project cycle
  - iii. Choosing between project options available

# CARBON FINANCE STRATEGY

*A strategic approach to the management of carbon finance projects in the City of Johannesburg*

## 1 Introduction

This section will outline the proposed strategic objectives for the CoJ and will address issues relating to the legal mandate of the CoJ to undertake projects; project ownership and management options; internal management arrangements with regards to carbon finance projects; and a proposed approach to the sales of carbon credits.

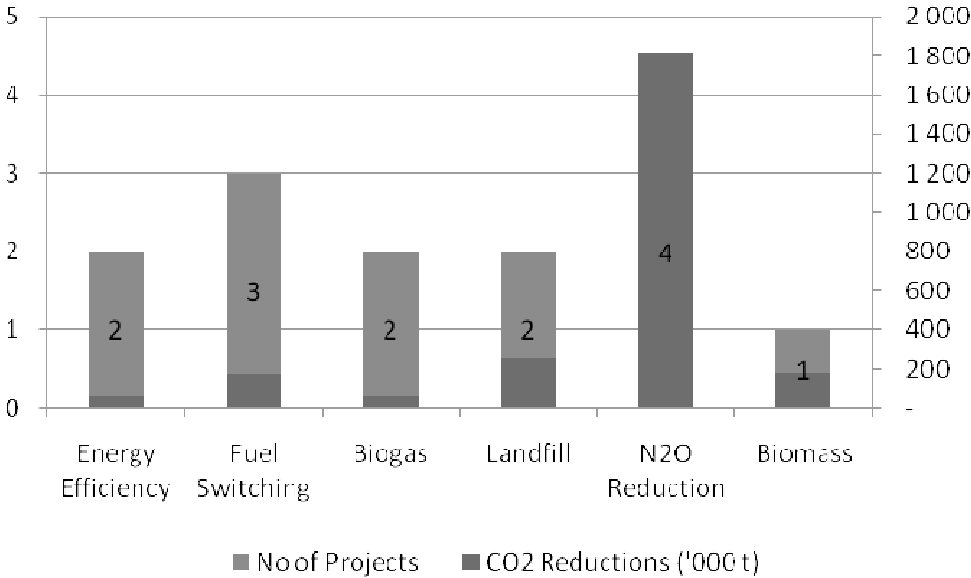
### 1.1 South Africa Within the Global Carbon Market

A brief overview of the current CDM market, which dominates the carbon market in developing countries, is provided to contextualise these guidelines.

In its December 2008 report, the United Nations Framework Convention on Climate Change (UNFCCC) stated that there were over 4 200 projects in the CDM project pipeline. The value of this market has been expanding rapidly since its inception and in 2007 was already estimated to be worth US\$64 billion (World Bank, 2007).

Of the projects in the pipeline by 2008, 1 253 were fully registered projects. Out of this total Africa had only 28 registered projects and 15 of these were based in South Africa (one pending registration). This relative lack of projects in South Africa is surprising as the country is the world's 19<sup>th</sup> largest CO<sub>2</sub> emitter (World Resources Institute) and the 8<sup>th</sup> largest developing country emitter. The country also has an extremely high emissions intensity when compared with similar middle income developing countries. These figures suggest that there remains significant potential for project development in the country.

**Figure 1. Registered CDM projects in SA**



Source: UNFCCC, (2008)

When the Certified Emission Reduction (CERs) or carbon credits issued by host country, are considered (see table) then the following becomes apparent:

- 229 million CER's had been issued by all host parties as at December, 2008.
- 90.58% of the market was controlled by just four countries.
- South Africa had issued just 517,740 CER's or 0.23% of the total.

**Table 1. Certified Emission Reductions issued by host party**

Number	Country	CER's	%
1	China	92 075 815	40.19%
2	India	53 984 428	23.57%
3	Republic of Korea	33 799 597	14.75%
4	Brazil	27 631 766	12.06%
5	Mexico	5 037 242	2.20%
6	Viet Nam	4 486 500	1.96%
7	Chile	2 868 874	1.25%
8	Egypt	2 368 833	1.03%
9	Thailand	815 224	0.36%
10	Bolivia	725 875	0.32%
11	Malaysia	648 718	0.28%
12	Guatemala	644 387	0.28%
13	South African	517 740	0.23%
	Others	3 472 701	1.52%

*Source: UNFCCC, (2008)*

As can be seen by the size of the market, the CDM has been a successful initiative but it also has some shortcomings which are important to note. The key criticisms levelled against it are:

- Lack of transparency
- Inadequate governance structures
- Cumbersome procedures
- Little contribution to sustainable development
- Inequitable geographical distribution of projects
- Limited ability to reduce GHG emissions in certain sectors

These and other issues have been noted and are being considered by the Executive Board of the Kyoto Protocol and the Ad-hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP).

The CDM market is driven by regulatory compliance requirements on countries and large companies in developed countries that have greenhouse gas reduction targets under the Kyoto Protocol. In addition to the CDM market there is also an emerging parallel market in voluntary emission reductions. This market is also of relevance to the CoJ, largely due to easier compliance requirements and is discussed later in the report.

## 2 CoJ Strategic Objectives

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The broad goal of the Environment Management Department is to lead, facilitate and coordinate the implementation of all environmental issues including air quality management and climate change projects within the municipality. Strategic objectives in support of this include the development and implementation of a Climate Change Action Plan which will incorporate both mitigation and adaptation strategies.

Within this broad framework it is proposed that specific goals and objectives with regards to carbon finance are established by the CoJ to guide their work. A set of such goals and objectives are proposed below. Final adoption of these would be subject to consideration by the Environment Management Department of the CoJ in light of the department's current strategic goals. Some possible targets are also proposed for the CoJ. Again, these would need to be considered by the department within the context of the business plan and available resources before being adopted or modified.

### Proposed Goals:

- To effectively use carbon finance to support service delivery and other core municipal functions
- To effectively use carbon finance to improve energy efficiency and to reduce the greenhouse gas footprint of the City of Johannesburg
- To unlock opportunities for greenhouse gas mitigation that would not have been possible without carbon finance

### Proposed Strategic Objectives:

- To develop adequate capacity within the Environmental Management Department and the CoJ as a whole to access carbon finance
- To capitalise on low cost and low complexity carbon finance opportunities in the short term
- To identify strategic carbon finance opportunities in the medium term
- To use carbon finance projects for awareness raising around climate change and energy efficiency within the CoJ
- To use carbon finance projects for the promotion and marketing of the CoJ as a sustainable world class African city.

### Proposed Targets

- Five carbon finance projects at development stage by 2010. At least one project to be in each of the following categories:
  - Energy efficiency (examples: building retrofitting, solar water heating)
  - Greenhouse gas reduction (example: wastewater methane capture)
  - Poverty relief and service delivery (examples: solar water heating, Bus Rapid Transit, CFLs)

## 3 Legal Requirements for Carbon Finance Projects

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The question of municipal legal competence must be considered in order to determine the CoJ's general legal capacity to carry out CDM projects.<sup>1</sup> The question of legal competence may come under particular scrutiny at certain stages which may arise during a project; for example, if the City wishes to borrow money to fund a CDM project or when credits are being sold from a project. At such points the external party, be it a lender or purchaser, would require confirmation that the project falls within the legal competence of the City as the counterparty to the transaction.

### 3.1 Municipal powers and functions

The powers and functions conferred on local government are the matters listed in Part B of Schedule 4 and Part B of Schedule 5 of the Constitution and any other matter assigned to it by national or provincial legislation. In addition, a municipality may exercise "any power concerning a matter reasonably necessary for, or incidental to, the effective performance of its functions".

Municipalities are under a constitutional and legislative duty to promote a safe and healthy environment. There are three major sources of this obligation: section 151 of the Constitution,<sup>2</sup> various provisions in the Municipal Systems Act<sup>3</sup> and various provisions in environmental legislation.<sup>4</sup>

Although neither the Constitution nor the Municipal Systems Act expressly authorizes municipalities to undertake carbon finance projects, such projects can be considered reasonably incidental to the effective performance of their functions and therefore in compliance with municipality's constitutional mandate.

The applicability and strength of this argument will partly depend on the particular project envisaged. Carbon finance projects based on a municipality's existing functions are more likely to fall within the municipality's competence, while projects which are remote from anything the municipality currently does may fall outside its legal competence. For example, projects based on landfill gas from the CoJ's solid waste disposal site or on biomass (sewage sludge) from its wastewater treatment works are reasonably incidental to the municipality's effective performance of its existing functions relating to solid waste or its sewage disposal.

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<sup>1</sup> Section 156 of the Constitution, read with Part B of Schedules 4 and 5, confers particular powers and functions on the local sphere of government. Section 41 of the Constitution prohibits the three spheres of government and the organs of state within each sphere from assuming powers and functions other than those conferred on them by the Constitution. The empowerment of local government in regard to particular functional areas, on the one hand, and the prohibition on municipalities' functioning outside those areas, on the other hand, is repeated in the local government-specific legislation. For example, section 164(1)(a)(i) of the MFMA forbids municipalities from conducting *"any commercial activities otherwise than in the exercise of the powers and functions assigned to [them] in terms of the Constitution or ... legislation"*.

<sup>2</sup> Section 151(1)(d) provides that one of the objects of local government is to *"promote a safe and healthy environment"*. In addition, municipalities are bound by the Bill of Rights, including the environmental right enshrined in section 24 of the Constitution.

<sup>3</sup> In terms of section 4(2), the council of a municipality has the duty to *"strive to ensure that municipal services are provided to the local community in a financially and environmentally sustainable way"* and to *"promote a safe and healthy environment in the municipality"*. See also sections 11(3)(l) and 73(2)(d).

<sup>4</sup> See in particular section 2 of the National Environmental Management Act, Act 107 of 1998. Section 2 prescribes national environmental management principles which apply to the actions of all organs of state potentially having a significant effect on the environment.

However, a project financed by carbon credits entailing the generation of electricity from wind would probably not fall within the municipality's competence as municipalities are not responsible for power generation.

The fact that CDM and other carbon finance projects assist municipalities in meeting their obligations to promote a safe and healthy environment supports the argument that generally such projects are incidental to the effective performance by municipalities of their functions.

### **3.1.1 Section 78 of the Municipal Systems Act**

Section 78 of the Municipal Systems Act prescribes the process which a municipality must follow, in certain circumstances, before deciding through what institutional mechanism to provide municipal services.<sup>5</sup> Whether section 78 must be complied with in a carbon finance project will largely depend on whether the project, or components of the project, constitutes a municipal service.

For example, in relation to a landfill gas CDM project, none of the activities which could arise as part of the CDM project, such as the flaring of gas, the collection and sale of gas, and the use of gas for electricity generation, constitutes a municipal service as contemplated in the Municipal Systems Act and hence Section 78 does not apply. By contrast, a municipality requiring a new landfill site would probably need to comply with section 78 before determining whether to build and operate the site itself, whether to outsource it, and so on, as solid waste disposal is a municipal service. Therefore, the carbon finance element of a project does not affect whether the CoJ needs to consider section 78 procedures. It is only the issue of whether a new municipal service is being provided within a carbon finance project that will influence this decision.

## **3.2 Procurement and Supply Chain Management Provisions**

Municipal procurement and supply chain management are regulated primarily by Part 1 of Chapter 11 of the MFMA and by the Supply Chain Management (SCM) Regulations published in terms of the MFMA. In addition, each municipality is obliged to have its own supply chain management policy (the SCM Regulations are fairly prescriptive as to what a municipality's policy must contain). The four categories of transaction which trigger an obligation on a municipality to comply with the supply chain management regulations are when the municipality:

- procures goods and services;
- disposes of goods no longer needed;
- appoints contractors in relation to the provision of municipal services other than in circumstances where Chapter 8 of the Municipal Systems Act applies; and
- appoints external mechanisms as service providers of municipal services in circumstances where Chapter 8 of the Municipal Systems Act applies.

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<sup>5</sup> "Municipal service" is defined in section 1 of the Systems Act as "a service that a municipality in terms of its powers and functions provides or may provide to or for the benefit of the local community irrespective of whether –

such a service is provided, or to be provided, by the municipality through an internal mechanism contemplated in section 76 or by engaging an external mechanism contemplated in section 76;  
fees, charges or tariffs are levied in respect of such a service or not".

Each municipality is obliged to have a supply chain management policy. The CoJ's Supply Chain Management Policy was adopted by the City in 2006.

There are various stages in the life cycle of carbon finance projects when procurement issues need to be taken into account as the project will involve, first, the acquisition of goods and services and, secondly, sales or disposals.

Likely examples of acquisitions and disposals are described below:

- Any appointment of a private sector entity in terms of an agreement to provide a service necessary for the project, for example the installation, commissioning, operation and management of the flaring project is subject to the supply chain management legislation. A simple purchase of, for example, flaring equipment would also be subject to the legislation.
- There may be appointments which are not part of the carbon project itself, but which are ancillary to that project, which are subject to the supply chain management legislation (for example, the appointment by the municipality of an environmental consultant to carry out the EIA process).
- The sale of carbon credits as well as other products of the project, such as landfill gas or energy, may constitute disposals of goods and may therefore be subject to the supply chain management legislation (see section 3.3 below).

With regard to the acquisition of goods and services, the City's supply chain management policy distinguishes between different levels of procurement on the basis of value. High-value procurements are subject to a more complex and stringent set of procedures than are low-value procurements. These appointments do not differ in any material way from the normal process of appointments that the CoJ would carry out on a typical project that was not financed by the sales of carbon credits.

### **3.3 Legal Requirements when Selling Carbon Credits**

The supply chain management legislation referred to above places municipalities under some obligations in regard to the disposal or letting of assets. However, disposals are regulated to a lesser extent than are procurements. In terms of the regulations, municipalities are required to sell movable assets by way of written price quotations, a competitive bidding process, auction or at market related prices, whichever method is most advantageous to the municipality. There is no specific obligation on the municipality to follow a competitive bidding process when making a disposal, even where the sale price of the goods is anticipated to be high; the obligation is to select the method which is most advantageous to the municipality.

It is suggested that none of the disposals which are likely to take place as part of the carbon finance project constitutes the kind of disposal governed by the supply chain management legislation. The supply chain management legislation applies to the disposal of "*goods no longer needed*". That phrase suggests that the legislation was designed with tangible assets which were once useful but are no longer needed – such as office furniture, computers, motor vehicles – in mind. The primary disposal (sale) from a carbon finance project will be carbon credits themselves. Other by-products, such as energy, bio-gas, compost or similar, may also need to be sold by the municipality. To suggest that those sales are disposals of "goods no longer needed" would be artificial.

#### ***The MFMA and Municipal Asset Transfer Regulations***

Section 14 and section 90 of the MFMA regulates the disposal of *capital assets* by municipalities and municipal entities. These provisions are further enhanced by the Municipal

Asset Transfer Regulations, 2008. The MFMA Act prohibits the disposal by municipalities of capital assets "needed to provide the minimum level of basic municipal services". It permits the disposal of other kinds of capital assets, but only after the council, in a public meeting, has decided on reasonable grounds that the relevant assets are not needed to provide the minimum level of basic municipal services and has considered the value of the assets and what is to be received in consideration for the assets.

It is submitted that none of the likely disposals in respect of carbon finance projects – such as carbon credits themselves, gas, electricity/energy and others – constitutes capital assets as contemplated in section 14. Although the term "capital asset" is not defined, the term generally refers to assets which are productive – in other words which are used to generate or produce other assets. A municipality's capital assets would include those assets which it needs to fulfil its functions as a municipality, for example the land and buildings, equipment and infrastructure used to deliver municipal services.

For example, while a landfill site would constitute a capital asset of the municipality, we are satisfied that gas extracted from a landfill site, electricity generated from that gas and carbon credits earned from the flaring of that gas do not constitute capital assets of the CoJ. Similar logic would apply to other projects. In our view there is therefore no obligation for the CoJ to comply with the procedures set out in section 14 and section 90 of the MFMA and the Municipal Asset Transfer Regulations, 2008 before disposing of carbon credits, gas or electricity.

### ***Recommendation***

Although the sale of carbon credits is not legally covered by the supply chain management regulations nor the asset transfer regulations it is recommended that the CoJ treat the disposals as if they are governed by this legislation – in other words, that the provisions relating to disposals be complied with. As an organ of state, the City is bound in any event to act in a way which is administratively fair; whatever method of disposal is used must therefore satisfy the requirements of administrative fairness.

It is therefore recommended that a publicly advertised competitive bid process is the most appropriate way of securing good prices and contractual conditions for the sale of carbon credits. Designing a process which complies with the supply chain management legislation will not add much complexity to the process.

The City's procurement policy provides the following with regard to the disposal of assets owned by the City and any sale of carbon credits should meet the principles of these requirements and be within spirit of the policy:

- The process of asset disposal should be transparent, equitable and fair;
- All asset disposal transactions should be through a public tender or public auction;
- The appointment of auctioneers should be through competitive bidding;
- Prior to the disposal of assets, reasonable efforts must be made to ensure that no other organ of state may have use of the items;
- Appropriate channels must be followed for disposing assets through donation mechanism.

### **3.4 Other MFMA considerations**

There are some other requirements arising from the MFMA that the CoJ needs to be aware of. These requirements do not pose any major obstacles to the development of a carbon finance project but do need to be complied with were relevant.

### **3.4.1 Section 33 of the MFMA: contracts with long term budgetary implications**

Municipalities may enter into contracts which will impose financial obligations on them beyond the three years covered in an annual budget only if they have first followed the procedure prescribed in section 33 of the MFMA. These financial obligations include contingent liabilities. There are a number of agreements potentially arising from the CDM project which could be subject to section 33. The procedure prescribed in section 33 is outlined below.

- At least sixty days before the council meeting at which the contract is to be approved, the municipal manager must:
  - make public the draft contract, together with an information statement summarizing the municipality's obligations under the contract;
  - invite comments and representations on the contract from the local community and other interested persons;
  - solicit the views and recommendations of the National Treasury, the provincial treasury and the Department of Provincial and Local Government.
- The council must, before making its decision, take into account:
  - the municipality's projected financial obligations under the contract for each financial year covered by the contract;
  - the impact which those obligations will have on future tariffs and revenues;
  - any comments and representations received from the local community and other interested persons;
  - any written views and recommendations received from the National Treasury, the provincial treasury and the Department of Provincial and Local Government.
- The council must, before entering into the contract, adopt a resolution in which it:
  - determines that it will secure a significant capital investment from the contract, or that it will derive a significant economic or financial benefit from the contract;
  - approves the contract in precisely the form in which it will be signed;
  - authorises the municipal manager to sign the contract on behalf of the municipality.

There are a number of agreements potentially arising from a carbon finance project which could be subject to section 33. For example, a public private partnership agreement which imposes financial obligations (for example a contingent obligation to make penalty payments in the event of a breach of the contract) on the municipality would constitute such an agreement. An operations or management agreement relating to a CDM project, in which the CoJ pays a private contractor an operating or management fee, would also be governed by section 33 if the term of the agreement exceeds three years, as would a carbon sale agreement with a term longer than three years.

