

## UPTAKE OF RENEWABLE ENERGY INTO MAIN ENERGY SUPPLY – SOME CHALLENGES

Author & Presenter: K Nassiep BSc, BSc (Hons) – Chief Director (Energy Planning) –  
Department of Minerals and Energy

### 1. INTRODUCTION

With the South African power generation sector dominated by low-cost highly efficient coal-fired plants, it is not surprising that renewable energy has not gained a measurable foothold in this area. Perceptions abound regarding the cost and reliability of such technologies with large grid-connected systems mainly located in affluent developed countries such as Denmark, Germany and Spain. Prior to 2003, the application of renewable energy in South Africa was limited to solar homes systems, whereby concessionaires installed 50 to 100We photovoltaic (PV) panels in off-grid communities. Given the low level of power associated with PV and the basic need for high-energy thermal power, it is not surprising that PV is not the preferred energy provider for low-income households. In fact, communities have gone as far as to be highly sceptical of the technology, branding it as inferior solutions for the poor. This is not the image that the Government had intended to create around renewable energy.

In 2003, then Minister of Minerals and Energy, Ms. Phumzile Mlambo-Ngcuka indicated the need to adopt a polluter-and-user pays principle when it came to electricity use involving cleaner energy carriers. This need was realized as a result of the years of benefiting from cheap electricity prices. The World Summit on Sustainable Development in 2002 in Johannesburg gave a measure of insight into the possibilities facing South Africa. Two important projects were launched by Eskom during WSSD, while Agama Energy was instrumental in coordinating a project to “Green the Summit”, by ensuring that all emissions associated with the event were offset by the sale of renewable energy to the Sandton venues. The Eskom experimental wind farm in Klipheuwel in Cape Town represented the first application of large wind turbines in Sub-Saharan Africa while the Dish Stirling System in Midrand, Gauteng proved to be the first such system to be installed on the African continent. The 3.2 MW wind farm is connected to an 11kV network and has so operated at an average load factor of 17% and a production cost of R0.44 c/kWh. The 25 kWe Dish Stirling System, which uses hydrogen as a working fluid to power the external combustion Stirling engine, provides power to the Development Bank of Southern Africa. Numerous technical glitches have hampered ongoing production by the unit and it is evident that more development work is required before these units are ready for mass rollout. The units are intended to be standalone systems operating in a distributed generation or embedded generation mode. The lessons learnt so far from both projects indicates that it is not that simple to import technology, as was the case with the Namibian experience with PV as well. African strategies are required to solve African challenges and there is no doubt that South Africa has the human capital to innovate and develop solutions to these challenges.

In November 2003, South Africa took an important step forward in the drive towards renewable energy uptake in the country. The White Paper on Renewable Energy was adopted by Cabinet, setting in motion a number of initiatives designed to create an enabling environment for a renewable energy industry. The most significant of these measures would be the development of a renewable energy strategy by the Department of Minerals and Energy. This strategy would serve as the blueprint for the rollout of renewable energy over the 10-year period of the target. This paper details the intention behind this strategy as well as the indicative contribution of each

of the major renewable energy carriers. The roles and responsibilities of each of the major public and state-owned entities are also detailed. Of immediate interest to the public would be the manner in which the State would support the uptake of renewable energy through appropriate fiscal or other incentive systems. It is clear that without full cost accounting in place renewable energy would not be able to compete on a level footing with conventional fossil fuels. It is also clear that there has to be a revision of the market rules governing the generation, transmission and distribution of power on the national grid. In particular, the introduction of Independent Power Producers needs to be addressed in the context of the sale of power on a willing seller, willing buyer basis. It is important to note that South Africa has opted for a Single Buyer Model, with Eskom and the municipalities responsible for the purchase of electricity. The generation and subsequent wheeling of the power must be catered for as well as transparent pricing systems to govern the transactions associated therewith.

South Africa is blessed with abundant renewable energy resources, in particular solar energy and wave energy. This paper will reference these resources and identify the locations where they should be deployed.

