

The energy sector accounts for approximately 15% of gross domestic product (GDP), creating employment for about 250 000 people. Total electricity sales in 2001 grew by 1,8% to 181 511 GWh. Total liquid fuels sales in 2001 rose by 0,3% to 20 934 million litres.

The national energy intensity is above average, with only 10 other countries having higher commercial primary energy intensities. This high energy intensity is largely a result of the economy's structure, with its large-scale, energy-intensive primary minerals beneficiation industries and mining industries. There is also a heavy reliance on coal for the generation of electricity. Also, industry has not generally used the latest in energy-efficient technologies, mainly as a result of relatively low energy costs.

Industry and mining are the largest energy consumers, accounting for more than half of total consumption. Energy consumed by households represents some 22% of the country's net use.

Electricity and coal provide about three-quarters of the energy consumed by industry and mining. The

balance comes largely from coke and blast-furnace gases, and small amounts of heating oils. The mining industry is particularly dependent on electricity, with 87% of its energy use coming from this source.

Liquid fuels such as petrol and diesel account for 92% of energy used for transport. Rail transport accounts for less than 5% of total national electricity consumption.

Petrol sales represent more than half of the total sales of local petroleum products. The total volume of liquid fuels sold during 2001 in South Africa was 20 934 MI in comparison to 20 868 MI sold in 2000. Of the sales in 2001, petrol and diesel accounted for 10 340 MI.

Demand for jet fuel has grown steadily since 1994 as a result of increased business and tourism activities.

Government has accepted a process of managed liberalisation for the liquid fuels industry. The Petroleum Products Act, 1997 will be amended to institute a licensing dispensation for participants in the liquid fuels industry.

South Africa's indigenous energy resource base is dominated by coal. Many of the deposits can be exploited at extremely favourable costs and, as a result, a large coal-mining industry has developed. The country is the world's sixth-largest coal producer.

Fully commissioned in 1985, the Koeberg Nuclear Power Station near Cape Town supplies 1 800 MW to the national grid when both reactors are operating at full power, contributing 7% of South Africa's electricity.

Technological feasibility studies are now being conducted into viable renewable energy resources. These include grid-connected wind farms and solar energy. With most areas enjoying more than 2 500 hours of sunshine per year, and average daily solar radiation levels ranging between 4,5 and 6,5 kWh/m² in one day, solar energy could well prove to be a feasible renewable energy source. Local production of solar equipment is developing rapidly.

South Africa has two conventional hydroelectric power stations and two pumped storage schemes.

Liquid fuels

Thirty-six percent of South Africa's consumption of 20 934 Ml of liquid fuel products in 2001 was met by synthetic fuels (synfuels) produced locally, largely from coal and a small amount from natural gas.

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 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.

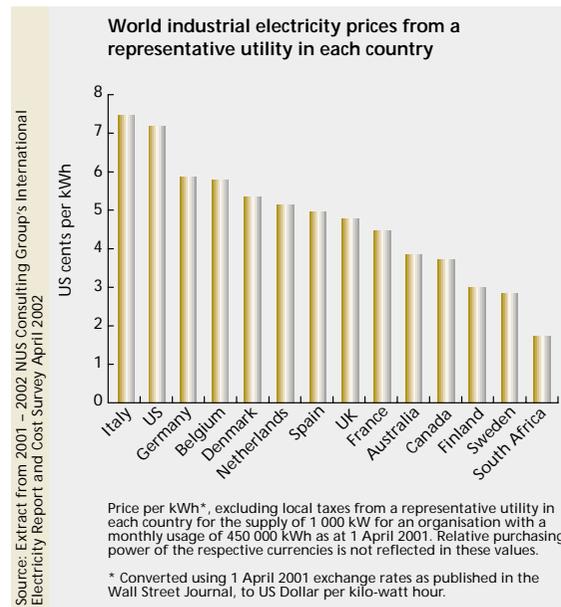
Sasol has grown into a global enterprise, producing more than 200 fuel and chemical products and exporting to 90 countries. The two plants in South Africa, at Sasolburg and Secunda, are estimated to contribute 50% and 12% respectively to the economy of the Free State and Mpumalanga. In addition, Sasol has production operations in Germany, the Netherlands, China, Canada, Italy, the Czech Republic, Dubai and the United States.

