

South African Designated National Authority for the Clean Development Mechanism

CDM

Status Review

South Africa

2011

VISION

To lead in the development and promotion of Clean Development Mechanism

MISSION

Effective and efficient regulation of Clean Development Mechanism Activities in accordance with the objectives of the United Nations Framework Convention on Climate Change

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EXECUTIVE SUMMARY

The international community attempt to curb anthropogenic greenhouse gas emissions resulted in the adoption of the United Nations Framework Convention on Climate Change as well as the Kyoto Protocol. Three market-based mechanism were initiated under the Kyoto protocol to assist Annex I parties to achieve their emission reduction targets. Clean Development Mechanism is one of these mechanisms and it well defined under Article 12 of the Kyoto Protocol. The mechanism allows industrialized nations with emission reduction targets to fund greenhouse gas emission reduction projects in developing nations in return for Certified Emission Reductions (CERs).

Even though Clean Development Mechanism (CDM) has been largely developed through a “learning-by-doing” approach, the mechanism has now been around for nearly a decade and it has involve since its inception. The mechaism has assisted the private sector in mobilising finance to implement low carbon projects and it has to a certain extend facilitated technology transfer. The market has grown rapidly, with the largest increase in terms of registration at the Executive Board. By end of 2011 more than 3,542 projects were registered in 72 countries and a further 3600 projects still in the pipeline, which may further expand the current CDM market to embrace the whole world. As of end 2011, South Africa had 21 CDM registered projects with the potential to reduce 3 573 780 tonne of carbon dioxide equivalent (CO₂e) /year). By far the greatest majority of projects registered so far fall in the category of fuel switching, nitrous abatement, methane recovery and flaring.

China remains the largest player in the CDM space accounting for 46% of the global registered projects, followed by India and Brazil with 21% and 5% respectively. Africa still accounts for 2% with only 72 registered projects at the end of 2011. Despite efforts by the CDM Executive Board and United Nations partner organisations to enhance project implementation in the region the region still account for only 2%. In terms of CERs issuance 1220 projects in 45 countries have been issued a total of more than 750 million CERs. The secondary CER prices suffered a sharp

drop in the second quarter of 2011, with prices dropping by more than 50 %. Prices were still very low by end of the year ranging between 2 to 5 Euros per ton of CER.

Within the South Africa context, CDM has developed at a very slow pace, with only 21 registered projects and only 8 projects receiving Certified Emission Reductions (CERs) as of end of 2011. Since its inception in December 2004, the South African DNA has reviewed 271 CDM project proposals. For this reporting year only two projects were registered including SASSA Low Pressure Solar Water Heater Programme and the Capture and Utilisation of Methane at the GFI Mining South Africa owned Beatrix Mine in South Africa). Furthermore, three projects received issuance of CERs; i.e. (Omnia Fertilizer Limited Nitrous Oxide (N₂O) Reduction Project, Transalloys Manganese Alloy Smelter Energy Efficiency Project and the Durban Landfill-Gas (Bisasar Road)).

The total expected emission reductions from the project pipeline will mainly come from renewable energy and energy efficiency. This is however not surprising given the high emissions profile of the energy sector. Project submitted to the DNA have demonstrated alignment with government objectives in terms of sustainable development contribution, particularly job creation. CDM proposals received in 2011 have a potential to generate about 42 193 jobs, of which 38 957 are permanent and 3 236 are temporal.

For this reporting year DNA conducted two project site visits; i.e. (Fuel switch project on the gluten 20 dryer of Tongaat Hullet Starch Pty (Ltd) Germiston Mill Project” and the “Lawley Fuel Switch Project)” to monitor the performance of these projects in relation to the sustainable development compliance as indicated in their respective PDDs. To further enhance project implementation in the country, DNA hosted six awareness-raising workshops, 5 provincial and one sector targeted.

The South African government successfully hosted the COP 17 from 28 November to 13 December 2011. South Africa also hosted the DNA forum from 25 to 26 November at Moses Mabhida Stadium in Durban. “Programme of Activities (PoA) Development in South Africa” as well as “Methane Capture and Energy Generation” CDM side events, were also held during

COP 17 at the Climate Change Response (CCR) expo on the 3rd and 7th of December 2012 respectively. After extending negotiations by two days beyond originally scheduled deadline, COP/MOP Parties agreed on a set of agreements. The agreements include the launch of the Green Climate Fund to scale up long-term climate finance to support developing countries mitigation efforts; the extension of the Kyoto Protocol even though the detail of the second commitment period as left for future negotiations to resolve; and the adoption of the “Durban Platform”.

In general, Durban maintained key elements of the global carbon market that may in future play a substantial role in promoting large-scale carbon dioxide removal. Other key decisions relating to CDM include the adoption of modalities and procedures for the inclusion of Carbon Capture and storage (CCS) under CDM project activities and the adoption of materiality standards under CDM.

There are strong indications of a viable carbon market after 2012 and the continued existence of the CDM. These signals include the adoption of the second commitment period under the Kyoto Protocol by the European Union during the Seventeenth Conference of Parties (COP 17) hosted in Durban, in December 2011. The European Union directive of restricting the use of CERs from non-least developing countries post 2012 in their European Trading Scheme (ETS) might pose a challenge to the development of CDM in the country taking into account that Africa still only accounts for 2% of CDM projects. We remain hopeful that our project developers will be able to find alternative carbon markets to sell their carbon credits.

Despite efforts to simplify continuous improvements in the CDM rules and registration processes, most project developers still have trouble in completing the CDM project cycle, especially in Africa. Some of the case studies in this report attest to that.

FOREWORD

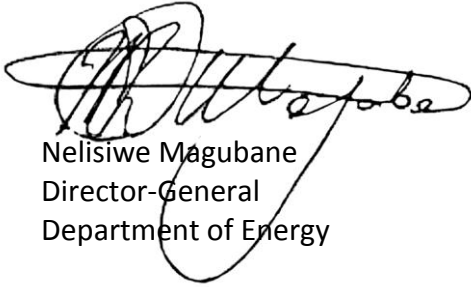


There are strong indications of a viable carbon market after 2012 and the continued existence of the CDM. These signals include the adoption of the second commitment period under the Kyoto Protocol by the European Union during the Seventeenth Conference of Parties (COP 17) hosted in Durban, in December 2011. The European Union directive of restricting the use of CERs from non-least developing countries post 2012 in their European Trading Scheme (ETS) might pose a challenge to the development of CDM in the country taking into account that Africa still only accounts for 2% of CDM projects. We remain hopeful that our project developers will be able to find alternative carbon markets to sell their carbon credits. Countries such as Australia and New Zealand have already pronounced their intention to allow CERs in their emission trading schemes.

A number of projects are already on the pipeline and we are hoping that more projects will be able to gain registration before the end of 2012, such that credits generated from the projects are still eligible under the ETS. With the movement towards a low carbon economy, South Africa will remain an attractive CDM destiny particularly the energy sector being the largest contributor of greenhouse gas emissions in the country. We are happy that by extending the Kyoto Protocol, COP/MOP also preserved its market mechanisms, CDM and Joint Implementation (JI).

The report primarily focused on the status of CDM in South Africa as of end 2011. Highlighting successes, challenges of implementing CDM in the country, of great importance is the key highlights of operational CDM case studies as reported by the project developers. Lessons learned from these case studies will greatly assist those intending to implement CDM projects and share some light to the public with regard to the dynamics associated with the development of these projects. Noting that despite efforts to simplify continuous improvements in the CDM rules and registration processes, most project developers still have

trouble in completing the CDM cycle. As a country and the department, we remain committed to engaging robustly with the project developers through national workshops to improve on the status as well as removing the policy barriers. I would, therefore like to express my sincere appreciation to all those who have provided inputs. I hope the report will provide useful inputs toward effective implementation of CDM in our country.



Nelisiwe Magubane
Director-General
Department of Energy

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1. Introduction

Clean Development Mechanism has been around for nearly a decade. This has been one of the most successful examples of how private finance can be effectively mobilised to tackle climate change. It is important, however to note that most types of CDM projects are only able to raise a portion of the total project costs from carbon finance, due to high costs associated with project implementation. Capital acquisition required to start the project has proven to be a challenge and is therefore as much of a problem in CDM project development like in many other private sector activities particularly in Africa. According to a recent CDM Executive report, CDM has catalyzed over US \$140 billion to abate greenhouse gas (GHG) emissions in developing countries by more than 750 million tons of carbon dioxide equivalent (CO₂e).

In order for developing countries to participate in the CDM initiative, they need to ratify the Kyoto Protocol and establish a Designated National Authority, which will have a regulatory responsibility. South Africa's participation in both the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol has provided the country with the opportunity to take part in Clean Development Mechanism. This also created new opportunities for South African companies and institutions to secure investment through the implementation of well-designed projects that generate carbon credits. As of end 2011, South Africa had 21 CDM registered projects with the potential to reduce 3 573 780 tonne of carbon dioxide equivalent (CO₂e) /year). By far the greatest majority of projects registered so far fall in the category of fuel switching, nitrous abatement, methane recovery and flaring.

The South African Designated National Authority has compiled this report to review and analyse the status of CDM implementation in the country in order to provide insights into the successes and challenges associated with these projects and to help the country to advance its status in project development, and carbon financing in general.

Our data sources are mainly project proposals (both Project Identification Notes and Project Design Documents) submitted to DNA as well as information received from project developers based on a set of questionnaires prepared by the DNA. The report will cover the following aspects: brief background on CDM and an overview of global carbon market development; CDM project development in the country; among several topics, the report will also focus on project submissions trends; potential emissions reduction; project issuance; key highlights for 2011; case studies: successes and challenges.

2. Background

The attempt to curb anthropogenic greenhouse gas emissions was initiated when the international community came together in 1988 to form the Inter-governmental Panel on Climate Change (IPCC). In 1992, at the Earth Summit in Rio de Janeiro, Brazil, a general blueprint for the reduction of global emissions was adopted through the establishment of the United Nations Framework Convention on Climate Change (UNFCCC). Five years later the Kyoto Protocol was also adopted and finally entered into force on February 16, 2005.

The Kyoto Protocol currently aims at reducing greenhouse gases by 5% below 1990 level thereby limit the average global temperature increase to a maximum of 2°C above the natural, pre-anthropogenic climate. The Protocol's first commitment period runs from 2008 to 2012. The three flexible mechanisms under the Kyoto Protocol include International Emissions Trading (IET) also known as Caps and Trade, Joint Implementation (JI) and Clean Development Mechanism (CDM). The six anthropogenic greenhouse gases listed in Annex A of the Kyoto Protocol are: Carbon Dioxide (CO₂); Methane (CH₄); Nitrous Oxide (N₂O); Hydro Fluorocarbons (HFC-23); Per-fluorocarbons (PFCs); and Sulphur Hexafluoride (SF₆).

The CDM is a key component of the Kyoto Protocol, as defined in Article 12, and the only flexible mechanism providing a practical link between Annex I (developed countries) and the non-annex I (developing countries). It enables Annex I countries to offset a part of their

emissions reduction commitments by implementing emissions reduction projects in developing countries. Developing countries with CDM projects in return gain technology and financing for GHG abatement.

The Protocol sets out four fundamental requirements regarding the implementation of CDM projects:

- 1) voluntary participation of each party involved;
- 2) real, measurable and long-term benefits related to the mitigation of climate change;
- 3) reductions in emissions that are additional to any that would occur in the absence of the certified project activity; and
- 4) that they meet the sustainable development criteria as defined by the host developing country.

2.1 CDM Governance

The CDM Executive Board (EB) supervises the actual operation of the CDM. It takes decisions on methodologies and projects, mandates reviews and revisions. The UNFCCC Secretariat together with various expert panels provide support to the CDM EB. The Conference of Parties also serving, as the Meeting of Parties to the Kyoto Protocol (CMP), is the executive body with the highest authority over CDM and guides the CDM EB's work. The decisions of the COP/MOP are not formally binding on any of the Parties. The acceptance of COP/MOP decisions is founded in a Party's consent rather than through the legislative authority of the COP/MOP.

2.2 CDM Project Registration Procedure

The CDM has specific procedures and modalities for registration and obtaining of Certified Emission Reductions. A project has to successfully complete the CDM project cycle. Figure 1 below, is a schematic representation of a CDM project cycle.

