

Electricity

Introduction

The electricity sector plays a key role in both economic and social development. Together with housing and water, Government has prioritised the provision of electricity to all households to improve the standard of living, and to alleviate poverty in South Africa.

Electrification of households is one of Government's priority programmes

South Africa has some of the cheapest electricity in the world. This lowers the cost of doing business and supports growth and employment. The highly successful housing electrification programme has shown the benefits of expanding domestic access to electricity.

The electricity industry consists of three main functions: generation, transmission and distribution. Generation is the process of producing electricity, transmission takes place via the high voltage long distance network, and distribution involves the local wires that deliver electricity to consumers. Coupled with these engineering functions are business and financial structures, such as the electricity retail sales operation.

Government is a key player in the electricity sector

The national and local spheres of Government play key roles in the electricity sector. National Government does not play a direct role, but is an agent through the wholly-owned public company Eskom, which owns the vast majority of generating (about 96 per cent) and transmission capacity. It also distributes electricity to major industrial users, business and households. Eskom and municipality distribution networks often overlap. Municipalities are the key distributors of electricity to households and businesses, and a few municipalities, such as Johannesburg, Tshwane, Cape Town and eThekweni metropolitan municipalities, currently still play a role in generation.

The Constitution empowers municipalities with responsibility for the reticulation of electricity. The current arrangements in distribution are the result of the apartheid legacy, where the previously white municipalities distributed electricity to white areas, and Eskom to black townships and some previous homeland areas. The few regional electricity utilities providing electricity to previous homelands were

Municipalities are involved in distribution

absorbed into Eskom around the time of the country's democratisation.

Department of Minerals and Energy sets the policy and regulatory framework for the industry

Through the Department of Minerals and Energy, Government sets the framework for the operation of the industry, as outlined in the White Paper on Energy of 1998 and the restructuring framework for the supply (generation and transmission) and distribution sides of the industry. The National Electricity Regulator (NER) also plays a key role in the sector, as it licenses distributors, oversees both quality standards within the sector and regulates tariffs set by Eskom and municipalities.

The next few years will see the electricity industry undergoing restructuring

The electricity sector faces considerable challenges in the next few years, as it undergoes significant restructuring. The goal of restructuring is to create an industry which is competitive at the levels of generation, transmission and distribution. This is a common approach in many countries, and its benefits are expected to arise from the price reducing effects of competition, the greater predominance of economic as opposed to engineering imperatives, and the ability to fully regulate the uncompetitive parts of the industry.

Focus is on restructuring the distribution and supply industries

Government has made two major decisions on restructuring. The first is to restructure the Electricity Distribution Industry (EDI). In 2001, Government determined that the distribution of electricity be separated from municipalities and Eskom, and merged into six regional electricity distributors (REDs) wholly owned by municipalities.

The second decision is to restructure the electricity supply industry (ESI). The ESI restructuring involves three key aspects: the sale of 30 per cent of Eskom's generating capacity to private investors, with a black empowerment equity stake of at least 10 per cent of capacity; the separation of Eskom into several generation clusters and a separate transmission company; and the introduction of an electricity market, which will ensure competition between the different electricity generators. These reforms will begin during the course of 2003.

Role of local Government

This chapter covers both the current state of play in the industry, and the future it faces, with the focus on local Government. The chapter should be read in conjunction with other chapters on local Government, particularly Chapter 3 on local government finances, *Annexure C* on specific municipal budgets, and Chapter 10 on personnel.

