

## COUNTRY ANALYSIS BRIEFS

# South Africa

Last Updated: April 2007

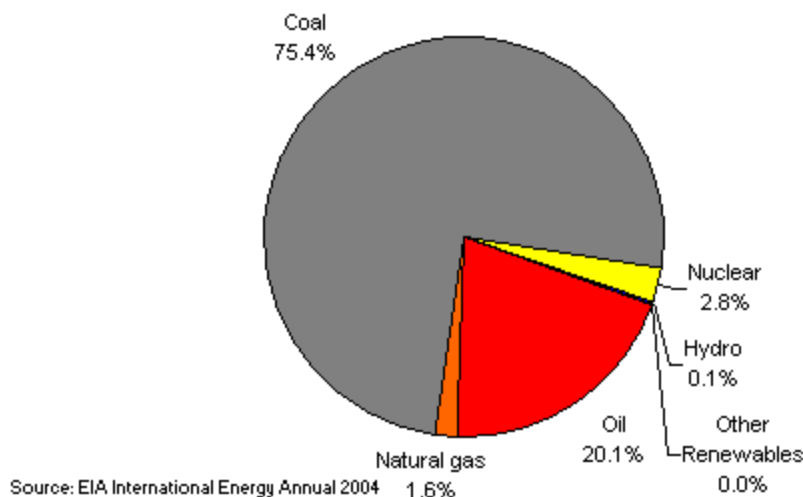
### Background

***South Africa is a significant coal exporter but imports large amounts of oil and some natural gas. The country has a highly developed synthetic fuels industry that uses coal, condensate and natural gas as feedstock.***

The South African government is seeking to increase jobs and promote business development throughout the country with the hope of reaching annual 6.0 percent GDP growth in the future. In 2006, South Africa's real gross domestic product (GDP) growth rate was 4.6 percent. The South African government has committed to ensuring that black-owned companies have access to the energy sector. Under its black economic empowerment (BEE) program, the South African government has set targets of 25 percent BEE ownership of energy companies by 2014. Large, predominately white-owned corporations have sold assets to achieve this objective, with the first sale occurring in 2000. BEE firms are commonly referred to as "empowerment" firms. The bulk of South Africa's energy consumption mix is comprised of coal, which the country primarily uses to produce synthetic fuels. South Africa also consumes a substantial amount of oil. Only a small percentage of the energy consumption mix is comprised of natural gas and nuclear.



### Total Energy Consumption in South Africa, by Type (2004)

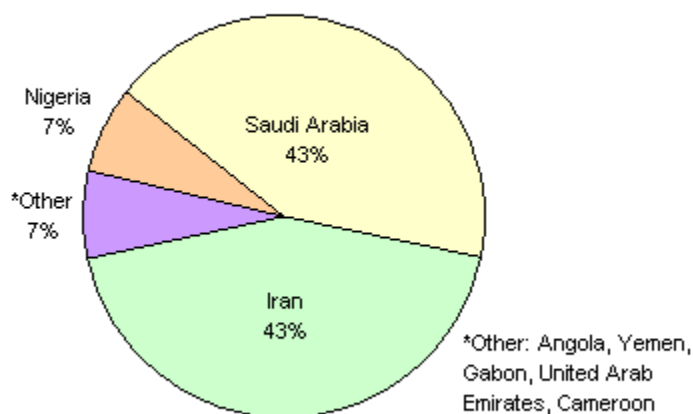


### Oil

**South Africa has the second largest oil refinery system in Africa. Since South Africa is not a major oil producer, the country imports the majority of crude oil used in refining from the Middle East.**

According to *Oil and Gas Journal (OGJ)*, South Africa had proven oil reserves of 15 million barrels as of January 2007. All of the proven reserves are located offshore southern South Africa in the Bredasdorp basin. In 2006, South Africa produced 200,000 barrels per day (bbl/d) of oil, of which 30,000 bbl/d was crude oil, and 170,000 bbl/d consisted of mostly synthetic liquids from coal and natural gas. Over 50 percent of South Africa's oil consumption is imported. In 2006, South Africa consumed 519,000 bbl/d of oil, and imported 319,000 bbl/d of oil. According to the South African Petroleum Industries Association (SAPIA), the majority of crude oil imports destined for South African refineries come from the Middle East, with Iran and Saudi Arabia as the country's chief suppliers. Nigeria and Angola (among others) also supply crude oil to South Africa.