The CoJ needs to take due account of the section 33 requirements and follow the prescribed procedure. Although somewhat cumbersome this process can typically be followed in parallel with other components of the project.

### **3.4.2 MFMA provisions relating to expenditure, borrowings and forex risk**

There are some further provisions in the MFMA which may arise in connection with a carbon finance project – for example in relation to the funding of a project or the conclusion of an emissions reduction purchase agreement.

#### ***Expenditure and borrowings***

In terms of section 18(1) of the MFMA, municipalities may not borrow in order to fund operating expenditure. Borrowings may be used to fund a municipality's capital budget only. If a municipality does not itself have the funds with which to fund the operating expenditure of a carbon finance project, this provision will constrain how the municipality structures the project.

In terms of section 19 of the MFMA, a municipality may spend on a capital project only if:

- the necessary money (excluding the cost of feasibility studies) has been appropriated in the municipality's capital budget;
- the project and the cost of the project have been approved by the council;
- section 33 of the MFMA has been complied with if it applies;
- the funding is available and has not been committed elsewhere.

If the municipality is to incur borrowings or to provide security in connection with the project, the provisions of Chapter 6 of the MFMA must be complied with.

#### ***Foreign Exchange Exposure***

In terms of section 47 of the MFMA, a municipality may incur debt only if the debt is denominated in South African rand. The debt may not be indexed to or affected by currency fluctuations. Debt is defined as including contingent liabilities. If, for example, a municipality's emission reduction purchase agreement for the sale of the carbon credits places an obligation on the municipality to pay a penalty if it fails to deliver carbon credits, then the amount of the penalty must be stipulated in South African rand.

In terms of section 163 of the MFMA, a municipality may not incur a liability or risk payable in a foreign currency. Exceptions are made for the case of debt (which is separately regulated under section 47) and for the procurement of goods or services which are denominated in a foreign currency, provided that the rand value is determined at the time of procurement or, if that is not possible and risk is low, at the time of payment. This provision will need to be borne in mind if, for example, the municipality purchases equipment for the carbon finance project (for example gas turbines or flaring equipment) from a supplier in another country.

## **4 Institutional Options for Project Implementation**

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A range of legal, institutional and regulatory factors need to be taken into account by the CoJ when making decisions on how to implement carbon finance projects. These include: who will implement the project; what funds will be used; what financial risks can be taken; and what regulatory requirements need to be addressed. Experience of South African municipalities over the last few years has shown that it is often the institutional questions which have most hampered and delayed CDM project development.

There are various institutional arrangements through which a municipality can undertake a CDM project. This section of the report briefly outlines three possible institutional structures for use by the City. These are public public partnerships, public private partnerships, or internal ownership of the project. The latter option can be further divided into whether the CoJ itself owns and manages the project or whether the project is owned and managed by one of the City's utilities, agencies or corporatised entities – this issue is discussed further below.

## **4.1 External Partnerships**

The City can partner with either private or public entities to develop and implement the project. The main reasons for the CoJ considering joining with external partners in the development of a carbon finance project are that:

- Technical or management capacity may not exist within the CoJ to develop and operate the project
- The CoJ may not wish to take on the risk associated with the project and would like to transfer all or some of this risk to an external partner.

In both cases the CoJ would want to retain some control over municipal assets used for the project. There are two types of external partnership arrangements that are likely to be worth consideration by the CoJ in implementing carbon finance projects. These are public private partnerships (PPPs) and public public partnerships (commonly called PUPs).

According to the National Treasury a public private partnership is a contract between a municipality and a private party, in which the private party assumes substantial financial, technical and operational risk in the design, financing, building and operation of a project.

### **4.1.1 Partnering with a Private Sector Entity**

The CoJ may select to partner with a private sector entity in the delivery of a carbon finance project. The Municipal Public Private Partnership Regulations defines a Public-private partnership as a commercial transaction between a municipality and a private party in terms of which the private party:

- a. Performs a municipal function for or on behalf of a municipality,
- b. Acquires the use of state/municipal property for its own commercial gain

The latter type is more likely to occur with respect to carbon finance projects.

Further, under a PPP the private partner:

- a. Assumes substantial financial, technical and operational risks in connection with the performance of the municipal function, the management or use of the municipal property; or both
- b. Receives a benefit from performing the municipal function, or from using the municipal property or both, by:
  - a. the municipality paying the private party for the delivery of the service, or
  - b. the private party collecting fees or charges from users of the service, or
  - c. a combination of these

In the case of a the private party using municipal property to generate revenue, such as carbon credits, the private party would also typically pay the municipality for this use. The payment could be in the form of a royalty or lease payment or similar.

PPPs for municipal institutions are governed by Chapter 8 of the Municipal Systems Act and chapter 11 of the MFMA which addresses supply chain management (in part 1) and PPPs (in part 2) as well as the Municipal Public-Private Partnership Regulations, which address the PPP provisions in both the MSA and the MFMA, and other matters in the MFMA related to the procurement of multi-year PPP agreements.

The Municipal Public-Private Partnership Regulations set out distinct phases to the PPP project cycle, these are:

- The Inception Phase which focuses on the identification of the project;
- A feasibility study which will focus on a needs analysis and the appropriate service delivery options and recommendations
- The procurement process which will involve procuring the services of a suitable service provider. This process must be done through a competitive bidding procedure;
- The management of the PPP contract by the municipality

The Municipal PPP Regulations require that the municipality solicit the views and recommendations of the National Treasury and the relevant provincial treasury before they publicly invite bids and prior to the execution of any PPP agreement. Whatever the PPP type, structure, payment mechanism, or sources of funding, all municipal PPPs governed by the Municipal Public-Private Partnership Regulations are subjected to three strict tests:

- Can the municipality afford the deal?
- Is it a value-for-money solution?
- Is substantial technical, operational and financial risk transferred to the private party?

In practical terms:

- the project would be registered in the name of the private entity
- credits will accrue to the private entity
- the private entity will fund the project
- the private entity will identify, procure and pay for any specialist advice needed; and
- the municipality would be paid a fixed fee, a royalty or a revenue- or profit-linked fee for giving the project rights to the private party.

### *Financing*

The Municipal Public-Private Partnership Regulations are not prescriptive about the financing structure of a PPP as these tend to vary from project to project and sector to sector, and will be closely linked to the funding sources that can be secured for each deal. However, in most PPPs the private party raises both debt and equity to capitalise the project. This is called "project financing". In smaller municipal PPPs, the private sector often obtains any required funding on the strength of its balance sheet, which is called "corporate financing."

### *Contract Management*

Under a PPP arrangement, as with the public public partnership discussed below, the CoJ will transfer risk to the private entity and will also transfer an appropriate share of the benefits. This option therefore exposes the municipality to the risk that they will not receive an appropriate share of the project benefits. To ensure a fair distribution of benefits the municipality will need to undertake close supervision of the contract between it and the private entity which outlines the relative responsibilities and rewards of the parties. Due to

the complexity and scale of some of these contracts the municipality may need to secure the services of specialist advisors to assist it in the contract management of the project and will need to procure such services in accordance with ordinary supply chain management requirements.

#### **4.1.2 Partnering with a Public Sector Entity**

Under a Public-Public partnership (commonly referred to as a PUP), the CoJ can enter into a partnership with another public sector institution or public organisation, where neither partner seeks financial profit. If the CoJ were to undertake a Public Public Partnership it would not need to follow the competitive bidding process as set out in sections 83 and 84 of the Municipal Systems Act but would need to develop a mechanism to consult with the community about the proposed partnership.

In practical terms the management and financial arrangements with a PUP would be very similar to those under a PPP. As with the PPP case the municipality will transfer an appropriate share of both risks and benefits to the public partner under the arrangement. Although the public partner may not be solely motivated by profit, similar risks of not receiving an appropriate share of the project benefits arises as with a PPP and therefore the same monitoring mechanisms will need to be put in place.

An example of a possible PUP partner is the Central Energy Fund (CEF (Proprietary) Limited), a national public entity which falls under the Department of Minerals and Energy, which is developing several landfill gas CDM projects around South Africa. The CEF is currently promoting this option amongst municipalities but there could be other public sector entities, such as Eskom, that could conceivably want to partner with municipalities on other carbon finance projects.

### **4.2 Internal Project Ownership**

Probably the simplest, option is that the City undertakes the carbon finance project itself, and does so through an existing department in its administration (for example, the solid waste department could undertake a landfill gas CDM project). The project would be registered in the name of the CoJ. Any credits generated by the project will be the property of the municipality, who will conclude an emissions reduction purchase agreement to sell those credits<sup>6</sup>. The municipality will be responsible for funding the costs of the project.

The municipality will almost inevitably need to secure the services of specialist advisors to assist it in implementing the project, for example consultants with CDM expertise and environmental consultants. The municipality will need to procure such services in accordance with its ordinary supply chain management requirements.

Because of the way that the CoJ is structured there are two possibilities that arise when the City embarks on a carbon finance project:

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<sup>6</sup> An Emissions Reduction Purchase Agreement (or ERPA) is the contract signed between the owner of a CDM project and the purchaser of the carbon credits accruing from the project. This is discussed in further detail below.

- The first is that the project is identified within the City itself, in which case, the City would undertake the project through an existing department in its administration. The project will be registered in the name of the CoJ. Any credits generated by the project will be the property of the municipality
- The second is that a CDM project is identified by one of the agencies and corporatised entities that have been created by the City and is implemented by that entity.

The relationship between the CoJ and the city's agencies, also referred to as the Municipal Owned Entities, with regards to carbon finance project implementation is elaborated on in section 5.1 below.

### **4.3 Supply Chain Management Burden**

The need for compliance with supply chain management requirements is likely to arise at several stages of a carbon finance project. If the CoJ structures the project as an in-house project, all the appointments and purchases must comply with the City's supply chain management requirements.

If an existing or new municipal entity or municipal owned entity undertakes the CDM project, then the municipal entity will need to comply with the supply chain management requirements when making the appointments and purchases described above.

If the CoJ implements a public private partnerships for the project, it needs to make the PPP appointment in accordance with the supply chain management requirements. Once that appointment has been made, however, the supply chain management burden for the municipality is lighter, as procurements necessary for the project (the purchase of equipment, the appointment of EIA consultants, and so on) are then done by the private party – the municipality has no role in those.

If the CoJ appoints a public sector entity to undertake the project, the supply chain management burden may be lighter, as the municipality does not have to follow a competitive process or the full PPP regulations when making that appointment. Subsequent appointments under the public public partnership are then also simpler to implement.

Under both the PPP or the PUP arrangements the municipality may still need CDM and/or financial and legal advisers of its own to advise it on negotiations with the public sector entity, and such advisers will need to be appointed in accordance with the supply chain management requirements.

The table on the subsequent pages summarises the advantages and disadvantages of the above arrangements and presents the various implications for the CoJ.

**Table 2: Summary table of institutional arrangements for CDM projects**

	<b>Advantages</b>	<b>Disadvantages</b>	<b>Examples</b>
<b>CoJ or Municipal Owner Entities (MOEs)</b>	<ul style="list-style-type: none"> <li>▪ No new structure needed – an existing department can run the project</li> <li>▪ If project is financially successful, municipality derives full benefit</li> <li>▪ Project can be well integrated with ongoing municipal operations</li> <li>▪ If undertaken within a MOE the CDM project is operationally and financially ring-fenced from the rest of the administration</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sometimes no obvious "home" for project (falls between environmental dept, solid waste dept, etc)</li> <li>▪ Can strain existing internal resources and skills and distract resources from core business</li> <li>▪ Internal project champion needed, with enough time and knowledge to drive the project</li> <li>▪ Municipality funds full cost of project either directly or through MOE</li> <li>▪ Municipality carries full risk of project</li> <li>▪ Time and cost of procurement. If the CoJ moves slowly there are real losses of potential carbon revenue which can jeopardise the project</li> <li>▪ Compliance with supply chain management requirements is required</li> <li>▪ The MOE must comply with both local government legislation and with the Companies Act</li> </ul>	<ul style="list-style-type: none"> <li>▪ The reduction of electricity distribution losses through an upgrade of distribution lines or introduction of a rigorous maintenance schedule. (The "in-house" option appears to be the most appropriate option for this project as it is part of core MOE operations.)</li> <li>▪ Improving the energy efficiency of municipal buildings through the installation of ceiling insulation and the use of CFLs.</li> </ul>
<b>Outsourcing to a public sector entity</b>	<ul style="list-style-type: none"> <li>▪ The municipality plays a minor role in developing implementing the project</li> <li>▪ Financing requirements are limited</li> <li>▪ Risk is limited</li> <li>▪ Municipal staff's energy is not diverted away from core business</li> <li>▪ Outsourcing to a public entity carries a relatively low supply chain management compliance burden</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited financial benefits accrue to the municipality</li> <li>▪ The municipality will be required to carry out careful regulation or monitoring of the project operation and finances to ensure that it is receiving fair value for the project as contracted.</li> <li>▪ The municipality may lose some control over some of its operations or assets if these are contractually bound for the use of the party to whom the project is outsourced</li> </ul>	<ul style="list-style-type: none"> <li>▪ A landfill gas project, in which the municipality grants the public entity the right to undertake the project using landfill gas from municipal sites and in return receives a fee or a share of the profit or revenue of the project</li> </ul>
<b>Outsourcing to a private sector entity</b>	<ul style="list-style-type: none"> <li>▪ The municipality plays a minor role in developing and implementing the project</li> <li>▪ Financing requirements are limited</li> <li>▪ Risk is limited</li> <li>▪ Municipal staff's energy is not diverted away from core business</li> </ul>	<ul style="list-style-type: none"> <li>▪ Time and cost of compliance with the PPP regulations</li> <li>▪ Limited financial benefits accrue to the municipality</li> <li>▪ The municipality will be required to carry out careful regulation or monitoring of the project operation and finances to ensure that it is receiving fair value for the project as contracted</li> <li>▪ The municipality may lose some control over some of its operations or assets if these are contractually bound for the use of the party to whom the project is outsourced</li> </ul>	<ul style="list-style-type: none"> <li>▪ A solar water heating programme in which the municipality contracts a CDM developer to develop the carbon revenue component of the project or to manage the entire project off the municipality's balance sheet</li> </ul>

## 5 Carbon Finance Management Within the CoJ

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As outlined above, if the CoJ implements a carbon finance project internally there are two possibilities that could arise: either the project is identified within the City, in which case, the City would undertake the project through an existing department in its administration, or the project is identified by one of the agencies and corporatised entities that have been created by the City and is implemented by that entity. These entities are referred to from here on as Municipal Owned Entities or MOEs.

Given the nature of the CoJ and its relationship to the MOEs the following questions arise:

- who would the contracting party be?
- who will fund the costs of the project?
- to whom will the credits and subsequent revenue generated by the project accrue?
- who in the CoJ should be responsible for the negotiation of carbon credits?

In order to answer these questions it is important to reflect on the current organisational status of the MOEs vis-à-vis that of the City. The CoJ is divided in to:

- The core administration of the City - within which there are functions such as environmental management that deliver services directly to consumers whilst there are other functions such as corporate services that deliver internal support services;
- 7 decentralised administrative regions; and
- 14 separate companies known as utilities, agencies and corporatised entities (collectively referred to as the MOEs).

### *The MOEs*

Based on the provisions of the Municipal Systems Act, the MOEs were established as autonomous companies in terms of the Companies Act. These companies have been established either as private companies or as section 21 companies. It appears that typically, those services which are provided to individuals have been ring fenced in to the private company structure whilst the services that are provided to the public at large have been ring fenced into the not-for-profit (section 21) company structure.

The City's *utilities* provide:

- water and sanitation (Joburg Water),
- electricity (City Power) and
- waste management services (Pikitup).

These three utilities are all companies that have been established by the CoJ. In most cases they own the infrastructure which they utilise to deliver services. They receive some funding from the City but receive most of the income through the fees that they generate for the services they provide.

The *agencies* created by the CoJ focus on:

- roads and storm-water (Johannesburg Roads Agency),
- parks and cemeteries (City Parks) and
- area-based economic development (Johannesburg Development Agency).

Entities such as the JRA and JDA are materially dependent on the City of Johannesburg for future funding. In the instance of these entities, the city ensures that it complies with all the necessary budgeted financial requirements.

The *corporatised entities* include:

- Johannesburg Zoo,
- Johannesburg Civic Theatre,
- Metrobus,
- Johannesburg Fresh Produce Market and
- Johannesburg Property Company

These entities were created to deliver specialised services and relate closely to their customers.

### *Oversight*

In order to ensure optimal management of the MOEs, the city established:

- a *contract management unit* to oversee the contractual obligations of the entities; and
- a *shareholder unit* which is responsible for the financial and investment performance of the MOEs and their corporate governance. The shareholder's unit ensures the representation of the City's interest as a shareholder in each of the municipal owned entities through ensuring sound corporate governance. The CoJ has established a corporate governance protocol, in line with the King Two Code of Corporate Governance to guide the MOEs.

Overall responsibility for each of the MOEs rests with its board of directors, including executive and non-executive directors. A managing director is charged with day-to-day operational responsibility. The board and managing director are responsible for developing a business plan that specifies service, revenue, service standards, customer care improvement, safety standards, environmental protection, social and economic development and new income ideas.

The CoJ has entered into a service delivery agreement (SDA) with each of the MOEs to operate specific municipal services in the city. The City retains the responsibility as shareholder of each of the MOEs and will:

- receive dividends in the case of utilities or
- provide subsidies in the case of agencies and certain corporatised entities.

The City also "regulates" the service in terms of financial issues such as tariffs and capital expenditure, human resource issues such as skills development, delivery targets in terms of maintenance of assets and addressing backlogs and standards for customer care.

The CoJ exercises oversight on all its MOEs through the Office of the City Manager in accordance with, inter alia, the MFMA, the Municipal Systems Act, the Articles of

Association of each of the Municipal Entities, the Service Delivery Agreements between the City and each of the Municipal Entities as well as the Corporate Governance Protocol for Municipal Entities.

The Service Delivery Agreements governing the relationships between the City and each of the MOEs requires that the entities submit to the City four quarterly reports and hold four quarterly meetings. The City is able to monitor the performance of the entities through these reports and meetings and provide support, guidance and assistance where necessary.

#### *Financial Statements*

In accordance with the circulars issued by National Treasury, the annual financial statements of the MOEs are consolidated into the City's Annual Financial Statements. In addition, National Treasury requires that municipal entities submit monthly reports.

In the event of a surplus the funds are retained on the books of the MOEs so that they can create their own revenue thereby ensuring their financial sustainability.

#### *Procurement of Capital Assets*

All capital projects undertaken by the MOEs needs to first have the City's approval. This typically requires the approval of the Finance Department of the City.

#### *Ownership of Assets*

We understand that Pikitup, Joburg Water, the Fresh Produce Market and City Power own their own assets (although some of the assets of Pikitup may still be owned by the City itself), whilst the remaining MOEs utilise assets that are owned by the City.

To date the CDM projects under consideration by the City have been identified by both the MOEs and the Department of Environmental Management (DEM) at the CoJ and the department has provided support to the MOEs in developing the carbon finance components of the projects.