Electrification and free basic services

3,5 million homes have been electrified since 1994

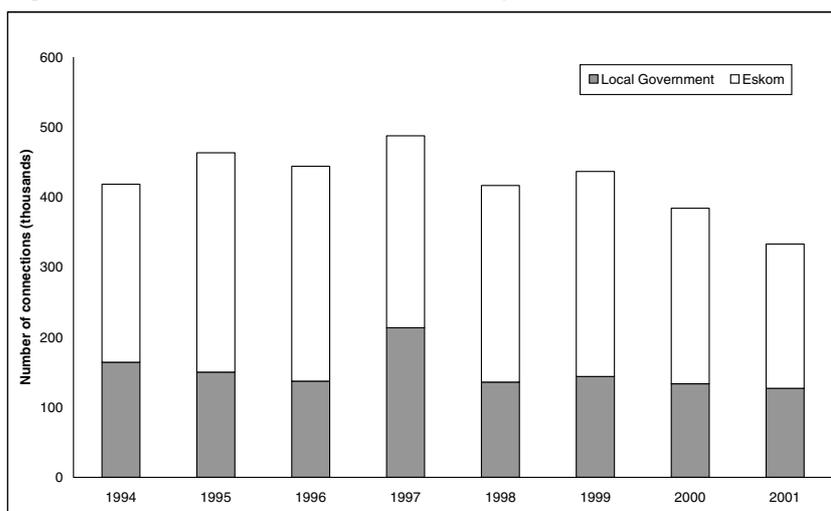
One of Government's key objectives is the electrification of all households, and the provision of free basic electricity to poor households. The electrification programme must rate as one of the most significant achievements by this country, and unprecedented internationally, as 3,5 million homes have been electrified since 1994. This translates into over 435 000 homes per annum. Figure 12.1 shows connections that have been made since 1994. The

electrification programme is expected to continue over the medium term, committing R3,3 billion in the 2003 MTEF.

Despite the inroads made in electrifying homes in urban centres, there is still a significant backlog. Nationally, the backlog is estimated to be around 34 per cent of households without electricity. These may persist due to the high rate of increase in informal settlements. The biggest backlogs are in rural areas, with 51 per cent of households still without electricity. The biggest backlogs are in KwaZulu-Natal, Eastern Cape and Limpopo provinces, with the former two provinces having 64 per cent and 62 per cent respectively of rural households without electricity.

30 per cent of households without electricity

Figure 12.1 Overview of electrification performance since 1994



Source: Department of Minerals and Energy

The overall level of backlogs in urban areas has been reduced to an average of 23 per cent, with the highest levels of backlog in KwaZulu-Natal at (33,0 per cent), Gauteng (28,1 per cent), Mpumalanga (24,2 per cent), and Northern Cape (22,7 per cent). The high level in Gauteng is probably indicative of increasing informal settlements, and suggests that further inroads in electrification in urban areas may be linked to the expansion of formal housing to such households, and the provision of free basic services.

Backlogs have been reduced but remain high in rural areas

Table 12.1 Percentage of non-electrified households as at end of 2001

	Total (%)	Rural (%)	Urban (%)
Eastern Cape	41,5	62,3	9,5
Free State	28,6	50,5	18,9
Gauteng	29,3	57,5	28,1
KwaZulu-Natal	46,7	64,4	33,0
Limpopo	37,7	41,9	12,5
Mpumalanga	28,1	30,9	24,2
Northern Cape	29,3	40,8	22,7
North West	29,5	45,9	3,3
Western Cape	17,7	31,4	16,1
National	33,9	50,9	22,8

Source: NER.

Electricity consumption

Table 12.2 outlines electricity consumption across the provinces, and the use of energy by different customer sectors within provinces, in 2000.

Table 12.2 Electricity consumption by sector

MWh 1000's	Total electricity sales	Domestic	Agriculture	Mining	Manufacturing	Commercial	Transport	General
Eastern Cape	5 755	2 032	221	3	2 061	764	180	494
Free State	7 368	1 531	238	4 057	993	442	90	805
Gauteng	52 039	14 492	495	5 166	9 764	8 644	710	2 769
KwaZulu-Natal	34 282	5 336	405	174	20 321	3 092	2 808	2 143
Limpopo	14 275	1 374	433	8 076	3 143	518	210	504
Mpumalanga	36 628	2 288	629	3 550	27 866	575	520	1 200
Northern Cape	2 177	495	239	597	218	183	224	201
North West	16 947	3 074	467	9 669	2 646	349	162	179
Western Cape	19 177	5 465	1 086	775	8 189	1 881	701	1 079
Total	188 648	36 087	4 213	32 067	75 201	16 448	5 605	9 374

Source: NER.

Total electricity consumption is 188 648 megawatts-hours. The manufacturing sector makes up 40 per cent, followed by the domestic sector at 19 per cent and mining at 17 per cent.