### South Africa Crude Imports, 2004



Source: South Africa Petroleum Industries Association

### Sector Organization

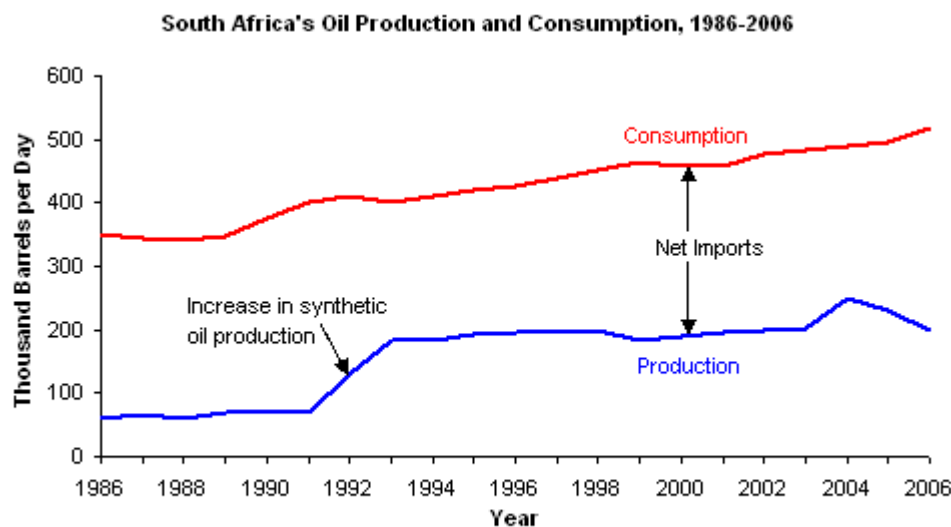
In 2005, South Africa launched the National Energy Regulator of South Africa (NERSA). NERSA regulates policy over the entire South African energy industry and is responsible for implementing South Africa's energy plan. South Africa also has a national oil and natural gas company, the Petroleum Oil and Gas Corporation of South Africa (PetroSA). PetroSA is responsible for managing and promoting the licensing of oil and natural gas exploration in the country. This

includes both onshore and offshore exploration. International oil companies (IOCs) involved in South Africa's upstream oil sector include Anschutz International, BHP Billiton, Forest Oil International, and Pioneer Natural Resources.

In February 2007, the South African government indicated that it would consult with the oil industry over a windfall tax on Sasol and PetroSA profits when oil prices reach \$45 - \$55 per barrel. The government believes the tax could provide cheaper fuel prices to local consumers, and the government will most likely make a final decision on the tax by July 2007. Sasol and PetroSA have argued against the tax, saying that it would harm investor confidence at a time when South Africa needs to expand its refining capacity to meet future energy demand

### Production and Exploration

The most prolific of South Africa's exploration blocks is Block 9 in the Bredasdorp Basin. PetroSA has made several discoveries on the block, including the Oribi, Oryx and Sable fields. PetroSA and Energy Africa began producing oil in 1997 at the Oribi field, which was followed by the Oryx and Sable fields in 2000 and 2003, respectively. PetroSA and Pioneer developed Sable under a joint partnership. The field has six subsea wells connected to a floating, production, storage and offloading vessel (FPSO) with the capacity to process 60,000 bbl/d of oil, re-inject 80 million cubic feet per day (MMcf/d) of natural gas and recover natural gas liquids (NGLs). In 2003, the fields produced 58,000 bbl/d of crude oil total; however, due to steady declines, the fields currently produce around 30,000 bbl/d of crude.



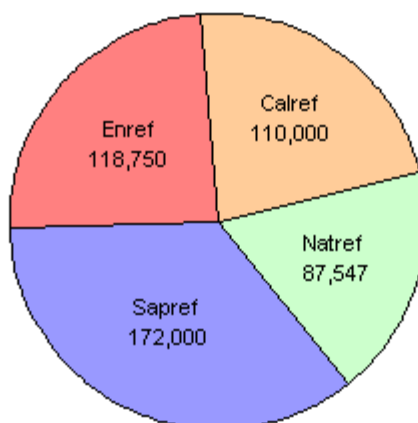
Sources: EIA *International Energy Annual 2004*,  
*Short Term Energy Outlook February 2007*

South Africa would like to locate additional oil reserves and increase oil production in the country. In 2007, South Africa will auction four offshore blocks for exploration. In addition, BHP-Billiton plans to drill for oil in offshore acreage in western South Africa.