## **5.1 Institutional Arrangements**

Based on the above description the following can be assumed:

- The MOEs, as the implementation arms of the CoJ, are in a good position to identify potential greenhouse gas reduction projects
- The MOEs are similarly in the best position to implement greenhouse gas reduction projects that fall within their sphere of operations
- There is the potential for multiple carbon finance projects within the City as a whole but each MOE is likely to be only responsible for a small sub-set of the total project
- The Department of Environmental Management (DEM), as a planning unit within the CoJ, has an oversight role in respect of climate change and is therefore also in a good position to identify projects
- The DEPM is in a good position to develop capacity that can be shared between the MOEs on components of the carbon finance project cycle that each MOE will only have to manage infrequently

On the basis of the above assumptions an institutional and operational structure is proposed that centralises the required carbon finance management capacity that can

be shared but utilises the operational expertise of the MOEs in project identification and implementation. The proposed approach is as follows:

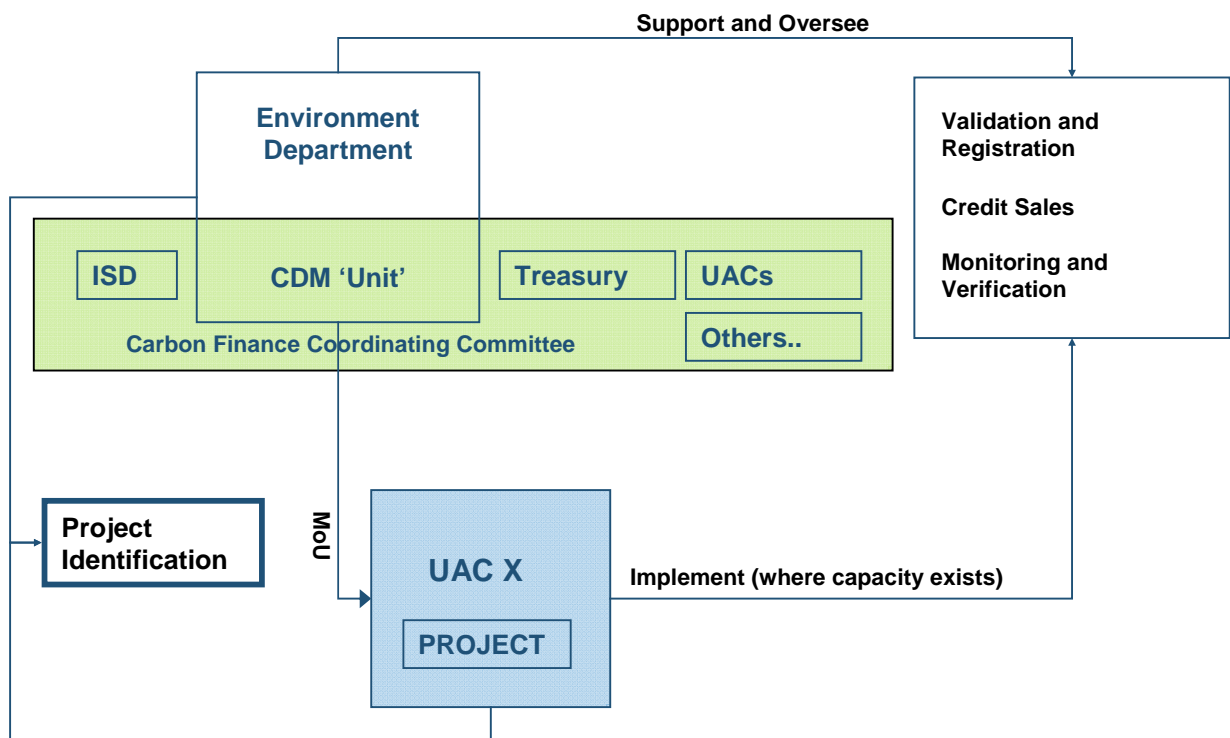
1. The Department of Environmental Planning and Management establish a unit responsible for carbon finance projects within the CoJ.
2. The unit would work with the MOEs and other key CoJ departments to identify greenhouse gas reduction and carbon finance projects.
  - The unit would use the existing Climate Change Committee within the CoJ as the primary project identification forum
  - The unit would draw on the greenhouse gas inventory of the City and other processes to identify projects
3. The carbon finance unit would provide support to MOEs and other departments within the CoJ who have identified projects that have the potential of generating carbon credits.
4. The support would be focused on helping in the management of elements of the carbon finance cycle that are common to all carbon finance projects. These services would include carbon reduction evaluation, PIN preparation, PDD preparation (or the contracting of PDD preparation services), project validation and registration, project verification, and the sales of carbon credits.
  - In addition to general project support the role of the unit would include convening a project reference group per project inclusive of all key role players within the City such as Treasury, Legal and so forth to advise on the process on a project-by-project basis. This would be particularly required for large projects.
  - On large projects the unit and the MOE would enter into a simple memorandum of understanding that would determine their respective roles and responsibilities in the project development, project negotiations and carbon sales contracting process on a project-by-project basis

#### *Procurement Arrangements*

Within the context of these institutional arrangements it is proposed that the CoJ and the MOEs abide by existing supply chain management practises rather than establish new governance, procurement or asset disposal practises. There appears to be little reason to establish specific arrangements for CDM projects with the possible exception of carbon credit sales where some modifications are proposed in section 6 below.

The proposed institutional arrangements are shown in the diagram below.

Figure 2. Proposed Institutional Structure for Carbon Finance Management



## 6 Sales of Carbon Credits

The sale of carbon credits is a relatively complex process but should not be seen as a significant obstacle to carbon finance project development. As outlined above, there do not appear to be any major legal constraints on the sales of credits and those constraints that do exist can be addressed through either following the appropriate procedures in the supply chain management and other municipal finance legislation and by suitable contract terms in any carbon sales agreement.

Outside of legal consideration the CoJ needs to have a strategic approach to the following issues with regards to sales of carbon credits:

- How to sell credits to minimise transaction costs and maximise returns
- How to manage risk related to credit sales
- How to allocate the revenue from the sales of credits

These following issues are addressed in turn below

### 6.1 Process to Sell Credits

Typically carbon credits (from both voluntary market projects, VERs, and the CDM market, CERs) will be marketed to international purchasers. To secure the best price and contract conditions the CoJ should be able to procure bids from a range of carbon purchasers – including direct compliance buyers (such as large energy utilities), financial institutions and carbon funds, and Annex 1 governments.

This requires a relatively complex procurement process since the bids need to be advertised or marketed internationally to the correct potential buyers; bids need to be compared both on price and on proposed purchase conditions; and individual contracts need to be signed with buyers.

There are a range of reasons why this process should be centralised within the CoJ itself rather than undertaken separately by the MOEs as project implementers. These include:

- the diverse nature of the municipal entities that have been created by the City, with some entities being more independent than others
- the fact that the City as the Shareholder exercises financial oversight over the entities
- the City has a very good credit rating and is a more attractive finance counterparty to carbon credit sale contracts
- The City has a need to protect its public image and reputation
- Contracts/initiatives undertaken by the MOEs have to be approved by the Mayoral Committee
- The City has one balance sheet that includes its MOEs, even though they exist as separate legal entities
- The MOEs present their budgets to the City for approval. They do the same for *ad hoc* expenditure
- None of the MOEs borrow money, the City borrows for them
- It is likely that each MOE will not be involved in many projects and therefore there is little reason for them to invest in understanding the carbon sales process.

On the basis of these reasons it appears to be prudent for the CoJ to manage the sales of carbon credits on behalf of all carbon finance projects in the City. There is a possible exception, where credits are being sold by the partner in a PPP or PUP, but even under such circumstances it is recommended that the City retain the rights to review and approve any carbon sales agreement prior to signature by the PPP.

There are also a number of common elements related to the sales of credits, such as maintaining a list of potential purchasers; developing a standard carbon sales agreement (often referred to as an Emissions Reduction Purchase Agreement or ERPA); and financial management of revenue flows arising. This supports the need to centralise an understanding and management of such processes in a single area.

Both the DEPM and the CoJ Finance Department are potential candidates for managing the carbon sales process. The location of this function should be decided in discussions between these two departments – with the further option of this being handled always as an inter-departmental function. Where possible the CoJ should act as the counterparty or guarantor of CERs in order to secure the highest price possible

It is recognised that the MOE or department actually implementing the project will have an interest in the terms of the ERPA. For example, the agreement may have implications on the actual project implementation approach, the project timing, monitoring arrangements and so forth. Therefore a representative of the project implementer should be included in any contract negotiations.

## 6.2 Placing Carbon Credits on the Market

The transaction costs for each sale of carbon credits can be quite high – since it involves an international tender/bidding process, bidder evaluations and ERPA negotiations. Also, there are risks that the CoJ will not secure the best price for its credits since it has not reached the most appropriate purchasers.

As an alternative to selling credits from individual projects directly to purchasers the CoJ could place credits on the market through an existing broker. The broker would place all credits of various types (VERs and CERs) on behalf of the City in return for a brokerage commission. This approach would simplify the transaction for the city as only a single broker would need to be appointed and would give some confidence that a market related credit price would be obtained. On the other hand there would be some loss of flexibility and some revenue loss for the city.

In this context two options are proposed for consideration by the CoJ:

### *Option 1.*

The CoJ appoints a broker for a two year period to place all credits arising from small scale CER or VER projects registered during that period. Small scale would be defined as 15 000 tonnes of CO<sub>2</sub>e per year which is roughly equivalent of 15 000 MWh of energy reductions per year. The appointment of the broker would be done on an open tender basis in which the brokers would be asked to bid on level of commission, other costs, operating procedures and track record and competence.

### *Option 2.*

All credits from all projects would be sold by the CoJ in separate tender procedures per project. The management of such procedures could be outsourced to consultants if required. Again, under such an arrangement legal advice would be procured preferably for all projects but certainly for all projects above the small scale threshold.

## 6.3 Risk Management

Key risks related to carbon sales are that the ERPA binds the CoJ to deliveries of credits that it cannot meet. This would impose potentially significant liabilities on the City. Other risks include receiving below market prices for credits or accepting other contract terms that are onerous on the City. For example, limitations on other City or MOE activities (a hypothetical example of the latter is that a carbon sales agreement related to a landfill gas project may imply or specify that the CoJ could not also embark on a separate project to remove organic matter from the waste stream for recycling or composting purposes).

To manage these risks it is proposed that:

- An open and international bidding process is carried out for all carbon credit sales (either directly or via a broker as above). This process is less onerous than it sounds as there are various international websites and forums where it is relatively easy to place a suitable tender advertisement. It is also easy for the CoJ to establish and maintain a list of key carbon purchasers globally.

- A standard ERPA is established by the CoJ with standard contract terms and that this is adhered to as closely as possible for all sales of credits. There are “seller friendly” ERPAs available for consideration by the City in this regards.
- The Legal department of the CoJ reviews all ERPAs and is involved in ERPA negotiations where possible. Suitable external legal experts are appointed to review all large scale ERPAs and preferably all ERPAs in the early stages of the process.
- All sales of CERs or VERs by MOES or via PPPs or PUPs are approved by the City. This is implied in the management procedures suggested above.

In respect of the Utilities who are in the main financially self sustaining, there should be leeway for the Utilities to play an equal or greater role than the City in the negotiation and contracting processes involved in the CDM projects as the utilities would be furthering their initiatives in respect of identifying new income ideas and ensuring that they are financially self sustaining. Utilities would also be best placed to identify project risk issues (such as technology related issues) that may be pertinent in any contract negotiations.

#### *Emission Reduction Purchase Agreement*

As is evident from the discussion above the CoJ should ultimately not select carbon buyers solely based on the unit price per CER or VER offered. Other factors need to be taken into account, these primarily being:

- The Emission Reduction Purchase Agreement contract conditions
- The credibility and security of the purchaser

**With regards to the latter point, the CoJ needs to consider the so-called counter-party risk involved in the contract. This involves an assessment of the financial stability of the purchaser and their likelihood of defaulting on the deal.**

With regards to the ERPA there are many issues such guarantees on credit delivery, penalties, and enforcement clauses, which can turn an ERPA from an asset to a liability. Such contracts can undermine the usefulness of an ERPA to secure debt financing and put an entire project and the municipality at risk. Many carbon contracts are also missing elements common to other long term purchase agreements, such as price adjustment clauses and limitations on liabilities.

These items need to be carefully considered by the CoJ and it is recommended that for large sales contracts both commercial legal advice and advice from lawyers with carbon finance expertise is sought on the nature of the ERPA. A model agreement, the Certified Emission Reductions Sale and Purchase Agreement (CERSPA), has been developed which is a free, open-source contract template for buying and selling Certified Emission Reductions (CERs) generated under the CDM. This documents is a useful resource for the CoJ when developing carbon sales contracts under the CDM. The document can also provide guidance to VER credit sales. The CERSPA has been developed as a freestanding contract that reflects both the interests of CDM project developers and investors as well as those of CER buyers and is intended to be a starting point for negotiations and not a universally applicable contract for all circumstances. Details on it can be found at:

- <http://www.cerspa.org/>

## 6.4 Allocation of Carbon Revenue

As outlined above, the City will assist the MOEs in securing the capital funding necessary for CDM projects. With respect to carbon credit revenue it is proposed that:

1. Revenue is first ring-fenced to the *project* as required for the project financing. Typically the project will depend on such revenue for project finance purposes.
2. In the event that there are surplus (profits) from the carbon revenues then these are ring-fenced to the MOE account
3. Under exceptional circumstances exceptional profits can be accessed by the CoJ as dividends from the MOEs

## 6.5 The Carbon Market Post 2012

An important consideration for any carbon finance project is the length of time for which credits can be sold. Although a CDM project can be registered for up to 21 years the first commitment period of the Kyoto Protocol ends in end-2012 and there is no certainty that a project-based global carbon market will exist after that time. There are, however, strong indications of the continuation of the carbon market and the CDM until at least 2020. These include the fact that the EU emissions trading scheme has been extended, irrespective of what happens in the Kyoto Protocol discussions, until 2020 and the CDM remains integrated with that scheme. Similarly, the Australian carbon pollution reduction trading scheme runs until at least 2020 and has also allowed for the use of CDM credits.

A further measure of confidence in the market post-2012 is that there are already carbon purchasers willing to purchase credits, albeit at some discount to pre-2012 prices, for the period from 2013 onwards. This provides a very good indication of the confidence that these institutions have in the value of carbon credits go forwards. Such institutions include the German Development Bank, KfW, the World Bank, and institutional purchasers such as First Climate.

It is likely that when the CoJ negotiates any carbon sales agreements that there will be specified differences, possibly in both price and terms, for credits generated and sold after 2012.

Because the voluntary carbon market is not tied directly to the Kyoto Protocol there is possibly some greater measure of confidence in the existence of the voluntary market after 2012 in the same form as it is today. It may also be easier to contract for the sale of voluntary market credits for the period after 2012.

# **CARBON PROJECT OPERATIONAL GUIDELINE**

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*Guideline for the development and management of carbon finance projects in the City of Johannesburg*

## **1 Introduction and Objectives**

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The objectives of this guideline are to provide a standard process for the CoJ to follow when managing carbon finance projects. The guideline also provides tools to the CoJ for making decisions at certain points of the project cycle.

## **2 Carbon Finance Project Development Cycle**

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There is a standard project cycle for the development of Clean Development Mechanism projects. This project cycle follows the rules and procedures laid down by the Executive Board of the CDM. Most voluntary market carbon standards base their project cycle in large measure on that of the CDM and therefore the standard CDM project steps are used as the basis for the proposed project development process to be followed by the CoJ.

In addition to the CDM steps, certain steps that are not required by the CDM have been added. These include steps prior to the formal carbon project stage, i.e. project identification and initial project evaluation, and steps distinct from the formal carbon project requirements, i.e. the sales of carbon credits.

The proposed carbon finance project cycle is comprised of eight steps as follows:

1. Project identification and eligibility
2. Carbon assessment
3. Project Identification Note preparation
4. Project Design Document
5. Registration (Validation, Letter of Approval and Registration)
6. Sales of Carbon Credits
7. Monitoring
8. Verification, Certification and Issuance of credits.

Each of these steps will be discussed below in relation the CoJ's responsibilities.

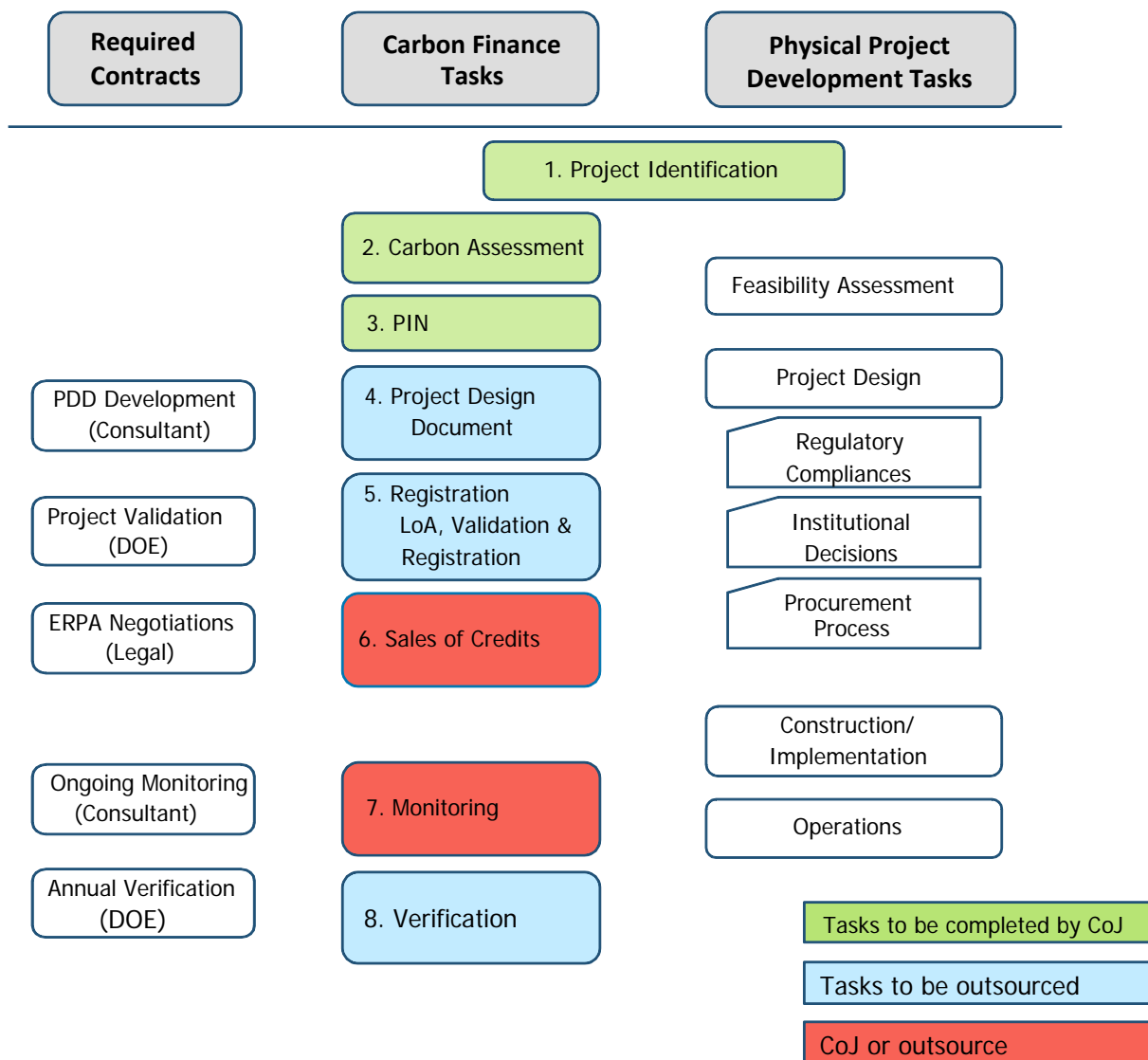
### *Relationship to conventional project development*

There are specific requirements for the development of carbon finance projects which ensure that the projects meet the international rules and procedures of the CDM or of the relevant voluntary carbon standard. These requirements will need to be addressed alongside the standard project development processes carried out by the CoJ for the project. These other project development processes, such as project engineering design and actual physical implementation of the project, are not addressed in this guideline. This guideline focuses specifically on the carbon asset creation components of the project. In other words, those actions necessary to ensure that the greenhouse

gas reductions that occur due to the project can be certified as carbon credits and hence can be turned into financial assets for the CoJ.