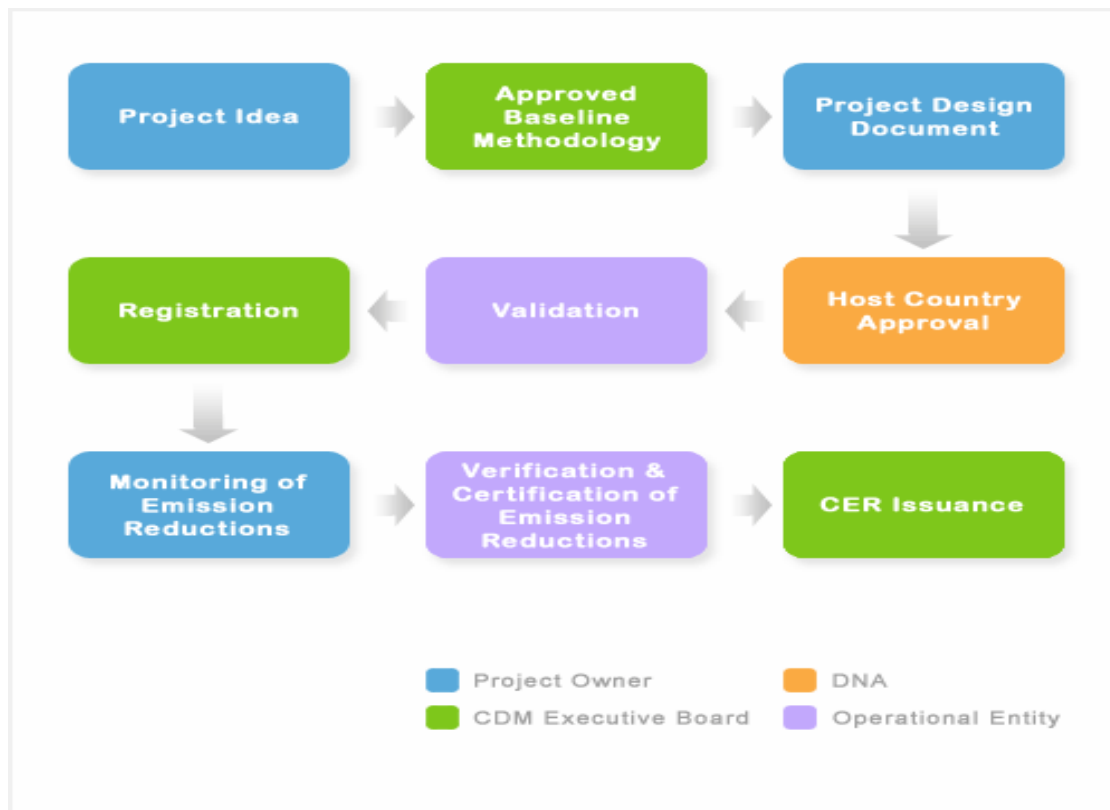


Figure 1: CDM Project Cycle, Source: <http://energypedia.info/images>

The stages involved in a project cycle include the following:

- A project needs a project plan outlined in a Project Design Document (PDD) that has been open for 30 days public comments and has addressed stakeholder concerns;
- The project has to be approved by the host nation’s Designated National Authority through issuance of a Letter of Approval as having complied with the sustainable development criteria of the host nation;
- The project should have a GHG reductions monitoring plan and make use of a GHG monitoring methodology that has been approved by the CDM Executive Board to monitor emission reductions; and
- A UNFCCC accredited third party known as a Designated Operational Entity has to audit emissions reductions by validating as well as verifying them accordingly.

To read and understand more about the CDM project cycle, “the South African Guideline for CDM Applicants,” can be downloaded from the Department of Energy’s (DoE) website:

3. Global Overview

3.1 Development of the Global CDM

CDM has steadily developed and expanded since the adoption of the Kyoto Protocol in 1997. The market has grown rapidly, with the largest increase in terms of registration by the CDM EB. By the end of 2011, more than 3,542 projects were registered in 72 countries and a further 3600 projects still in the pipeline for registration, which may expand the current CDM market to embrace the whole world. According to the World Bank, (<http://blogs.worldbank.org/climatechange/carbon-markets-valley-creation>), the global carbon market climbed in 2011, the total value of the market grew by 11 % year on year (yoy) to US\$176 billion, and transaction volumes reached a new high of 10.3 billion tons of carbon dioxide equivalent (CO₂e).

China remains the largest player in the CDM space accounting for 46% of the global registered projects, followed by India and Brazil with 21% and 5% respectively. Figure 2 below indicates registered projects by Host Parties. Despite efforts for the development of CDM projects in Africa, Africa still account for only 2% of the registered projects. South Africa has the most CDM registered projects in Africa, with 21 registered projects. Nigeria however, accounts for the largest share of expected total credits to be issued because most of its projects are on nitrous oxide (N₂O) abatement. N₂O is a high potent GHG with a global warming potential of 310.

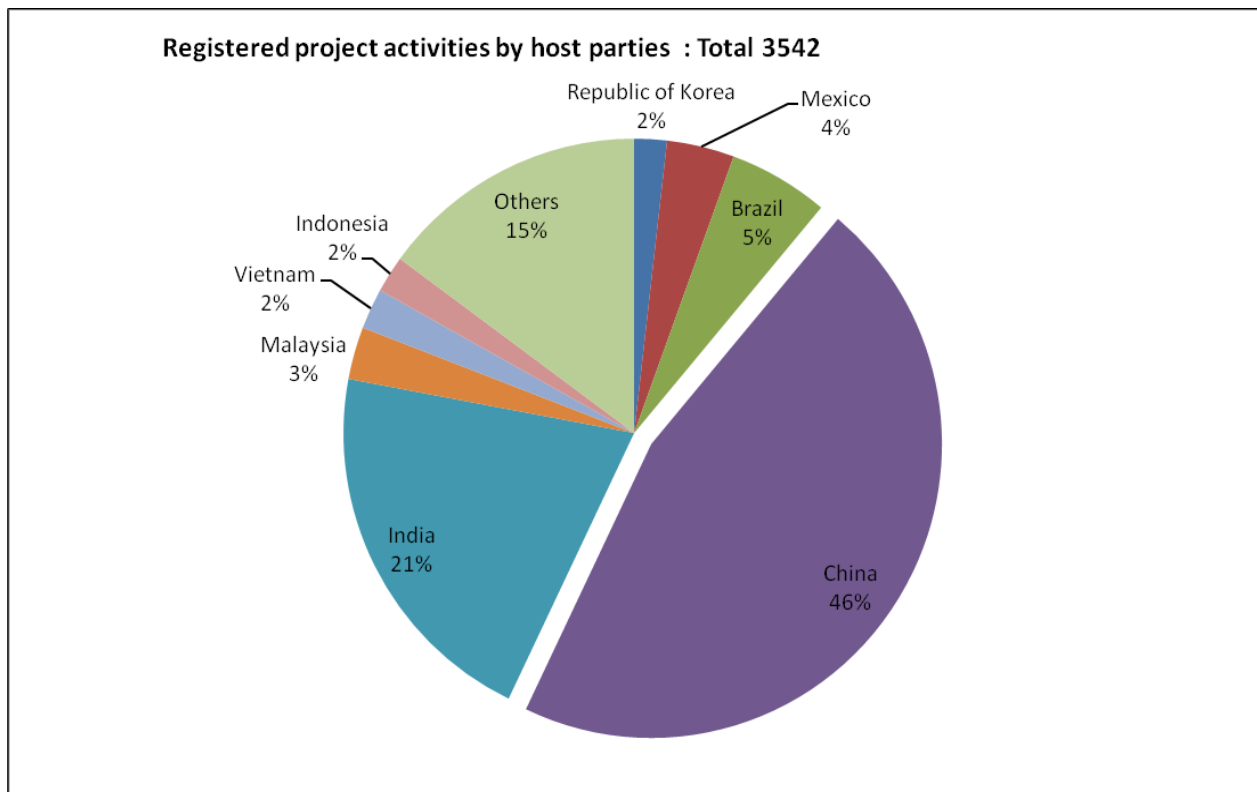


Figure 2: Registered Projects by Host Parties, Source: <http://cdm.unfccc.int/>

According to the United Nations Environment Programme RISØe Centre, over US \$2 billion has been invested in African carbon projects to date, and annual carbon revenues from African registered before the end of 2012 are projected to be over US \$1 billion. 1220 projects in 45 countries have been issued a total of more than 750 million CERs.

The move toward programmatic CDM is an extremely positive development. It seems to be a very attractive option for Africa as the number of PoAs in region is now more than a quarter of the total global PoAs pipeline. There are now 13 registered PoAs in 11 countries, with 1103 CDM Project Activities (CPAs). More up to date project statistics are available on the UNFCCC website, www.unfccc.int.

A number of guidelines and procedures are continuously developed by the EB to facilitate regional distribution and simplification of CDM requirement while maintaining the environmental integrity. Some of the activities undertaken in 2011 includes:

- The development of guidelines on standardized emission baselines that allow countries to calculate the typical emissions for an entire sector and create a list of technologies or measures that are automatically additional;
- A project standard for project participants;
- A validation and verification standard for designated operational entities, and a project cycle procedure that includes opportunities for direct communication between project participants and the UNFCCC secretariat;
- Further simplifying the procedures for micro-scale project activities;
- Guidelines for “suppressed demand”; and
- Identifying an agency to implement a loan scheme.

3.2 Carbon prices

The secondary CER prices suffered a sharp drop in the second quarter of 2011. Prices were down by more than 50 percent since the start of June 2011 as the demand waned due to an abundance of carbon credit supply and prospects of slow growth (Reuters, 2011). Prices were still very low by end of the year ranging between 2 to 5 Euros per ton of CER.

4. CDM in South Africa

South Africa ratified the Kyoto Protocol in 2005 and this awarded the country an opportunity to participate in CDM.

4.1 Institutional Arrangement to Handle CDM in South Africa

The Designated National Authority (DNA) was established in 2004, through regulations under the National Environmental Management Act of 1998. The DNA was initially located within the Department of Minerals and Energy (DME) and because of the split of DME into two departments namely the Department of Mineral Resources and the Department of Energy in May 2009, the DNA function now resides with the Department of Energy. It assumes the following roles:

- Issuance of Letters of No Objection and Letters of Approval for CDM Projects;
- Confirmation of project contribution to national sustainable development;
- Awareness raising and capacity building for CDM project activities.

DNA works hand in hand with a technical advisory steering committee. The committee is comprised of members from thirteen National Departments, which include the Department of Energy (as a Chair Department and secretariat); Water Affairs, Environmental Affairs; International Relations and Cooperation; Trade and Industry; Agriculture, Forestry and Fisheries; Transport; National Treasury; Science and Technology; Health; Public Works; Human Settlements and Mineral Resources. DNA has published several useful documents, which include the South African CDM Project Approval Procedure; Sustainable Development Criteria; Guideline for CDM Applicants in South Africa, as well as several CDM sector booklets. All these documents are available on the DoE website (www.energy.gov.za/dna). Hard copies of the documents can be obtained from the DNA's offices.

4.2 CDM Potential in South Africa

South Africa offers tremendous opportunities for investors given its energy intensive activities and dependency on fossil fuels. This makes it a good CDM destination due to high baseline emissions. The energy sector is the largest source of greenhouse gas emissions, accounting for approximately 80% of the country's emissions in 2000 (DEA, 2009). Among the country's advantages to investors, are its abundant natural resources, which include solar and wind.

Given the high emissions profile of the energy sector, the potential to develop CDM is large both for supply-side and demand-side projects. Examples are listed below:

- Renewable Energy
 - Wind energy: in areas with strong wind like Western Cape and Eastern Cape;
 - Solar energy: for generating electricity, heat/drying for industries , solar water heating for public buildings and hotels;
 - Small hydro power; and
 - Electricity generation from biomass.
- Fuel switching from fossil fuel based electricity to using natural gas,
- Carbon capture and storage projects,
- Energy efficiency improvements in industry and residential areas through energy management use of energy efficient appliances and designing energy efficient buildings.
- Waste sector: composting and Landfill-Gas-To-Energy Projects,
 - This is a promising area considering that nearly all municipalities have at least one waste dumping site, particularly the metropolitan municipalities with high volume of waste. For example, eThekweni municipality has already established an operational CDM project. Other CDM projects from several metropolitans such as the City of Joburg, Tshwane and Nelson Mandela Bay are at CDM different stages of development but not yet operational. Already South Africa has registered 5 landfill gas to energy projects and 5 more are in the pipeline.

