South Africa

1. Overview of National Energy Policy

South Africa's Department of Minerals and Energy (DME), the main government agency responsible for national RE/EE policies and targets, has focused its energy policy on achieving the following objectives (Burger, 2005):

- attaining universal access to energy by 2014
- accessible, affordable and reliable energy, especially for the poor
- diversifying primary energy sources and reducing dependency on coal
- good governance, which must also facilitate and encourage private-sector investments in the energy sector
- environmentally responsible energy provision.

Because of the country's abundant indigenous coal resources, electricity has traditionally been low cost and widely available. Coal accounts for 77% of the country's primary energy needs (Burger 2005). Coordinated national strategies to promote energy efficiency and renewable energy have been conceived and implemented only in the last five years.

South Africa's governmental commitment to RE/EE was jump-started in the wake of the World Summit on Sustainable Development (WSSD), which was hosted by South Africa in 2002. In 2003, the Cabinet approved a renewable energy white paper that set a target of producing 10,000 GWh of energy from renewable sources (mainly from biomass, wind, solar and small-scale hydro) by 2013. In 2005, the DME finalized the country's first energy efficiency strategy, setting a target to achieve a reduction of 12% in projected national energy demand by 2015.

There have been several new developments in South Africa's energy policies. First, in January of 2007 the Cabinet of South Africa approved the Draft Biofuel Strategy, to be fine-tuned after consulting with the industry. Additionally, the Department of Minerals and Energy (DME) published the Mineral and Petroleum Resources Development Amendment Bill of 2007. Thirdly, the Draft Nuclear Energy Policy and Strategy was released in July 2007 by the Minister of Minerals and Energy inviting comments by October 2007. Also, the energy Summit 2007 was held in Johannesburg, South Africa. As stated by the DME, the "focus of the Summit programme is [not only the White Paper Policy] but on those policy positions that have either not been implemented or from which there has been deviation or have had major challenges. Lastly, the Energy Security Master Plan – Liquid Fuels was released this year. This plan focuses on developing solutions to South Africa's liquid fuels supply challenges, management of liquid fuels demand, and emergency response tactics.

Below is a table listing energy decrees, policies, and laws

Table 1. Relevant Decrees, Regulations, Policies, and laws Affecting the South African Energy Sector

Law	Date enacted	Purpose
Electricity Act of 1922	1922	Established the Electricity Control Board to regulate national electricity supply, excluding direct control of municipal electricity.
Escom Act 40 of 1987	1987	Defined the responsibilities of Eskom, the national electricity utility.
Electricity Act 41 of 1987	1987	Redefined the responsibilities of the Electricity Control Board and assigned to local government authorities the sole right of electricity supply within municipal boundaries.
Electricity Amendment Act 58	1989	Provided for an electricity levy.
Electricity Amendment Act 46 of 1994	1994	Re-established the Electricity Control Board as the National Electricity Regulator (NER)
Electricity Amendment Act 60 of 1995	1995	Laid out the funding and objectives of the NER, defined as: • Eliminating monopolies in the generation and sales/supply sectors • Rationalising end-use prices and tariffs • Giving customers the right to choose their electricity supplier • Creating an electricity market • Introducing competition into the industry, especially in the generation sector • Addressing the impact of generation, transmission and distribution on the environment • Permitting open, non-discriminatory access to the transmission system • Creating similar opportunities for all distributors of electricity
White Paper on Energy Policy for Republic of S.A.	1998	Defined energy policy objectives, created ground rules to encourage independent power producers (IPPs), and established gov't-owned Regional Electricity Distributors (REDs).
The Municipal Systems Act No. 32 of 2000	2000	Included provisions on municipal authority regarding bulk electricity supplies.
Eskom Conversion Act	2001	Converted Eskom into a public company.
Petroleum Products	2003	Provided for licensing of petroleum suppliers.