The figure below outlines the proposed CoJ carbon finance cycle. The middle column shows the specific carbon finance tasks. The right hand column shows at what point in the broader project development process these tasks will typically be carried out. The left hand column indicates where it is likely that external contracting may be required to support the CoJ in the project development process.

**Figure 3: Proposed standard CoJ carbon project cycle**



Although the focus of this guideline is on the carbon finance components it should be noted that there will be an interaction between the carbon asset creation and the physical project design and implementation that will need to be managed. For example, a CDM project may require specific monitoring equipment to meet the required CDM standards. This will affect the design specifications of the project as well as the project costs.

It should also be noted that some of the CDM processes in particular are complex and time consuming and can lead to delays in project implementation. This needs to be considered when establishing project time-frames. For example, there are specific requirements for public consultation at points in the CDM process. In most cases, however, physical project planning and implementation can proceed in parallel with the carbon finance components.

As can be seen from the diagram a carbon finance project does not end with the project commissioning. Since credits are generated during project operations there will be ongoing technical monitoring and verification requirements. There are also likely to be ongoing contract management requirements associated with the sale and transfer of CERs. The CoJ needs to ensure that there are sufficient systems and “institutional memory” to continue the successful management of the project which will typically be at least seven years in duration.

## 2.1 Project Identification and Eligibility

The first activity that has to happen is to *identify* suitable projects and to ascertain whether they meet the relevant carbon finance *eligibility* criteria. The question of which projects are eligible for carbon finance is discussed first, followed by a project identification process.

### 2.1.1 Project Eligibility

In broad terms the eligibility requirements for a CDM project are that the project should demonstrate real, measurable and long term greenhouse gas reductions. The meaning of these terms are:

- **Real:** the project actually reduces greenhouse gas emissions below the business as usual scenario
- **Measurable:** the emission reductions can be monitored and measured to a sufficient degree of accuracy and this monitoring can be verified by an outside agency
- **Long term:** the emission reductions will be permanent or very long term and are not simply deferring emissions to a later date

The application of the above three principles provides a good starting point to evaluate whether a project may be eligible for carbon finance. More specifically, the eligibility requirements for CDM projects are listed below (the requirements for voluntary market projects will differ in some ways and typically be less stringent). The CDM requirements are that:

- The Party hosting the project has met the participation requirements -
  - South Africa has met these requirements
- Stakeholders have been consulted with -

- Comments by local stakeholders must be invited, a summary of the comments received provided, and a report given to the designated operational entity on how due account was taken of any comments received
- The environmental impacts of the project have been considered -
  - Project participants must have submitted to the designated operational entity documentation on the analysis of the environmental impacts of the project activity, including trans-boundary impacts and, if those impacts are considered significant by the project participants or the host Party, have undertaken an environmental impact assessment in accordance with procedures as required by the host Party
- Emission reductions are additional -
  - The project activity is expected to result in a reduction in anthropogenic emissions by sources of greenhouse gases that are additional to any that would occur in the absence of the proposed project activity. This is discussed further below.
- Baseline and monitoring methodologies comply with requirements -
  - The baseline and monitoring methodologies used in the project must comply with requirements pertaining to methodologies previously approved by the Executive Board of the CDM or the procedures for establishing new project methodologies. Provisions for monitoring, verification and reporting are in accordance with the procedures of the CDM
- The project complies with all other relevant requirements -
  - The project must meet any other procedural requirements laid down by the CDM Executive Board.

In addition, typically projects will need to demonstrate that they contribute to **sustainable development**. The contribution to sustainable development is a requirement that is evaluated domestically by the Designated National Authority for the CDM following their own sustainable development criteria<sup>7</sup>. The sustainability test is not a specific quantification of project impact but will require satisfying the DNA that the project does not cause environmental harm and that the project, particularly if it has significant revenue benefits, will have beneficial local socio-economic and environmental impacts. For some voluntary market projects, such as those under the Gold Standard, there will be additional or stronger criteria around sustainable development impacts that will have to be addressed as well.

#### *Real Emission Reductions and the Additionality Test*

The way in which emissions are identified as being 'real' are whether they would have occurred anyway in the absence of the carbon finance element of the project. This is conventionally referred to as the additionality test. If a project would happen anyway, even in the absence of the CDM or other carbon revenue, then the argument is that the emission reductions due to the carbon revenue are not additional and the project is unlikely to qualify for carbon revenue. The stringency of the additionality test does

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<sup>7</sup> See: [www.dme.gov.za/dna/dna\\_documents1.stm](http://www.dme.gov.za/dna/dna_documents1.stm)

differ between the CDM and the voluntary market and this is discussed further on in the guidelines.

The CDM 'additionality' framework consists of four steps:

- **Identification of alternatives:** if no credible alternatives exist, including the business as usual or do nothing scenario, then the project can't be additional
- **Investment analysis:** are the alternatives financially more attractive? If yes then the project is additional as rational investors will choose the more financially attractive option
- **Barrier analysis:** are there any barriers that offsets could help resolve? For example technical skills that are not readily available locally
- **Common practice analysis:** what actions do project participants take in the absence of carbon offsets? For example, if all building owners in the CoJ were already migrating to CFL bulbs then an incandescent to CFL replacement project may not qualify as additional

#### *Prior consideration of the CDM*

In support of the additionality test above the rules of the CDM require project developers to demonstrate that the CDM project is not the business-as-usual course of action. For example, if a municipality was implementing a public transport project, such as the Gautrain in any event, it is unlikely that the CDM Executive Board would accept an argument which stated that the Gautrain would not go ahead in the absence of its registration as a CDM project. The Gautrain is therefore not eligible and any greenhouse gas reductions due to decreased private car use cannot be claimed as CERs by the project.

A component of proving that the project was not the business as usual scenario and that carbon finance is required to support the project is proof **of prior consideration of the CDM**. The CoJ therefore needs to be able to show that the City has considered the creation of CERs early in the project design phase and that the City requires the additional financial resources from the CDM to allow the project to go ahead. It is important that the CoJ therefore builds in the evaluation of carbon finance into projects at the earliest possible stage and **documents** this consideration. Such documentation can include the commissioning of carbon finance evaluations, the inclusion of carbon revenue into project finance considerations, noting the need for carbon finance in Council items and so forth.

#### *Sectoral eligibility*

There are few restrictions on project types under the CDM that would affect the CoJ. In other words almost all projects that reduce the emissions of one of the six greenhouse gases listed in the Kyoto Protocol would be eligible<sup>8</sup>.

The CDM Accreditation Panel (CDM-AP) of the CDM Executive Board has adopted a list of sectoral scopes used for categorising projects. These sectors provide a useful guide to the types of projects that may be available within the City and are:

- Energy industries (renewable and non renewable)
- Energy distribution

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<sup>8</sup> These gases are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and Sulphur hexafluoride (SF<sub>6</sub>).

- Energy demand
- Manufacturing industries
- Chemical industries
- Construction
- Transport
- Mining and mineral production
- Metal production
- Fugitive emissions from fuels (solid, oil and gas)
- Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
- Solvent use
- Waste handling and disposal
- Afforestation and reforestation
- Agriculture

Of these the ones that are likely to be the most applicable to the CoJ are:

- *Energy industries (renewable and non renewable)*: This would include such projects as landfill gas to energy, wind or solar power generation and biomass energy projects.
- *Energy distribution*: CoJ distributes electricity through City Power and projects under this sector could include increased efficiency within the distribution network.
- *Energy demand*: The CoJ can play an important role as far as this sector is concerned since they can influence the manner in which both residential and non residential consumers utilise energy. CoJ is also a relatively large energy consumer itself – both electricity and liquid fuels. Energy efficiency in social housing initiatives managed by CoJ would also be included here.
- *Construction*: In instances where the CoJ is responsible for the construction of houses, municipal buildings and infrastructure the applicability of the CDM becomes an option. CoJ can also consider projects in this sector through building standards, spatial planning, municipal infrastructure design and standards, and building design when they are directly responsible for construction projects.
- *Transport*: Relevant to this sector is the municipal vehicle fleet management as well as any public transport that the municipality is responsible for.
- *Waste handling and disposal*: Opportunities exist with the collection and disposal of solid, liquid or gaseous waste streams. Greenhouse gas reduction opportunities exist at various points in the waste management chain.

### 2.1.2 Project Identification

The criteria for assessing whether a project might be eligible for carbon finance has been explained above. However, carbon finance projects should also be identified that

are suitable for the CoJ itself. In this regards a simple set of selection criteria are proposed to guide project identification, these being that projects should:

- Meet eligibility rules of the CDM
- Be within the operational mandate of the CoJ
- Support service delivery
- Have the potential to contribute significant revenue
- Support energy reduction and climate change mitigation objectives of the CoJ

In addition to the selection criteria the CoJ also needs a procedure for the initial identification of such projects.

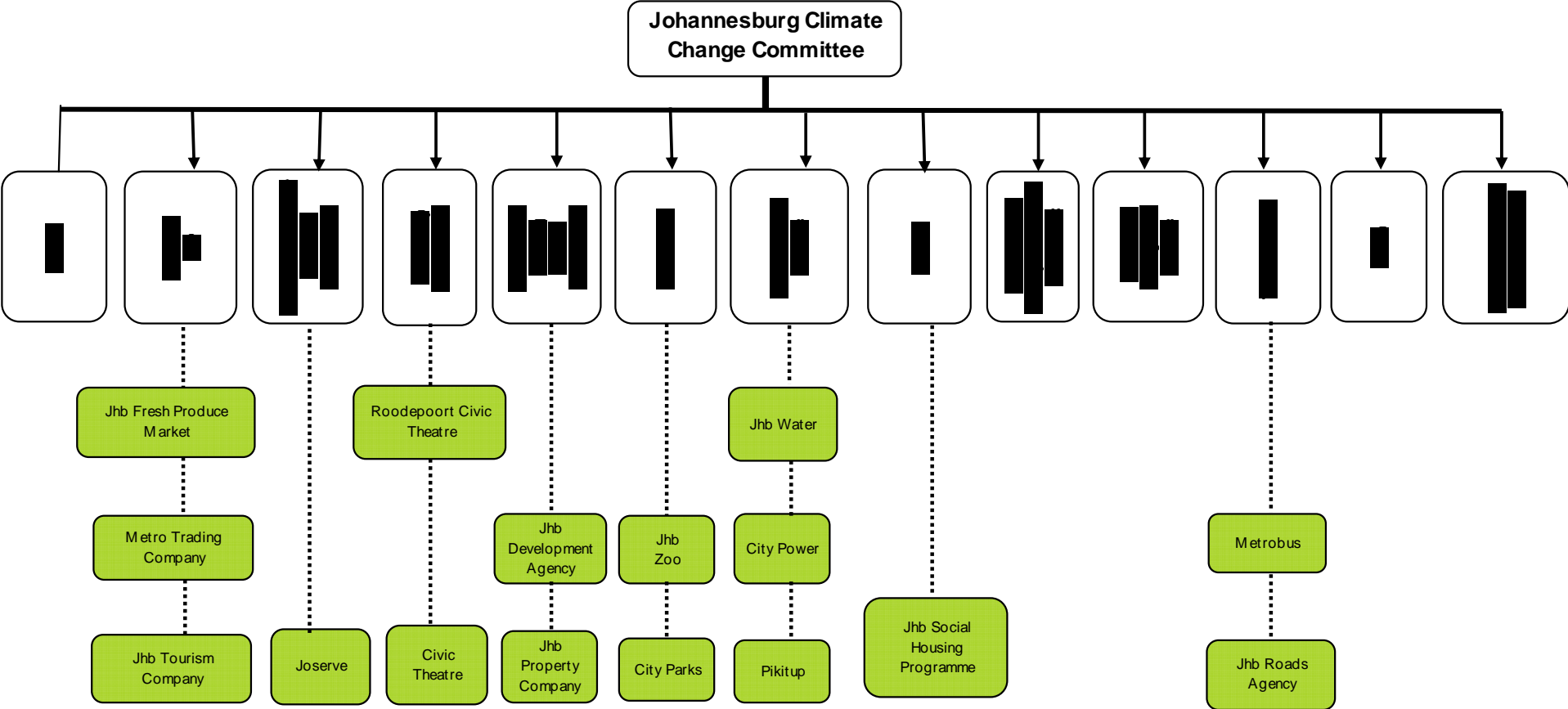
#### *Project identification process*

It is recommended that the CoJ develops a process which is able to identify and assess viable carbon reduction projects. Ideally this function should largely reside with the Johannesburg Climate Change Committee (JCCC). Project ideas or proposals from all the departments within the CoJ feed into the JCCC as illustrated in figure 2. These project proposals can come directly from the MOEs or from the relevant departments overseeing the MOEs. To ensure that successful project ideas are generated the following process is proposed:

- All departments should be made aware of the JCCC unit and its intention to identify and develop carbon finance projects. Simple criteria, as above, should be provided to help departments and MOEs identify projects.
- Buy-in from the various departments and utility heads is critical if the programme is to be successful. The financial and environmental benefits of carbon finance opportunities should be explained to facilitate this buy-in.
- The project idea communication process must not be cumbersome, complicated or use terminology that may confuse. This guideline and other good publicly available guidelines can be made available to departments (see Annex 2: CDM Information Sources below).
- Many of the projects will come from the MOEs, therefore the JCCC must be able to communicate directly with them and ensure they are included in all communication.
- The JCCC should be receptive to ideas from outside of the CoJ – either from the private sector, NGOs or other organs of government. While due account needs to be taken of procurement regulations, external ideas or partnership proposals should be supported.

Figure 4: The JCCC in Relation to the CoJ Organisational Structure

*Municipal owned entities shown in green*



## 2.2 Carbon Assessment

The second step in the project development process is an initial 'carbon assessment' of the project – in other words an initial evaluation of the greenhouse gas reduction potential of the project.

The CoJ should rapidly assess the viability of proposals put forward by the departments and MOEs. It must be in a position to evaluate the project from a high level and get a rough estimate of the following key criteria:

- *Project potential*: how many tons of GHG emissions the project would displace on an annual basis
- *Project duration*: the expected lifespan of the project
- *Project cost*: the approximate capital cost requirement of the project (or the additional expenditure required to secure the greenhouse gas reductions).

Once the CoJ has assessed the above project parameters and has a sense of the size and the duration the decision trees (section 4) should be used to identify the viability and type of the carbon offset project.

## 2.3 Project Idea Note (PIN)

The third step in the carbon finance project process is the preparation of a Project Idea Note or PIN. This step is not a formally required step in either the CDM or voluntary market project cycle but it is a very useful step to prepare a general overview of the project and to identify the key project parameters and project development considerations. A PIN is also often asked for by potential project funders or partners at an early project stage.

A typical PIN provides general information on the carbon finance project and identifies whether the project meets the general criteria of the CDM, the particular voluntary standard being used and of the DNA. The PIN can also be used to secure additional funding from potential investors or as a marketing tool to identify investors.

There are various PIN templates available and a PIN typically has three components - project description, greenhouse gas reductions and other benefits (environmental and social) and finance. The table below gives an illustrative example of a PIN done in Cambodia for the 'Angkor Bio Cogen Power Generation Project' (Institute for Global Environmental Services, 2004).

There is also an official PIN template developed by the South African DNA which needs to be completed if the project is being submitted to the DNA for an initial Letter of No Objection (as discussed later, this is a voluntary step in the project development process). The DNA PIN is somewhat more detailed than the example below. It is recommended that the South African DNA PIN template is used as the information required for the PIN will be useful later in the project development process and will also be required in the submission of the project to the DNA for a Letter of Approval.

A copy of the South African DNA PIN is appended to this report. It can also be sourced from the DME website:

- [http://www.dme.gov.za/dna/dna\\_documents2.stm](http://www.dme.gov.za/dna/dna_documents2.stm)

**Table 3. Simple PIN example**

Project Description	Example
Objectives of the project	Production of electricity and heat using rice husk for internal consumption at the rice mill
Proposed description and proposed activities	1.5MW rice husk fired cogeneration plant Replacement of currently used diesel generators
Technologies to be employed	Travelling grate boiler with 75% rated efficiency Steam impulse turbines
Expected schedule and project start date	2005 and to start operating in 2006
Project lifetime	20 years
<b>Project Developer</b>	
Name of the project developer	Angkor Bod Cogen Co., Ltd
Location of head office	753 Monivong Blvd, Phnom Penh, Cambodia
Site location	Kandal Province, Angsnoul district
Email	angkorrice@hotmail.com
Contact person	Mr Adirson Chieu
Name of host country and status of ratification of Kyoto Protocol	Kingdom of Cambodia Ratified on July 4th. 2002
Designated National Authority	Ministry of Environment (MoE) being appointed as the interim DNA for CDM
Sustainable development criteria	To be announced
<b>Expected Environmental and Social Benefits</b>	
Social benefits	Excess electricity will be sold inexpensively to nearby community. The community has agreed to the implementation of the project. The public consultation meeting was held in September, 2004
Environmental Impact Assessment (EIA)	The environmental impacts of the project are minimal. EIA is not required for a project less than 5MW in Cambodia
<b>Finance</b>	
Total project cost estimates	USD 4.1 million and to be revised in a new feasibility study
Sources of financing	90% not yet secured
Revenues from CER's at USD 5 / tCO <sub>2</sub>	Annual: 18kt X \$5 = \$90,000* Over 10 years: \$900,000* Over 21 years: \$1,890,000* *Estimate

*Source: IGES, (2004)*

## 2.4 Project Design Document

The project now enters the fourth stage of the project cycle as illustrated in Figure 5. This is the detailed project design stage. The main requirements from a carbon finance perspective is the development of a formal Project Design Document which outlines the key elements required to allow the project to be validated, i.e. check to see whether it conforms with the rules and requirements of the CDM or applicable voluntary carbon standard.