## 2. CURRENT POLICY & REGULATORY FRAMEWORK

It is apparent that renewable energy can only flourish in the presence of supporting policy and legislation. The White Paper on Energy (1998) does, however, call for a diversified energy supply in the pursuit of energy security. In particular, it hones in on renewable energy and indeed energy efficiency as target areas for government intervention and legislative support. What were lacking in 1998, however, were strong enough drivers to promote renewable energy in the face of a lack of appropriate legislation. This could loosely be translated into a lack of political will, although it must be noted that other social priorities, e.g. healthcare, welfare, education and housing took precedence over energy. This is despite South Africa's visible support for the physical environment, through its ratification of the United Nations Framework Convention on Climate Change (1997) and it's Kyoto Protocol in 2002. The Kyoto Protocol, adopted in December 1997 and which came into force in February 2005 is an attempt to curb greenhouse gas emissions that contribute to global warming through the development of less-emitting technologies. The developed countries that have ratified the Kyoto Protocol, with the notable exception of the USA and Australia, have all agreed to targets based on 1990 levels of greenhouse gas emissions. Developing countries, such as South Africa, who do not have prescribed targets would benefit from the Protocol through the development of Clean Development Mechanism (CDM) projects. CMD projects are designed to allow developed countries to meet their emission reduction targets by purchasing Certified Emission Reduction (CER) credits from projects established in developing countries. There is more reference to these types of projects later in this paper, under the sub-section focusing on the Designated National Authority for the Clean Development Mechanism.

### 2.1 White Paper on Renewable Energy (2003)

The World Summit on Sustainable Development (2002), staged in Johannesburg, proved to be a powerful catalyst for the development of a policy promoting the uptake of renewable energy. Governments and financing institutions voiced their support for the introduction of cleaner methods of production, increased uptake of renewable energy and promotion of energy efficiency. The resultant Johannesburg Plan of Implementation (JPOI) focused heavily on action plans for energy, with specific focus on renewable energy. While there was no consensus reached on global targets for renewable energy, the debates sparked renewed interest in developing renewable energy strategies and partnerships to break down the barriers to implementation. Of interest was the creation of many so-called Type II partnerships, such as the Renewable Energy and Energy Efficiency Partnership (REEEP). REEEP has been instrumental in creating a multilateral forum for stakeholders to propose and develop key projects in developing countries.

Cabinet approved the White Paper on Renewable Energy in November 2003, following the recognition of support from the World Bank (in particular) during WSSD. Early drafts of the policy were compiled with the assistance of the World Bank. The policy had to create a realistic platform for a sustainable renewable energy industry and would have to involve the support of both the public and private sectors. Government's goals revolved around the following key objectives:

- Ensuring diversity of energy supply and ultimately protection of indigenous resources
- Protection of the environment in terms of climate change mitigation and water conservation
- Sustainable job creation
- Development of sustainable industries to support the future roll-out of renewable energy

Capacity building would prove to be an essential requirement for Government to meet any target for renewable energy. Limited human capital resided in both government and key state-owned enterprises to design, propose and implement any target for the uptake of renewable energy. A target had to be set, to firstly indicate Government's commitment to renewable energy while at the same time, giving the private sector the comfort of a concerted programme to bolster the fledgling industry. This target has been set as follows:

***White Paper on Renewable Energy (November 2003): Target***

***10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels.***

This is equivalent to replacing two (2x 660 MW) units of Eskom's combined coal fired power stations.

This is in addition to the estimated existing (in 2000) renewable energy contribution of 115,278 GWh/annum (mainly fuelwood and waste) (Hughes et al, 2000). More efficient conversion of wood and waste for power generation will contribute to the target.

The target is designed to be a cumulative one, in which annual contributions will be added each of the 10 years of the target to produce a resultant 10,000 GWh at the end of 2013.

## 2.2 Electricity Regulation Bill (Draft, 2005)

The Electricity Regulation Bill supercedes and replaces the Electricity Act of 1987. It is designed to create a suitable regulatory framework for the new electricity supply and distribution industries. Relevant excerpts from this Bill are reproduced for information. Note that numbering here refers to the actual Draft Bill, not this paper.

### **Objects of Act**

2. The objects of this Act are to –

- (a) promote the efficient, effective, sustainable and orderly development and operation of the electricity supply infrastructure in South Africa;
- (b) ensure that the interests and needs of present and future electricity customers are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic of South Africa;
- (c) facilitate investment in the electricity supply industry;
- (d) ensure universal access to electricity;
- (e) promote the use of diverse energy sources and energy efficiency;
- (f) promote competitiveness and customer choice where feasible; and
- (g) facilitate a fair balance in and between the interests of customers, licensees, investors in the electricity supply industry and the public.

