

General discussion of South Africa

The last decade has witnessed an unprecedented transformation in South Africa in almost all spheres of life. The 1990 unbanning of the African National Congress, and the negotiations that led to the end of apartheid and the country's first democratic elections in 1994, were events almost unthinkable only a few years before. That this political and social transformation was accomplished with so little violence, after so many decades of oppression and violence under apartheid, makes it all the more impressive. In the last seven years, virtually every major national policy has been reviewed and replaced by one based on the new government's values of democracy, development and empowerment. The 1994 Reconstruction and Development Programme (ANC 1994) laid out important economic, social and environmental goals – with a special emphasis on poverty alleviation, service provision and redistribution. National policy reviews in all key areas followed this, with White Papers and new legislation across all sectors. The 'Growth, Employment and Redistribution' (GEAR) strategy that followed in 1996 laid out a new fiscal policy to reduce the deficit, thereby creating conditions for lower inflation and interest rates (DTI 1996). This in turn is expected to increase rates of investment, economic growth and job creation, although there is increasing controversy over the impacts of fiscal reforms on poverty alleviation and delivery of social services.

While, in some cases, it will take many years for these broad policy statements to transform all of the local regulatory, economic and social environment, dramatic change is already happening – and the energy sector is no exception. The shift in priorities for the energy sector in South Africa has been almost 180 degrees – moving from the apartheid era single-minded emphasis on energy security to a broader concern about access to affordable energy, economic efficiency, and environmental sustainability. Transforming an energy economy based on vast, inexpensive supplies of coal, large public investments in synthetic liquid fuels and nuclear power, and highly inequitable access to clean household fuels, however, presents a major challenge, and sets the context for this discussion of energy sustainability.

► Profile of South Africa

South Africa lies at the Southern tip of Africa and covers a wide range of climates – from Mediterranean coastal areas to arid interior deserts to tropical and Afro-montane forest. With roughly 43 million people on 1.2 million square kilometres, South Africa is a third the size of India with only one twentieth of the population. South Africa is blessed with large supplies of minerals, precious metals, precious stones, making it the largest producer of gold and platinum group metals, the number five producer of diamonds, the number four producer of hard coal, and the second largest exporter of hard coal in the world (DME 2001e). Importantly for sustainability in the energy sector, it also has one of the highest solar insolation rates in the world. Annual global solar radiation average is about 5.5 kWh/m²/day for South Africa, compared to about 3.6 kWh/m²/day for parts of the United States and about 2.5 kWh/m²/day for Europe and the UK (DME 2001c).

On many development indicators, South Africa compares well to 'upper middle income' countries, and is far better off than her neighbours in sub-Saharan Africa. As shown in Table 1, income, literacy, and education levels in South Africa are well above those of other African countries and on a par with middle-income Latin American countries. Life expectancy, however, as for much of sub-Saharan Africa, is still well below world averages. This is why South Africa's Human Development Index is not higher (UNDP 2001). The literacy rate and school enrolment rates are all the more impressive if we consider the systematic denial of adequate services to the poor, black majority under apartheid until 1994.

Table 1: Key development indicators for South Africa and the World, 1999

	<i>Life expectancy at birth</i>	<i>Adult literacy rate</i>	<i>First, second and third level gross enrolment ratio</i>	<i>Real GDP/capita</i>	<i>Human Development Index</i>
	<i>Years</i>	<i>%</i>	<i>%</i>	<i>PPP\$</i>	
South Africa	53.9	85%	93%	8908	0.702
Sub-Saharan Africa	48.8	60%	42%	1604	0.467
Latin Am & Caribbean	69.6	88%	74%	6880	0.760
All developing countries	64.5	73%	61%	3530	0.647
World	66.7	98%	65%	6980	0.716

Source: (UNDP 2001)

The new government has faced enormous challenges in dealing with the poverty and inequality that is the legacy of apartheid. In 1993, for example, the Gini coefficient index for South Africa – a measure of income inequality – was the fourth worst of 105 countries in a World Bank survey (World Bank 2000). More recently, Finance Minister Trevor Manuel announced that South Africa had an income distribution even more unequal than Brazil, which was ranked a more unequal in the World Bank survey (Anon. 2000). Moreover, in 1994, more than 10% of South Africans lived on less than \$1 per day, while 35% lived on less than \$2 per day (World Bank 2000). As Table 2 shows, although South Africa per capita GDP is in the 'upper middle income' category, private consumption per capita has fallen significantly over the last 20 years, in contrast to the growth in other upper middle income countries. As in all Sub-Saharan African countries, HIV/AIDS is becoming a major public health, social and economic crisis, with almost 13% of the population infected as of 1999 (Day & Gray 2001).

Table 2. Income per capita and growth in consumption

	<i>GNP/cap (\$PPP 99)</i>	<i>Growth private cons per cap % pa 80-98</i>
South Africa	8 318	-0.1
Sub-Saharan Africa	1 450	-1.2
Upper middle income	8 320	1.5
Middle income	4 880	2.2
World	6 490	1.3

Source: (World Bank 2000)

In fact, as Figure 1 shows, in real terms GDP per capita and household disposable income per capita are still slightly below their 1990 levels (SARB 2002 p. S-149). What this also conceals is the enormous disparities in income between racial and ethnic groups. For

example, the 1996 census showed that 65% of white men earned more than R3500 per month (\$810 at 1996 exchange rates), while 48% of African women earned less than R500 per month (\$115) (SSA 1996). Only 6% of African men and 5% of African women earned more than R3500 per month.

