



WORLD CLASS MINERALS AND ENERGY SECTORS THROUGH SUSTAINABLE DEVELOPMENT

DEPARTMENT OF MINERALS AND ENERGY



the dme

Department:
Minerals and Energy
REPUBLIC OF SOUTH AFRICA

Energy Status in South Africa

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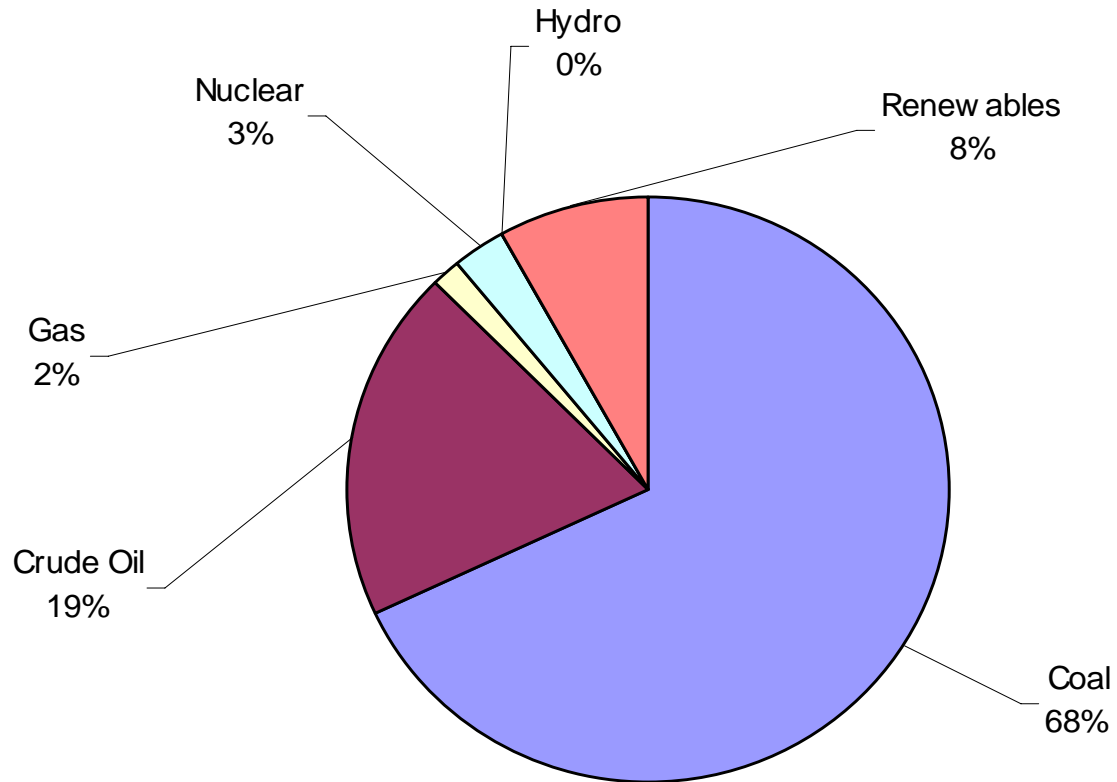


DME Energy Policy Objectives

- 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; and
- Environmentally responsible energy provision.

Primary Energy Supply

Primary Energy Supply: 2004



Energy Overview

- **Minister of Mineral and Energy Affairs:** Buyelwa Patience Sonjica
- **Proven Oil Reserves (*Oil and Gas Journal*; 1/1/05E):** 15.7 million barrels (bbl)
- **Oil Production (2003E):** 194,600 barrels per day (bbl/d), of which about 165,000 bbl/d is synthetic
- **Oil Consumption (2003E):** 469,000 bbl/d
- **Net Oil Imports (2003E):** 274,400 bbl/d
- **Crude Refining Capacity (*Oil and Gas Journal*; 1/1/05E):** 519,547 bbl/d

Energy Overview

- **Natural Gas Reserves (*Oil and Gas Journal*; 1/1/05E):** 1 billion cubic feet (Bcf)
- **Natural Gas Production/Consumption (*South African DME*; 2003E):** 1.3 trillion cubic feet (Tcf)
- **Recoverable Coal Reserves (2002E):** 54.6 billion short tons (Bst)
- **Coal Production (2002E):** 245.3 million short tons (mmst)
- **Coal Consumption (2002E):** 171.6 mmst
- **Net Coal Exports (2002E):** 73.7 mmst