- Transport sector: mode switching to less carbon intensive transport systems such as rail, use of cycles; moving towards mass transportation systems; using less carbon intensive fuels in vehicles such as biodiesel,
- Mining sector: recovery of methane from coalmines, flaring and subsequent energy generation,
- Construction sector: energy efficiency improvements, using energy efficient vehicles,
- Agricultural sector: animal waste or manure management; reduction of methane emissions from livestock, and
- Afforestation and reforestation: including community agro-forestry, plantation forestry, rangeland improvement, degraded lands restoration.

4.3 Eligibility criteria for CDM projects in South Africa

One of the objectives of CDM is to promote sustainable development. To that end, the South African DNA applies the following criteria that need to be considered when designing CDM projects in the country. Potential CDM projects should, as a rule satisfy the following:

- Comply with the National policies,
- Obtain, where applicable all relevant national authorization for project implementation , for example Environmental Impact Assessment(EIA), electricity generation license, water permit ,etc;
- Address National related action plans and strategies,
- Aim at transferring a technology which is environmentally friendly,
- Aim at poverty alleviation by generating additional employment and improving standards of living,
- Bring in additional investment finance or capital flows,
- Foster or create partnerships with local institutions, non –governmental organisations (NGOs) or local private companies,
- Bring economic and social development to the country. The South African sustainable development criteria document is available on the following link

<http://www.energy.gov.za/files/esources/kyoto/Web%20info/Annex%203%20SA%20Sustainable%20Development%20Criteria.pdf>,

- Ensure that a CDM project fits within the scope of national development plans and national environmental and socio-economic frameworks.

4.4 Financial incentives and other policy instruments

There are several financial incentives related to the development of renewable energy and energy efficiency, which can be major areas for delivering CERs in the country. These include the Renewable Energy Independent Power Producers Programme and the Energy Efficiency Tax rebates incentive Scheme. There is also the energy efficiency incentive for infrastructure development investments between R30 million and R200 million by the Department of Trade and Industry. It is hoped that forthcoming financial incentives will help South Africa to become the largest deliverer of CERs in the world. The Carbon Tax Discussion paper published by National Treasury might also make CDM projects much more competitive. The discussion paper on a carbon tax was released in 2010, mulling tax levels of R10/t CO₂, and it is anticipated to stimulate the carbon market in the country. Work is in progress to finalize the discussion paper on carbon tax as one of the country's priorities to reduce emissions by enforcing several environmental tax tools.

4.5 Statistical Analysis

Clean Development Mechanism in South Africa has grown at a very slow pace as compared to other developing countries such as China, India, and Brazil. As of December 2011, South Africa only had 21 registered projects, these are highlighted in Figure 3 below together with the emission reductions potential from each of these projects. Considering the country's emissions intensity, 21 is still very low. However, a slight improvement has been realized in comparison with the 2010 CDM status report. In 2010, the country had 19 registered CDM projects.

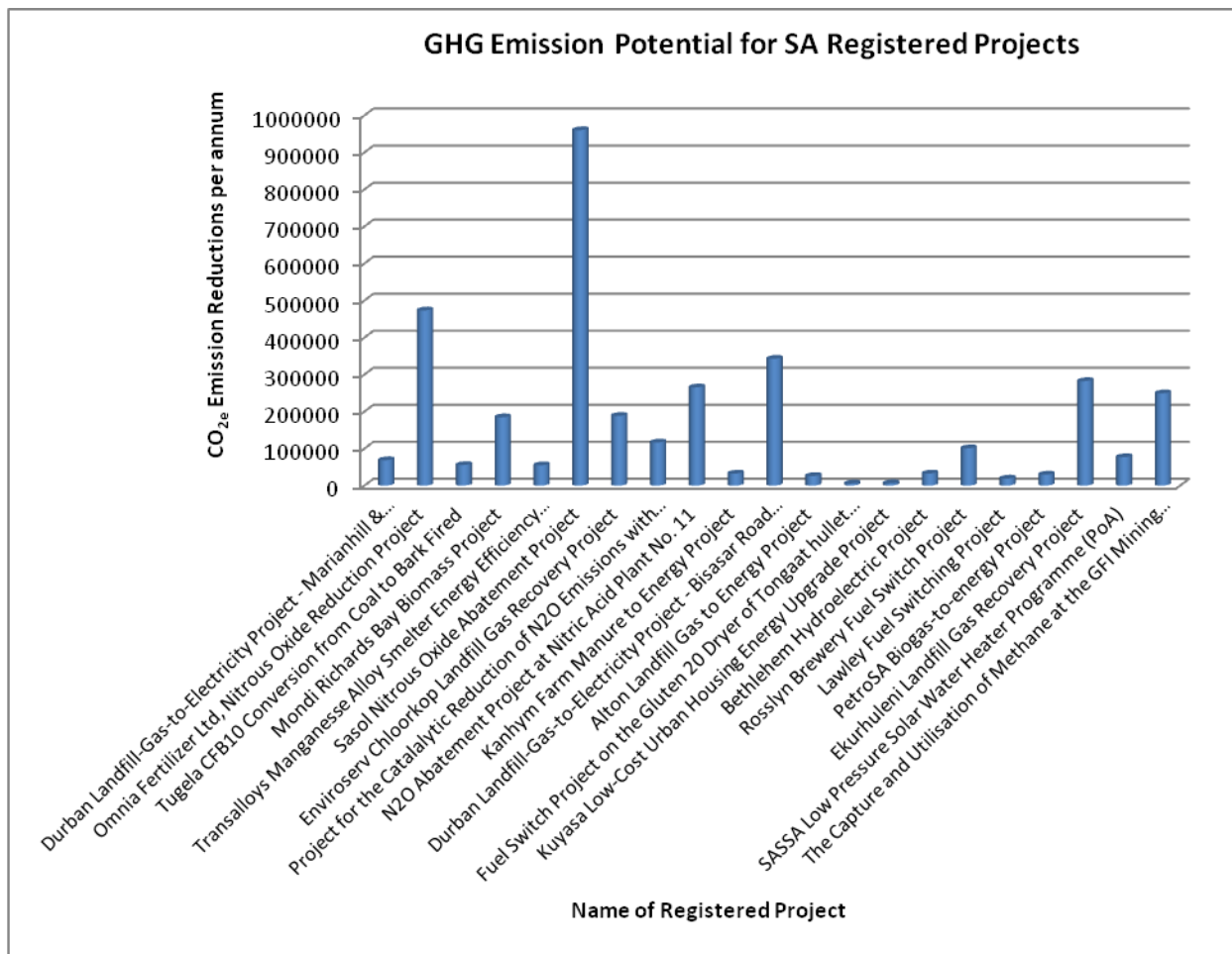


Figure 3: Emissions Reduction Potential for Registered projects

Project submissions have increased gradually since DNA establishment in 2004. By December 2011, 271 CDM project proposals were submitted to the DNA –, these include 219 Project Idea Notes (PINs) and 52 Project Design Documents (PDDs). Looking at the rate of PINs submission over the years it is clear that many CDM project proponents are capable of developing project ideas but problems arise in the PDD stage. Figure 4 below indicates submission trends for both PINs and PDDs from 2004 to December 2011.



Figure 4: Project Submission Trend since December 2004, Source: DNA

For this reporting year, 78 projects were submitted for review, of which 62 were Project Idea Notes and 16 were Project Design Documents. The PDD submissions have almost doubled as compare to the previous years. Table 1 below indicates all Project Design Documents that were submitted for review in 2011. A comprehensive South Africa project portfolio can be downloaded on the DoE website (www.energy.gov.za/dna).

Project No.	Project Title	Project Description	Project Type	Estimated tCO ₂ e Emission Reductions
1.	Cogeneration from Waste Smelter Gas at Richards Bay Minerals in South Africa	The project activity involves the use of waste furnace off-gas to generate electricity and heat for use on site. The proposed project will have electricity generation capacity of 9MW.	Cogeneration	57 018
2.	Nelson Mandela Bay Metropolitan's Landfill Gas Project	The project activity involves the use of waste and landfill gas (LFG) to generate electricity. It will collect the LFG by means of a number of horizontal and vertical extraction wells installed in the sites. The proposed project will have electricity generation capacity of 9MW and will be connected to the national grid.	Methane recovery and flaring/Electricity generation	100 000
3.	Standard Bank Low Pressure Solar Water Heater Programme for South Africa	The objective of the Programme of Activities is to install South African Bureau of Standards (SABS) approved non-pressure (also called low-pressure) Solar Water Heaters (SWHs) to low income households at minimal cost. The SWHs will replace conventional means of heating up water and hence reduces CO ₂ emissions.	Energy Efficiency	385 632
4.	Fuel Switch at Corobriks Driefontein Brick Factory in South Africa	The objective of the project is to implement a fuel switch that entails the conversion of coal to natural gas to an existing clay brick firing tunnel kiln at Driefontein brick factory owned by Corobrik (Pty) Ltd.	Fuel Switch	38 062
5.	Joburg Landfill Gas to Energy Project	The project entails the development of landfill gas extraction and utilization systems at five landfill site within Joburg.	Methane Recovery and Flaring	530 083
6.	IMF Integrated Clean Energy	The project aims to utilize waste furnace offgas as a source of energy to generate clean electricity and contribute to lower	Waste Management/C	175 731

	Project	greenhouse gas emission by replacing fossil fuel based power from the national grid.	ogeneration	
7.	Klawer Grid Connected Wind	The objective of the project is to install a wind power plant with a generating capacity of 30 MW and supply it into SAs national electricity grid.	Renewable Energy	81 451.76
8.	Grid Connected Wind Power Plant in Witberg, South Africa	The objective of the project is to reduce greenhouse gases by installing a wind power plant with a generating capacity of 150 MW and supply it into SAs national electricity grid.	Renewable Energy	527,492.16
9.	Renewable Energy Generation Through Anaerobic Digestion And Biogas-Based Energy Generation in South Africa.	The objective of the project is to generate renewable energy through anaerobic digestion and biogas-based energy generation.	Renewable Energy	4 909
10.	Springbok Grid Connected 55.5MW Wind Farm, South Africa	The aim of the proposed project is to construct and operate a wind farm with an installed capacity of up to 55.5mw and supply electricity generated to the National Grid.	Renewable Energy	1 278 330
11.	Body Coal and Clamp Kiln Fuel Switch at Allbrick, South Africa	The objective of the proposed project involves implementing a fuel switch from coal to charcoal produced from wood waste in the clamp kilns	Fuel Switch	5 604
12.	De Aar Grid Connected 100.5 MW Wind Farm, South Africa	The objective of the proposed project is to construct and operate a wind farm with installed capacity of about 100.5 MW. The electricity generated will be supplied to South Africa's National Grid.	Renewable Energy	227 892
13.	Coega IDZ Windfarm	The proposed project will involves the installation of 25 wind turbines with an installed electricity generation capacity of 73.8 MW. In the Coega Industrial Development Zone (IDZ),	Renewable Energy	166 498

		near Port Elizabeth in the Eastern Cape province in South Africa.		
14.	Use of waste gas at Namaqua sands in South Africa	The objective of the proposed project is to reduce greenhouse gas emissions by utilizing waste gas from a smelter operation. The waste gas will be fed into engines for the generation of electricity. The project will use cleaned furnace off-gas, which was previously flared, to generate electricity using internal combustion engines.	Waste Management/CO ₂ generation	83 547
15.	International Water Purification	The objective of the proposed Programme of Activities (PoA) is to use carbon finance for the introduction of low greenhouse gas emitting water purification systems to provide clean drinking water to low income households. It seeks to further the access of households and communities to clean and safe drinking water, by promoting low greenhouse gas emitting water purification technologies	Waste Management	60 000
16.	Omnia N ₂ O Abatement Project II	The objective of the proposed project is to reduce N ₂ O emissions in the tail gas by installing a tertiary N ₂ O abatement technology and specialised monitoring equipment that is installed at the tail gas stream after the abatement of N ₂ O emissions.	Nitrous Oxide	339 238

Table 1: Project Design Documents Submitted to the DNA in 2011

4.5.1 Project Submissions by Sectoral Scope

Analysis of the project pipeline shows that whilst there are diverse ranges of project types, the total expected emissions of the projects mainly come from renewable energy and energy efficiency, as shown in figure 5 below. This is mainly because South Africa is heavily reliant on coal for energy generation, particularly electricity thereby resulting in high baseline emissions and consequently huge mitigation potential in renewable energy and energy efficiency scopes.