## **Regulator**

### **Conditions of licence**

- 15.(1) The Regulator may make any licence subject to conditions relating to –
- (d) the setting and approval of tariffs, rates and charges levied or charged by licensees;
  - (q) the persons from which and to whom electricity must or may be bought or sold;
  - (r) the types of energy sources from which electricity must or may be generated, bought or sold;
  - (u) the compliance with energy efficiency standards and requirements, including demand side management;

### **Powers and duties of licensee**

- (2) Licensees may not discriminate between customers or classes of customers regarding access, tariffs, prices and conditions of service, except for objectively justifiable and identifiable differences approved by the Regulator.
- (3) A transmission or distribution licensee must, to the extent provided for in its licence, provide non-discriminatory access to its transmission and distribution power systems to third parties.

## **Reticulation**

### **Powers, duties and functions of municipalities**

- (7) A municipality must, if technically possible, provide non-discriminatory access to distribution power systems and associated infrastructure under its control.

### **Norms and standards**

- 31.(1) The Minister, acting in consultation with the Regulator, must prescribe compulsory national norms and standards for reticulation services, which may include norms and standards for -
- (b) the setting and structuring of tariffs, rates and charges that relate to reticulation services or the use of distribution power systems used for reticulation, which may include a national tariff framework that a municipality must utilise in determining such tariffs, rates or charges;

(h) appropriate investments in reticulation services and distribution power systems used for reticulation;

### **New Generation capacity**

#### **(3) The Minister may on the advice of the Regulator, by notice in the *Gazette* –**

- (a) determine that new generation capacity is needed to ensure the continued uninterrupted supply of electricity;
- (b) determine the types of energy sources from which electricity must be generated, and the percentages of electricity that must be generated from such sources;
- (c) determine that electricity thus produced may only be sold to the persons or in the manner set out in such notice;
- (d) determine that electricity thus produced must be purchased by the persons set out in such notice;
- (e) require that new generation capacity must –
  - (i) be established through a tendering procedure that is fair, equitable, transparent, competitive and cost-effective ;
  - (ii) provide for private sector participation.

#### **(4) The Minister may, by notice in the *Gazette*, make regulations regarding—**

- (l) national norms and standards that apply to reticulation;
- (m) new generation capacity;
- (n) the types of energy sources from which electricity must be generated;
- (o) the percentages of electricity that must be generated different energy sources;
- (p) the participation of the private sector in new generation activities;

### **Exemption From Obligation To Apply For And Hold A Licence**

1. Any generation plant constructed and operated for demonstration purposes only
2. Any generation plant constructed and operated for own use
3. Non-grid connected supply of electricity except for commercial use

## **2.3 Energy Bill (Draft, 2005)**

The Energy Bill attempts to put in place legislation covering all areas specified in the White Paper on Energy (1998) that have not been legislated elsewhere. The pertinent extracts from this Bill are indicated below. Please note once again that the numbering below refers to the Bill itself, not this paper.

### **Renewable energy**

**18. (1)** The Minister must promote the contribution of renewable energy to the national energy supply in order to optimise the contribution of renewable energy to the national energy supply is to contribute to sustainable development.

**(3)** The Minister --

- (a) must cause to be established and maintained a renewable energy promotion capability within the Department;
- (b) may set targets for the use of renewable energy after consulting the National

- Energy Advisory Committee;
- (c) may prescribe minimum contributions to the national energy supply from renewable energy sources;
  - (d) may prescribe the nature of the sources that may be used for renewable energy contributions to the national energy supply;
  - (e) may prescribe the manner in which any person, state institutions, agency and regulator responsible for energy matters must comply with subsection (3)(b) and (c);
  - (f) may institute measures and incentives designed to promote the production, consumption, investment, research and development of renewable energy;
  - (g) may prescribe technology standards for renewable energy; and  
may prescribe certifications and qualifications necessary for persons involved in the application of renewable energy measures.

### 3. PROPOSED RENEWABLE ENERGY STRATEGY

#### 3.1 Purpose

The renewable energy strategy is intended to serve as a blueprint for the 10-year rollout of renewable energy in South Africa. It is intended for release before the end of the year and a draft document is already in place. The strategy aligns the objectives of Government to the three pillars of sustainable development, i.e. economic, social and environmental benefit. Projects developed in South Africa must indicate evidence of benefit to all these sectors and this will also be aligned to the sustainable development criteria developed for CDM projects in South Africa.