Amendment Act No. 58 of 2003		Authorized the Minister of Mines and Energy to issue regulations for the sector, including related to biofuels.
White Paper on Renewable Energy	November 2003	Established targets and objectives for the renewable energy sector.
Energy Efficiency Strategy of the Republic of South Africa	March 2005	Established targets and objectives for national energy efficiency.
Government Notice R. 627 of Gazette No. 28958 Regulations: Petroleum Products Specifications and Standards	June 2006	Regulation establishing, among other provisions, voluntary specifications for biofuels.
Draft Biofuels Industry Strategy	November 2006 January 2007	Publicized draft policies on the biofuels industry for public review and comment. Approved by Cabinet.

2. National Programs/Policies and Targets for Renewable Energy

The 2003 Renewable Energy White Paper set a target of producing 10,000 GWh of energy from renewable sources (mainly from biomass, wind, solar and small-scale hydro) by 2013. The RE technologies identified for initial implementation include:

- Sugar-cane bagasse for cogeneration;
- Landfill gas extraction;
- Mini-hydroelectric schemes;
- Commercial and domestic solar water heaters;

Many of the feasibility studies and plans underlying government RE policies and activities were produced under the Capacity Building Project in Energy Efficiency and Renewable Energy Project (CaBEERE), funded by the government of Denmark from 2002-2005.

The DME operates a renewables subsidy scheme out of its Renewable Energy Finance and Subsidy Office (REFSO). In 2005, the government budgeted approximately R 4 million (about GBP 0.35 m) for RE projects (CaBEERE newsletter, September 2005).

South Africa's renewable energy subsidies and incentives are largely focused on biofuels. The DME estimates that biofuels may achieve 75% of the RE generation target by 2013[1].

[1] As indicated on the DME website: http://www.dme.gov.za/energy/renew_bio.stm.

The DME's stated objectives in promoting the biofuels industry are to stimulate the rural economy, create jobs, help reduce greenhouse gas-emissions and boost foreign exchange.

South African law exempts small biodiesel producers from the fuel levy. Small producers are defined as those producing less than 300 m3 of biodiesel annually. Large producers have received a 30% exemption from the fuel levy since 2003, and a 40% exemption from 2005. Biofuels investments qualify for a tax-depreciation write-off of 50:30:20 percent over three years, which equates to about $ 2/bbl crude oil equivalent effective support. In September 2005, the National Treasury approved a Renewable Energy Subsidy Scheme. The subsidy allocation methodology for 2006/7 provides for 16.7 c/L for bioethanol and 27.3 c/L for biodiesel up to a maximum of R 20 million (GBP 1.4 m) (DME 2006). In 2006, South African National Standards (SANS) finalized specifications for biodiesel and fuel ethanol, and proceeded to develop a standard for ethanol gel fuel.

In November 2006, the DME published a draft strategy for the biofuels industry for public comment. The draft strategy proposes an average market penetration target for biofuels of 4.5% of liquid road transport fuels (petrol and diesel) by 2013. The draft biofuels strategy also proposes extending the biodiesel tax exemption to bio-ethanol in proportion to its energy content relative to diesel (70%) (DME 2006). The consultation period on the draft strategy was scheduled to close on March 10, 2007, and the biofuels task team is scheduled to report back to the Cabinet in May 2007.

A. Progress/Barriers

Capacity Building Project in Energy Efficiency and Renewable Energy Project (CaBEERE) projects, all at different stages of implementation.

1. Durbvan Ethekwini landfill: This use methane landfill gas from three landfill sites to provide 10 MW of electricity. Construction has not yet begun, but financial closing has been completed.
2. Darling wind farm: Ten 1.3 MW wind turbines are to be built in Darling South Africa. The planning phase of this project has been completed.
3. Easter Cape wind farm: Construction has not yet begun on this project. The first phase will include 15 MW of electricity. The details of the second phase are still to be determined.
4. Tongaat Hulett biomass: This project has been completed. There is 72 MW capacity of which 8.5 is grid connected and available for export. Bagasse is used at this plant.
5. This project is to be completed at the As River, one of the only rivers in South Africa to have constant yearly flow. 3.9 MW of electricity are planned to be generated from this small hydro plant. The construction phase of this project has not yet begun.