### Refining and Downstream

According to OGJ, South Africa has the second largest refining capacity in Africa (488,297 bbl/d), surpassed only by Egypt (726,250) as of January 2007. South Africa's refined products are sold in the local market and exported within Southern Africa and in the Indian and Atlantic Basins. Major refineries include Sapref (172,000 bbl/d) and Enref (118,750 bbl/d) in Durban, Calref (110,000 bbl/d) in Cape Town, and Natref (87,547 bbl/d) at Sasolburg.

**South African Oil Refinery Capacity- 2007**  
**Thousand Barrels per Day**



Sources: Oil and Gas Journal, South African Petroleum Industries Association

IOCs, including BP, Chevron, Engen, Shell, and Total are major participants in South Africa's downstream petroleum markets. Several domestic firms are also involved, including Naledi Petroleum and Afric Oil. Worldwide Africa Investment Holdings (WAIH) owns 55 percent of Afric Oil, 51 percent of South African Zenex, and 20 percent of Engen.

In 2005, Drako Oil and Energy announced the proposed construction of a 300,000 bbl/d refinery at Richards Bay in the KwaZulu-Natal province. The facility would have a 6.2 million barrel storage capacity and would be linked to the Petronet pipeline system. Crude oil for the facility would most likely come from Algeria or the UAE. Late in 2006, Drako Oil and Energy applied at the South African Department of Minerals and Energy for a license to proceed on the refinery project.

On January 1, 2006 South Africa switched to unleaded fuels in motorized vehicles. Prior to the fuel switch, an estimated 60 percent of South African vehicles were leaded fuel users. The South African government, under the clean fuels policy, paid to have older vehicles adapted for unleaded fuel. In addition, diesel fuel used in South Africa after January 1, 2006 has ultra-low sulfur content of 0.005 – 0.05 percent, increasing its cost by \$0.11 per gallon.

**Synthetic fuels account for approximately 76 percent of South Africa's oil production.**

### **Synthetic Fuels**

South Africa has a highly developed synthetic fuels industry supported by abundant coal resources, offshore natural gas and condensate production in Mossel Bay, and natural gas imports from Mozambique. Sasol, with a capacity of 160,000 barrels per day (bbl/d) from coal-to-liquids (CTL), and PetroSA, with a capacity of 45,000 bbl/d from gas to liquids (GTL), are the major producers of synthetic fuel in South Africa. Together, the two firms supply approximately 40 percent of the South African fuels market.

#### *Sasol*

Sasol is the world's largest manufacturer of oil from coal. Sasol uses coal-to-liquids (CTL) technology, which makes synthetic gas from low-grade coal at liquefaction plants located at the Secunda and Sasolburg refineries. The synthetic gas is then converted into pipeline gas and liquid fuels, which include liquefied petroleum gas (LPG), jet fuel, kerosene and petrochemicals. As of December 2006, Sasol was considering the possibility of constructing an additional 80,000 bbl/d synthetic fuels refinery, which would be located close to the Waterberg coal deposits near Gauteng. The South African government would like to see the refinery built as it would help satisfy future energy demand in the county, while helping to reduce foreign oil imports.

In July 2005, Anglo American's Isibonelo coal mine produced its first coal for shipment to Sasol's Segunda refinery. The \$65 million project supplies 5 million short tons (Mmst) of thermal coal annually to Sasol Synthetic Fuels since reaching full production in late 2006. Anglo America and Sasol also announced plans to develop the Kriel South coalfield. Anglo will establish an operation

on the northern portion of the field, and Sasol plans to expand its existing underground operations at the Syferfontein colliery (coal mine). Coal from the two operations is expected to supply Sasol's refinery for the next 20 years.