Gauteng consumes the largest share of electricity

At the provincial level, the biggest user of electricity is Gauteng followed by Mpumalanga.

Table 12.3 provides information on electricity sales by customer classes. In 2002 the total number of residential customers exceeded 3,3 million, while the agricultural and commercial customer bases are 79 000 and 48 000 respectively. In the same year, re-distributors account for 40 per cent of Eskom sales followed by the industrial sector at 28 per cent.

Table 12.3 Eskom sales of electricity to categories of customers

	Number of Customers			GWh Sold		
	2001	2002	% Change	2001	2002	% Change
Redistributors (municipalities)	989	734	-25,8%	72 189	74 636	3,4%
Residential	3 159 990	3 283 848	3,9%	7 301	7 888	8,0%
Commercial	35 534	48 514	36,5%	6 407	6 483	1,2%
Industrial	3 416	3 215	-5,9%	48 664	51 581	6,0%
Mining	1 337	1 252	-6,4%	31 923	32 549	2,0%
Agriculture	72 519	79 125	9,1%	4 224	4 009	-5,1%
Traction	600	511	-14,8%	3 481	3 259	-6,4%
Distr International	46	5	-89,1%	286	228	-20,3%
Eskom International	8	8	0,0%	6 710	6 956	3,7%
Internal	424	440	3,8%	326	368	12,9%
Total	3 274 863	3 417 652	4,4%	181 511	187 957	3,6%

Source: Eskom Annual Report 2002.

Table 12.4 shows the customer profiles for a sample of municipalities, measured in terms of number of consumers. It is evident that the residential customers are the biggest consumer segment, followed by commercial users.

Table 12.4 Electricity consumer profile in selected municipalities: 2002-03

	Residential Consumers	Commercial users	Industrial and Mining	Agricultural and Pre-Paid users	Total
Tshwane (Pretoria)	302 171	7 056	811	5 295	315 333
Ekurhuleni (East Rand)	278 711	14 952	6 778	3 634	304 665
Msunduzi (Pietermaritzburg)	55 892	7 482	–	–	63 374
Drakenstein (Paarl)	24 017	3 094	1 640	–	28 551
Rustenburg	15 573	2 599	Unavailable	10 472	28 644
eThekweni (Durban)	471 875	43 432	814	–	516 121

Source: National Treasury Survey.

Free basic services

The implementation of a free basic electricity policy relates to the provision of appropriate levels of service. Government has allocated R300 million for the provision of free basic electricity to poor households nationally as part of the local government equitable share of nationally raised revenue. These funds will be allocated to municipalities. Regular reporting by municipalities on the rollout of this policy in their respective jurisdictions is imperative for Government to measure this policy.

R300 million allocated for free basic electricity

The provision of free basic electricity in terms of the grid-connected customers will be made on a self-targeting basis, where poor households choose the benefit from subsidies, subject to being connected to a reduced level of supply (10Amps). This means that a poor household, legally connected to the national grid at a metered point of supply, will be issued with free basic electricity of 50kWh per month. The average cost of this benefit is about R25 and will depend on prevailing service provider tariffs.

50 kWh free electricity per month for grid connections

The free basic electricity allocation will enable a poor household to have sufficient energy for lighting, ironing, water heating, TV and radio.

Subsidy of R48 per month for non-grid connections

In the case of consumers using non-grid electricity supply technologies, a capped maintenance and operational cost of R48 per month is made available to assist households connected to Solar Home Systems (SHS). These systems can provide sufficient electricity for a small black and white TV, basic lighting and a small radio.

It is estimated that a further 15 000 households will benefit this year and a rollout to 300 000 households by 2007 is planned.

The major challenge for the electrification programme now lies in the rural areas. Given the low household density levels associated with high capital and running costs and lower revenue earning capacity, the rollout will be more expensive than for urban areas.