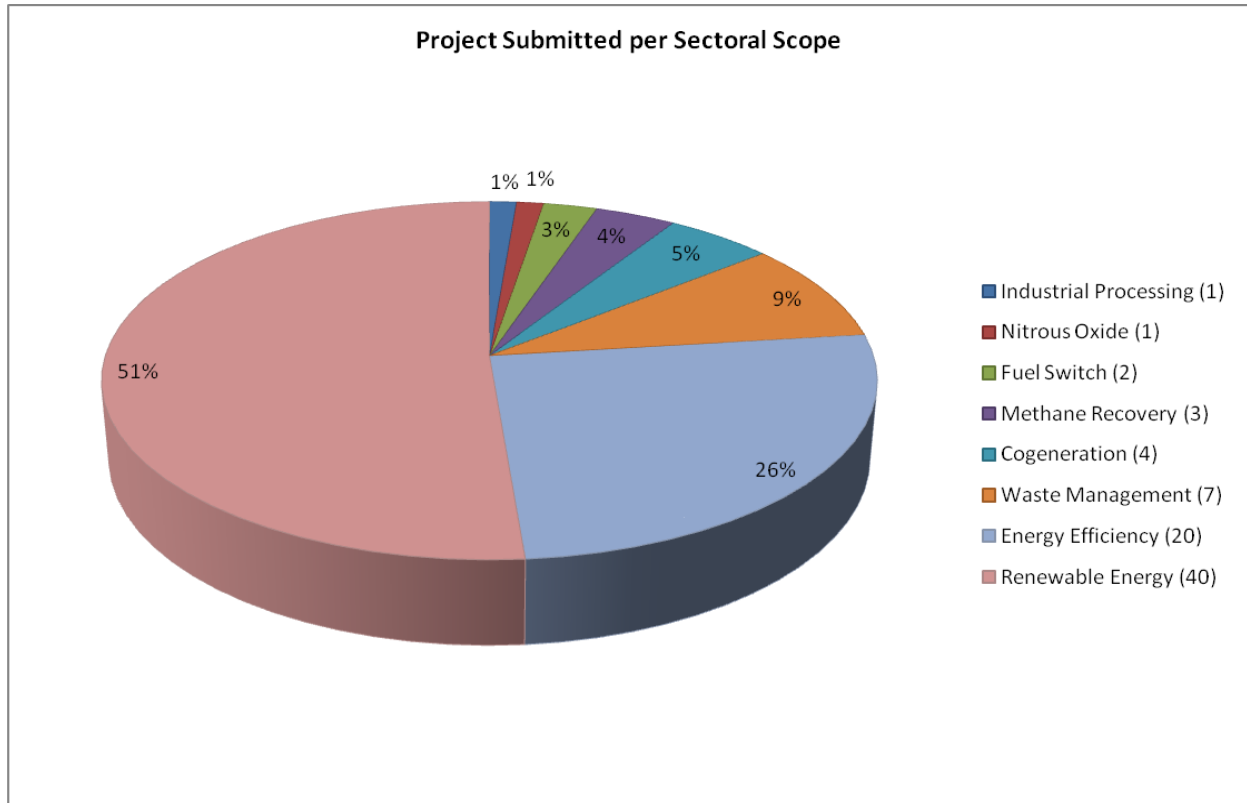


Figure 5: Project Submission per Sectoral Scopes, Source: South African DNA

4.5.2 Certified Emission Reductions Issuance

Table 2 below indicates all projects issued with CERs in 2011. The total number of CERs issued amounts to 2 537 140 carbon dioxide equivalent (CO₂e).

Name of Project	1st Issuance	2nd Issuance	3rd Issuance	4th Issuance	5th Issuance	6th Issuance	Total CERs issued / Project(CO ₂ e)
Omnia Fertilizer Limited Nitrous Oxide Reduction Project	26276	157352	321234	151795	167673	251685	1076015
Transalloys Manganese Alloy Smelter Energy Efficient Project	223073	112292	82934				418299
Sasol Nitrous Oxide Abatement Project	259537	543502					803039
PetroSA Biogas to Energy Project	32730						32730
Enviroserv Chloorkop Landfill Gas Recovery Project	83135						83135
Lawley Fuel Switch	18098	17032					35130
Tugella Mill Fuel Switching Project	23081						23081
Durban Landfill-Gas-to-Energy Bisasar Road	65711						65711
Total number of CERs	731641	830178	404168	151795	167673	251685	2537140

Table 2: CERs Issuance since inception of the South African DNA since the inception of the DNA to the end of 2011, Source: <http://cdm.unfccc.int/>

Notable, all nitrous oxide reduction projects have been issued with CERs more than once, this is because these projects offer large volumes emission reductions because N₂O has a very high global warming potential of 310. It also has low performance risk, limited requirements for investment and have short lead times.

Further analysis also shows that the majority of expected reductions are delivered by the abatement of NO₂ and energy efficiency projects of which mainly implemented by the industry as also shown in figure 6 below. Omnia Fertilizer Limited Nitrous Oxide Reduction Project is the highest success with six issuances amounting to 1 076 015 CERs accounting for 42.1%. Sasol Nitrous Oxide Abatement Project is the second with two issuances amounting to 803 039 CERs thereby accounting for 31.7% with Transalloys Manganese Alloy Smelter Energy Efficient Project as the third with three issuance amounting to 418 299 CERs and accounting 16.5%. The remaining 9.5% is shared amongst the remaining 5 projects, i.e. PetroSA Biogas to Energy Project; Enviroserv Chloorkop Landfill Gas Recovery Project; Lawley Fuel Switch; Tugella Mill Fuel Switching Project and Durban Landfill-Gas Bisasar Road. In terms of social contribution to sustainable development on the issued projects, the following number of jobs was created:

- Transalloys Manganese Alloy Smelter Energy Efficient Project: 15 continuous temporary jobs for both manual labour and operations;
- Sasol Nitrous Oxide Abatement Project: 2 permanent jobs involved in the monitoring of nitrous oxide abatement;
- PetroSA Biogas to Energy Project: 4 permanent engineers for operations and maintenance;
- Enviroserv Chloorkop Landfill Gas Recovery Project: 1 permanent job for monitoring the wells as well as optimizing gas flow;
- Durban Landfill-Gas Bisasar Road: 11 permanent jobs for operations and 250 temporary for construction.

NB: It is worth noting that during the compilation of the report, job creation in terms of the remaining 3 issued projects could not be obtained.

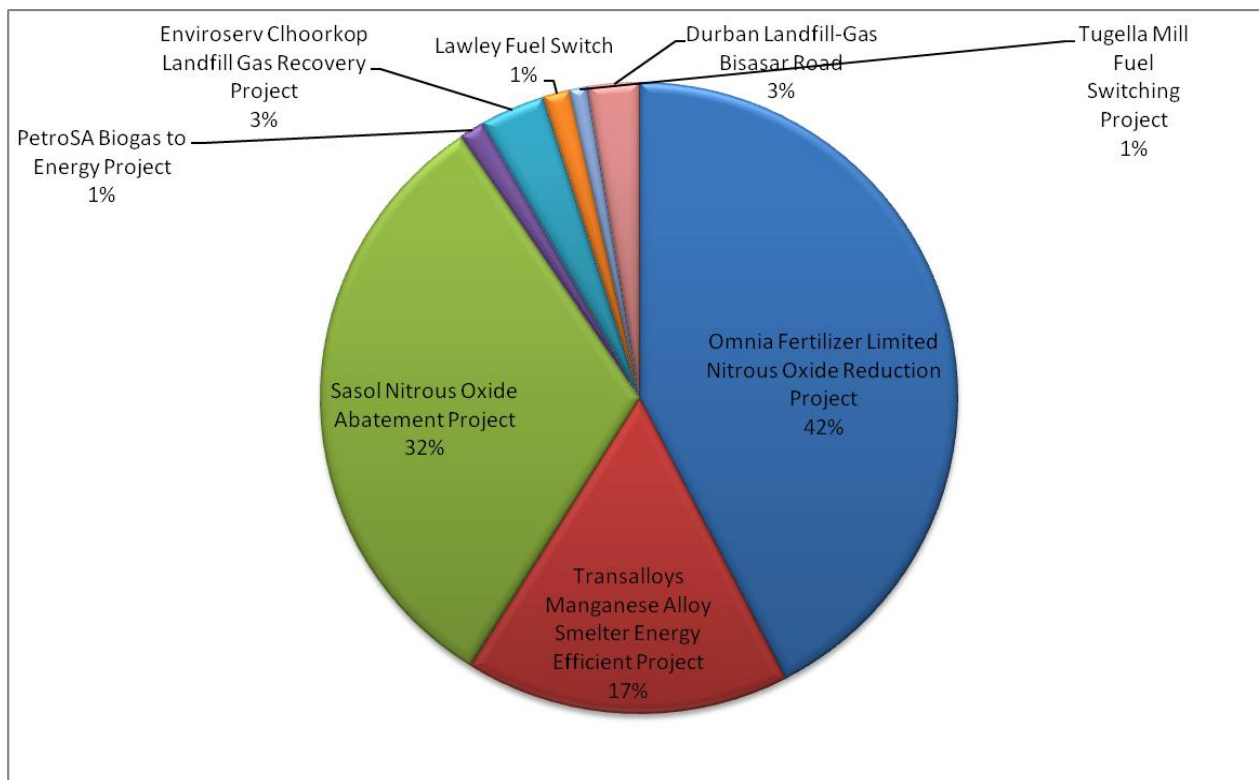


Figure 6: Percentage Distribution of CER Issuance in South Africa, Source: South African DNA

In terms of estimated reductions per crediting years, the Sasol Nitrous Oxide Abatement Project has the highest number at 960 322, followed by Omnia Fertilizer Limited Nitrous Oxide Reduction Project at 473 338. This is due to the fact that emission reductions that were originally estimated were simply assumptions based on approved methodologies, as well as feasibility studies.