#### 3.2 Anticipated Benefits of Meeting the Target

A Macro-economic analysis of the target concluded that:  
The target is economically viable with some government financial support, ODA and "green" funding (e.g.. CDM, "green" premium). Achieving the target could add about 1667 MW new renewable energy capacity with, in comparison with coal-fired power stations: a net impact on GDP as high as R1 071 million per year, additional government revenue of R299 million, additional income that would flow to low-income households as much as R128 million, just over 20 000 new jobs would be created and water savings of 16.5 million kilolitres, which translates into a R26.6 million saving, could be realised.

#### 3.3 Phases and Contribution of each Carrier

The target has been split into 3 phases and a macro-economic modeling study indicated the technologies that are deemed closest to commercialization. Note that large wind turbines are not excluded from the first phase, but that any financial assistance rendered by the State would be targeted at the technologies listed first in table 1 below.

Table1: A proposed 10 000 GWh RET's portfolio based on DME/CaBEERE macro-economic and World Bank economic and financial analysis due diligence studies (exclude biofuels, CSP, wave)

	<i>Nov 2003-Nov 2007</i>	<i>Nov 2007- Nov 2010</i>	<i>Nov 2010 – Nov 2013</i>	<i>MW</i>	<i>Load factor</i>
Sugar bagasse	164	715	1544	339	52
SWH	162	1,000	3756		
Pulp & Paper	85	235	405	51	90
Hydro	285	1210	3210	654	56

Landfill gas	291	840	840	120	80
Wind	13	0	245	100	28
<b>Total</b>	<b>1000</b>	<b>4000</b>	<b>10,000</b>	<b>1264</b>	

**Table 2**  
**Biofuels, CSP, wave**

	<i>Nov 2003 – Nov 2007</i>	<i>Nov 2007 – Nov 2010</i>	<i>Nov 2010 – Nov 2013</i>	<i>Nov MW Load factor</i>
CSP		613	613	100 70
Bio Diesel* (Mill litre/a)	748	748	748	
Bio Ethanol** (Mill litre/a)	176	176	176	
Wave		14	84	24 40
<b>Total</b>	<b>924</b>	<b>1551</b>	<b>1621</b>	<b>124</b>

CSP Concentrating Solar Power generation

\*1% biodiesel blend

\*\* 1/3 of available bio ethanol (sugarcane) converted to e.g. bio-ethanol gel (2% of paraffin market)

### 3.4 Progress to date

To date, some 90 GWh has been generated already, mainly from sugarcane bagasse cogeneration, mini-hydro, wind and solar water heating. This is roughly on target, but several large projects are currently under development that will significantly boost this figure in the coming year. The bulk of the new projects have been registered as CDM projects, which is proving to be a powerful catalyst for renewable energy projects.

### 3.5 Implementation Strategy

An implementation strategy has been developed for each of the major energy carriers to be targeted. These can be summarized as follows:

#### 3.5.1 Biofuels (Biodiesel and Bioethanol)

The proposed strategy is based on job creation for the energy crops and biofuels chain. 1<sup>st</sup> Economy assistance will be provided through regulatory means (no direct financial assistance). Second economy direct financial assistance will be enabled (no new additional agricultural subsidies) through integration with existing support schemes such as CAPSA and MAFISA. Implementation requires a high level Task Team and multidisciplinary coordination of government etc stakeholders. Regulation through registration and licensing as provided for in the Petroleum Products Amendment Act.

#### 3.5.2 Bioethanol Gel

The DME has in its White Paper on Energy Policy (1998), emphasised Government's demand side approach to meeting energy needs. The White Paper on Renewable Energy (2003) signalled that Government is seeking to assist or stimulate the production of fuels in a cost-effective way from renewable energy sources. The Minister of Finance has announced a 30% reduction in the Fuel Levy for Biofuels.

Among the initiatives to reduce the amount of paraffin used in the homes of the poor that are being examined by the DME is the use of an ethanol gel as a replacement for paraffin in appliances that are designed to use the gel. There are a number of manufacturers and distributors of this product and stoves that use this product in the market place, albeit on a limited scale. The Department has commissioned a "Comparison Study" on ethanol gel fuel, paraffin and LPG, to investigate the social, environmental and economic aspects of the different energy carriers.