#### *PetroSA*

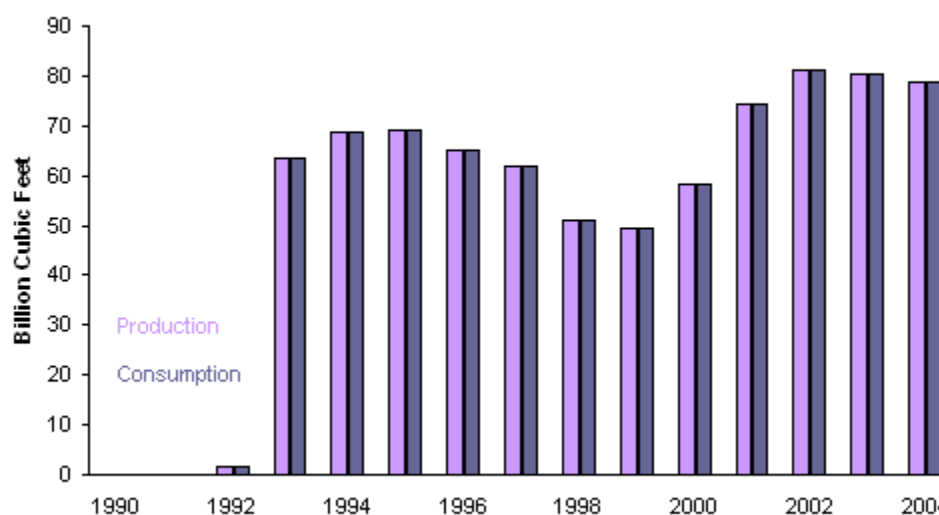
State-owned PetroSA began synfuel production in 1993 at its Mossel Bay GTL refinery, which is the largest GTL plant in the world. The plant receives natural gas and condensate feedstock from the FA, EM, and EBF fields in Mossel Bay through a pair of 56-mile pipelines. PetroSA converts the natural gas into a variety of liquid fuels, which include motor gasoline, distillates, kerosene, alcohols and LPG. Due to declining domestic natural gas production, PetroSA and Pioneer plan to further develop existing natural gas resources at Sable oil field and six adjacent undeveloped fields. Initial production from the development is set to begin in the third quarter of 2007, with the hope of prolonging the lifespan of the Mossel Bay GTL refinery.

## Natural Gas

**South Africa produces only small amounts of natural gas, which it uses in synthetic fuel production.**

According to Cedigaz, South Africa had 353 billion cubic feet (Bcf) of proven natural gas reserves as of January 2006. In 2004, South Africa produced 79 Bcf, which was all consumed domestically. To compensate for the lack of natural gas reserves, South Africa has developed natural gas supply agreements with neighbors Mozambique and Namibia. In 2005, Mozambique supplied natural gas to South Africa via a pipeline from the Pande and Temane fields. The South African government would like to locate additional natural gas reserves and has provided investment money for exploration in fields in Mossel Bay. Any recoverable natural gas reserves will be developed with the intent of extending the lifespan of the Mossel Bay gas-to-liquids (GTL) plant. For more information on the Mossel Bay plant see Synthetic Fuel segment in the Oil section of the South Africa Country Analysis Brief.

**South Africa Natural Gas Production and Consumption, 1990-2004**



Source: *International Energy Annual 2004*

### Sector Organization

South Africa has numerous government agencies and companies involved in the natural gas industry, including iGas, PetroSA, Petroleum Agency of South Africa and Petronet. The agencies and companies work to promote and develop natural gas exploration and production in South Africa.

#### *Pipelines*

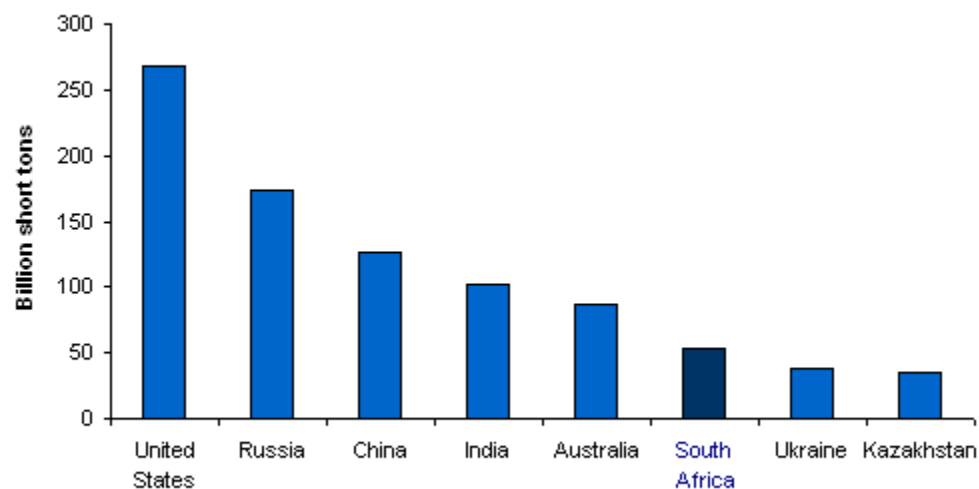
Natural gas from Mozambique is imported through a 536-mile transport pipeline, which Sasol, the South African government, and the government of Mozambique own through a joint venture. The pipeline has peak capacity of 524 million cubic feet (MMcf/d) of natural gas. There is also a proposed pipeline between Namibia and South Africa. The pipeline, if it is built, would carry natural gas from Namibia's Kudu field (with estimated proven reserves of 1.3 trillion cubic feet, Tcf) to Cape Town, South Africa.

