



Energy and water

Bringing clean and affordable water and energy within everyone's reach is a key national goal. At the same time, planning ensures that these key drivers of economic growth are delivered reliably and cost-effectively to industry, commerce and agriculture.

Energy in South Africa

- Electricity prices in South Africa are among the lowest in the world.
- The production and distribution of energy contributes 15% of Gross Domestic Product (GDP), creating about 250 000 jobs.

South Africa has the world's 11th highest commercial primary energy intensity, with large-scale, energy-intensive primary mineral beneficiation industries and mining industries being vast consumers of power.

Technical/business performance indicators: Eskom

	2002	2003
Total electricity sold, GWh	187 957	196 980
Coal burnt in power stations, Mt	96,46	104,37
Energy availability factor, %	89,30	87,50
Peak demand on integrated system, MW	31 621	31 928
Nominal capacity, MW4	42 011	42 011
Net maximum capacity, MW4	39 810	39 810
Power lines (all voltages), km	325 010	336 270
Electricity customers, (thousands)	3 418	3 505

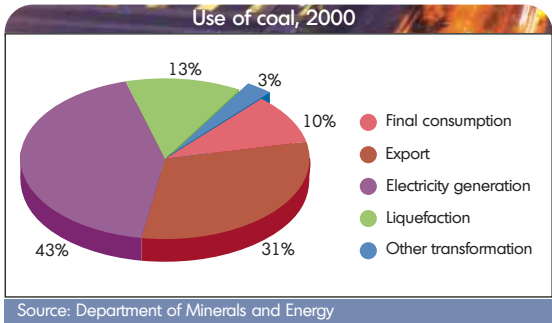
Source: Eskom Annual Report

Electricity

Grid connections

1994–1998	1999–2002	Total
2,3 million	1,5 million	3,8 million

Source: *Towards a Ten Year Review*



Power sources

Coal

South Africa is the world's sixth largest coal producer, with about 46% of output coming from open-cast mines. Many deposits are exploited very cheaply.

Nuclear

Eskom Koeberg Nuclear Power Station's two reactors outside Cape Town supply 1 800 megawatts to the national grid when both reactors are operating at full power, contributing about 6% to South Africa's electricity.

FACT

South Africa has 34 nuclear medicine-imaging centres, of which 75% are privately owned. These centres together perform between 25 000 and 30 000 diagnostic procedures per annum. In addition, 30 oncology clinics and hospitals are equipped with teletherapy and accelerator equipment used in nuclear therapy to treat life-threatening diseases.

The National Nuclear Regulator is the prime safety regulator and is responsible for the protection of persons, property and the environment against nuclear damage through the establishment of safety standards and regulatory practices. It exercises regulatory control related to safety over the siting, design, construction and operation of nuclear installations and other actions.

Liquid fuels

South Africa consumed 21 267 million litres (ML) of liquid-fuel products in 2002. Thirty-six percent of the demand is met by synthetic fuels (synfuels) produced locally, largely from coal and a small amount from natural gas. The rest is met by products refined locally from imported crude oil.

From April 2003, the Basic Fuel Price Formula was phased in to replace the In Bond Landed Cost Pricing Mechanism, a move expected to save fuel users more than R1 billion a year.

To offset fuel levy increases, the diesel fuel rebate was increased by 15 cents a litre in February 2004, thus providing relief for the agricultural, forestry and mining sectors.

Sasol

The Sasol group of companies comprises diversified fuel, chemical and related manufacturing and marketing operations, complemented by interests in technology development, oil and gas exploration, and production.

Its principal feedstocks are obtained from coal, which the company converts into value-added hydrocarbons through Fischer-Tropsch process technologies. The company supplies 41% of South Africa's liquid fuel needs. It also



FACT

Sasol is bringing natural gas from fields off Mozambique 865 km to Mpumalanga. Initial capacity is 120 million gigajoules a year, equivalent to 4 000 MW. The first batch of gas was delivered to Secunda at the end of February 2004.

provides 200 000 direct and indirect jobs, contributes R34 billion annually to South Africa's GDP, and produces 23% of the country's required coal.

Indigenous oil and gas resources and production

The EM gasfield complex off Mossel Bay started production in the third quarter of 2000, and will ensure sufficient feedstock to PetroSA to maintain current liquid-fuel production levels at 36 000 barrels (bbls) of petroleum products a day until 2009.

PetroSA's gas-to-liquid plant supplies about 7% of South Africa's liquid-fuel needs.

PetroSA's new oilfield, Sable, situated about 150 km south off the coast of Mossel Bay, is expected to produce 17% of South Africa's oil needs.

The field, which came into operation in August 2003, was initially projected to produce 30 000 to 40 000 bbls of crude oil a day and 20 million to 25 million bbls in the next three years.

Eskom

Eskom currently supplies 95% of South Africa's electricity.

The utility is among the top seven in generating capacity and among the top nine in terms of sales. Eskom was incorporated as a public company on 1 July 2002.