### *Project description*

Once a suitable project has been identified a clear operational description should be prepared. This involves detailed designs and should include process flows where applicable. The project description of a CDM project should include an analysis of the greenhouse gas reductions that are likely to occur due to the project.

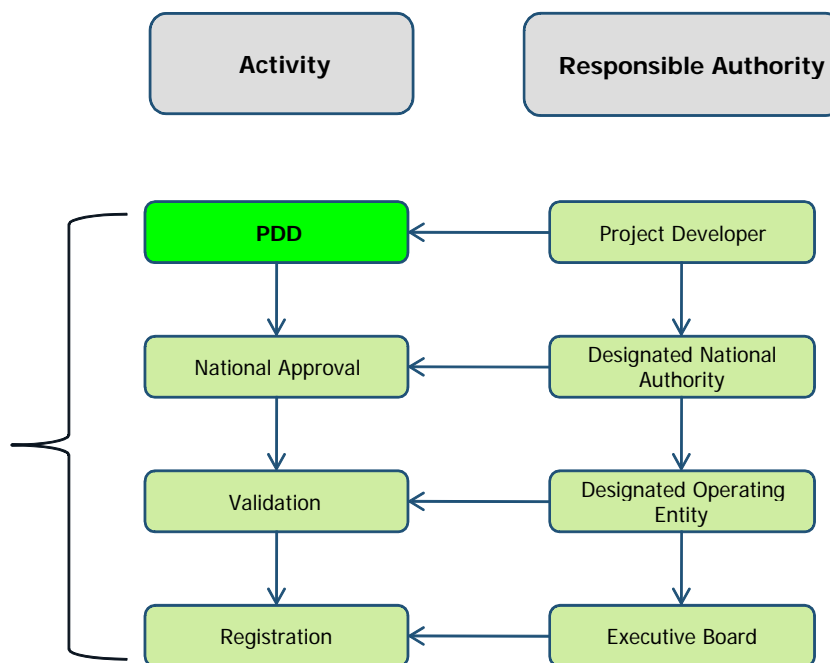
The documentation that is prepared for this phase should be prepared in a manner that makes it possible for use in the Project Design Document (PDD). A copy of the latest version of the PPD template can be downloaded from the United Nations Framework Convention on Climate Change website, where there are current versions of all CDM documents.

- [http://cdm.unfccc.int/Reference/PDDs\\_Forms/index.html](http://cdm.unfccc.int/Reference/PDDs_Forms/index.html)

The requirements of the PDD that are applicable to the project feasibility and design phase are primarily those related to the project description sub-phase and include technical and technological descriptions of the project activity. Further detailed technical specifications for the PDD may only be available later at a project engineering design phase.

It is useful to review the PDD template, as well as the likely CDM methodologies to be used for the project, to understand what information should be collected and generated at the project design stage. This is likely to reduce delays when developing the formal CDM documentation. For example, the emission reduction calculations required in the CDM (and voluntary market project) will require specific information sources. The methodologies will also require specific monitoring approaches which will affect the project design and ongoing project operations.

**Figure 5. Project Design Phase (Project Design Document)**



*Source:* CDM into Energy Planning, (2005). *Note:* This is a more detailed illustration of the PDD and Registration steps in *Figure 3* above showing the location of the PDD stage.

The PDD is the first step in the official project cycle and creates the basis for the validation and registration process under the United Nations. This document presents the proposed plans for the project and must be presented in a standard format describing how the project meets the pre-requisites for CDM activities. A guide to the development of the PDD can be found at the link below and, even if the CoJ itself is not completing the PDD, it is useful to review this guide.

- <http://cdm.unfccc.int/Reference/Guidclarif/index.html>

It is important to note that the PDD is checked by an independent auditor (see validation below) and a poorly developed PDD can lead to significant delays in the validation process due to required edits and changes. The PDD can also only be finalised once an EIA is undertaken and environmental authorisations received if the project requires an EIA authorisation. The PDD also requires that public comment is allowed. A statement of how public comments were addressed must be included in the PDD.

Therefore it is recommended that the PDD, particularly for large projects, is written by an external consulting firm which has experience both in the specific project technology and carbon offset business. This may result in the CoJ contracting with different firms depending on the nature of the projects under consideration as some firms will have expertise in specific project types. Once the CoJ has gone through the project cycle for a particular project type it may become possible for the City to manage the project registration process in-house but it is not recommended that this is done at the outset.

Additional expense will be required at the outset but the use of external expertise should ensure that the project cycle and tasks are done efficiently and effectively which in turn will increase the chances of a successful CDM project. Further, the costs of potential delays from a poorly prepared PDD are likely to outweigh the expenses of contracting the PDD development.

The PDD will address, to the required level of detail, the following:

- Terms of operation of the project
- Project description
- Present the proposed methodology for calculating GHG emissions
- Project boundary within which the emission reductions will occur
- Project additionality
- Project timeline and crediting period
- Calculation of emission reduction – project baseline is developed
- Impact assessment – environmental and local community
- Monitoring plan - what data is required and how it will be collected. Illustrating that the project developer is credible and transparent is crucial.
- Stakeholder consultation process and stakeholder comments

#### *Monitoring and project design*

As noted above, the project planning must take into account the specific CDM monitoring requirements during project implementation. This monitoring is a crucial element of later ensuring that verification of emission reduction can occur by an outside auditor (the DOE). **Note:** If the emission reductions cannot be confirmed by the DOE the entire CDM project will be at risk and CER payment may be withheld.

The procurement processes related to a CDM project will also differ from conventional procurement in some cases. Some of these issues are addressed in the institutional decisions section, but some relate to technical procurement considerations. For example, project tender specifications should include, amongst others:

- Inclusion of *monitoring equipment* that is adequate to meet the CDM requirements;
- The use of technology with suitable *CDM compatible design standards* that ensures the promised greenhouse gas reductions;
- The possible inclusion of *incentives or penalties for contractors* related to their CDM performance in addition to other performance measures.

#### **2.4.1 Regulatory Compliance**

As with any other project developed by the CoJ a carbon finance project will need to comply with all relevant legislation, including health and safety, planning and environmental legislation. The fact that a project is a carbon finance project does not impose additional regulatory requirements. The PDD explicitly requires a consideration of environmental impacts and of stakeholder comments. These items will generally be considered as part of a project design in any event – and will definitely have to be included in project planning in any case if an EIA for the project is required.

##### *Environmental Impact Assessment*

If an EIA is being undertaken it makes sense for the municipality to include CDM considerations into the EIA and EIA consultation process. This avoids having to have a separate consultation process specifically on the CDM elements of the project. The EIA consultants managing the EIA process should be briefed on the carbon finance elements and the CDM consultation elements should be included in their terms of reference. DOEs will often require documented evidence of consultation processes (such as copies of advertisements posted) and of how comments were taken into account.

##### *Due Diligence*

The DOE can ask for evidence of regulatory compliance at its discretion. For example, a DOE can ask to see whether a landfill site is holding the necessary permits from the Department of Water Affairs and Forestry (now transferred to the Department of Environmental Affairs and Tourism), or whether an electricity distribution network is in conformance with all its regulatory requirements.

In the case of the sale of a large volume of CERs, the CER purchaser is also likely to require some form of due diligence investigation. This would be partly to ensure that the project's CERs are actually owned by the CoJ and may require proof that the underlying asset (for example, a building subject to an energy efficiency retrofit) is actually owned by the CoJ or one of its MOEs. The due diligence may also be to detect any project risks due to non-compliance.

There is therefore a particular responsibility in developing carbon finance projects in ensuring that relevant due diligence documentation is in order and available for inspection.

#### **2.5 Registration Process**

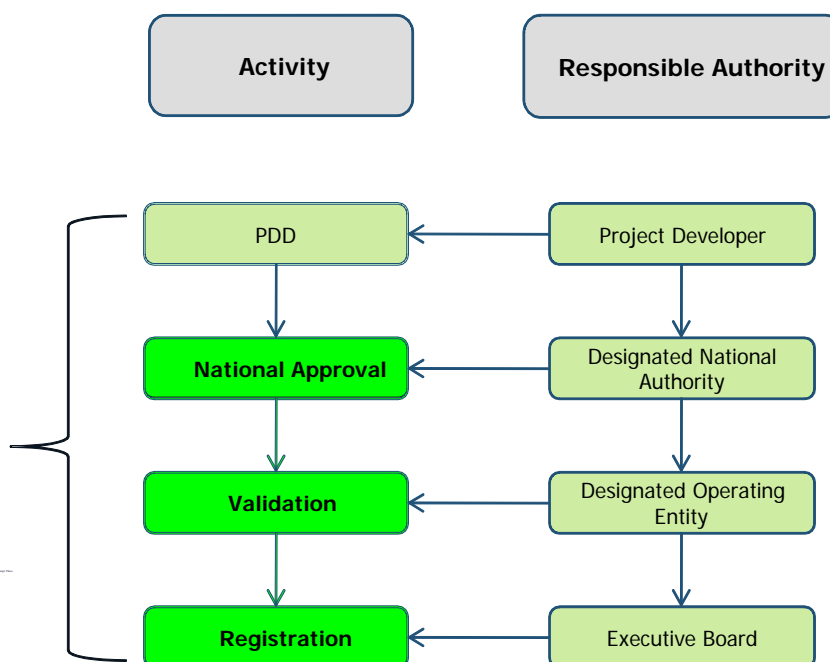
The process of project registration is a formal procedure in which the project is registered with either the Executive Board of the CDM or the particular voluntary carbon standard being used. Without project registration the emission reductions generated by the project have little or no value. To be registered under the CDM the project needs to follow a specific process which includes:

1. **Independent validation** of the project by a Designated Operational Entity (DOE). The DOE is an independent project ‘auditor’ who checks compliance with all the rules of the CDM.
2. **Receipt of a letter of approval** from the host country Designated National Authority (DNA). In South Africa the DNA is a directorate within the Department of Minerals and Energy. If the project is being conducted with a partner from an Annex 1 country the project will also require a letter of approval from that country’s DNA.
3. **Submission by the DOE of the validation report**, letter of approval and project documentation to the Executive Board of the CDM.
4. **Payment of a registration fee** to the CDM executive board by the project proponent is also required. The scale of this fee depends on the size of the project (i.e. the size of emission reductions occurring under the project).

A similar, but generally less rigorous process is required for voluntary market projects. Such projects do not need a letter of approval from the DNA. These projects also will have a lesser registration fee and will be submitted to the relevant voluntary standard organisation.

The various project steps leading to registration after the PDD has been developed are shown in Figure 6 and discussed separately below:

**Figure 6. Project Design Phase (Approval to Registration)**



*Order of Steps in the Process*

The ordering of the national approval and global validation processes are somewhat confusing. In order to prepare a final validation report, the DOE requires (due to the rules of the CDM) that the project has received national approval in the form of a letter of approval. However, the South African DNA (as with a number of DNAs worldwide) have stated that they will only approve projects after the validation process has completed because a number of project elements may change during the project validation process. This clearly presents a problem.

To get around this issue the DNA has agreed to accept a 'Draft Validation Report' which is complete in all respects except for the letter of approval. This allows the validation process to go ahead, for the project proponent to then submit the project with the draft validation report to the DNA, and for the project to be then submitted for a final validation report to the DOE once the letter of approval is provided.

The order in the figure above is therefore strictly speaking correct – national approval is required before *final* validation, but in practice the bulk of the validation process will occur before the letter of approval is requested.

### 2.5.1 Validation

Validation is an independent evaluation of whether a proposed CDM project meets the requirements of the CDM. The validation is carried out by an independent third party auditor who is hired by the project participants. Project validators must be Designated Operational Entities (DOEs) who are accredited by the Executive Board of the CDM. A list of accredited DOEs can be found at:

- <http://cdm.unfccc.int/DOE/list/index.html>

**Note:** not all DOEs are accredited for all types of projects and in selecting a DOE the CoJ must check that the DOE is accredited for the relevant project sector.

The DOE carries out the following activities:

- reviews the project design documents to determine whether a proposed project meets CDM requirements
- prepares a validation report
- submits the validated project to the CDM Executive Board for registration

Once a project has been validated by a designated operational entity it can be registered with the CDM Executive Board as a CDM project.

#### *DOE appointment*

The project proponent is typically responsible for appointing the DOE. The CoJ or its partner organisations in a project will be responsible for securing the services of a DOE to perform these functions. The DOE will need to be appointed in line with normal procurement and SCM processes.

At the time of writing there is a shortage of DOE capacity and DOE costs of validation have risen considerably. There is also no DOE from South Africa, although a number of international DOEs do have some local presence through local partners or subsidiaries. Due to the shortage of DOE capacity and procurement procedures there can be quite long delays in appointing a DOE and this should be done relatively early in the project development process. There is also merit in having a DOE appointed relatively early to enable the CoJ to raise issues early on with the DOE, such as information requirements, and to be able to attend to these issues as the project is being developed.

The validation process itself is a potential source of significant project delays and it is important that the DOE commit to a specified time-frame for its validation processes and is held to such a time-frame. Although the DOE is an independent auditor of the project it is also contracted by the CoJ and therefore, in terms of performance requirements, is bound by the terms of its contract with the CoJ. The CoJ should therefore agree with the DOE on specific time-frames and operating approaches for the validation to ensure that the process runs as smoothly and quickly as possible.

### *Validation process*

In the validation process the DOE will check that the PDD and the project itself conforms to all the requirements of the CDM. For most voluntary standards a similar validation process is required but it will typically be less onerous since there will not be the need to comply with all

The steps in the validation process are:

1. The DOE will make the PDD publicly available (internationally via the UNFCCC website). This will be for a 30 day period. Comments will be received by the DOE and taken into account in the further validation
2. The DOE will check the PDD and supporting documentation to ensure that the CDM requirements have been met. The DOE will focus on whether the baseline and monitoring methodologies used have been approved by the CDM Executive Board and have been applied correctly. The DOE will also focus on the additionality arguments presented in the PDD.
3. The DOE will make a determination as to whether the PDD should be validated and will inform the project participants
4. Once the DOE has received the letter of approval from the DNA the DOE will submit the project to the Executive Board for registration with all the required documentation

**The validation process is a rigorous and onerous process. If a PDD consultant is appointed it is important that their terms of reference clearly specify that they are required to manage the validation process and secure a registered project – rather than simply prepare the initial PDD.**

The CoJ should also be aware of the documentation requirements of the validation process and should work closely with the PDD consultant to ensure that all assumptions and data used in the PDD can be referenced and that such reference material is available to the DOE at the time of validation. In the event that the CoJ undertakes the PDD preparation itself it should pay considerable attention to similarly ensuring that all documentation is available. There is additional merit in careful document management at the PDD stage which is that the same documentation is likely to be required for any due diligence process carried out later on the project by a CER purchaser.

### **2.5.2 Host Country Approval**

Each CDM project needs to receive a letter of approval from the host country government before it can be validated and registered with the CDM Executive Board. Special authorities, referred to as the Designated National Authority (DNA) have been authorised in each host country to perform this function.

The South African DNA is located within the national Department of Minerals and Energy. Details of the DNA can be found at:

- <http://www.dme.gov.za/dna/index.stm>

The DNA has established a specific approval procedure, which includes the possibility of a pre-approval process in which the DNA will provide a letter of no-objection for a project. This pre-approval process has been established to allow project developers to engage with the DNA on the design of their project and to identify any potential problems early on in the project development process. It is important to note that this pre-approval process is not legally binding, i.e. the project may receive an initial pre-

approval (a Letter of No Objection) from the DNA but still not be approved at a later stage. It is also important to note that the pre-approval process is a voluntary step and can be skipped if desired.

The CoJ or its partner organisations will be responsible for the submission of an application to the South African DNA and for securing the letter of approval. This letter of approval must then be forwarded to the DOE for the purposes of final validation and project registration. The DNA has a template for the submission of a request for project approval which can be found at:

- [http://www.dme.gov.za/dna/dna\\_documents2.stm](http://www.dme.gov.za/dna/dna_documents2.stm)

#### *Sustainable Development Criteria*

The DNA has established a set of criteria to assist it in assessing whether a project meets the sustainable development objectives outlined in the Kyoto Protocol. The CoJ should take careful note of these criteria and ensure that CDM projects are in compliance with them (a copy of these criteria are attached) In essence, the DNA will primarily check whether the project is in accordance with these sustainable development criteria and will largely base its approval or rejection on this appraisal.

The CoJ therefore needs to present careful and complete arguments to the DNA for as many of the sustainable development components identified. In most cases this will be a relatively manageable exercise since CDM projects tend to facilitate new investment, improve local environmental quality and have other benefits. However, there may be cases where projects have real or potential negative impacts and in such cases the CoJ will have to convince the DNA that the project benefits outweigh the negatives.

It should be noted that voluntary market projects do **not** require DNA approval.

### **2.5.3 Registration**

Once the DOE has completed the validation report and received the letter of approval the DOE then submits the project for registration with the CDM. In summary, the registration process is as follows:

- The designated operational entity (DOE) submits a request for registration;
- The secretariat processes the request;
- The Executive Board appoints a Registration and Issuance Team (EB-RIT) to appraise the request for registration; and
- On the advice of the EB-RIT, the Executive Board either approves or rejects the proposed project activity.

There is also a registration fee payable for projects on registration. The scale of this fee is pro rata to the scale of the project itself (i.e. the emissions reductions expected from the project) and will need to be paid by the project proponent. Guidance on the scale of the fees can be found at this site:

- <http://cdm.unfccc.int/Reference/Guidclarif/reg/index.html>

The Executive Board will only consider the request for registration to be complete once the registration fee has been paid. Once the Executive Board has received a complete request for registration it will make the request publicly available for eight weeks and, unless a request for a review is received or the EB-RIT review suggests that the validation process was incorrect, the project is deemed to be registered eight weeks after receipt by the Executive Board.

There is no role for the CoJ to play during this process apart from the payment of the registration fee. The DOE will provide guidance on the methods of payment.

Under voluntary market standards there will typically be a registration process with the relevant standards organisation but the process will tend to be much simpler and less time consuming.

## 2.6 Sale of Credits

The sale of carbon credits is not a formal requirement in terms of either the CDM or any voluntary carbon credits standard but is clearly a key issue for the CoJ in the process of raising carbon revenue. The sale of credits is a potentially complex process as it is not simply the sale of a standard product for a set price – there are a range of contractual issues that need to be addressed within the sales process.

A process for the sale of credits is outlined in Part 1, Section 6 (Sales of Carbon Credits) above. This section also deals in some detail with the emissions reduction purchase agreement. The carbon sales process is outlined as step 7 of the project cycle but can in fact be done earlier in the process or in parallel to the earlier steps. Some projects have sold credits while the PDD was still in development, while some have only entered agreements after project registration.

The timing of the sales of credits will have an impact on the eventual price received and the contract conditions. One of the risks that purchasers face is that the project will not be registered. The further towards registration the project is the smaller this risk becomes (clearly falling to zero after project registration). Therefore purchasers will tend to offer a higher price for projects that are closer to registration than those in the early stages. On the other hand, the CoJ may want to sell credits early so as to have some financial certainty with respect to the carbon revenue in the early project feasibility stages. The lesser price received may be worth the financial certainty.