Among Sasol's recent international developments is an agreement signed with the Mozambican Government for the development of natural gas-fields in the country and the construction of a pipeline to South Africa. It is expected that the first gas from this source will be available in South Africa by 2004.

Sasol registered on the New York Stock Exchange on 9 April 2003.

The Petroleum Agency of South Africa has successfully encouraged exploration companies to evaluate the country's oil and gas opportunities. Nine exploration subleases are active, involving 11 international companies.

Natural gas and associated condensate production is currently limited to gas-fields off Mossel Bay. The core



of this is the world's largest commercial scale gas-to-liquids plant, owned by the State-owned petroleum company, PetroSA, which converts the gas and condensate to liquid fuel. The EM gas-field complex was brought into production in the third quarter of 2000, and will ensure sufficient feedstock to maintain current liquid fuel production levels at 36 000 barrels of petroleum products a day until 2009.

South Africa produced 1 513 431 t of natural gas and 271 787 t of associated condensate in 2000, accounting for about 1,5% of total primary energy supply. Development of regional gas-fields, such as those off Mozambique, will lead to natural gas becoming a more important fuel in South Africa.

Electricity

South Africa, which supplies two-thirds of Africa's elec-

tricity, is one of the four cheapest electricity producers in the world. Ninety-two percent of locally produced electricity is produced from coal. Generation is currently dominated by Eskom, which also owns and operates the national electricity grid.

Eskom supplies more than 95% of South Africa's electricity and more than 60% of electricity consumed throughout Africa. In global terms, 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 in July 2002 and currently runs on business principles for the benefit of its customers. The utility also operates the integrated national high-voltage transmission system and supplies directly to large consumers such as mines and large industries.

Restructuring of the electricity supply industry is now well under way. It is proposed that Eskom will retain no less than 70% of the existing electricity-generating market sector and that the introduction of private-sector participation in the generation sector be increased to 30%. By the end of 2003, it is envisaged that the involvement of black economic empowerment within the generation sector be about 10% of capacity.

Eskom will not be allowed to invest in new generation capacity in the domestic market.

Distribution, it is proposed, will be restructured to transform the current fragmented state of the sector into one structured along regional lines through the creation of six regional distributors.

The first regional electricity distributor is expected to be operational from 2004.

Low electricity prices in South Africa are widely acknowledged. Over the period 1995 to 2000, Eskom reduced the real price of electricity by 14,1%. South Africa's electricity prices may be among the lowest in the world, but they are still unaffordable to many.

The Integrated National Electrification Programme is the flagship of the Department of Minerals and Energy. In 2001, R909 million was spent on this Programme.

Since 1994, 3,8 million electricity grid connections have been made. In 2000, 71,7% of households were using electricity for lighting compared to 63,5% in 1995.

In the State of the Nation Address in February 2003, President Thabo Mbeki said that poor households, in areas connected to the grid, would be provided with up to 50 kW of free basic electricity. In non-grid areas, such households will be provided with a subsidy of up to 80% of the market cost to provide access to electricity systems.

In February 2003, Eskom launched an experimental wind energy farm aimed at exploring the use of wind energy for bulk electricity generation.

Wind energy is environmentally friendly and helps reduce global warming and greenhouse gases. The Eskom farm, the first of its kind in Africa, is located in Klipheuwel, Western Cape.

Water

South Africa is a water-stressed country in which water planners and managers are faced with increasingly complex issues. The country is largely semi-arid and prone to erratic, unpredictable extremes in the form of droughts and floods.

Water is most abundant in the geographically small escarpment areas which are remote from the major demand centres in the hinterland. Many large storage dams have been constructed to regulate the natural variable flow of rivers and to facilitate water transfers between catchments.

Countrywide, the average annual rainfall is about 500 mm, compared to a world average of about 860 mm. On average, only some 9% of rainfall reaches the rivers as run-off.

Twenty-one percent of the country, mainly in the arid west, receives less than 200 mm a year. The Orange River Basin is the largest river basin in South Africa with a total catchment area of 1 million km², almost 600 000 km² of which is inside South Africa.