Eskom does not have exclusive generation rights but does enjoy a practical monopoly on bulk electricity. It also operates the integrated national high-voltage transmission system and supplies electricity directly to large consumers and some residential consumers.

Recommendations to restructure the electricity supply industry will see:



FACT

In 2002, Eskom electrified 211 628 homes, against government's target of 205 371.

- companies other than Eskom acquiring 30% of the generation market
- the State establishing a transmission company for the medium term
- a sophisticated multi-platform electricity market eventually being developed
- a distribution company overseeing a move from the current fragmented system to one dominated by six regional distributors.

Integrated National Electrification Programme

Between 1994 and 2003, some 3,8 million households were connected to the extended national electricity grid. According to Census 2001, the percentage of households using electricity has increased from 57,6% to 69,7% between 1994 and 2001.

During 2002/03, a further 24 776 households, 974 schools and nine clinics were grid-electrified at a cost of R950 million.

From 2003, poor households in areas connected to the grid have received up to 50 kilowatt of free basic electricity. In non-grid areas, such households are provided with a subsidy of up to 80% of the market cost to provide them with access to electricity.

Energy and the environment

South Africa's per capita production of greenhouse gases is well above global averages and that of other middle-income developing countries.

The economy is carbon intensive, producing only US\$259 per ton of carbon dioxide emitted, as compared with US\$1 131 for South Korea, US\$484 for Mexico and US\$418 for Brazil.



FACT

The first wind farm in Africa was opened at Klipheuwel in the Western Cape in February 2003.

Coal is used by about 950 000 households countrywide, resulting in indoor air-pollution problems.

Fuel wood is the primary energy source of three million rural households. Studies have shown that fuel-wood users are exposed to even higher levels of particulate emissions than coal users.

To address this situation, the Department of Minerals and Energy is investigating improved woodstoves and other alternatives, such as solar cookers and biogas, as well as speeding up electrification.

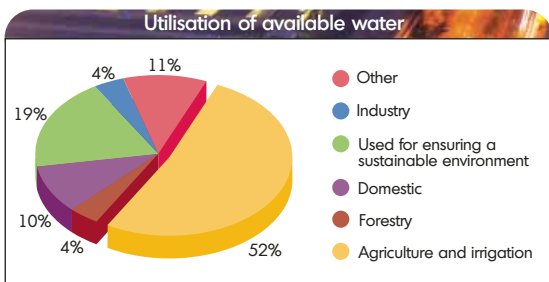
Water

South Africa is largely a semi-arid, water-stressed country. Nationwide, the average rainfall is only about 500 mm, the minimum required for successful dry-land farming. To overcome the problem of variable river flows, many large storage dams have been built.

Dams experience high evaporation rates, further reducing available water, as do commercial afforestation and sugar-cane farming.

On average, South African rivers receive about 50 billion m³ of water a year with a further six billion m³ available from underground aquifers.

Of this 56 billion m³, 21 billion m³ is utilised as follows:



Source: South Africa Yearbook 2003/04



The Working for Water Programme has created 20 000 jobs as well as having a profound environmental impact.



In July 2003, the nine millionth connection of safe water since 1994 was made. In 2002/03, some 1,2 million people received water-supply infrastructure and 65 105 toilets were installed. In 2003/04, R321 million was allocated to provide sanitation to 120 000 people.

Government is on target to eradicate the backlog in water infrastructure and sanitation infrastructure by 2008 and 2010 respectively.

Percentage of all rainfall returned to the sea:

Worldwide average: 31%

South African average: 9%.

Free basic water

By June 2003, 78% of municipalities were implementing the Free Basic Water Policy, launched two years earlier.

This meant that 27 million people were receiving free basic water, some 6 000 litres per household per month.

Water policy

South Africa is developing a multidisciplinary approach to managing its scarce water resources. This is aimed at conserving resources and determining the reserve water required for basic human needs, and maintaining ecological flow for aquatic ecosystems.

The strategy also describes provisions for authorising water use, water conservation, demand management and water pricing.

It outlines plans for investment in new dams and related infrastructure over the next 25 years, and proposes arrange-

Water services

Services	Period	Quantity
Proportion of households with access to clean water	1996	60%
	2001	85% 9 million citizens/ 3,7 million additional households
Expenditure on water and sanitation	1995 – 2003	R5 billion
Access to sanitation	1994 – 2003	49%–63%
Increase in electricity connections	1996	32%
	2001	70%
Use of electricity in poor areas for heating		49,1%

Source: *Towards a Ten Year Review*

Major dams in South Africa

	Full supply capacity	River
	(10m ³)	
Gariep	5 341	Orange
Vanderkloof	3 171	Orange
Sterkfontein	2 616	Nuwejaarspruit
Nuwejaarspruit Vaal	2 603	Vaal
Pongolapoort	2 445	Pongola

Source: Department of Water Affairs and Forestry

ments with neighbouring countries for managing shared rivers.

One of the most ambitious binational water projects ever is the Lesotho Highlands Water Project between South Africa and Lesotho, the first phase of which was completed in 1998.

The first phase consisted of the construction of three dams, various tunnels and a hydroelectric plant.