It should also be recognised that the process of selling credits, including advertising them, receiving and evaluating bids, and negotiating an ERPA can take many months. There is therefore merit in starting this process somewhat early in the project development cycle to take account of these delays.

## 2.7 Implementation and Monitoring

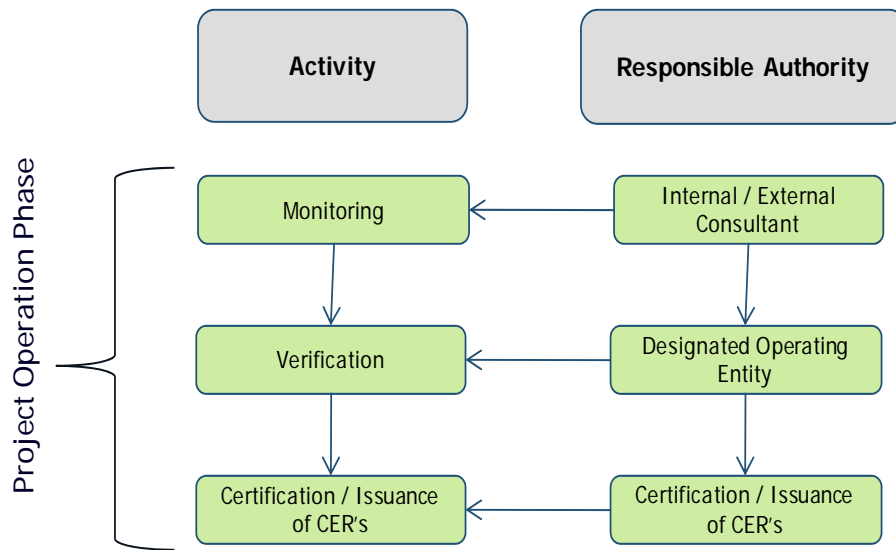
The project now enters the operations stage in the project life cycle as illustrated in *Figure 3*. The CoJ, or relevant MOE actually implementing the project, must monitor the emissions that occur from the project once it has been implemented. A monitoring plan is prepared as part of the project design phase and proper implementation of the monitoring plan is a condition for verification, certification and the issuance of certified emission reduction credits.

The importance of monitoring the relevant project parameters and storing the monitoring data correctly cannot be over-emphasised. Any deviations from the monitoring and data management protocols outlined in the PDD can lead to the non-verification of the projects credits and the project not receiving credits for emissions reduced and hence not receiving revenue. In most cases it will be impossible to recover these lost credits.

The CoJ and the MOEs, or its partner organisations, will be responsible for ensuring that satisfactory monitoring is carried out. The CoJ can contract the monitoring to an independent service provider and in many cases this will be a sensible option to ensure satisfactory technical standards and consistency.

The results of the monitoring will be audited as part of the project verification process.

**Figure 7: Project Operation Phase**



*Source: CDM into Energy Planning, (2005)*

Carbon finance projects begin to generate credits from commissioning (as long as the project is already registered with the CDM Executive Board or relevant standard) and will continue to generate emissions for either three, seven year periods (i.e. 21 years in total), or a fixed ten year period. Therefore long-term and ongoing project management is required to ensure that projects are effectively monitored and continue to generate credits and hence raise the envisaged revenue.

For example, a building energy efficiency project may require monthly monitoring of electricity usage at each building in the programme and data-logging of this information. The CoJ must ensure that there are systems in place for the long term project management and monitoring which is required of these kinds of projects. If not, they run the risk of the project not generating the desired revenue in the future.

## 2.8 Verification, Certification and Issuance of Credits

Once the project is operational, it is starting to reduce emissions. However, the emission reductions only acquire value with their verification and certification. Verification is the determination of the reductions in emissions after these reductions have occurred, as determined by an entity independent of both the project developer and the purchaser of the emission reductions.

The project developer monitors the project as specified in the project design document. On an annual basis (or more regularly), a monitoring report is prepared, which estimates the emission reductions generated by the project during the year. This report is submitted for detailed review by the independent entity, which then certifies the amount of emission reductions. The verification report is critical to the issuance of the emission reductions. The CDM Executive Board can issue CERs only on receipt of the verification report. The report is made available to the public.

The independent entity must be an accredited DOE for CDM projects and cannot be the same DOE that validated the project. The CoJ or its project partners will need to appoint a suitable DOE and this requires a procurement process as with any other

service providers. This is made somewhat complex by the fact that there are no locally registered DOEs and therefore the procurement process is of necessity an international tender process.

There is also merit in the CoJ appointing the same DOE to verify the project for a reasonably long period (three or more years) since this allows the DOE to understand the project and avoids verification difficulties due to different approaches between DOEs.

### **2.8.1 Certification and Issuance of Credits**

The DOE that carries out the verification also certifies the project. Certification is the written assurance by the DOE that, during a specified time period, the project achieved the stated level of emission reductions. The certification report constitutes a request by the DOE that the CDM Executive Board issue CDM credits equal to the verified amount of emissions reductions flowing from the certified project activity. A similar, but less complex process is carried out for voluntary market projects. This is to avoid double-counting of emission reductions (i.e. the issuance of more than one CER or VER for each tonne of carbon dioxide reduced).

Once the emissions reductions resulting from the project have been certified by the DOE the CDM Executive Board begins a process to issue credits to the project participants.

### **3 Carbon Finance Project Types**

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There are a number of different types of carbon finance projects. The key distinction is between the compliance market, which is effectively the trading of CERs from CDM projects, and the voluntary market, producing VERs.

There are a number of different types of CDM projects themselves – including large scale projects (the ‘standard’ CDM project), small scale projects, programmatic CDM and projects dealing with afforestation and reforestation. The latter type of projects are not addressed here as they are unlikely to be of relevance to the CoJ. There are also a range of different types of VER projects, largely distinguished by the particular voluntary standard which is chosen. This is explained later in some detail.

The CoJ therefore has, in many circumstances, a choice between project types. This section describes the differences between the standard CDM and the other project types. The following section provides a procedure for selecting between project types.

#### **3.1 Small scale CDM projects**

In order to reduce the costs of establishing small projects under the CDM rules, simpler requirements have been developed for the following types of activity:

- Type I: small renewable energy activities up to 15 megawatts (or equivalent),
- Type II: small energy efficiency improvements which reduce energy consumption by up to 15 gigawatt hours per year, and
- Type III: other project activities that both reduce emissions caused by human activities and produce in total less than 15 kilotonnes of carbon dioxide (or equivalent for other gases) annually.

The simplified requirements for these types of project are:

- Small project activities can be bundled or grouped together so that key aspects of CDM rules such as design, registration and verification can be addressed for the whole bundle rather than for individual projects.
- Simpler requirements for the project design documents.
- Simpler methodologies for developing a project baseline.
- Simpler requirements for monitoring emissions.
- A single third party verifier may undertake validation, and verification and certification of small projects to reduce costs.
- The CDM Executive Board may charge lower administration fees for small projects.

All other CDM requirements also apply to small projects.

#### **3.2 The Programmatic Clean Development Mechanism**

Although the CDM has been effective in reducing GHG emission growth it was widely recognised that some improvements were required to improve the effectiveness of the mechanism. The following provisions were put forward and adopted:

- To render 'project activities under a programme of activities' eligible for the CDM
- To allow 'bundling' of project activities

These project approaches could involve more than one project type, be implemented in several locations, be executed over time and / or occur in more than one sector. This Programme of Activities (PoA) is commonly referred to as the Programmatic CDM (PCDM). A Programme of Activities is defined as (CDM Executive Board, 2007):

"a voluntary coordinated action by a private or public entity which coordinates and implements any policy/measure or stated goal (i.e. incentive schemes and voluntary programmes), which leads to anthropogenic GHG emission reductions or net anthropogenic greenhouse gas removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM Programme Activities"

Key characteristics of a PCDM are:

- Large number of small homogenous activities
- Involves a large number of emission reduction actions, such as a soft loan or grant
- The programme itself is the project
- The programme enacting agent (in this case the CoJ) is the participant
- An approved CDM methodology must be used
- Policies and standards alone cannot create the emission reductions as this makes them difficult to prove and measure. The actual CDM activity resulting from the implementation of the policy measure reduces the emissions and it is this activity which is measured and monitored
- The programme can be a private sector initiative or a government measure – but must be voluntary
- The size and timing of the induced actions may not be known at the time of registration

In practical terms this means that CDM project that seeks registration as part of a programme of activities can be a small project (for example, 50 houses that will install solar water heaters) and thus pay a very small registration fee which is based on the projected number of carbon credits a project will generate. Following this initial registration a large number of similar units (50,000 more houses, for example) can be added one or more at a time to the same project with no additional registration fee required and no need for additional project validation, as long as all units of the project use the same methodology.

Registration of a PCDM can allow for greater flexibility in the expansion of a project boundary and reduce the need for a rigid definition of the geographical area in which the activities will take place. While it is still necessary for the coordinating entity of a Programme of Activities to specify the geographical area, it appears that this geographic area can be very broadly stated – e.g. a Metro, a country or a number of countries.

However, it must be noted that the PCDM has had limited success since its inception and the numbers of PoA submitted so far to the Executive Board of the CDM is

insignificant compared to the high expectations of the initiative, not least due to the assumed higher sustainability qualities of activities addressed through the PCDM (Programmatic CDM feedback to the Executive Board, 2008). The key shortcomings highlighted by the authors were:

- *Validation*: Process is more stringent than the standard CDM process, thereby increasing the DOE's risk. This is reflected in higher fees.
- *Methodology*: A PoA has to be revalidated every time the baseline methodology is revised. This increases the workload and lowers the CER prices.
- *Methodology*: A PoA may only use a single CDM methodology. Standard CDM projects often use two methodologies.
- *Methodology*: PCDM's can only use existing CDM methodologies and cannot develop its own.
- *Region*: Geographical overlapping may not be allowed. This may result in promoting monopolies and low efficiency of PoA implementation.

PCDM offer a real possibility, especially for the public sector, to tackle certain demand side energy inefficiencies and improve energy access, especially to lower income groups. Despite the limitations mentioned above such projects should be considered by the CoJ as a viable mechanism to implement carbon offset projects. Many actions available to the CoJ to reduce greenhouse gas emissions are likely be the coordination of actions such as the development of public transport initiatives, or the rollout of compact fluorescent light-bulbs, as well as the implementation of other policy measures which are allowed under programmatic CDM.

**Note:** Certain international organizations, such as the German development bank, KfW, offer financial support and technical expertise on prospective programmatic CDM projects. The CoJ should explore and take advantage of these programmes.

### 3.3 The Voluntary Market or Voluntary Emission Reductions

With increasing pressure to decrease their carbon emissions many countries and/or companies look to do this indirectly via the offset market. Even though many organisations are not required under global or national regulation to offset their emissions there is still the demand for such offsets on a voluntary basis. The drivers for this demand are corporate responsibility, marketing and other factors. There is similarly a demand for voluntary offsets from individuals who are willing to purchase offsets to compensate for their own emissions – from air travel or other activities.

This demand has led to the development of the voluntary market which operates outside of the compliance markets. These voluntary credits are therefore not certified by any national or international agreement but fall under a variety of different standards with varying levels of stringency, credibility and market acceptance.

In its analysis of the voluntary carbon offset market, the WWF identified the following reasons for the inception, growth and promotion of the voluntary offset market:

- *Increases participation*: allows unregulated sectors or countries whose governments have not ratified the Kyoto protocol, such as the United States, to offset their emissions
- *Preparation for future participation*: companies can gain experience with carbon inventories, emissions reductions and carbon markets. This can be done at a lower cost and will prepare them for the more onerous compliance market

- *Innovation and experimentation*: reduced regulatory environment should allow projects to be approved that would otherwise be rejected. (Projects that are too small, too disaggregated or use of new concepts)
- *Corporate goodwill*: by voluntarily reducing their emissions, companies can benefit from a positive public perception
- *Cost effectiveness that allows for deeper caps or voluntary commitments*: by decreasing the costs the entire project becomes economically more attractive. This in turn may accelerate the pace at which nations, companies, and individuals commit to reductions

### 3.3.1 Size of Market and Participants

Voluntary carbon markets have been trading since 1989. However, it was only in 2002 that the market took-off. The number of organizations supplying credits to the market has grown by over 200% during this six year period. Volumes show a similar trend. Only 35 millions of tons (MtCO<sub>2</sub>) of voluntary credits was traded before 2002. As shown in *Table 4* in 2007 this number increased to 65 MtCO<sub>2</sub>. Almost three times as much was traded in one year than that traded over the preceding 13 year period. This should be seen against the size of the larger CDM market of about 551 MtCO<sub>2</sub> in 2007.

**Table 4: VER Transaction Volumes and Values**

	Volume (MtCO <sub>2</sub> )		Value (US\$ M)		% Change	
	2006	2007	2006	2007	2006	2007
Total Voluntary Market	24	65	97	331	174%	242%
Total Compliance Market	1,642	2,918	31,051	64,028	78%	106%

*Source*: New Carbon Finance & EcoSystem Marketplace, 2008: State of the Voluntary Carbon Markets 2008; World Bank, 2008: State and Trends of the Carbon Market.

Analysis of the demand which drives the VER market shows that most of it comes from the developed countries - specifically North America, Europe and to a much lesser extent Australia. *Table 5* illustrates the shifts that have taken place over the last year.

**Table 5: VER Demand by Region**

	2006	2007
North America (USA & Canada)	71%	34%
Europe	28%	47%
Australia	1%	8%
Other	0%	11%
<b>Total</b>	<b>100%</b>	<b>100%</b>

## 3.4 Explanation of the Various Voluntary Standards

One of the key challenges facing the VER market is the question of credibility. In particular the following questions are asked of projects:

- Did the projects actually comply with the requirement of additionality?
- Did the money actually go to projects they said they were going to?
- Was there double counting i.e.: were the credits sold twice by unscrupulous developers?

- Are the carbon market actors credible?

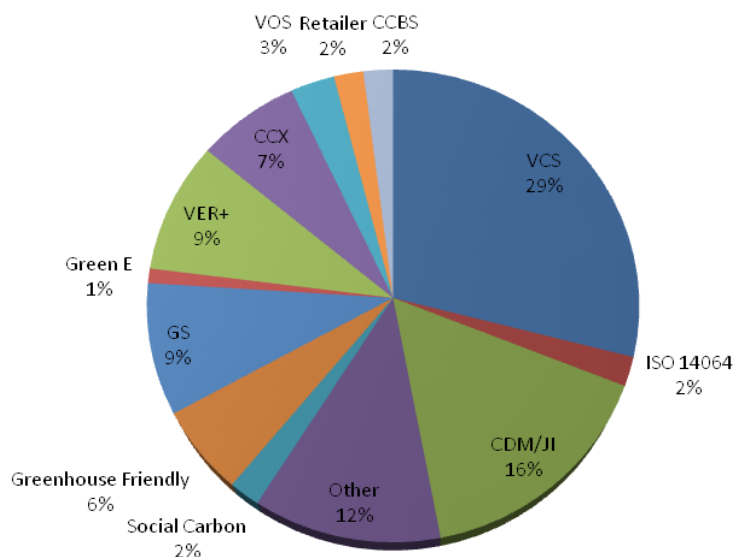
There was a significant amount of bad publicity in the developed markets in 2007. The carbon market actors responded by moving towards greater standardisation and quality controls and also recording project details in registries to improve transparency and credibility. However, credibility remains a key issue and it is important to ensure that the CoJ chooses the appropriate standard in pursuing VER projects.

There are three different approaches which have defined the establishment of voluntary market standards. These approaches are summarised as follows:

- *Voluntary market should match the CDM:* In this view to protect the reputation of the compliance market it is essential that sub-standard (non-additional) VERs do not enter the market. As any loss in credibility could be detrimental to the compliance market VER standards should be *equivalent* to CDM standards. Another reason raised is that the procedures for CERs are well established. To secure quality and transparency all voluntary offset standards should match the CDM procedures.
- *Voluntary market should be more stringent than CDM:* In this view the previous point is taken even further with a view of the credits becoming beyond reproach and aiming to start setting the standards for the compliance market by 'pushing the envelope'.
- *Voluntary market should align with CDM but must also have differences:* This school of thought argues that although the voluntary market can help shape future rules of the compliance market, the whole point of the voluntary market is to reduce bureaucracy, stimulate innovation and creativity.

The transaction volume by standard used is shown in *Figure 8* gives an indication of who the dominant market players are.

**Figure 8: Transaction Volume by VER Standard (2007)**



*Source:* New Carbon Finance, Eco System Marketplace (2008).

Note: the CDM projects shown in the graph above are CDM projects which have sold their credits to the voluntary market rather than the compliance market. The CDM in total remains a significantly larger market than the voluntary market. As can be seen, the Voluntary Carbon Standard (VCS) is becoming a dominant VER standard.

Depending on which approach they adopt different voluntary market standards have different requirements for the certification of VERs.