## Coal

**South Africa has the world's sixth largest recoverable coal reserves.**

South Africa has the world's sixth largest recoverable coal reserves (53.7 billion short tons), approximately 5 percent of the world total. Although South Africa has 19 official coal fields, 70 percent of recoverable reserves lie in just three -- Highveld, Waterberg, and Witbank. In 2004, South Africa produced 268 million short tons (Mmst), and consumed 195 Mmst. The vast majority of consumed coal is used in electricity generation and the synthetic fuel industry. Almost one-third of coal produced in South Africa is exported, with the primary importers being the European Union (Germany and Spain) and East Asia (Japan).

**Top Recoverable Coal Reserves Holders, 2004**



Source: *International Energy Annual, 2004*

## Profile

### Country Overview

<b>Chief of State</b>	President Thabo Mbeki
<b>Location</b>	Southern Africa, at the southern tip of the continent of Africa
<b>Independence</b>	31 May 1910 (from UK)
<b>Population (2006E)</b>	44,187,637

### Economic Overview

<b>Minister of Trade and Industry</b>	Mandisi Bongani Mabuto Mpahlwa
<b>Currency/Exchange Rate (4/3/07)</b>	1 Rand (ZAR) = 0.1385 USD
<b>Inflation Rate (Consumer Price Index)</b>	2006E: 4.6%
<b>Gross Domestic Product</b>	2006E: \$252 billion
<b>Real GDP Growth Rate</b>	2005E: 5.1%, 2006E: 4.9%
<b>Unemployment Rate</b>	2006E: 25.5%
<b>External Debt</b>	2006E: \$55.47 billion
<b>Exports (Merchandise)</b>	2006E: \$61.94 billion
<b>Exports - Commodities</b>	gold, diamonds, platinum, other metals and minerals, machinery and equipment (1998 est.)
<b>Exports - Partners (2005E)</b>	Japan 9.9%, UK 9.7%, US 9.7%, Germany 6.5%, Netherlands 4.6%
<b>Imports (Merchandise)</b>	2006E: \$69.87 billion
<b>Imports - Commodities</b>	machinery and equipment, chemicals, petroleum products, scientific instruments,

	foodstuffs (2000 est.)
<b>Imports - Partners (2005E)</b>	Germany 14.2%, China 9.1%, US 7.9%, Japan 6.8%, Canada 6.3%, UK 5.6%, France 4.5%, Iran 4.2%
<b>Current Account Balance</b>	2006E: \$ -13,640 million

## Energy Overview

<b>Minister of Mineral and Energy Affairs</b>	Ms Buyelwa Patience Sonjica
<b>Proven Oil Reserves (January 1, 2007E)</b>	15 million barrels
<b>Oil Production (2006E)</b>	200 thousand barrels per day, of which 15% was crude oil.
<b>Oil Consumption (2006E)</b>	520 thousand barrels per day
<b>Crude Oil Refining Capacity (2006E)</b>	488 thousand barrels per calendar day
<b>Proven Natural Gas Reserves – Cedigaz estimate (January 1, 2006E)</b>	353 billion cubic feet
<b>Natural Gas Production (2004E)</b>	79 billion cubic feet
<b>Natural Gas Consumption (2004E)</b>	79 billion cubic feet
<b>Recoverable Coal Reserves (2004E)</b>	53,738 million short tons
<b>Coal Production (2004E)</b>	268 million short tons
<b>Coal Consumption (2004E)</b>	195 million short tons
<b>Electricity Installed Capacity (2004E)</b>	41 gigawatts
<b>Electricity Production (2004E)</b>	227 billion kilowatt hours
<b>Electricity Consumption (2004E)</b>	207 billion kilowatt hours
<b>Total Energy Consumption (2004E)</b>	5.1 quadrillion Btus*, of which Coal (75.4%), Oil (20.1%), Nuclear (2.8%), Natural Gas (1.6%), Hydroelectricity (0.1%), Other Renewables (0%)
<b>Total Per Capita Energy Consumption (2004E)</b>	115 million Btus
<b>Energy Intensity (2004E)</b>	12,477 Btu per \$2000-PPP**

## Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2004E)</b>	430 million metric tons, of which Coal (82%), Oil (17%), Natural Gas (1%)
<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2004E)</b>	9.7 metric tons
<b>Carbon Dioxide Intensity (2004E)</b>	1 Metric tons per thousand \$2000-PPP**
<b>Environmental Issues</b>	lack of important arterial rivers or lakes requires extensive water conservation and control measures; growth in water usage outpacing supply; pollution of rivers from agricultural runoff and urban discharge; air pollution resulting in acid rain; soil erosion; desertification
<b>Major Environmental Agreements</b>	party to: Antarctic-Environmental Protocol, Antarctic-Marine Living Resources, Antarctic Seals, Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling signed, but not ratified: none of the selected agreements



## Oil and Gas Industry

<b>Organization</b>	State-owned Petroleum Oil and Gas Corporation (PetroSA) manages the licensing of oil and gas exploration in the country.
<b>Foreign Company Involvement</b>	BP, Total Elf Fina, Caltex, Shell
<b>Major Refineries (capacity, bbl/d)</b>	Sapref (172,000), Enfref (118,750), Calref (110,000), Natref (87,547)-Synthetic Fuel Refineries, Sasol (160,000), PetroSA (45,000)

\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

\*\*GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

## Links

### EIA Links

[EIA - Country Information on South Africa](#)

### U.S. Government

[CIA World Factbook - South Africa](#)

[U.S. Department of Energy's Office of Fossil Energy's Int](#)

[U.S.-South Africa Data Exchange Page](#)

[U.S. State Department's Consular Information Sheet - South Africa](#)

### General Information

[MBendi Country Profile - South Africa](#)

### Associations and Institutions

[Atomic Energy Corporation of South A](#)

[Chamber of Mines](#)

### Foreign Government Agencies

[Department of Environmental Affairs and Tourism \(DEAT\)](#)

[Department of Mineral](#)

### Oil and Natural Gas

[Energy Africa](#)

[Engen](#)

[Eskom](#)

[Petroleum Agency South Africa \(PASA\)](#)

[Petroleum, Oil and Gas Corporation of South Africa \(PetroSA\)](#)

[Petronet](#)

[Sasol](#)

[South African Petroleum Industry Association \(SAPIA\)](#)

### Electricity

[Eskom](#)

[National Energy Regulator of South Africa \(NERSA\)](#)

### Coal

[Anglo](#)

[Ingwe](#)

[Kumba](#)

[Xstrata](#)

## Sources

Africa Energy Intelligence

African Energy

Afroil

AFX News



Agence France Presse  
AllAfrica.com  
Associated Press  
Business Day ( South Africa )  
Business Wire  
Cedigaz  
Chevron-South Africa  
CIA World Factbook  
Coal Week International  
Department of Minerals and Energy  
Economist Intelligence Unit ViewsWire  
Engen  
Eskom  
Factiva  
Financial Times  
Hart's Africa Oil and Gas  
International Monetary Fund  
Inter Press Service  
McCloskey Coal News  
Mining Journal  
National Electricity Regulator Electricity Supply Statistics: 2001  
Oil and Gas Journal  
The Oil Daily  
Petroleum Argus  
Petroleum Intelligence Weekly  
Reuters  
Shell-South Africa  
South Africa Info Reporter  
South African Chamber of Mines  
South African Ministry of Mineral and Energy Affairs  
South African Petroleum Industry Association (SAPIA)  
South African Press Association  
Statistics South Africa  
U.S. Energy Information Administration  
World Bank  
World Gas Intelligence  
Xinhua

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