The SABS has a technical steering committee to draw up standards for Bioethanol Gel, which the DME is apart of. This will aid the department to make more informed decisions regarding Bioethanol gel. Municipalities have already started offering allocations of bioethanol gel in lieu of free basic electricity. This is somewhat premature as the necessary standards for fuel and appliances needs to be put in place still.

### 3.5.3 Biomass Cogeneration

The Department has assisted in mapping the available resources to power a cogeneration facility. The contribution from this source is substantial and is therefore high on the list of DME priority areas.

The strategy to support biomass cogeneration is through incentives such as the once-off capital subsidies, CDM and support from the Demand Side Management Fund.

### 3.5.4 Landfill Gas

Over 50 potential sites have been identified around the country so far. Landfill sites are also excellent CDM candidates, due to the high greenhouse gas potential of methane. Various municipalities are currently conducting feasibility studies on landfill gas sites and Durban has developed 3 sites for power generation.

The strategy to support landfill gas plants is through incentives such as the once-off capital subsidies, CDM and support from mixed credits facilities.

### 3.5.5 Solar Water Heating

The South African Solar Water Heating (SWH) market has considerable potential to leverage electricity savings, increase employment opportunities, improve electricity demand management and reduce greenhouse gas emissions. Although a wide range of products is available on the market, the industry is faced with severe limitations in terms of SWH standardization, awareness, affordability and financing, which ultimately prevents widespread technology adaptation. A key project initiated by Government and to be implemented by EDC, a division of CEF (Pty) Ltd. The project aims at transforming the market for SWH in South Africa by tackling these barriers and creating a susceptible market environment.

The project will install and incentivise about 500 Solar Water Heaters (SWHs) in low, medium and high income urban households while in parallel standardizing the SWH quality and testing regime. In addition the project will consolidate an expansive distribution and maintenance infrastructure, offer low-interest financing options and ensure continued awareness and involvement on both the supply- and the demand-side.

EDC has commissioned the purchase of the Solar Water Heating test rig through Department of Science and Technology funding the University of Stuttgart and are in the final stages of contract negotiation. The test rig will be built to the necessary specification and will test local and international mechanical/ thermal tests. The purchase of this test

rig will be of great benefit for the SWH industry in South Africa and SADC as it will be the first solar test rig in Africa.

The first phase of the financing mechanism has been completed with some possible collaboration within various partners. The main outcomes of the research has shown that at this stage a “project” based financial mechanism may be the best route to follow in financing the end user at this stage of market development.

The project will be implemented in 3 areas, namely Cape Town, Durban and Gauteng in an equal distribution. Installations will occur in low, middle and high-income groups so as to facilitate additional research and evaluation possibilities for all income groups and areas.

#### 3.5.6 Mini-hydro

Even though there are limited hydro resources of note within South Africa, there are at least a dozen sites of 4 MW or less that could be developed for hydroelectric power generation. The production costs at the Bethlehem Mini-hydro scheme indicate that the project is viable with CDM credits as well as soft loans. Additional once-off subsidies from the Department would have created a small yet significant increase in the rate of return expected for the project. The strategy is to encourage development of these projects by project developers both in the public (local government) and private sector. Government subsidies will be targeted at mini-hydro projects as well, which is further incentive for developers.

#### 3.6 Incentive Schemes under Consideration

It is apparent that additional incentives will be required to bridge the gap between the cost of conventional fossil fuels and renewable energy. Some of the measures under review include the following:

- Interim period- once-off capital subsidies,
- Clean Development Mechanism,
- Tradeable Renewable Energy Certificates,
- Long term feed –in tariffs e.g. Eskom, municipalities obliged to take up % RE as per Electricity Regulation Act and Energy Act with cost recovery mechanism(s)
- Mixed Credits, i.e. a combination of grant and soft loans
- Demand Side Management funding from Eskom and the NER

## 4. MARKET RULES AND VOLUNTARY TRADE MARKETS

#### 4.1 Grid Code Amendments

Renewable energy power plants by their very nature are usually smaller than conventional fossil fuels. This presents a different outlook when applying for generating licences, in terms of ensuring access to the grid for these small plants. In addition, wind farms are usually classified as self dispatching, implying that they are not available at pre-determined periods. This will play a role when assessing the needs of the grid in terms of reliability. There are therefore strong grounds to review the existing grid code to accommodate renewable energy.