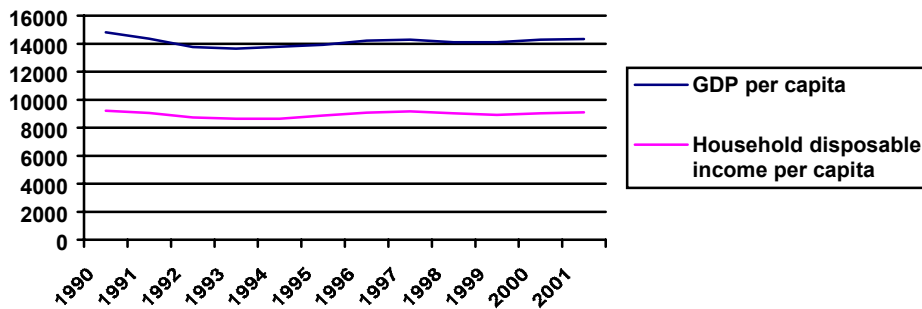


Figure 1. GDP and household disposable income per capita (1995 constant Rands)(SARB 2002)

► South Africa's energy sector

The South African energy sector has historically been at the centre of the country's development. The origins of the electricity supply industry in the first years of the twentieth century, for example, were driven by the needs of the booming mining industry. The more calculated decisions of the apartheid government in the 1950s to develop a synthetic petroleum industry and a local nuclear capacity reflected the strains of isolation and later the oil embargo. Today, with the new government's focus on widening household access to electricity, the energy sector continues to be at the heart of structural developments in the economy (Spalding-Fecher *et al.* 2000b).

The energy sector has supported massive investments in heavy industry and mining. Much of the manufacturing sector is also linked to mining activities through minerals beneficiation and metals production. All of these activities are energy intensive, relying on the availability of cheap coal and electricity. The presence of the 'minerals-energy complex', with its links to mining products and reliance on low energy prices, underpins much of the South African economy. Massive power station projects initiated in the 1960s and 1970s, with the assumption of continued rapid increases in electricity demand, left the national utility with large excess capacity in the 1980s and 1990s, which has helped to keep electricity prices low, although this excess capacity will be exhausted within the coming three to five years (Eskom 2000b). The presence of low energy prices, including coal-generated electricity, has been one of South Africa's key competitive advantages and continues to drive much of new investment in industry.

Figure 2 illustrates the coal-dependence of the economy, with 74% of total primary energy supply (TPES) coming from coal (DME 2000). This compares to a share of 20% for the OECD and a world average of 24%(IEA 2001).

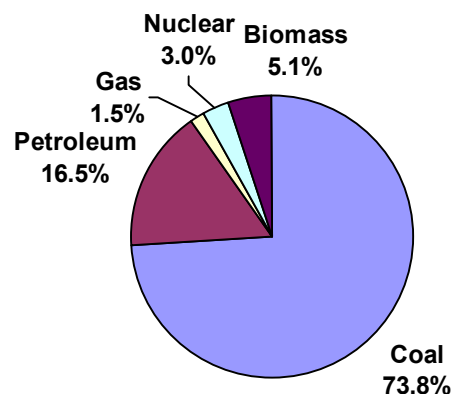


Figure 2. Share of total primary energy supply, 1999
Source: (DME 2001d)

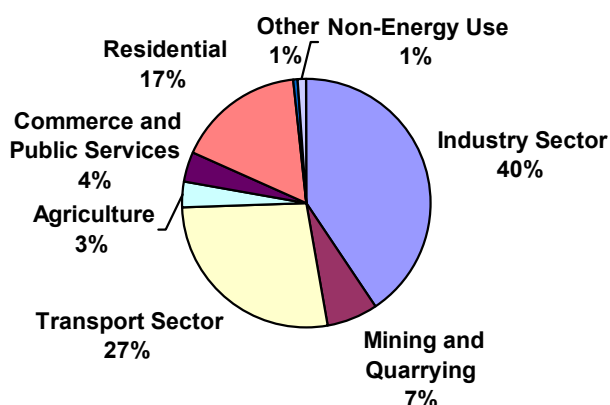


Figure 3. Share of final consumption, 1999
 Source: (DME 2001d)

Figure 3 shows the large share of final energy consumed by industry, mining, and transportation. Energy consumption levels in South Africa are significantly higher than many other developing countries, particularly consumption of electricity – where South Africa consumes half of Africa’s electricity with only 5% of her population (IEA 2001). Energy intensity - how much energy is required to generate a unit of economic output - is 50% higher than for OECD countries, even when taking into account purchasing power parity (PPP) to compare economic output (see Table 3).

Table 3. Energy consumption and intensity indicators, 1999

	<i>TPES/capita</i>	<i>TPES/GDP</i>	<i>TPES/GDP</i>	<i>Elec. consumption per capita</i>
	<i>toe/capita</i>	<i>toe/000 1995 US\$</i>	<i>toe/ 000 PPP 1995 US\$</i>	<i>kWh/capita</i>
South Africa	2.60	0.67	0.30	4,480.05
Africa	0.06	0.86	0.33	49.25
Non-OECD	0.95	0.76	0.28	988.33
OECD	4.68	0.20	0.22	7,840.77
World	1.65	0.30	0.25	2,280.28

NB: TPES = total primary energy supply, toe = tonnes of oil equivalent, PPP = purchasing power parity, GDP = Gross domestic product

Source: (IEA 2001)