**Table 6: The primary voluntary standards currently available**

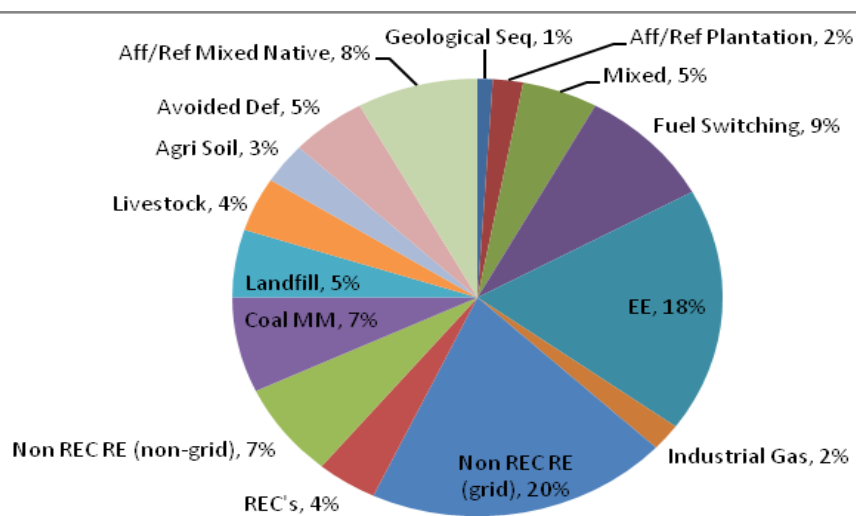
Standard	Main Supporters	Example of Supporters	Additionality Test – Relative to CDM	Registry	Standard's Philosophy
CDM/JI	Kyoto signatories	EU, RSA, Russia	=	Yes	CDM
Gold Standard (GS)	Environmental NGO's	WWF	=/+	Planned	Exceed CDM
Voluntary Carbon Standard 2007 (VCS)	Carbon Market Actors	International Emissions Trading Association (IETA), The Climate Group & EcoSecurities	=	Planned	Align with CDM but can offer differences
VER+	Carbon Market Actors	TUV-SUD	=	Yes	Tracks CDM
Voluntary Offset Standard (VOS)	Carbon Market Actors and Financial Institutions	ABN AMRO, Barclays Capital & Climate Change Capital	=	Planned	Tracks CDM
Social Carbon	Environmental NGO	Ecologica	=	N/A	Exceed CDM
Chicago Climate Exchange (CCX)	Carbon Market Actors and CCX Members	CCX Members	-	Yes	Align with CDM but can offer differences
Climate, Community & Biodiversity Standards (CCBS)	Environmental NGO's	BP, CARE & Rainforest Alliance	=	N/A	Exceed CDM
Plan Vivo System	Environmental NGO's	Bio Climate Research	=	Yes	Exceed CDM
Greenhouse Friendly	Australian government	All Australian business	-	Yes	Independent of CDM. Australia's response to CDM
Green E	US interest groups	All American business	-	Yes	Independent of CDM

### 3.4.1 Project Types

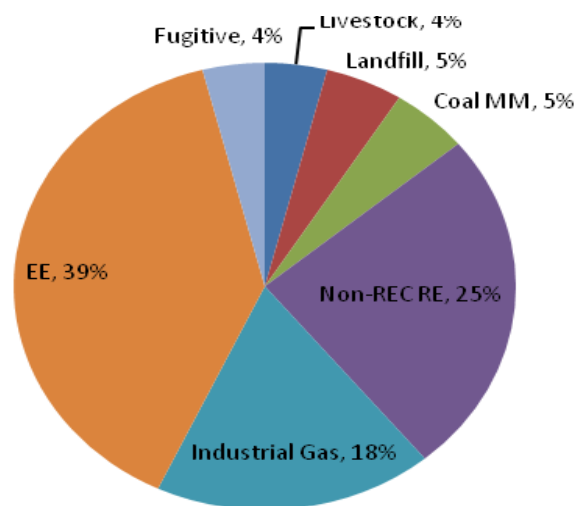
It is beneficial to note the type of projects that were able to attract VER funding in 2007 compared to CDM projects. A comparison between graphs 2 and 3 below shows the following:

- The voluntary market encourages innovation and experimentation - this is evidenced by more than twice as many *types* of projects receiving funding
- Buyers of VER credits have supported projects that aim to reduce the dependence on fossil fuels. This is witnessed by high investments in renewable energy (27%), energy efficiency (18%) and fuel switching (9%) projects
- Buyers of VER credits are attracted to projects that they can relate to or understand, such reforestation plantations (2%) and avoided deforestation (5%)

**Figure 9: VER Project Types (2007)**



**Figure 10: CDM Project Types (2007)**



Source (both graphs): New Carbon Finance, Eco System Marketplace (2008)

### 3.4.2 Key Elements of Offset Standards

In its report on the Voluntary Carbon Market, the WWF noted that 'the best and most successful standards will be those that are simple yet rigorous and have very wide support from carbon project developers, offset traders and buyers, environmental NGOs and the financial industry'.

The report identified the following three components as being critical for a carbon offset standard to be complete and credible.

- *Accounting Standards*: to ensure that offsets are 'real, additional and permanent'
- *Monitoring, Verification and Certification*: to ensure that projects perform as per project design document
- *Registration and Enforcement Systems*: to ensure offsets are only sold once

Table 7 compares the voluntary project lifecycle relative to the compliance or CDM cycle. As can be seen while the project cycles are similar they are not exactly the same across standards.

**Table 7: Comparison of VER Project Cycles with the CDM**

CDM	Gold Standard	VCS	VER+	VOS	CCBS
PDD	PDD	PDD	PDD	PDD	Identify target groups
Host country approval	Main consultation	Validation & verification of PDD**	Host country approval	Host country approval	Specify offset systems
Validation of PDD	Validation of PDD	Registration	Validation of PDD	Validation of PDD	Training
Registration	Registration	Submitted to registry	Registration	Registration	Planning
Monitoring	Verification	Registry approval	Monitoring	Monitoring	Registration
Verification	Certification & Issuance of credits	Issuance of credits	Verification	Verification	Carbon sales
Certification & issuance of credits			Certification & issuance of credits	Certification & issuance of credits	Monitoring
Commercialization			Commercialization	Commercialization	Payment
Ongoing monitoring & verification	Ongoing monitoring & verification	Ongoing monitoring & verification	Ongoing monitoring & verification	Ongoing monitoring & verification	Ongoing monitoring & verification

\*CCX, Social Carbon, Greenhouse Friendly and Green E are standards that are particular to the USA or Australia as non-signatories to the Kyoto Protocol and therefore are not suitable for CoJ purposes.

\*\*This step includes independent project verification that stated GHG reductions were achieved

The scope of this report does not require detailed analysis of the project cycle of each standard and is therefore not included. It is important to note however that all the standards must consider the following:

- Additionality
- Performance standards
- Baselines
- Project boundaries and leakage
- Project types i.e: energy efficiency, sequestration etc
- Project location
- Start date and crediting periods
- Third party auditors
- Registration and registries used

### 3.4.3 VER Pricing

VER prices are lower than CER prices for reasons explained in the report. *Carbon Finance*, in their 2008 report on the voluntary carbon market stated that the average price of a credit sold in the VER market rose from EUR 2.80 / tCO<sub>2</sub>e in 2006 to EUR 4.15 / tCO<sub>2</sub>e in 2007. *Table 8* gives the range payable by the different standards. Multiple factors impact on the price, the key one being the price of CERs which in turn is influenced by government policies, global developments on climate change such as the extension of the Kyoto protocol. Micro factors such as the type of project, supply and demand also have an influence on the price

**Table 8: Estimate of VER Pricing (WWF, 2008)**

Standard	Price of Offsets (EUR)	Price in Rands
CDM/JI	14-30	182-390
Gold Standard (GS)	VER 10-20 (CER up to 10€ premium)	130-260
Voluntary Carbon Standard 2007 (VCS)	5-15	65-95
VER+	5-15	65-95
Voluntary Offset Standard (VOS)	N/A	
Chicago Climate Exchange (CCX)	1.2-3.1	16-41
Climate, Community & Biodiversity Standards (CCBS)	5-10	65-130
Plan Vivo System	2.5-9.5	33-124

**Note:** The prices shown in the table are indicative prices and can fluctuate significantly. It is recommended that before a standard is chosen or a project undertaken that a quick review of current prices is undertaken.

As can be seen Gold Standard projects do seem to secure a premium price for their credits over the next tier of voluntary market standards. This is due to the greater emphasis on environmental sustainability and positive ancillary impacts placed on such projects.

### 3.5 Choosing between the CDM and the Voluntary Market

The CoJ has the option to choose between the voluntary market and the compliance market for the generation of carbon revenue. In general, compliance market credits, CERs, command a higher price than voluntary market credits, VERs. Therefore, in most circumstances the CoJ will prefer to generate CERs. However, there are a number of reasons why the City should utilise the voluntary market. The key circumstances for using the voluntary market are:

- Use VERs when there is no CDM methodology or it is too expensive to create one and a VER methodology is available. In principle it is not recommended for the CoJ try and develop a new CDM methodology unless the financial rewards are significant.
- Use VERs when the project type is not eligible under the CDM but is eligible under a voluntary standard.
- Use VERs when the project is too small or marginal to warrant the CDM expenditure. An important determinant of the overall project size is for how long the carbon reductions will extend? If it is only for a short period then perhaps it is more prudent to choose a simpler and therefore quicker process, which a VER standard might offer.
- Use VERs when the time delays of the CDM are problematic, i.e. when the project requires cash-flows in a short period of time.
- Use VERs as a stop-gap until the project is registered, i.e. if a project has already started operations but there are delays in CDM registration then it may be possible to generate VERs in the interim or retrospectively from the start of project operations until the date of CDM registration (at which point CERs will be generated). In such cases the CoJ should consider:
  - The time delay between the point at which VER credits can be generated and the time of CDM registration (the longer the delay the greater the reason to register the project as a VER project first and then a CER project later)

More generally, to assess whether the voluntary market should be utilised the CoJ should consider:

- The cost of implementing the VER methodology and the price per ton
- The cost of implementing the CDM methodology and the price per ton
- The time delays expected in project registration under the CDM versus VERs
- The expected lifetime of the project

The VER market is a mature and viable alternative to the mandatory market. The trade off for a lower price is the greater flexibility, supposedly less complex and therefore a more expedient project cycle than the voluntary market offers. This must be considered carefully by the project sponsor before any decision is made.

The research undertaken is summarised in *Table 9* and aims to give a 'rule of thumb' for the CoJ on which standard to choose when evaluating a project. It is based on number of tonnes per annum but the other criteria noted above must be considered as well. These other considerations have been included in a simple way in the decision trees shown in *Figure 12* and *Figure 11* below.

### **3.6 Choosing a Voluntary Market Standard for the CoJ**

Given the large number of voluntary market standards it is felt that the CoJ should select a preferred standard or standards under which to carry out any voluntary market projects. As discussed below there may be circumstances when another particular VER standard is required but in general it will be simpler and more manageable for the City to use a one or two preferred standards.

On the basis of the review of VER pricing; the market share and credibility of various standards; the ease and cost of implementation it is felt that two VER standards, the Gold Standard and the Voluntary Carbon Standard, should be used by the CoJ as appropriate.

Before deciding on a voluntary market standard it is useful to consider the philosophy behind their development. The Gold Standard (GS) was developed as premium standard for the mandatory market, with the Kuyasa project in Cape Town being the first one to be registered. The premium paid for the carbon was because the project strongly complied with the requirement of 'sustainable development'. This includes environment sustainability, social sustainability and development, and economic and technical development.

The GS then decided to offer a similar approach in the voluntary market. The GS distinguishes itself by aligning itself to the CDM process and offers real, measurable and credible carbon offsets, which sell at a premium. The downside to the GS is that it is expensive to develop GS projects since the requirements are in large measure the same as those for the CDM.

The Voluntary Carbon Standard (VCS) has followed a different approach. As mentioned earlier, the VCS aims to give project owners more freedom to follow a broader range of carbon reducing activities as well as recognising that the CDM process is complicated, time consuming and expensive. Its methodology aims to reduce these hurdles resulting in innovation and increased market activity. The standard is credible and is growing in market share but does not command the same prices as the GS due to the higher confidence in the ancillary benefits of Gold Standard projects.

#### **3.6.1 Recommendation**

From the above analysis and from a CoJ perspective, the most credible standard that differs in a significant way from the CDM methodology is the Voluntary Carbon Standard (VCS). As mentioned, the Gold Standard aims to match and exceed the CDM while the VCS aligns with CDM but offers greater flexibility. The use of two standards is suggested because there is merit in the CoJ accessing the premium prices for GS projects but also merit in using the VCS when GS processes are too expensive or when they do not allow for specific project types. On this basis the table below recommends when the two standards should be used.

**Table 9: Recommended VER and CDM Standards by Project Size**

Project Size	Recommendation	Discussion
<5,000 t per annum	GS (Micro)	DOE not required. One in 10 projects are checked by GS. Costs are minimised. The GS is recommended because at this scale the process is simple but the credits will command premium prices.
>5,000 < 15,000 t per annum	VCS	Registration process for the VCS is simpler which reduces costs and time. Generally, the premium paid for GS carbon is not sufficient in this project size to warrant the extra cost associated with GS certification
>15,000 t per annum	CDM	The CDM process is almost the same as GS. Consider GS CDM if the project meets the required criteria to secure a premium price.

As discussed above it should be noted that in certain circumstances there may be projects at the scale of 15 000 tons per year or greater that should also be undertaken under the voluntary market. These circumstances would include:

- If the project types or methodology is not eligible under the CDM
- If there is a strong requirement for a rapid carbon revenue process from the CoJ
- Where a project is being registered under the CDM but there is the possibility of generating VERs in the interim until registration

A number of other considerations that may impact on the choice of carbon standard are discussed further under separate headings below:

### 3.6.2 Programmatic VER Projects

As detailed in the CDM section of the document a programmatic CDM aims to be a more effective, inexpensive means of structuring a CDM project for a large scale rollout. There are many perceived advantages to a programmatic CDM project but the key ones are cost and reduced processes. However the programmatic CDM is a relatively new concept conceived only in 2005.

The VCS Standard allows for 'grouped projects'. This is similar to the programmatic CDM and is explained as 'any combination of GHG projects or project categories that meets the requirements of the VCS 2007 can be registered as a grouped project. A grouped project can include one or more sub-groups, for example a combination of project categories or projects, as long as each sub group retains its distinctive characteristics. A grouped project shall have one central GHG information system and controls associated with the project and its monitoring.'

The Gold Standard (GS), which is the closest match to the CDM methodology has made provision for and will register Programmatic VERs. The process is identical to the CDM process.

### 3.6.3 Retrospective VER Credits

A key test for all carbon revenue projects is the concept of additionality. The simplest definition for this concept is that the project can only generate credits for GHG gas emission reductions or removals which are additional to those which would have occurred in the absence of the project receiving carbon revenues.

Therefore it must be shown that the project went ahead because of anticipated carbon revenues (Gold Standard Toolkit, August 2008) and that the project would not have been implemented in any event. This becomes significantly harder to prove if the project has been operational for a period of time before registration as the implication is that the project was deemed additional yet was still profitable without the revenue of the CDM pre-registration credits.

Nevertheless, retrospective crediting is allowed under the VCS and the Gold Standard as follows:

- *VCS*: The earliest start date for retrospective crediting for VCS is 28 March, 2006.
- *Gold Standard*: The earliest start date for retrospective crediting for GS projects is 01 January, 2006. The GS methodology requires extensive stakeholder consultation before a project commences. The CoJ would have to produce this documentation, failure to do so would disqualify the project from being registered.

### Implications for the CoJ

An important question is whether the CoJ claim retrospective credits in the VER market if it identifies a project it has done in the past, which has resulted in carbon emissions reduction but which it did not do with CDM or VER funding in mind? On the basis of the analysis above it is unlikely that it will be able to register this project with VCS or GCS, or any other credible standard for the above reasons.

The key test always lies with additionality and the issuance of retrospective credits is aimed at allowing project developers to realise the full carbon revenue potential and therefore maximising the financial returns. The carbon aspect cannot be an afterthought of the project.

The above is designed to make claiming retrospective credits more onerous than following the project cycle from inception. It is therefore recommended that all CoJ projects consider carbon upfront and follow the cycle from inception and not retrospectively. **It should also be noted that retrospective crediting is no longer allowed in the CDM market.**

### 3.6.4 VCS and GS Validation and Verification

CDM and the Gold Standard (VERs) requires the use of a CDM accredited DOE. To avoid conflict of interest, validation and verification cannot be done by the same auditor.

However, with the VCS the project owner can choose to use one of the following:

- A CDM Executive Board accredited DOE
- Certified auditors under ISO 140065
- Auditors registered under the Joint Implementation process

- Auditors certified by the VCS board

### 3.6.5 Additionality

The VCS and GS additionality approach is very similar to that of the CDM.

The GS standard uses the UNFCCC additionality tool. This is mandatory for their VER and CER certification.

The VCS requires all of the following three tests to be satisfied in order for the additionality of the project to be demonstrated. In summary what must be shown is the following:

- Project is not mandated by law
- Project faces one or more of the following barriers: investment (project requires the additional revenue to proceed), technology (finance needed to overcome technology based costs) or institutional (project faces financial, organizational, cultural / social that the revenue stream can help overcome)
- Project is not common practise in region it is being implemented as compared to similar projects which have received no carbon finance.

### 3.6.6 Methodology

The baseline methodology chosen may come from an appropriate methodology approved by the Methodology Panel of the CDM Executive Board or a new one can be submitted for review – however, this incurs extra time and cost. For CDM projects however only EB approved methodologies can be used.

Standard	How are baselines determined?	How are methodologies determined and approved?
CDM	Project specific baselines based on approved methodologies of similar projects  Performance standards can also be used in some cases	New methodologies are submitted to CDM Methodology Panel, they are reviewed and the Panel submits recommendations to CDM EB, where a final decision is made
GS	GS CER: CDM approved methodologies  GS VER: CDM methodologies or GS small scale working group or UNDP carbon facility or proposed new methodology by GS technical advisory committee	GS CER: CDM approved methodologies  GS VER: New methodologies must be approved by independent experts and then approved by GS technical advisory committee
VCS	Use one of the programme approved methodologies  CDM methodologies are also accepted  New methodologies must be approved through a double approval process  Best practise or performance standards are allowed but have not yet been developed	New methodologies must be reviewed by two VCS accredited independent verifiers and then accepted by VCS Board  Any methodology approved under a GHG programme which is approved under the VCS is automatically accepted

Source: WWF, A comparison of carbon offset standards

### 3.6.7 Project Size

VER projects are more suitable to smaller scale projects than the CDM. The VCS and the GS both allow for micro-scale projects, smaller than the CDM small scale projects category, while the GS also has a small scale category.

**Table 10: Gold Standard VER Project types and sizes**

Micro-scale	Small-scale	Large-scale
<5,000 tonnes CO2 per year	>5,000 < 15,000 tonnes CO2 per year	>15,000 tonnes CO2 per year

**Table 11: Voluntary Carbon Standard VER Project types and sizes**

Micro-projects	Projects	Mega-projects
<5,000 tonnes CO2 per year	>5,000 < 1,000,000 tonnes CO2 per year	>1,000,000 tonnes CO2 per year

There is a requirement for micro-scale projects to show that the project is not part of a larger project being deployed in smaller projects.

### 3.6.8 Registry

This is being developed for the voluntary GS standard. An issuance fee is charged.

### 3.6.9 Summary of Differences between the VCS, GS and CDM

The table below summarises the major differences between the three standards that the CoJ is likely to use.