#### 4.2 Voluntary Trade Market for Renewable Energy

A pilot project to investigate the potential for a green power trading market has been launched by the Department of Minerals and Energy. The pilot project will assess whether

green power can be traded between willing sellers and willing buyers in what is essentially a single buyer market. Eskom have agreed to participate in the pilot as the Independent Market Operator, responsible for measurement and verification, contracting and wheeling power (where necessary). City Power have also demonstrated their commitment to this pilot, having participated in a project to provide power to the Pan African Power Congress in Gallagher Estate, Midrand, during 2005. The pilot project will allow a trader to conduct negotiations with customers in a pre-determined location and then to negotiate terms with the local authority affected by the transaction. The NER has also given its in principle support to the project.

#### 4.3 Tradeable Renewable Energy Certificates

Tradeable Renewable Energy Certificates (TRECs) have been successfully introduced in other countries such as the UK and Canada. The scheme is focused on the renewable nature of the power generated, i.e. not the carbon emission associated as in the case of certified emission reduction credits (CERs). Each 1 MWh of electricity produced is recorded and a certificate, endorsed by the Department of Minerals and Energy or a delegated entity such as SABS, is produced. This certificate then becomes a tradeable commodity that can be traded locally or internationally, provided that international protocols are adhered to. The DME has commissioned a study to review the market for these TRECs, as well as the appropriate scheme that could be introduced, based on international best practice.

## 5. SUPPORTING PROJECTS AND STRUCTURES

### 5.1 Renewable Energy Market Transformation (REMT) Project

This project has been formulated over several years between the World Bank and the DME.

The REMT project aims to transform South Africa's renewable energy power generation markets. The overall principle guiding the transformation is to focus on areas where there is potential for scale up. There is clearly realizable technical and economical potential for grid-based renewable energy power generation, and this is the focus of the REMT. The project's approach is technology neutral, with the intention being to support those projects first that (i) require the smallest subsidies, and (ii) have good prospects for implementation and support from the GEF and possibly PCF.

The overall responsibility for project management will be with the Department of Minerals and Energy, which will also administer the Government subsidies to be provided for renewable energy power generation, as well as the GEF grants. PCF will provide its funds directly to each project that it supports; PCF has appointed the Development Bank of Southern Africa (DBSA) as its agent for Southern Africa. In addition, DBSA will also be responsible for administering the GEF grants for the commercial solar water heating industry and, will be the designated agent providing business-to-business development support services, and facilitating training and capacity building for all stakeholders. The National Electricity Regulator (NER) will be responsible for developing the regulations for sale of renewable energy power to the main grid and wheeling. The private sector will be responsible for implementing all the investments to be supported under this project.

This project will provide technical assistance to the various developers in order to meet the targets set out in the White Paper.

### 5.2 Renewable Energy Finance and Subsidy Office (REFSO)

This office has recently been supported by National Treasury and will commence with a call for proposals for subsidies during October 2005. The office is responsible for disbursement of once-off capital subsidies to projects. An evaluation methodology for projects has been developed and guidelines are in place to detail the level of funding that this applicable to eligible projects.

Essentially, R250 000 / MW will be payable to projects, with support capped at R1 million per project. This is due to the limited size of the funds available in the first few years.

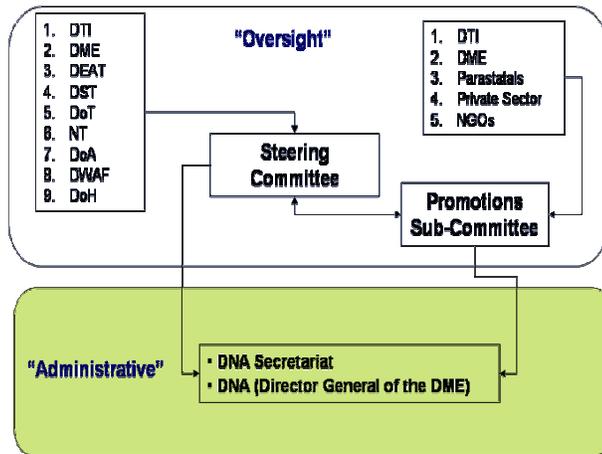
### 5.3 Designated National Authority for the Clean Development Mechanism (DNA)

To allow CDM projects to occur, host countries need to designate national authorities to evaluate and approve the operation of CDM projects in their countries. South Africa has established a Designated National Authority to fulfil this function as well as other functions related to the successful implementation of the CDM in South Africa including the promotion of investment in CDM projects.