By February 2003, over 26 million people were receiving free basic water.

South African rivers receive about 50 billion m³ of water a year, with a further 6 billion m³ available from underground aquifers. This translates into 1 400 kilolitres on average per person per annum. Of this 56 billion m³, 21 billion is utilised. Of this volume, 52% is

used for agriculture and irrigation, 4% for forestry, 4% for industry, 10% for domestic use, with 19% allocated to ensure a sustainable environment.

Only about 32 000 million kilolitres of the annual run-off can be economically exploited using current methods. Usable run-off is further reduced by land uses such as commercial afforestation and sugar-cane, and by high evaporative losses from the numerous storage dams throughout the country.

The past few years have seen a number of achievements in the management of water resources in South Africa, and the implementation of the country's internationally acclaimed National Water Act, 1998. Key achievements include:

- developing conservation and demand management strategies for the industrial, agricultural and domestic sectors
- environmental awareness, learning, communication and networking through the school-based approach and broader public programmes
- promoting water conservation and integrated water resource management
- developing resource learning and support material
- continued collaboration with the Department of Education at all levels, specifically on the National Environmental Education Programme
- reaching 5 517 schools through an integrated approach to environmental learning
- registering significant abstract uses of raw water for the management of scarce water resources, and for the implementation of the national pricing strategy



- developing strategies to deal with the impact on water quality of mining and industrial developments, and dense settlements and an environmental assessment tool.

South Africa is developing a multidisciplinary approach to managing the country's scarce water resources, based on technical, economic, social, political and environmental considerations.

The National Water Resources Strategy, released in August 2002, describes provisions for water resource protection, water use and how it will be authorised. It also spells out water conservation and demand management, water pricing, the institutional arrangements for water-resource management, infrastructure development, monitoring and information systems and public safety in water matters.

A number of new dam and water schemes are being undertaken by the authorities to relieve water stress.

One of these is the Lesotho Highlands Water Project which will bring vast amounts of water from Lesotho to the high-consuming areas of the highveld, particularly Gauteng. The first phase of this project was completed in January 1998.

The main components of Phase 1A are dams at Katse and Muela, an 82-km water-transfer tunnel, and a hydroelectric plant at Muela. Phase 1B includes the construction of the Mohale Dam and Tunnel and the Matsoku Tunnel and Weir.

The latter was inaugurated in October 2001. The Mohale Tunnel, which will be used to transfer water from Mohale to Katse Dam and the Vaal Dam, is scheduled to be completed by December 2003.

Water for all

The Constitution of South Africa stipulates that it is every person's right to have access to clean water.

Since 1994, the Department of Water Affairs and Forestry (DWAF) has provided access to basic water supply to over eight million people. Over the last year,

1,2 million have received water-supply infrastructure and 50 000 households sanitation. Government is on target to eradicate the backlog in water infrastructure and sanitation facilities by 2008 and 2010 respectively.

Free basic water

Adequate, potable water and safe sanitation are essential drivers for poverty eradication. DWAF is directly addressing this through the free basic water programme and is in the process of developing strategies for a free basic sanitation programme. The Free Basic Water Policy was launched in July 2001

By February 2003, the programme could boast a number of achievements:

- over 26 million people, 57% of the population, were receiving free basic water
- of those with access to water-supply infrastructure, 73% were beneficiaries
- the programme was being implemented by 71% of South Africa's municipalities
- the Department had established Provincial Support Units in each province, staffed by trained free basic water specialists.

Working for Water Programme

This is a labour-intensive initiative to clear invasive alien plants. These species have a negative impact on South Africa's water security, biological diversity, the ecological functioning of natural systems, the productive use of land and the intensities of fires and floods. Estimates are that over 10 million ha – an area bigger than KwaZulu-Natal – are already invaded by alien plants, and that these invaders are spreading.

The Working for Water Programme is one of the biggest conservation programmes in the world with an annual budget of over R400 million. Approximately 55% of the workforce are women. In 2002/03, the Programme provided approximately 20 000 temporary

employment opportunities as well as training. The Programme has also created entrepreneurial opportunities for the poor by developing secondary industry opportunities such as wood used for crafts, furniture, building materials, etc.