Grid-connected renewable energy systems are minimal or non-existent in South Africa, and official statistics do not yet capture growth RE rates, either in the aggregate or individually.

Solar PV: While there are no PV systems connected to the grid, an estimated 70,000 households, 250 clinics and 2,100 schools use off-grid PV systems.

Solar thermal electricity: Eskom is reportedly considering the establishment of a solar thermal power station with a capacity of 300 MWe in the Northern Cape (Winkler 2006, p.58).

Bagasse cogen: Sugar refineries using biomass in their own processing operations have installed generation capacity of 245 MW (Winkler 2006, p.49).

Hydro: In 2006, South Africa had an installed hydroelectric power capacity of 665 MW, of which 665 MW are owned by Eskom (Winkler 2006, p.54).

Wind: Eskom established a 3.2 MW demonstration wind farm at Klipheuwel in 2002 with three turbines and total annual production of just over 4 GWh. In March 2005, the government approved a 5 MW private, commercial wind farm to be established through a public-private partnership with Danida.

Table 2. Progress Towards RE Targets

Year	Progress	Target
2004	70 GWh from RE	10,000 GWh from RE by 2013
2005	Statistics are under preparation	

South Africa is currently two-thirds of the way through its first implementation phase for energy efficiency targets that were adopted in March 2005. The phases of energy demand reduction were set out in the Energy Efficiency Strategy as follows:

- Phase 1: March 2005 to February 2008;
- Phase 2: March 2008 to February 2011;
- Phase 3: March 2011 to February 2015.

Interim results toward achieving national energy efficiency targets have not yet been collated and published.

3. National Programs/Policies and Targets for Energy Efficiency

The Energy Efficiency Strategy of 2005 set a voluntary target of reducing national energy demand by 12% compared to projected demand in 2015. Sub-sector reduction targets for 2015 were established as follows:

- Industry and Mining – 15%
- Power Generation – 15% reduction in "parasitic" electrical usage

- Commercial and Public Building Sector – 15%
- Residential Sector – 10%
- Transport Sector – 9%

4. National Programs/Policies and Targets for Other Clean Energy Technologies

Nuclear: South Africa has two nuclear reactors generating 6 percent of its electricity. According to the DME, the government's commitment to the future of nuclear energy is strong. Budget approval to proceed with a demonstration Pebble Bed Modular Reactor was given in 2004. The nuclear sector in South Africa is mainly governed by two acts; The Nuclear Energy Act of 1999 and the National Nuclear Regulator Act of 1999.

Natural gas: Natural gas is not a major contributor to South Africa's energy sector. However, the government does have an interest in expanding it. There are said to be 350 billion cubic feet of natural gas reserves in South Africa. According to DME, South Africa produced 23, 571 million litres of liquid fuels in 2005, according to SAPIA. About 36 percent of the demand is met by synthetic fuels (synfuels), which are produced locally, largely from coal and from natural gas. Products refined locally from imported crude oil meet the remaining 64%.

Table 3: Dry Natural Gas Production and Consumption in South Africa, 1993-2003 (in tcf)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Production	0.06	0.07	0.07	0.07	0.06	0.05	0.05	0.06	0.07	0.08	0.08
Consumption	0.06	0.07	0.07	0.07	0.06	0.05	0.05	0.06	0.07	0.08	0.08

note: "dry" gas means gas with condensates removed
Source: DOE/EIA

Clean Coal: South Africa has joined the Carbon Sequestration Leadership Forum that investigates technologies to sequestrate carbon. "The Carbon Sequestration Leadership Forum is an international climate change initiative that is focused on development of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and long-term safe storage. The purpose of the CSLF is to make these technologies broadly available internationally; and to identify and address wider issues relating to carbon capture and storage."

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