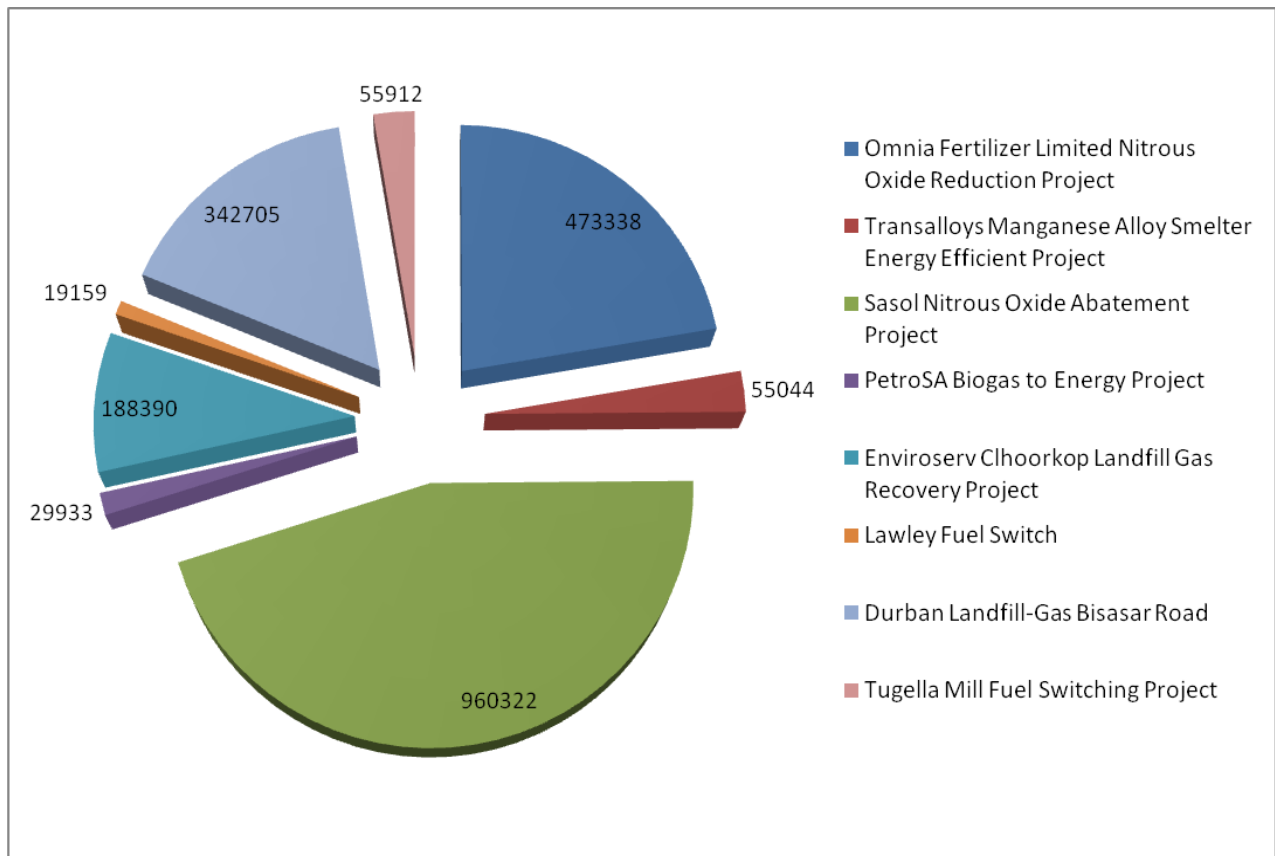


Figure 7: Total Estimated Reductions for Projects Issued with CERs, Source: www.unfccc.int

4.5.3 Project’s Contribution to Sustainable Development

One of the key objectives of CDM is to promote sustainable development. As a custodian of CDM in the country, it is crucial for DNA to also report on project contribution to sustainable development. CDM projects submitted to the DNA are reviewed against the set core criteria of Sustainable Development (SD) as defined under the National Environmental Management Act 107 of 1998. The criteria are also in line with the government objectives of integrating social, environment and economic issues into planning and developmental processes.

4.5.3.1 Sustainable Development and Job Creation in South Africa

The proposed CDM projects (PINs and PDDs included) submitted to DNA in 2011 have the potential to create a total of 42 193 jobs. PINs have the potential to create a total of 38 835 jobs, of which 36 272 are temporal and 2 563 are permanent. The PDDs have the potential to create 3 358 of which 2 685 are temporal and 673 permanent. These statistics are based on the information provided by project developers as outline in the PINs and PDDs.

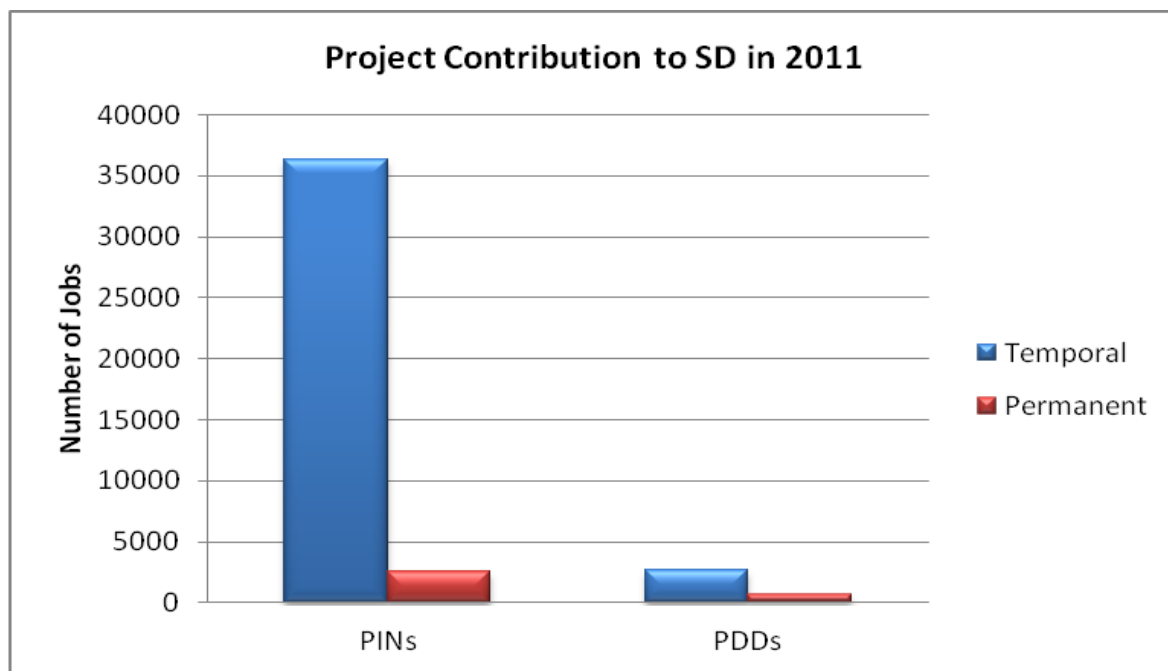


Figure 8: Anticipated number of Jobs, Source: South African DNA

4.5.3.2 Monitoring of CDM Projects

The DNA's Project Evaluation and Monitoring sub-directorate also conducts post-approval site visits to monitor project compliance to sustainable development commitments as indicated during submission for approval by DNA. Projects are monitored using a sustainable development (SD) questionnaire indicator, which determines the difference between SD performances at the time of approval against performance at the time of implementation and

any changes are noted in the DNA's monitoring report. The monitoring report provides the detailed information on projects monitored by the DNA, the analysis and the findings of the monitoring process.

In the cases of non-compliance, the DNA notifies the project developer as well as the CDM steering committee. So far the DNA has not yet experienced non-compliance during project monitoring. The monitoring relies on verbal information, as there is no mandatory legislative requirement for compliance during monitoring. The DNA encourages the project developer to adhere to the SD criteria as stipulated in the approved PDD to avoid a call for review by DNA during project verification process, which may delay the CERs issuance.

Although projects site visits were conducted, the DNA still faces difficulties in validating some of the information provided by project developers during the visits. For this reporting year only two projects were visited due to budgetary constraints. The projects visited are:

**a) Fuel switch project on the gluten 20 dryer of Tongaat Hullet Starch Pty (Ltd)
Germiston Mill**

This is a fuel switch project on the Gluten 20 dryer, within the Tongaat Hullet Starch Pty (Ltd) Germiston Mill, located in Germiston in Gauteng Province. The project site visit was done on the 21st of September 2011. The project contributions to sustainable development were highlighted as follows:

Environmental:

- Geographically Tongaat Hullet Starch (Pty) Ltd is within residential vicinity therefore the switch from coal to natural gas led to emission reductions of the unpleasant off-gas smell, which the community initially complained about.

Economically:

- The project brought additional benefits and economic improvement for the local businesses. Gas is supplied by Sasol through a pipeline and it is liable for the maintenance of the pipeline.

Socially:

- The Natural gas furnace was purchased from abroad and installed at Tongaat Hullet, so workers were trained to operate the furnace.

b) Lawley Fuel Switch Project

The project entails the conversion from coal to natural gas of the thermal fuel used in clay brick baking kilns at Lawley Brick Factory, an existing brick factory wholly owned by Corobrik (Pty) Ltd, South Africa. The project is located in Lenasia, Gauteng Province and was visited on the 30th of September 2011. The project was developed, financed and implemented by Corobrik (Pty) Ltd. During the DNA site visit, Mr. David Matlou, Mr. John Anthony & Mr. Andreas Ntseki represented Corobrik (Pty) Ltd.

The project contributions to sustainable development are as follows:

Environmental:

- The project has resulted in improved air quality by reducing an estimated 3 5130 tCO₂e per annum resulting in direct benefits in terms of employee's health and safety.

Economically:

- The project will result in replicable gas technology transfer that will benefit similar industries as well as Corobriks Driefontein Bricks Factory in South Africa;
- The project has received estimated revenue of R2 million in 2008 from the sale of carbon credits.

Socially:

- The switch from coal to natural gas did not result to job losses, employees were retained and trained to operate and maintain the technology.

4.5.4 Barriers to CDM Development in South Africa

Through some engagements with several CDM stakeholders the following elements were identified as barriers to CDM projects implementation:

➤ *Lack of Project Finance*

Funding is one of the main barriers to CDM development in South Africa. Many projects are stuck at an idea note because project developers do not have enough capital to implement the project. Financial institutions also conduct risk assessment before providing loans to CDM project proposals which further aggravates the problem. The costs associated with carbon consulting can be quite high ranging from R300 000 to R1 million. The scale of the project also has a direct influence on the overall costs, which large scale projects costs tending to be extremely high.

➤ *Complexity of the CDM*

The CDM in its actual sense is a very complex and lengthy mechanism. Complicated process and continuous development of the CDM procedures are some of the hurdles that have been pointed out by project participants. The EB rules keep on changing from time to time with guidance from CMP and compiling documents such as a PDD often requires the expertise of qualified CDM consultants.

➤ *High Transaction costs*

Transaction costs associated with completing the CDM project cycle represent a common hurdle facing many project developers, especially for small-scale projects. This is because transaction costs are incurred up-front, while CDM revenue is only generated once the project has been registered and credits verified and issued. The validation and verification costs are very high ranging from R 300 000, 00 to over a million.

➤ *The current regulations and structure within the electricity market*

Given the number of potential projects which involve electricity generation (e.g. Landfill gas, fuel switching, co-generation), the operation of the electricity market is closely linked to the CDM industry in South Africa. Many CDM projects in South Africa require Power Purchase Agreements (PPAs) and an overwhelming number of project developers cited the terms of PPAs as being key stumbling blocks for many potentially successful projects. The aforementioned perceived gaps in Renewable Energy policy exacerbate these problems.

➤ **Post 2012 regime and the impact of the European Union directive**

The European Union directive on restricting the use of CERs from projects registered post-December 2012 unless they are from Least Developing Countries (LDCs) will pose a major challenge for South Africa as a developing country that has not reached satisfactory stage on CDM development. When compared to other developing countries with significant number of registered projects like China, Brazil and India, South Africa is lagging behind. EU is currently a major buyer of CERs, responsible for over 96%.

4.5.5 Overcoming national-level barriers

Clearly developing a vibrant CDM project portfolio in the country will require the support of multiple stakeholders including both national and international. More importantly, there is a need for the South African DNA to work together with the other government departments and agencies to help identify and remove existing policy barriers. The development of new policies to support for key elements of the CDM process is of utmost importance. A CDM project requires a number of different aspects to come together successfully, including; financing for

the project, an underlying asset to which the project applies, the technology and the regulatory environment, and hence it is crucial that all these elements are considered.

CDM projects can have widely varying capital cost requirements, depending both on the project type, and on whether or not the CDM costs encompass the entire project, or just a CDM “add-on”. As with other types of investments, a positive national investment climate is highly important to attract CDM funding, particularly on inward investment for capital-intensive projects. Some of the suggestions on how CDM implementation could be enhanced include:

- Government increasing interest in CDM project development within the country by undertaking a variety of actions to improve the general investment and policy framework, as well as on improving CDM specific frameworks and institutions.
- Support programs of building the capacity of project participants and Designated Operational Entities.

5. Highlights for 2011

5.1.1 Project Registration

The DNA would like to congratulate the following projects on their successful registration:

- i. International Carbon on the registration of the first Programme of Activities in South Africa, "SASSA Low Pressure Solar Water Heater Programme" (4302), registered on 12 April 2011.
- ii. Beatrix Mine on the registration of "The Capture and Utilisation of Methane at the GFI Mining South Africa owned Beatrix Mine in South Africa" (4728) project, registered on 10 June 2011.