Energy Overview

Electricity Generation Capacity (2002E): 40.5 gigawatts (GW) operational, with an additional 3.8 GW mothballed

Electricity Generation (2004EB): 205 000 gwh202.6 billion kilowatthours (bkwh), of which 190000 bkwh was thermal, 564 gwh for geothermal, 12000 gwh nuclear and 2400 gwh hydroelectric

Electricity Consumption (2004EB): 189.4 bkwh



Coal

Coal is the primary fuel produced and consumed in South Africa . The country has the world's seventh largest amount of recoverable coal reserves (54.6 billion short tons), approximately 5% of the world total.

Coal Production

South Africa is the world's sixth largest coal producer, producing 245.3 million short tons (mmst) of coal in 2002. The Mpumalanga province accounts for 83% of South African coal production, while Free State (9%) Limpopo (7%) and KwaZulu-Natal (1%) also house production facilities.



Coal Exports

Although only one-third of coal produced in South Africa is exported, primarily to the European Union (EU) and East Asia, South Africa was the world's third largest net coal exporter (73.7 mmst) in 2002.

The vast majority of South African coal exports are shipped through the Richards Bay Coal Terminal (RBCT).



Coal Consumption

South Africa consumed 171.6 mmst of coal in 2002, 90% of which was used for electricity generation and the synthetic fuel industry. Other coal consuming sectors include the non-synthetic fuels industrial sector, metallurgical industries, and the merchant & domestic sectors.



Oil

South Africa imports the majority of its crude oil from the Middle East, with [Saudi Arabia](#) and [Iran](#) as its chief suppliers. Because South Africa is trying to diversify its [sources of imported crude](#) and reduce its dependence on Iranian oil imports, Nigeria is now the third largest supplier of imported oil to South Africa . Other major oil sources include [Kuwait](#), [Russia](#) and [Angola](#), and Equatorial Guinea

In December 2001, oil companies including BP, Caltex, Shell and Total signed the [Oil Industry Charter for Transformation](#), a BEE mandate, which aims to have black-controlled companies owning 25% of the oil sector by 2011. Similarly, the government aims to reserve 10% of new natural gas exploration licenses for BEE companies.





Oil exploration

PetroSA, the national oil company, has made several discoveries on Block 9 within the Bredasdorp Basin . Three significant fields have been found on Block 9 including the Oribi, Oryx and Sable fields.

Oil production

Total oil production in South Africa currently accounts for approximately 10% of domestic needs. PetroSA and Energy Africa began South Africa 's first oil production at the Oribi oil field in 1997 using a floating production, storage and offloading vessel (FPSO).

Natural Gas

An offshore natural gas discovery was made off South Africa 's border with [Namibia](#) in Block 2A in March 2000. US-based companies Forest Oil Corporation (Forest) and Anschutz, along with BEE Company Mvelaphanda, are exploring the Ibhubezi field (15 Tcf). In August 2003, PetroSA purchased a 30% share in the Ibhubezi Gas Field project. PetroSA hopes that Ibhubezi gas, along with gas from Namibia and Mozambique , can be used at its 45,000 bbl/d Mossel Bay GTL plant, where reserves may be depleted by 2007.

Refining and Downstream Activity

South Africa has the second largest refining capacity in Africa (519,547 bbl/d), surpassed only by [Egypt](#). Its refined products are both sold in the local market and exported, mainly within Southern Africa , but also into both the Indian and Atlantic basin markets. Major refineries include Sapref (172,000 bbl/d) and Enref (150,000 bbl/d) in Durban , Calref (110,000 bbl/d) in Cape Town , and Natref (87,547 bbl/d) at Sasolburg.

Multinational companies, including BP, Shell, Caltex (ChevronTexaco), Engen, and Total, are major participants in South Africa 's downstream petroleum markets. Several domestic firms are also involved, including black-owned firms Naledi Petroleum and Afric Oil.

Synthetic Fuels

South Africa has a highly developed synthetic fuels industry supported by abundant coal resources and offshore natural gas and condensate production in Mossel Bay . Sasol, with a capacity of 150,000 barrels per day (bbl/d), and the Petroleum Oil and Gas Corporation of South Africa (PetroSA), with a capacity of 50,000 bbl/d, are the major producers of synthetic fuel in South Africa .