The DNA for South Africa is established at the Department of Minerals and Energy. The main task of the DNA is to assess potential CDM project to determine whether they will assist South Africa in achieving its sustainable development goals and to support project developers and facilitate promotion of South Africa as an attractive location for potential investors.

#### 5.3.1 Institutional arrangements to handle the CDM in South Africa

The authority of the DNA is formally vested with the Director General of the DME. The Director General is supported by the DNA Secretariat. An Inter-departmental steering Committee has been established comprising the Departments of Minerals and Energy, Environmental Affairs and Tourism, Trade and Industry, Science and Technology, Transport, Treasury, Agriculture, Water Affairs and Forestry and Health which provides policy direction and oversight to the DNA.



#### 5.3.2 Legal basis

The regulations establishing the DNA at DME were gazetted on 22 July 2005. This means that the DNA is legally established. According to the gazetted regulations No R. 721 for the establishment of the Designated National Authority for the Clean Development Mechanism, under section 25(3) of National Environmental Management 1998 Act 107 (NEMA), the

responsibilities of the DNA are allocated to the Director-General of the Department of Minerals and Energy, who shall perform all such powers, duties and functions of the DNA and may delegate any power conferred on that authority by these regulations to one or more officials in the Department of minerals and Energy.

### 5.3.3 Sustainable Development Criteria

The DNA has developed an approval procedure for evaluating a project's fulfilment of the sustainable development requirements for South Africa in terms of the Kyoto Protocol. A set of sustainable development criteria to be used to guide this evaluation (the rules of the CDM leave the definition of what sustainable development is as a sovereign decision of each developing country) has also been established.

The DNA evaluates CDM projects submitted to it through consideration of the following three criteria:

- a) **Economic Development:** Does the project contribute to national economic development?
- b) **Social Development:** Does the project contribute to social development in South Africa?
- c) **Environmental Impact:** Does the project conform to the National Environmental Management Act principles of sustainable development? These are that "sustainable development requires the consideration of all relevant factors including the following:

### 5.3.4 Projects status

To date the DNA office has received 11 Project Idea Notes and 3 Project Design Documents

Type of project	Gas targeted	Status	CO <sub>2</sub> reduction per annum	Crediting period
N <sub>2</sub> O Reduction	N <sub>2</sub> O	PIN	42, 000	21
Renewable energy generation	CO <sub>2</sub>	PIN	26, 433	21
Energy Efficiency	CO <sub>2</sub>	PIN	12,400,000	21
Fuel Switching	CO <sub>2</sub>	PIN	25, 383	15
Renewable energy generation	CO <sub>2</sub>	PIN	26, 939	20
Fuel Switching	CO <sub>2</sub>	PIN	6, 490, 000	10
Waste Gas Reduction	N <sub>2</sub> O	PIN	250, 000	20
Renewable energy reduction	N <sub>2</sub> O, CO <sub>2</sub> & CH <sub>4</sub>	PIN	30, 000	10
Cogeneration	N <sub>2</sub> O, CO <sub>2</sub> & CH <sub>4</sub>	PIN	30, 000	10
Cogeneration	CO <sub>2</sub>	PIN	763,960	20
Waste Gas Reduction	N <sub>2</sub> O	PIN	610, 000	10
Fuel Switching (coal to biomass)	CO <sub>2</sub>	PDD	44 000	21
Fuel Switching(coal to biomass)	CO <sub>2</sub>	PDD	7070	10
Fuel Switching (Coal to biomass)	CO <sub>2</sub>	PDD	107 403	7

## 6. CONCLUSION

The challenges facing the renewable energy sector are significant but not insurmountable. Renewable energy has the advantage that it can be deployed as distributed generation and in some cases, close to the source of the demand for electricity. Enabling policies and legislation will soon create an environment more conducive to investment. Market rules to promote the generation of power from IPPs and the sale thereof to willing buyers will be put in place. A phased approach to implementation has been adopted for the purpose of meeting the specified target and strategies have been proposed for each of the major energy carriers deemed closest to commercialization. Given the scale of implementation and the sizeable investment associated with the rollout of renewable energy, it is vital that public private partnerships be established to drive key processes. In particular, the role of the state owned enterprises and municipalities would be fundamental to renewable energy implementation on the grid. Demand Side Management funding from Eskom is undergoing review at the moment and there is a strong likelihood that alternative energies that support load management will also be funded.