5.1.2 CERs Issuance

The following projects received CERs issuances in 2011:

- (i) "Omnia Fertilizer Limited Nitrous Oxide (N₂O) Reduction Project" with three issuances in 2011 including 151 795 CERs for the monitoring period 01 February 2009 to 31 May 2009; 167 673 CERs for the monitoring period 1 June 2009 to 31 October 2009 and 251 685 CERs for the monitoring period 1 November 2009 to 31 May 2010. The first two issuances for 2011 was on the 4 November 2011 and the third issuance on 16 December 2011.
- (ii) "Tugela Mill Fuel Switching Project" with an issuance of 23 081 CERs for the monitoring period 16 January 2008 to 28 February 2009 on the 21 April 2011.
- (iii) "Transalloys Manganese Alloy Smelter Energy Efficiency Project," with an issuance of 82 934 CERs for the monitoring period 01 July 2009 to 28 February 2010 on the 3 March 2011.
- (iv) "Durban Landfill-Gas Bisasar Road," with an issuance of 65 711 CERs for the monitoring period 26 March 2009 to 31 August 2009 on the 30 December 2011.

Information on these issuance and related documents are available on the UNFCCC CDM website (http://cdm.unfccc.int/issuance/cers_iss.html).

5.1.3 The Accreditation of the first African Designated Operational

The DNA would like to congratulate Carbon Check (Pty) Ltd, for being the first African company to be accredited as a Designated Operational Entity (DOE). Carbon Check (Pty) Ltd had initially applied for 13 sectoral scopes, however it was accredited for validation and/or verification of nine scopes, including: Scope 1: Energy industries (renewable / non-renewable sources), Scope 2: Energy distribution, Scope 3: Energy demand, Scope 4: Manufacturing industries, Scope 5:

Chemical industry, Scope 8: Mining/mineral production, Scope 9: Metal production, Scope 10: Fugitive emissions from fuels (solid, oil and gas), and Scope 13: Waste handling and disposal.

5.1.4 DNA CDM Awareness Campaigns

Over the years, DNA has continued to engage with a variety of stakeholders interested in developing CDM projects through workshops, one on one meetings and seminars. These engagements have been relatively successful even though attendance has dropped in other provinces mainly because of the post 2012 deadline for registration. For this reporting year, the DNA hosted five provincial workshops: Gauteng; North-West, Western Cape, Kwazulu-Natal, Limpopo and one sector targeted workshop on Carbon financing. During these workshops a number of issues were flagged which included threat posed by EU directive on post 2012 project registration, uncertainties around post 2012 (second commitment period), validation and verification challenges and hurdles in obtain record of decision for environmental impact assessment and other permits.

5.1.5 What is the status of global climate negotiations in 2011?

Throughout the year, the UNFCCC hosted four negotiation meetings, but little progress was made until Durban. The South African government successfully hosted the COP 17 from 28 November to 13 December 2011. What follows are the brief highlights of some of the activities that took place as well as some of the key decisions adopted in Durban.

➤ *The Twelve Designated National Authority Forum*

The South African DNA in partnership with the UNFCCC Secretariat hosted the Twelfth Designated National Authorities (DNA) Forum, from the 26 to 27 November 2011 at Moses Mabidha Stadium in Durban. The aim of the forum was to exchange views, to share experiences relating to the CDM and bring forward common views and issues to the attention of the CDM EB. Key issues discussed during the forum included standardized baselines; updates on the

guidelines for demonstrating additionality of micro-scale project activities; how to enhance the role of DNAs under the CDM and new modalities for communication with the CDM EB.

➤ ***COP 17 decisions relating to CDM***

After extending negotiations two days beyond the originally scheduled deadline, the COP/MOP agreed on a set of agreements. The agreements included the launch of the Green Climate Fund to scale up long-term climate finance to support developing countries; the extension of the Kyoto Protocol even though most details of this second commitment period were left for future negotiations to resolve; and the adoption of the “Durban Platform for Enhanced Action”, which provides a roadmap toward a global legal agreement on climate change to be agreed in 2017 and take effect in 2017.

By extending the Kyoto Protocol, parties also preserved its market mechanisms, CDM and Joint Implementation (JI). In general, Durban maintained key elements of the global carbon market that may in future play a substantial role in promoting large-scale carbon dioxide removal. Other key decisions relating to CDM include the adoption of modalities and procedures for the inclusion of Carbon Capture and storage (CCS) under CDM project activities and the adoption of materiality standards under CDM.

The Conference of Parties serving as the Meeting of Parties (CMP) also requested the CDM EB; amongst other things to do the following:

- Develop appropriate voluntary measures, and to continue its work to improve the implementation of CDM;
- To make technical reports publicly available;
- Improving the consistency, efficiency and transparency of its decision-making;
- To revise the draft procedure on baseline and monitoring methodologies and additionality;
- To extend the simplified modalities for the demonstration of additionality to a wider scope of project activities;

- To continue ensuring environmental integrity when developing and revising baseline and monitoring methodologies;
- To conduct further work to develop simplified top-down baseline and monitoring methodologies, tools and standardized baselines;
- To continue promoting the equitable distribution of project activities by providing inter alia:
 - Training to assist DNAs , applicants and Designated Operational Entities (DOEs) and project participants with regard to technical matters related to CDM;
 - Support DNAs in the development and submission of standardised baselines and micro-scale renewable energy technologies that are automatically defined as additional; and
 - Support the DNAs and stakeholders in the implementation of the guidelines on standardised baselines and suppressed demand.

➤ **CDM Policy Dialogue**

Another milestone in Durban was the launch of the high-level panel on the CDM policy dialogue. The UNFCCC Executive Secretary, Ms. Christiana Figueres and the Chair of the CDM Executive Board, Mr Martin Hession launched the policy dialogue on December 15, 2012 during COP 17. The panel consisted of distinguished policy makers and representatives of civil society and business who have engaged a wide range of stakeholders. Mr Valli Moosa was appointed as chair of the Policy Dialogue. The main aim of the panel was to take stock of the lessons learned implementing the CDM and to recommend on how to position the mechanism going forward. The report is expected to provide recommendations for the future design and operations of the CDM as well as inform negotiations on related issues, including potential new market-based mechanisms.

➤ ***Climate Change Response Expo (CCR Expo)***

The Department of Energy hosted more than 23 side events at the Climate Change Response Expo (CCR Expo). These included CDM seminars on landfill gas to energy CDM projects; CDM Programme of Activities Development in South Africa; and Market development seminar for

Clean Energy. The South Africa's landfill gas to energy CDM projects seminar was hosted jointly with UNFCCC Secretariat. Presentations can be downloaded from Department of Energy's website (www.energy.gov.za).

➤ **CDM Project Showcasing**

The DNA together with the South African CDM Project Developers displayed successful CDM projects during COP 17 in the form of interactive map, fact sheets and videos at the DoE's exhibition stand at the CCR expo. Our appreciation and gratitude goes to Natural Balance SA (Pty) Ltd and Microsoft for creating the state of the art interactive map and sponsoring the project. Furthermore, we would also like to thank all project participants for their continuous support provided during COP 17 preparations.

Site visits to SASSA Low Pressure Solar Water Heating and Durban Landfill Gas to Energy project were also undertaken, to show case the success of CDM project implementation in the country.

6. CDM CASE STUDIES

6.1 The Capture and Utilisation of Methane at the GFI Mining South Africa owned Beatrix Mine in South Africa

The project activity involves the destruction and utilisation of methane at Beatrix Mine in South Africa. The project comprise of two distinct activities:

- The first phase involves the destruction and utilisation of mine methane; which originates in the main Beatrix mine from intersecting geological faults whilst mining. The

mining activity releases underground methane. The origin of this methane is unknown. Methane is highly explosive and a safety hazard. Currently, the underground mine methane is diluted with ventilation air to low its explosion limits and released into the atmosphere through ventilation shafts.

- The second phase involves the destruction of non-mine methane which is methane emitted from boreholes drilled for exploration purposes by the Beatrix mine. Since the start of the drilling program in the 1950s, a number of boreholes have intersected methane-carrying geological structures. During the development of this project, 488 holes were identified in the GFI Mining South Africa mining area. Only five of these boreholes, geographically far apart from each other, are venting methane at rates that justify the implementation of a CDM project. The project is located in Welkom Gold Fields under the Masilonyana Local Municipality. Figure 9 below depicts a picture of Beatrix Mine.



Figure 9: Beatrix Mine in the Free State Province, South Africa

Project Validation and Verification

Carbon Check (Pty) Ltd. validated the project.

Project CDM Status

The Project's PDD was approved by the DNA on 24th of March 2011 and registered by CDM EB on 11th of June 2011.

Project Finance

The project was financed in-house.

Project Highlights for 2011

Commissioning of the bore hole flares during March 2011 and commissioning of the main flare on 21 May 2011 marked the project's highlights for 2011.

➤ **Contribution to Sustainable Development**

Economic:

The project will contribute to foreign reserve earnings for South Africa through the carbon credit sales revenue.

Environmental:

At a regional level, the project will have a positive impact on the environment, as it will reduce the use of coal-based electricity and its associated environmental consequences. These consequences include: the impact of coal mining, the utilisation of scarce water resources, Sulphur-Dioxide (SO₂) emissions and the impacts associated with the disposal of coal ash.

Social:

The project will create jobs during construction and operations phases. GFI Mining South Africa has committed to contributing a percentage (R0.20 per ton of CO₂e and 0.5% of pre-tax profit) of their carbon credit revenue to The Gold Fields Foundation. This is similar to the contribution that GFI Mining South Africa makes out of gold mining revenue in terms of its social sustainable development obligations as dictated by the South African mining legislative framework relating to sustainable development. The Gold Fields Foundation is involved in a number of projects aimed at the social upliftment of the local communities.

Challenges and Lessons Learnt

There were no challenges experienced

6.2 SASSA Low Pressure Solar Water Heater Programme

The objective of the project is to install low pressure vacuum tube Solar Water Heaters (SWHs) that have been approved by the South African Bureau of Standards (SABS) to low

income households in South Africa. The size of the SWH may vary, but are typically 110-litre storage tank SWHs. The project will be implemented throughout South Africa.



Figure 9. SASSA Low Pressure Solar Water Heating Programme

Project Validation

Japan Consulting Institute (JCI) validated the project.

Project CDM Status

The small-scale Programme of Activities Design Document (PoA-DD) was approved by the DNA on 12th of November 2010 and registered by the CDM EB on the 12th of April 2011. The project has submitted the Project Activity (CPA)-002 for validation, which was expected to have been added in the PoA in the first quarter of 2012. Furthermore, the issuance process for CPA-001 was expected to have been initiated by February 2012 and finalized by mid-2012. No CERs had been issued for CPA-001 during compilation of this report.

Project Finance

The funders include Industrial Development Corporation (IDC) for working capital facility, Eskom's Demand Side Management (subsidy) and Standard Bank (carbon transaction fee) for the costs of PoA-DD and CPA001-DD..

Project Highlights for 2011

The SASSA Low Pressure Solar Water Heater Programme was developed and registered on record time and it is the first PoA to be registered by South Africa and the first-ever solar water heating (SWH) programme to be registered globally. The project was registered in April 2011.

Contribution to Sustainable Development

Economic:

The programme aims to achieve over 200,000 installations over a 10 year crediting period which will have immediate impacts on the livelihood, health and economic well-being of the targeted low income households which have never had proper water heating systems. There are over 5 million households in South Africa that are currently connected to the electrical grid but do not have a proper hot water heating systems.

The programme also contributes towards to the Government's target of installing a million SWHs by 2014/15 financial year. While there is progress on nation-wide, mass rollout has been slow, it will gain momentum with help of additional carbon financing.

Environment:

With the 75,000 installations, the programme is expected to generate an annual average emission reductions of approximately 97, 000t CO₂e (using the South Africa grid factor of 0.95t/CO₂ per MWh). Upon completion, CPA-002 will bring the total units

installed to 90,000. Therefore, the programme will reduce the emissions of greenhouse gases resulting in improved air quality.

Social:

By the end of September 2011, approximately 75,000 solar water heaters were installed in low income households through this project, free of charge, with the help of carbon revenues which covers the shortfall in the Eskom rebate. It is very unlikely that the target market would be able to purchase such units without the assistance of the carbon revenues, even with the Eskom subsidy.