Sasol, the world's largest manufacturer of oil from coal, maintains coal liquefaction plants located at Secunda (oil) and Sasolburg (petrochemicals).

Sasol began importing gas from Mozambique in 2004.



Synthetic Fuels

Mozambique's Temane gas field came onstream in February 2004 through a 536-mile transport pipeline, owned by a joint venture between Sasol, South African government, and the government of Mozambique. A pipeline carries gas from the Mozambican fields Temane and Pande, estimated to hold reserves of 3.2 Tcf, to Sasol's Secunda facility.

State-owned PetroSA began synfuel production in 1993. The PetroSA plant receives feedstocks of natural gas and condensate from the FA, EM, and EBF gas fields in Mossel Bay through a pair of 56-mile pipelines and can process up to 8,000 bbl/d of imported condensate. PetroSA converts the gas into a variety of liquid fuels including motor gasoline, distillates, kerosene, alcohols and liquefied petroleum gas (LPG).



Electricity Supply Industry

Eskom the state-owned vertically integrated utility, dominates the ESI and supplies 95% of South Africa's electricity requirements, while it supplies more than 45% of the electricity generated on the African continent.

Eskom has 24 power stations with a nominal capacity of 42 011 megawatts (MWs) country's electricity.

In 2001, Eskom recorded the maximum peaking demand of 30 599 MW.



Electricity Supply Industry

Annual demand has grown by 3.5% year on year and Eskom recorded a peak demand of 32 000 MW in 2003.

In June 2004, a 7.1% increase in peak demand was observed.

Surplus capacity is diminishing at a rate faster than expected and investment in new generation capacity is now inevitable.



Electricity Generation Capacity Planning

Over the past 10 years the reserve margin has fallen very significantly as a result of growth in demand of around 3% (equivalent to 1,000MW of additional peak demand) per year and the very limited amount of new capacity commissioned.

In the short term, nonetheless, the capacity requirements are as indicated below, based on 4% electricity growth, in order to minimise the risk of blackouts. This is over and above Eskom RTS programme.

Plant	Capacity	Commission date	Investor
OCGT 1	1050 MW	2007	Eskom
OCGT 2	1050 MW	2008	Eskom
OCGT 3	1000 MW	2009	IPP
CCGT	1600 - 2400 MW	first unit - 2010	IPP
Project Alpha	2100 MW	first unit - 2010	Eskom

NERSA

South Africa 's [National Electricity Regulator of South Africa](#) (NERSA), which handles, licensing of electricity generators, transmitters, and distributors in the country, licensed Eskom as the national distributor. NERSA is responsible for regulation of the electricity, gas and pipelines industry in SA.



Pebble Bed Modular Reactor

The Nuclear Energy Corporation of SA (NECSA) plans to start building a pebble bed modular reactor (PBMR) demonstration plant next year with full operation by 2012.

According to Minister Sonjica “ there is a need to increase investment in nuclear research and development” and indicated that “in order to support the expansion in nuclear power there is a need for greater manufacturing capability, nuclear safety, regulation of the nuclear sector as well as skills development”



Environment

In 2002, 74% of total [energy](#) consumption in South Africa came from coal. Because coal is a highly carbon-intensive fossil fuel, overreliance on it for energy needs can have negative environmental impacts, including air [pollution](#) due to coal combustion, groundwater pollution due to mining, and disruption of ecosystems

The National Environmental Management Air Quality Act (NEMA) provides for the Department of Environmental Affairs and Tourism's (DEAT) to establish national norms and standards for ambient air quality, emissions, air quality monitoring and air quality information management.



Environment

In recent years, a growing environmental movement in South Africa has challenged strip-mining operations in a sensitive wetland area, drawn international attention to pollution and conditions at the country's refineries, and legally challenged the establishment of South Africa's PBMR program in Koeberg.

Environmentalists oppose development of the PBMR, insisting that the scheme's environmental impact assessment is flawed. In June 2004, the South African government confirmed that the country would be forced to rely on nuclear power in the near future, encouraging environmental groups to focus on positive aspects of the project, including a reduction in carbon dioxide emissions.



THANK YOU



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