**Table 12: Key differences between the CDM and VERs (VCS and GS)**

Criteria	CER	VER	
		VER (VCS)	VER (GS)
<b>Basic Principle</b>	Benchmark	Allows greater flexibility	Same as CER but process simplified
<b>Project Size</b>	Small and large	Micro, Project and Mega	Micro, Small and Large-scale
<b>Geography</b>	Only in Kyoto Annex 1	All countries	Only in Kyoto Annex 1
<b>Project Eligibility</b>	Benchmark	More project types allowed	Same as CER
<b>Additionality</b>	1-ODA rules 2-EB methodologies only	1-ODA less stringent 2-New methodologies considered 3-Amendments to methodologies allowed	1-ODA less stringent 2-New methodologies considered
<b>Baseline</b>	PD's can only choose from Executive Board	New methodologies	Methodologies may come from a few

Criteria	CER	VER	
		VER (VCS)	VER (GS)
<b>Methodology</b>	approved methodologies	considered	approved sources
<b>Sustainable Development</b>	Must be shown	Must be shown	Must be shown
<b>Public Consultation</b>	Benchmark	No	Same as CER
<b>DNA Letter of Approval</b>	LOA required	LOA not required	LOA not required
<b>Validation and Verification</b>	DOE	VCS approved validators	DOE (except micro-scale)
<b>Registry</b>	In place	Being implemented	Being developed

## 4 Tool to Select the Type of Carbon Project

Chapters 1-4 have explained carbon finance opportunities in both the mandatory and voluntary markets. The reader should have a sound understanding of what each offers and the complexity involved. If a project idea is presented to the CFCC then the following must be ascertained:

- Size of project – how many tons of CO<sub>2</sub> per year are likely to be reduced
- Lifespan of project
- Budget available to implement i.e. the available project development funds

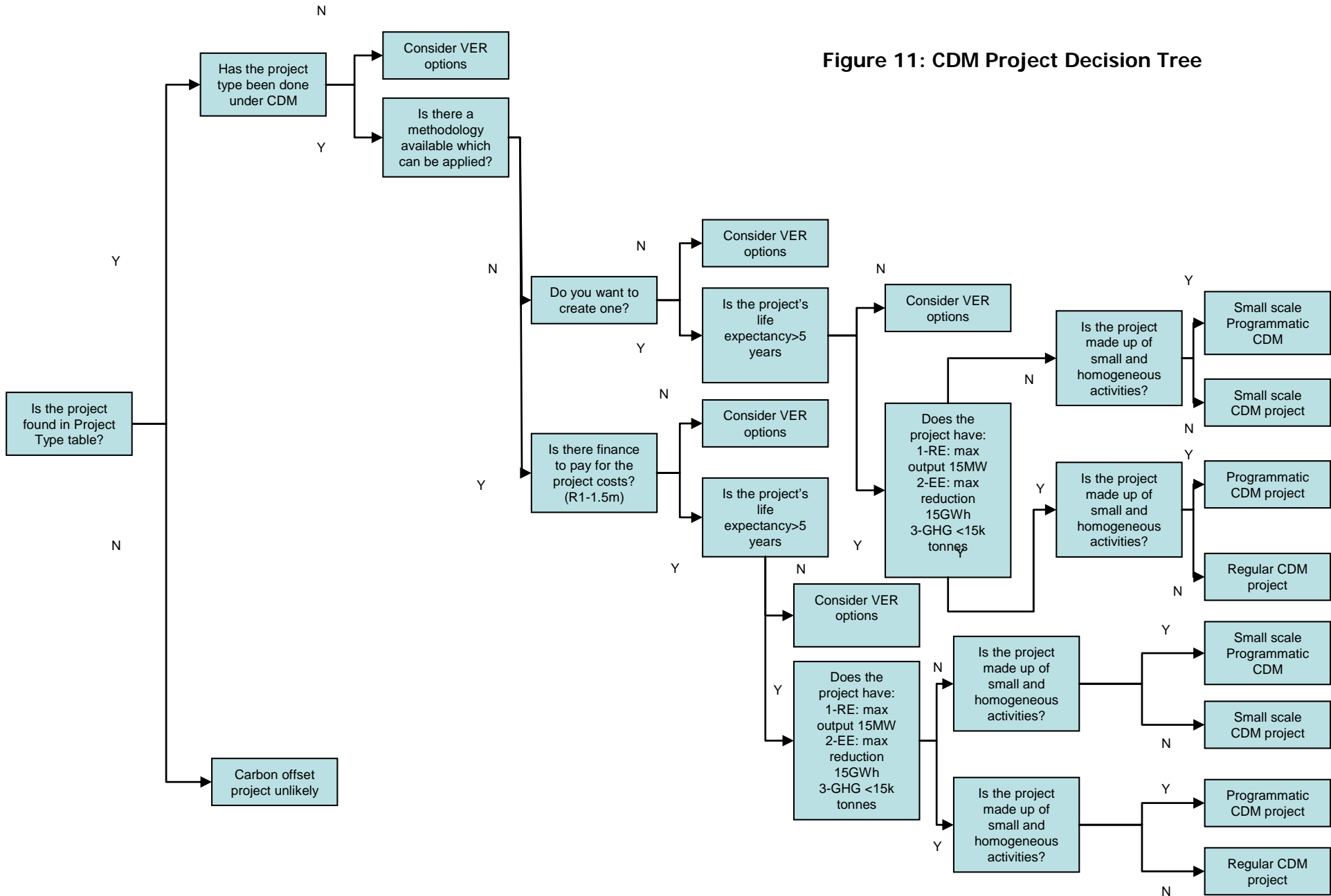
Once these three items are known then the attached decision trees can be used to determine the most suitable project type. They are designed to default to the best option for the sale of the carbon offset. The user would use CDM decision tree first and then default to the VER decision tree if instructed.

The table below, showing eligible project types, is required for the first steps of the decision tree.

**Table 13: Project Type Table (for Decision Tree)**

Project Type	GS	VCS	CDM
<b>Energy Efficiency</b>			
Industrial	✓	✓	✓
Domestic	✓	✓	✓
Transport sector	✓	✓	✓
Public sector	✓	✓	✓
Agricultural sector	✓	✓	✓
Commercial sector	✓	✓	✓
<b>Renewable Energy</b>			
Solar Thermal	✓	✓	✓
Electricity	✓	✓	✓
Heat	✓	✓	✓
Ecologically sound biomass, biogas and liquid fuels	✓	✓	✓
Heat, electricity and cogeneration	✓	✓	✓
Transport	✓	✓	✓
Wind	✓	✓	✓
PV	✓	✓	✓
Geothermal	✓	✓	✓
Small low impact hydro (max 15MW)	✓	✓	✓
<b>Methane Capture</b>	✓	✓	✓
<b>Industrial Gases</b>	✗	✓	✓
<b>HCFC</b>	✗	✗	✗
<b>Biological Sequestration</b>	✗	✗	✗
<b>Fuel Switching</b>	✓	✓	✓

Figure 11: CDM Project Decision Tree





## 5 Conclusion

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This document has provided insight into the various processes that must be followed to implement CDM or VER projects in a consistent manner. Based on consultations with the CoJ it is apparent from the current CDM project approach in the Metro that a range of approaches are being used to implement CDM projects. This is not posing a problem at present but as the number of projects increase the management of the suite of projects will become more complex and inconsistencies in approaches between projects may become increasingly problematic.

Carbon offset revenue, despite its shortcomings and complexity, will allow many projects to become economically feasible. Coupled with the private and public sector pressures on all municipalities to reduce their GHG emissions the CoJ should take advantage of the carbon revenue opportunities where available.

## **Annex 1. Project Opportunities for the CoJ**

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This section provides a list of possible projects that can be carried out by the CoJ. A sectoral breakdown of the projects is used for the purposes of manageable classification.

The projects were chosen by reviewing the full database of accredited CDM projects available on the UNFCCC website (<http://cdm.unfccc.int/Projects/registered.html>) and identifying the project types that are likely to be applicable at a municipal level in South Africa – given the legal mandate and sphere of operations of South African local government.

The projects presented in the subsequent tables are those that are under the direct control of the municipality – i.e. where the municipality owns or manages the assets or where the municipality has regulatory power over the actions concerned. There are many more project options available at a local level, however not all of these are under the control of the municipality (for example energy efficiency measures at local manufacturing plants).

In line with this report's recommendation that the CoJ set a target of five carbon offset projects by 2010, the authors of the document have highlighted (in green) the projects which they believe are the real 'low hanging fruit' and should be considered first.

**Table 14: Potential CoJ Carbon Revenue Projects**

Industry	CDM/VER Category	Project	Project Description	Comments	Applicability
Energy Industry	Normal	Electricity generation from renewable resources	Electricity generation from wind, solar or other RE resources and the subsequent feed in of the electricity into the grid.	Wind unlikely to be viable in Johannesburg but other options may be available.	The CoJ is unlikely to develop such a project themselves but could support projects through purchase of power from such projects.
			Generation of electricity from biomass burning and the subsequent feed in of this electricity into the national grid.	This technology is promising since biomass is generally readily available.	This as a possible option for the use of biomass from waste-water treatment works, biomass from parks or landfills, or from smaller centres such as the produce market and zoo.
		Fuel switching	Fuel switch from fossil fuels to biomass or gas in boilers for heat generation during electricity production	This is a project that can be easily done provided the biomass residues are in close proximity to the electricity plant or gas is available.	Would only be applicable to generation facilities under the control of City Power.
		Improve efficiency at existing power generation plants	The improvement of current power plant operations to enhance electricity output per unit of fossil fuel used. This could range from using coal that burns more efficiently to improved maintenance strategies.	This would include an energy balance across the power plant to identify inefficiencies and then look at options to improve the process. An example would be retrofitting of turbines.	Would only be applicable to generation facilities under the control of City Power.
	Small scale	All the above projects could be done on a scale that would put them in a small scale CDM category			
Energy Distribution	Normal	Reduce losses during electricity distribution	Losses are reduced by upgrading the voltage on transmission lines, installing substations and having a rigorous maintenance schedule that replaces transformers and transmission lines as required.	This project is doable at a municipal level provided the infrastructure is available (To reduce proportional losses higher voltage cabling and more sub stations might be used, for this additional land is required).	This as a viable option for the CoJ / City Power as the electricity distributor
	Small scale	Reduce losses during electricity distribution	This project will involve upgrading the voltage on a transmission line or replacing a transformer where the measurable savings will be up to 60 GWh per year.		This as a viable option for the CoJ / City Power as the electricity distributor

Industry	CDM/VER Category	Project	Project Description	Comments	Applicability
Energy Demand	Normal	Reduce electricity consumption by the distribution of efficient light bulbs	The project activity is implemented by a project coordinator (for example CoJ) who sells at a reduced price compact fluorescent lamps (CFLs) to households within a defined geographical area thereby replacing less energy efficient light bulbs.	This project is applicable only if the households are connected to the electricity grid and use electricity for lighting.	This can be implemented at a municipal level and it is advisable the users be educated as to the benefits of using the CFLs.  Similar projects could be developed using other energy efficient appliances though few are as simple as light-bulb replacement.
	Small scale	Energy efficiency improvements to buildings	This project involves installing ceiling insulation, using CFLs and designing building so that there is passive heating and cooling as opposed to air conditioners and heaters.  The <b>passive heating and cooling</b> of buildings can also fall into the <b>Construction sector</b> .	This project can be readily and easily implemented since installing insulation and providing CFLs is not capital intensive. There are already a number of successful municipal examples but few, if any, have yet gained from carbon revenue.	Applicable to municipal buildings and housing stock, as well all other buildings that are used by the municipalities e.g. abattoirs, fire stations and local clinics.
		Energy efficiency of municipal services	Projects include energy efficiency interventions not related to building design. These could include process improvements in waste-water treatment or water distribution, energy efficient cooling and refrigeration.	These projects relate to a number of municipal service areas aside from facilities management.	Improved energy efficiency at local government waste-water treatment plants, warehouses and stores, fresh produce markets and so forth would all fall within this category.
	Programmatic	Energy efficiency	Retrofitting houses and buildings with SWH on a large scale.	This is easier if done to new houses as the general public is generally reluctant to change existing sources of energy. An excellent example of this is the Kuyasa low cost urban housing project run by the City of Cape Town. It was South Africa's first registered CDM project.	Applicable to municipal buildings and housing stock, as well all other buildings that are used by the municipalities e.g. fire stations and local clinics. Private houses can also take be included in these programmes.
		Energy efficiency of public facilities and services	Efficient street lighting or public lighting.  Efficiency of public services under municipal control	This type of project could involve the replacement of incandescent with CFL or LED bulbs in all government buildings and street lighting	Easily applied to all public areas

Industry	CDM/VER Category	Project	Project Description	Comments	Applicability
Construction	Small scale	Designing and building energy efficient buildings	This project involves designing and building new houses and buildings so that they consider both passive (natural light) and active (SWH) measures.	There are many examples of this project type and little new investigation or technology transfer is required.	This is applicable to the building of municipal buildings. The CoJ can also introduce bylaws that incentivise or require energy efficient designs. <b>Note:</b> additionality rules must be considered before by-laws are passed to ensure that carbon revenue potential is not compromised  Most applicable where the municipality is directly involved in housing delivery. Could also include social housing projects.
	Programmatic	Designing and building energy efficient buildings	This project involves designing and building new houses and buildings so that they consider both passive (natural light) and active (SWH) measures.	An example of this is the Kuyasa project in the Western Cape.	Applicable to delivery of housing at a local level.
Transport	Normal	Bus rapid transit (BRT)	BRT is a bus-based mass transit system that delivers fast and cost effective urban mobility. BRT systems replace conventional public transport systems. The new bus system transports passengers who, in the absence of the project, would have used the conventional public transport system or other modes of transport such as passenger cars.	A BRT reduces greenhouse gas emission by improved fuel usage through new and larger buses and potentially a fuel switch to low carbon fuels.	The CoJ is currently considering carbon revenue for their BRT project
		Switching from road to rail transport	This project will encourage commuters to choose rail transport over road transport by providing incentives for using rail or penalties for using road transport.	This type of project will have to have its home in transport planning and will need a champion.	Only applicable if the CoJ were in able to influence modal switches to rail.
	Small scale	Fuel switching and energy efficiency	Running the existing CoJ vehicle fleet on renewable fuel sources and regular maintenance of the vehicles to improve energy efficiency.	This project can be done to the CoJ's vehicle fleet and would typically involve an easy retrofit of the existing engine.	Applicable to the CoJ if the fleet size and characteristics are suitable.
	Small scale	All the above normal projects could be done on a scale that would put them in the small scale CDM category.			
	Programmatic	Some of the above projects could possibly be done more easily as programmatic CDM. These could include incentives for moves from private to public transport			
Waste Handling	Avoided methane	This project involves the introduction of	If the wastewater is not being treated but directed to open lagoons that have	Applicable at all waste water treatment	The CoJ has potentially suitable sites

Industry	CDM/VER Category	Project	Project Description	Comments	Applicability
and Disposal	emissions from waste water treatment plants	new treatment systems at existing wastewater treatment facilities to avoid methane emissions from wastewater treatment.	<p>anaerobic conditions the wastewater can be treated in anaerobic digesters. The biogas generated can be flared and the residual from the anaerobic digester can be treated aerobically.</p> <p>In contrast, if the wastewater is being treated in a treatment plant and the sludge is directed to anaerobic pits the treatment of the sludge is reconsidered. The sludge is either treated in anaerobic reactors and the methane that is produced is flared or used for electricity generation or else the sludge is dewatered and applied to land.</p>	plants.	
	<b>Methane reduction by co-composting of organic waste water and organic solids</b>	Organic waste water and solids are treated aerobically thereby reducing the production of methane. The by-product is carbon dioxide.	The process has to remain aerobic by the introduction of air into the lagoons. An initial capital outlay will be required to purchase large scale blowers.	Applicable at all waste water treatment plants and organic solid waste sites.	The CoJ has potentially suitable sites
	<b>Landfill gas project activities</b>	The collection and subsequent flaring of methane at landfill sites. The methane can also be used directly as an energy source.	This project is easy to implement and there are examples of these at Ethekewini and Ekurhuleni Metros	Applicable at all landfill sites.	Project under development in the CoJ
	<b>Composting</b>	Biodegradable waste that is collected by the local municipality can be composted.	Composting is generally done by municipalities but not in a very controlled manner. If a tighter operating regime where applied to the process the composting process could be more efficient and effective.	Applicable at all waste collection sites.	Should be considered as an alternative to methane collection at landfill sites. Has dual benefit of methane reduction and production of useful compost material. Also reduces landfill costs
All the above normal projects could be done on a scale that would put them in the small scale CDM category.					



## Status quo

The City of Johannesburg currently has 3 potential CDM projects:

- **The Cosmo City solar water heating project** (the process design documents are being prepared): Solar geysers have been fitted to 170 homes in extension two, Cosmo City. The project is the first of its kind in Johannesburg and cost the city about R2 million; each unit, consisting of a geyser and a solar panel, cost R13 000. Extension two residents come from informal settlements; they began moving into the newly built Reconstruction and Development Programme houses in November 2005, and to date more than 2 000 of these homes have been occupied. Although equipped with water, sanitation and electricity, they have no geysers. The Cosmo City manager in the City's department of environmental management says that over time, the project result in savings to the environment and consumers. Electric geysers use about a third of a household's total electricity consumption; direct solar heating generally reduces electricity consumption by between 10 and 30 %.
- **The Rea Vaya bus rapid transport system** (the project idea note has been accepted by the DNA): In the 2006/07 financial year, the City took the strategic decision to go the route of the Bus Rapid Transit system (BRT). BRT is based on the idea of creating rail-like performance using road-based technologies that are affordable to most cities. This initiative is branded by the City as Rea Vaya. The overall goal of the Rea Vaya initiative is to improve the quality of life of Johannesburg citizens through the provision of a high-quality and affordable public transport system. The long-term vision is to develop a system that places over 85% of Johannesburg's population within 500m of a Rea Vaya trunk or feeder corridor. The principal long-term objectives of the Rea Vaya project encompass the fundamental pillars of Johannesburg's competitiveness as a city, including economic, social, and environmental sustainability.
- **The conversion of landfill gas to energy** (the process design documents are being reviewed): A consortium has been appointed by the City to take the landfill gas to energy project forward. The consortium will incur all costs relating to the development of the projects including the trading of carbon credits and power. Johannesburg will share the in the profits resulting from the sale of carbon credits and electricity. The landfill sites can produce as much as 20 to 25 megawatts of electricity for about 15 to 20 years, but the rate of gas production is dependent on a number of variables, including the age and composition of the waste; the temperature and moisture content of each site; and the design and operation of the site, among others.

## Annex 2: CDM Information Sources

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As indicated there are a number of sources of information on CDM project development that provide detailed information on developing CDM projects. These are very useful for municipal officials seeking deeper understanding of the CDM. These resources, however, largely address the specific rules of the CDM and do not provide guidance on how South African municipalities in particular can best implement CDM projects given their institutional, operational and legal context.

Locally produced CDM project development guides include two excellent guidebooks on the CDM both freely downloadable from the Energy Research Centre at the University of Cape Town from the following link <http://www.erc.uct.ac.za/pastpub.htm>:

- Spalding-Fecher, R. et al, 2002: *Clean Development Mechanism Guidebook for Southern Africa*, Energy and Development Research Centre, University of Cape Town.
- Energy Research Institute and Future Energy Solutions, 2002: *The Clean Development Mechanism: A Guide for Potential Participants in South Africa*, prepared with support from the UK Foreign and Commonwealth Office.

Other available guidance on CDM project development is available from various organisations including:

- SouthSouthNorth: An international NGO with offices in South Africa who have published a CDM toolkit available at
  - <http://www.cdmguide.com/toolkit/index.jsp>
- United Nations Environment Programme: CD4CDM – Capacity Building for the CDM programme which has a number of good guidance publications and information available at:
  - <http://www.cd4cdm.org/>
- The CDM Rulebook: The CDM Rulebook is a database of all sources of law for the CDM, including Article 12 of the Kyoto Protocol and decisions of the COP, the COP/MOP and the Executive Board and can be found at:
  - <http://cdmrulebook.org/>

Essential official sources of information and documentation are:

- Department of Minerals and Energy, 2008: DME Designated National Authority for the CDM:
  - <http://www.dme.gov.za/dna/>
- United Nations Framework Convention on Climate Change (UNFCCC), 2008: UNFCC website:
  - <http://cdm.unfccc.int/index.html>