The requirement for local-content is a serious obligation that SASSA has responded to. SASSA supports localisation and is currently establishing a local manufacturing plant in Alberton, Gauteng Province of which approximately 87% at which all components will be locally sourced. More than 800 new jobs were created through this project particularly local communities have benefited. Awareness was created to training of local communities. A second phase of training was undertaken with 10% of all installers representing the respective beneficiary communities. They were trained to become qualified plumbers.

Challenges and Lessons Learnt

The success of the SASSA SWH programme in South Africa indicates that similar programmes could be implemented around the world, utilising a similar model or framework. These types of project activities are particularly suitable for African circumstances, where barriers such as poor access to capital and modern technologies and skills abound. The assurances that installations are undertaken as per the CDM framework, in conjunction with the provision of carbon finance, are of crucial importance in overcoming such obstacles. The uncertainties and limitation regarding Eskom subsidy have been and still are the biggest barrier to the programme.

6.3 Sasol Nitrous Oxide Abatement Project

The project activity involves the use of a secondary catalyst whose sole purpose is the decomposition of the N_2O into harmless atmospheric gasses N_2 and O_2 . The methodology AM0034: Catalytic N_2O destruction in the tail gas of Nitric Acid Production Plant is used in this project. The project activity is located at two nitric acid plants owned by Sasol. The smaller unit (557 tonne per day) is located in Sasolburg and the other unit (860 tonne per day) in Secunda. Greenhouse gas reduction typically exceeds 500 000 tons per annum of CO_2 equivalent. The nitric acid produced is used for the manufacture of fertilisers and commercial explosives.



Figure 10. Sasol Nitro Nitric Acid Plant, Sasolburg

Project Validation and/or Verification

TÜV SÜD Industrie Service GmbH validated the project.

Project CDM Status

Sasol Nitrous Oxide Abatement Project was registered by the CDM EB in May 2007 and 2 batches of CER's were issued, that is 223 073 CERs on the 7 August 2008 for verification period of 25 May to 1 October 2007 and 543 502 CERs for the verification period of 2 October 2007 to 9 August 2008.

Project Finance

Project costs included mainly the cost of the secondary catalyst installation as well as maintenance of the monitoring equipment and costs of verifications. All costs were funded by Sasol.

Project Highlights for 2011

Verification audit of the third monitoring period was successfully completed and submitted to the UNFCCC. The CERs issuance is expected during 2012. The verification audit of the forth-monitoring period is also underway.

Contribution to Sustainable Development

Economic:

The project is contributing to regional, national economic and technological development via the installation, operation and monitoring of the secondary catalyst Nitrous Oxide abatement technology.

Environmental:

The installation of secondary catalysts has a positive environmental impact because it reduces N₂O emissions to the atmosphere and thereby results in cleaner overall air quality.

Social:

The project improves the labour and health conditions of Sasol Nitro employees' onsite. Trans-boundary pollution is also reduced to the regions adjacent to the plants. The project has a positive impact in that Sasol employees acquired new skills in operating the plant with the secondary catalysts, operating and maintaining of the monitoring equipment and managing of the CDM Project. Other than the positive impacts as described above, the project has no negative impact on community social structures, social heritage, the provision of social amenities to the community, the development of previously underdeveloped areas or specially designated development nodes.

Challenges and Lessons Learnt

To date, no major challenges were currently experienced from a technology, operations or CDM Project management point of view. The current low and declining CER market price is a concern in view of the significant costs associated to operate the project.

6.4 Durban Landfill Gas to Electricity Project Bisasar Road Landfill

The project was originally conceived as a joint project with two other landfill sites in eThekweni municipality, Mariannhill and LaMercy, under the Durban Landfill Gas to Electricity scheme. The project activity involved the collection of landfill gas at the Bisasar Road Landfill site and the use of the recovered gas to produce electricity, which is then fed into the municipal's grid replacing the electricity that the municipality buys from ESKOM. The Bisasar Road landfill site is situated 7km from the Durban CBD. The project is a Large Scale with the capacity to generate 6.5 MW of electricity.

Project Validation and Verification

The Validation process was conducted by Tuv Sud and Verification process by DNV Climate Change Services.

Project CDM Status

The project was registered by the CDM EB on the 26 March 2009 and it received first CER issuance amounting to 65 711 CERs on the 30 December 2011 for the monitoring period 26 March to 31 August 2009.

Project Finance

Subsidies from Department of Energy amounting to R6 million through Renewable Energy Finance and Subsidy Office (REFSO) as well as R17,3 million from the Department of Trade and Industry through the Critical Infrastructure Programme (CIP). The subsidies were then supported by a loan of R56 million from French Development Bank (Adf). Capital Expenditure for the project was R86 million and the operating of R10,4 million per annum.

Project Highlights for 2011

The project received its first Issuance on the 30 December 2011 as indicated above. It has been indicated that there is no buyer of the CERs at this time as Trading Emissions Plc withdrew from the contract. To date, the project has awarded bursaries to four engineering students as part of the social contribution. One of the students awarded a bursary graduated in 2011 with a Bachelor of Science in Engineering at the University of KwaZulu-Natal. The graduate is currently working in the electricity division of eThekweni Municipality.

Contribution to Sustainable Development

Air quality has improved around the landfill because of the project has destroyed approximately 240 000 tons of methane (CH₄) in terms of the 2011 reporting. Figure 11 below depicts some of the project's achievements.

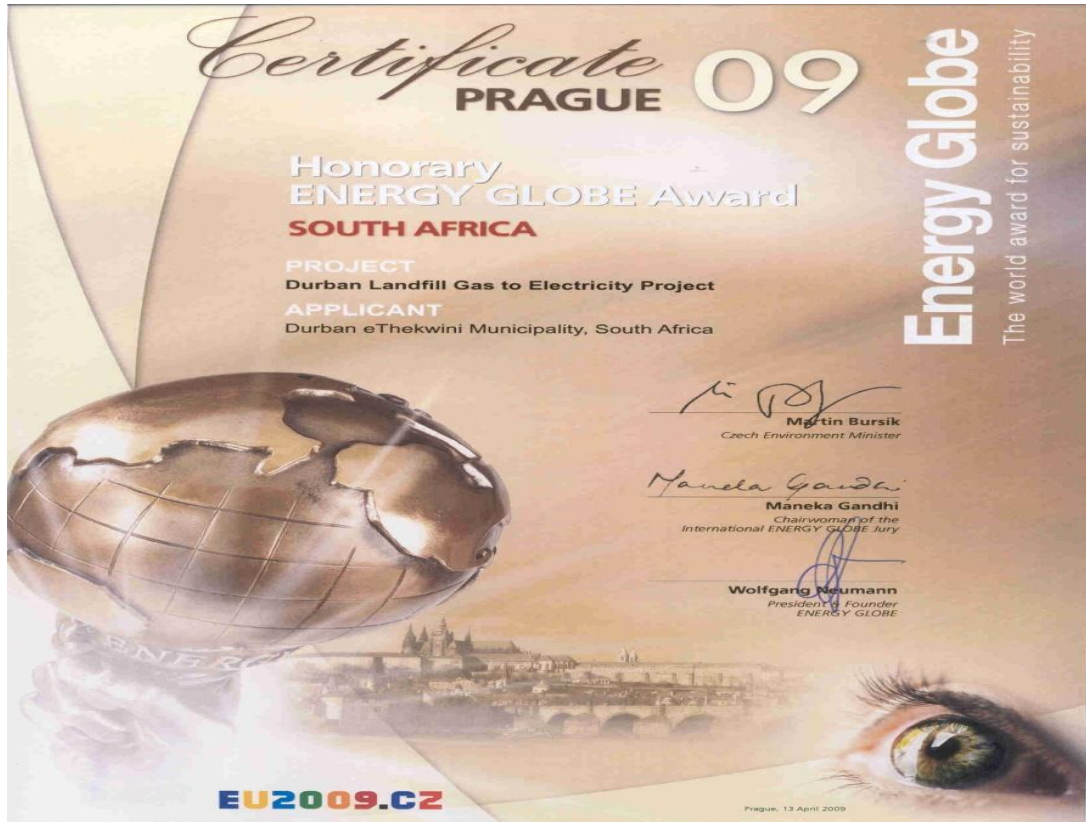


Figure 11: Honorary Certificate, Durban-Landfill Gas to Electricity Project

Challenges and Lessons Learnt

Municipal Financial Management Act (MFMA) poses a risk to the project. The municipality is unable to renew contractor's contracts after 3 years and this will have a negative impact on the project because the current contracts are already trained to operate the equipments.

6.5 Tugela Mill Fuel Switching Project

The mill generates 70 000 tonnes of bark per year and is discarded as solid waste. The bark comes from the debarking of timber used for the production of pulp and paper products. The purpose of the project is to reduce greenhouse gas emissions by co-firing waste bark and coal for steam generation in a biomass thermal energy boiler. This directly reduces the use of coal and reduces the input of bark into a landfill which in turn results in the reduction of methane emissions to the atmosphere.



Figure 12: Biomass Feed Conveyor, Tugela Mill Fuel Switching Project

The proposed project activity comprises of two components:

- Recovery of biomass that consists of fines, wood chips, logs which were being disposed at local registered sites landfills.
- Utilisation of biomass in a co-fired (biomass and coal) power boiler as an alternative fuel to generate thermal energy and steam at Tugela mill.

The project is situated at the Tugela Mill in the town of Mandini, KwaZulu Natal Province. The project is within the small scale category with an annual estimated emission reductions of 54,143 tCO₂e per year.

Project Validation and Verification

The project was originally validated by DNV Climate Change Services and registered on the 12th of February 2007. Gas usage was initially not included in the original PDD version, which led to the revision of the PDD. SGS United Kingdom Limited was appointed to validate the revised PDD and the project was registered on the 20 August 2010. SGS United Kingdom Limited was also responsible for the project verification.

Project CDM Status

The first monitoring period took place from 16 January 2008 to 28 February 2009 and its 1st issuance of 23 081 CERs occurred on the 21st of April 2011.

Project Finance

The thermal supply from biomass involved the installation of new equipment at capital cost of approximately R 27 million.

Project Highlights for 2011

In 2011, the modified boiler continued replacing coal with biomass to generate the thermal energy required and the project received CER issuance as well.

Contribution to Sustainable Development

Environmental:

The project activity reduces the consumption of coal in Sappi's number 10 boiler. This has the following direct environmental benefits

- Greenhouse gas reduction;
- The emission of Sulphur Dioxide (SO₂) due to the combustion of coal is reduced;
- The emission of particulates from the coal combustion is reduced;
- Methane emission from biomass waste is also reduced;
- The environmental impact of coal mining is reduced; and
- The environmental impacts and emissions associated with coal transport are reduced.

Challenges and Lessons Learnt

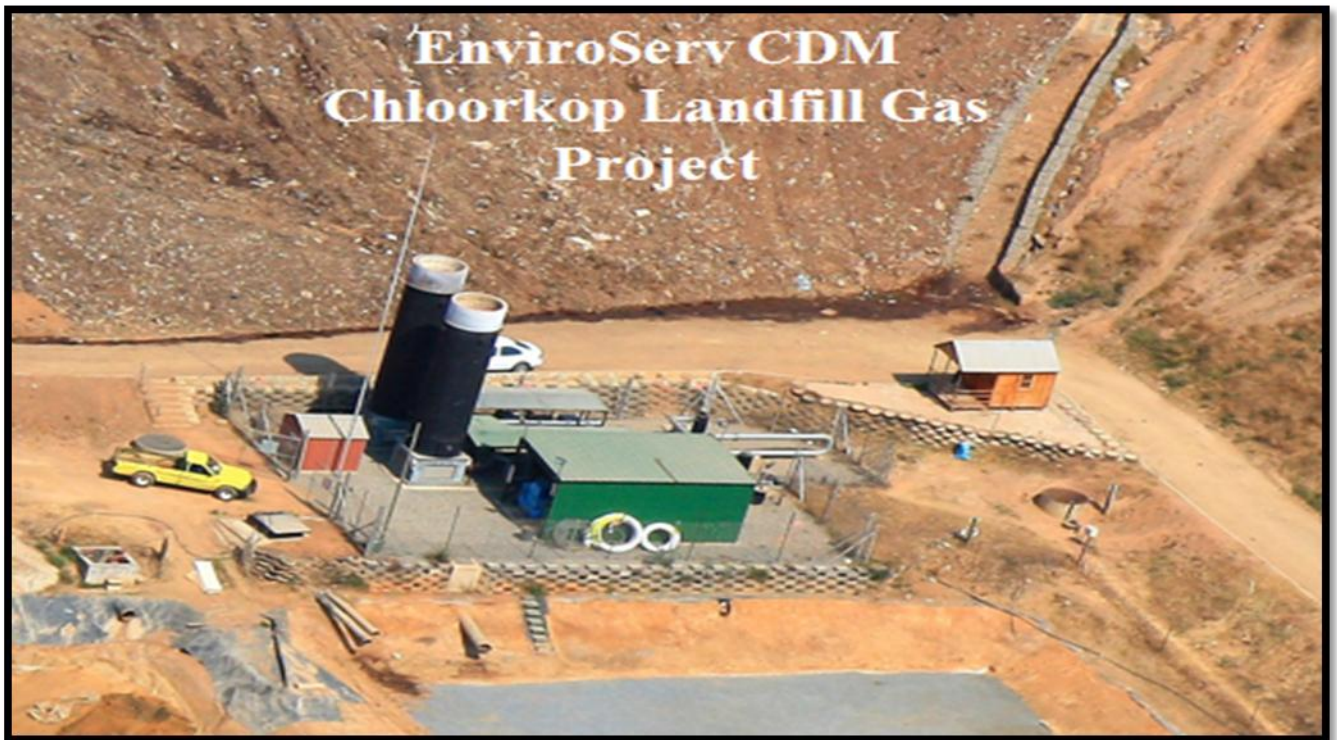
Some of the challenges experienced include the shutdown of the boiler for 3-5 months during the retrofitting which resulted in financial losses and high capital costs for the new equipment. However, positive gains were realized in relation to the landfill management associated costs and CER revenue.

6.6 EnviroServ Chloorkop Landfill Gas Recovery Project

The purpose of the project activity is to extract and capture methane generated through decomposition of waste at the EnviroServ Chloorkop Landfill Site and combust it by flaring. This reduces the effect of greenhouse gas emissions. EnviroServ Chloorkop Landfill Gas Recovery Project is located in the Northern part of Ekurhuleni Metropolitan Municipality, Gauteng Province, at Portion 63 of the farm Klopfenstein 12 1R, Kempton Park.

Scale of the project

The landfill site has a landfill gas extraction system, which was being installed in phases across the six landfill cells since 2007. Once completed, the system was able to extract



4000Nm³/h of landfill gas for combustion in the two flares. Currently, the project is operating at 2200Nm³/h gas extraction. The project produced an average of 11,042 CERs per month during 2011.

Figure 13: EnviroServ Chloorkop Landfill Gas Project

Project Verification

The DOE responsible for verification of the 2011 monitoring period is Carbon Check (Pty) Ltd.

Project CDM Status

The project was registered by CDM EB on 27th of April 2007 and commissioned on the 19th of January 2008. EnviroServ Chloorkop Landfill Gas Recovery Project was issued 83 135 CERs for the verification period 19 January to 31 Dec 2008 and the 2nd CER issuance is in progress.

Project Finance

The project is funded Japan Carbon Finance.

Project Highlights for 2011

Installation of additional 6 horizontal and 4 vertical landfill gas wells was approved and implemented in 2011. All ten wells are expected to be supplying gas to the gas flares by February 2012.

VERTICAL WELLS



Figure 14: Wells installed at EnviroServ Chloorkop Landfill Site

Contribution to Sustainable Development

The project is contributing to the reduction of green house gas emissions by flaring methane from the landfill site and converting it to carbon dioxide and water. Japan Carbon Finance company funded the project and overall the project contributed to skills development in the country.

Challenges and Lessons Learnt

Several gas wells became aerobic during September 2011 and had to be closed in order to recover. A section of the main gas line supplying Flare 1 was damaged during landfill site works. These two incidents resulted in relatively low CERs generation during September, October and November 2011.

6.7 Project for the catalytic reduction of N₂O emissions with a secondary catalyst inside the ammonia reactor of the No. 9 nitric acid plant at African Explosives Ltd (“AEL”), South Africa

AEL is the developer, producer and supplier of commercial explosives, initiating systems and blasting services for mining, quarrying and construction markets in Africa. The nitric acid produce is mainly utilised by AEL’s own Ammonium Nitrate (“AN”) production plant for commercial explosive manufacturing, mainly for mining purposes and some is also supplied in aqueous solution to local fertiliser manufactures.

The purpose of the project is to reduce current levels of N₂O emissions from the production of nitric acid at one of AEL’s nitric acid plants (No.9 Plant). It is a catalytic reduction of N₂O inside the ammonia burner of nitric acid plants and it involves the installation of a new N₂O abatement technology. The project is based at No. 9 nitric acid plant, Modderfontein Industrial complex in Gauteng Province, South Africa.

Project Validation and Verification

Validation process was carried out by TUV SÜD and Verification process by DNV Climate Change Services.

Project Status

The DNA approved the project on the 25 September 2007 while it was registered by the CDM EB on the 8th of February 2008. The verification was done in the same year. The project is now at the stage of requesting issuance.

Project Finance

AEL Mining Services is liable for the finances of the project.



Figure 6: No 9 Nitric Acid Plant at African Explosives Ltd

Project Highlights for 2011

The project received two verification audits, however no CERs have been issued as yet.

Contribution to Sustainable Development

Economic:

The project enhances skills development as employees have been trained to operate both the N₂O abatement catalyst and the Automated Monitoring System.

Social:

AEL's shares are owned by AECI and Tiso (a black economic empowerment investment company). A share of AEL's CDM profits will go to the Tiso-AEL Community Development Trust which will benefit the two local communities near Modderfontein: Alexander and Tembisa. The benefit is focussed on an Environmental Education Project (EEP) targeting local schoolchildren.

Challenges and Lessons Learnt

Challenges experienced were technical which mainly relate to the compliance on to the CDM project requirements and the level of traceability necessary. Personnel turnover is also an issue.

6.8 Lawley Fuel Switch Project

Lawley Fuel Switch project involves the conversion from coal to natural gas of the thermal fuel used in clay brick baking kilns at Lawley Brick Factory. Corobrick (Pty) Ltd, one of the largest brick producers, owns the Lawley Brick Factory. The conversion requires the replacement of coal burners on the kilns with gas burners. Lawley is located on an industrial site near Lenasia within greater Johannesburg area, Gauteng Province.

Scale of the project

The project is small scale with emission reductions of 41,244 tCO₂e per year.

Project Validation and Verification

The DOE involved in the approval of changes of a registered PDD was SGS. The project needed to apply for approval because the initial PDD did not exactly follow the emission reduction calculation methodology because a more conservative interpretation of the methodology was allowed, which was not fully in line with the Validation and Verification Manual (VVM).

Project CDM Status

The PDD was registered as a CDM project on the 6th of March 2006. It received the first issuance of 18 098 CERs for verification period 1 January 2005 to 31 December 2006 on the 13 June 2008 and second issuance of 17 032 CERs for verification period 1 Jan 2006 to 31 December 2006.

Project Highlights for 2011

The CDM EB of the UNFCCC approved the 'Request for the approval of changes of a registered PDD' on the 2nd of March 2012. The project will be applying for the verification for emission reductions between 2007 and 2009.

Contribution to Sustainable Development

The project will vastly improve the general working environment in particular health conditions at the plant. The improvements are mainly due to the reduction in the airborne particulate levels at the plant resulting from the combustion of coal. These benefits together with the GHG emission reductions and economic benefits (foreign reserve earnings for South Africa) of the project meet the sustainable development objectives of the South African Government.

Challenges and Lessons Learnt

Most of the challenges facing this project were overcome by the CDM

6.9 Alton Landfill gas to Energy project.

The project's objective is to generate electricity from utilising landfill gas (LFG) with the purpose of reducing methane emission, controlling odour nuisances, health risks and adverse environmental impacts. The project activity includes two different stages. In the first stage, the landfill gas is only captured and destroyed using LFG flare. In the second stage, the captured methane is fed to the LFG Flare and a modular electricity generation plant. The project activity is located in Richards Bay in the city of uMhlatuze, KwaZulu-Natal Province. The project is a small scale and is estimated to reduce greenhouse gas emissions by 26,443 tCO₂/year on average over 10 years.

Project Validation

The project was validated by SGS United Kingdom Limited.

Project Status

The project was registered by the CDM EB on the 24th of August 2009 and is still in operation. No verification has been undertaken yet.

Project Finance

The project has been funded through Equity funding.



Figure 7: Alton Landfill Gas to Energy Project

Project Highlights for 2011

The project had no specific highlights for the year 2011.

Contribution to Sustainable Development

The project has created employment for a site technician and is producing renewable electricity that is sold to industry at the same time as reducing harmful green house gasses. This has a positive impact on the local community for both employment and reduced pollution from landfill gas.

Challenges and Lessons Learnt

The main challenge for landfill gas to electricity projects is the ability to sell electricity at the a price high enough to make the projects work as the South African Market does not have an enabling environment for small Independent Power Producers and the wholesale power price is low to support the project even with CER revenue.

7. Conclusion

CDM has been largely developed through a “learning-by-doing” approach. It has, however effectively assisted project developers to mobilise finance and generate additional revenue for their projects. Despite efforts to simplify and continuous improvements in the CDM rules and registration processes, most project developers still have trouble in completing the CDM project cycle, particularly in Africa. Lack of finance and technical capacity remain major hurdles to project implementation and some of the case studies in this report attest to these.

The South African DNA will continue to engage with all key stakeholders to drive the development and exploitation of CDM opportunities across the country. It recognizes the need to constantly work together with other key stakeholders such as the South African CDM Industry Association in improving the development of CDM in the country. In conclusion the South African DNA also needs to commit to addressing .

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9. Abbreviations

CCS	Carbon Capture and Storage
CCR	Climate Change Response
CDM	Clean Development Mechanism
CDM-CPA-DD	Clean Development Mechanism CDM Project Activity Design Document
CDM EB	Clean Development Mechanism Executive Board
CERs	Certified Emission Reductions
CFCs	Chlorofluorocarbons
CH ₄	Methane
CFLs	Compact Fluorescent Light-bulbs
CME	Coordinating Managing Entity
COP/MOP	Conference of Parties serving as Meeting of Parties to the Kyoto Protocol
COP17/MOP 7	17 th Conference of Parties serving as the 7 th Meeting of Parties to The Kyoto Protocol
CPA	CDM Project Activity
CSP	Concentrated Solar Power
CSWH	Commercial Solar Water Heating
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DIRCO	Department of International Relations and Cooperation
DHS	Department of Human Settlements
DNA	Designated National Authority
DoE	Department of Energy
DOE	Designated Operational Entity
DTI	Department of Trade & Industry
DoT	Department of Transport
DWA	Department of Water Affairs

DVR	Draft Validation Report
ERPA	Emission Reduction Purchase Agreement
ERU	Emission Reduction Units
EU-ETS	European Union Emissions Trading Systems
F-CDM-SS-Bundle	Small Scale Clean Development Mechanism Bundle Form
HFC-23	Hydro fluorocarbons
ICC	International Convention Centre
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
IPPs	Independent Power Producers
JI	Joint Implementation
KP	Kyoto Protocol
LDCs	Least Developing Countries
LEDs	Light Emitting Diodes
LoA	Letter of Approval
LoNO	Letter of No Objection
MFMA	Municipal Finance Management Act
MW	Megawatts
NDoH	National Department of Health
NEMA	National Environmental Management Act
NERSA	National Energy Regulator of South Africa
NT	National Treasury
N ₂ O	Nitrous Oxide
PPA's	Power Purchase Agreement's
PCF	Prior Consideration Form
PDD	Project Design Document
PIN	Project Identification Note
PoA	Programmes of Activities
PoA-DD	Programme of Activities Design Document
PV	Photovoltaic

QELRO	Quantified Emission Limitation & Reduction Objectives
RE IPP	Renewable Energy Independent Power Producer Programme
SABS	South African Bureau of Standards
SC	Steering Committee
SDCs	Small Developing Countries
SDIs	Small Developing Island States
UNFCCC	United Nations Framework Convention on Climate Change
VER	Voluntary Emission Reductions
ZAR	South African Rand