Government funds electrification through the Department of Minerals and Energy

The Department of Minerals and Energy began funding the National Electrification Programme (NEP) in April 2001. It was previously funded through Eskom, which was exempt from corporate taxes. Eskom is still responsible for the implementation of the programme in its supply areas. The operating costs continue to be the responsibility of the licensed distributors. According to its 2002 annual report, Eskom spent R546 million in 2002 (R441 million in 2001) and electrified 211 628 homes (209 535 in 2001), including those of farmworkers for and on behalf of the Department of Minerals and Energy. Eskom has honoured its three-year commitment made in 1999 to electrify a further 600 000 homes between 2000 and 2002, exceeding this target by 77 186 household connections.

Eskom plays a crucial role in electrification of schools

Eskom has also undertaken a limited programme to electrify schools and clinics. As from 2003, the Eskom Development Foundation no longer funds the schools and clinics electrification programme as this is now all funded by the Department of Minerals and Energy. Funding from the Foundation amounts to R9,6 million covering 197 schools and clinics in 2001, and R4,0 million covering 61 schools and clinics in 2002. The bulk of funds amounting to R3 million covering 109 schools and clinics in 2001 and R41 million covering 915 schools and clinics in 2002, was funded by the Department of Minerals and Energy.

The primary responsibility for this electrification resides with provincial departments of Education and Health, but they provide very little information on progress made in this area. From a policy perspective it is preferable if the electrification of schools and clinics is funded from provincial budgets directly.

R3,3 billion for electrification over the next three years

Government currently funds electrification through grants to municipalities and Eskom. It provides funding for electricity infrastructure through the electrification capital grant and other infrastructure grants. The 2003 Budget provides R1,1 billion in each of the first two years and R1,2 billion in the third year of the MTEF. Linked to the costs of electrification are the costs of providing free basic electricity, that Government funds through the equitable share

allocation to municipalities, which allocates funds for the provision of basic services to poor households. The provision of these funds is also meant to reduce the pressure on cross-subsidisation between urban and rural areas, and between industrial and domestic customers.

The challenge for municipalities is to ensure the smooth rollout of free basic services, including electricity. The results of a recent survey on the implementation of free basic services among 202 municipalities, conducted by National Treasury and the Department of Provincial and Local Government, revealed that most municipalities are providing free basic services, albeit to varying degrees.

Municipalities are key to successful rollout of free basic electricity...

The approach to providing free basic electricity also differs, with some municipalities providing a certain level of kilowatts free and others providing rebates through their tariff policy. The majority of municipalities provide between 10kWh to 50kWh free. Two of the municipalities surveyed provide more than the first 50kWh of electricity free. These are Stellenbosch, which provides the first 70kWh free, and Polokwane (formerly Pietersburg), which provides the first 100kWh of electricity free. In terms of the survey, for electricity, the number of poor households (measured by 4,5 persons in each household) benefiting from the provision of free basic services is 1,3 million. Currently Eskom does not provide free basic electricity to the poor in its distribution areas in former black townships and homelands. This poses a major challenge for Government and it is hoped that new legislation will formalise the relationship between Eskom and municipalities through service-level agreements.

... but services among municipalities are not standardised

The structure of the electricity industry

This section outlines the size of the electricity industry, Eskom and municipalities in relation to their budgets, assets, number of employees, and number of connections.

Players in the electricity sector

Electricity generation dominates the electricity, gas, steam and water sector – accounting for about 90 per cent of total production in this sector. The energy sector's average contribution to gross domestic product for the past 10 years was 3,6 per cent, with electricity contributing 3,4 per cent on average.

The sector's output is typically determined by the strength of the overall economy. Furthermore, structural changes in demand have taken place, with the economy generally moving towards more capital-intensive and energy-intensive methods of production. Electricity demand has also increased because of the electrification programme aimed at making electricity accessible to communities which previously did not have access.

Outputs in the electricity sector reflect trends in overall economic performance

It should be noted that because very few municipalities run electricity as a separate cost centre, it is difficult to provide accurate figures for municipalities. This is further complicated by the fact that as municipalities have been restructured three times since 1993, resulting in break-ups and mergers, and are still consolidating their activities, the information provided at this stage is only estimates. In particular, liabilities for the electricity function cannot be easily attributed to the

function because of the consolidated nature of capital funding and the separation of all other liabilities of the municipality.

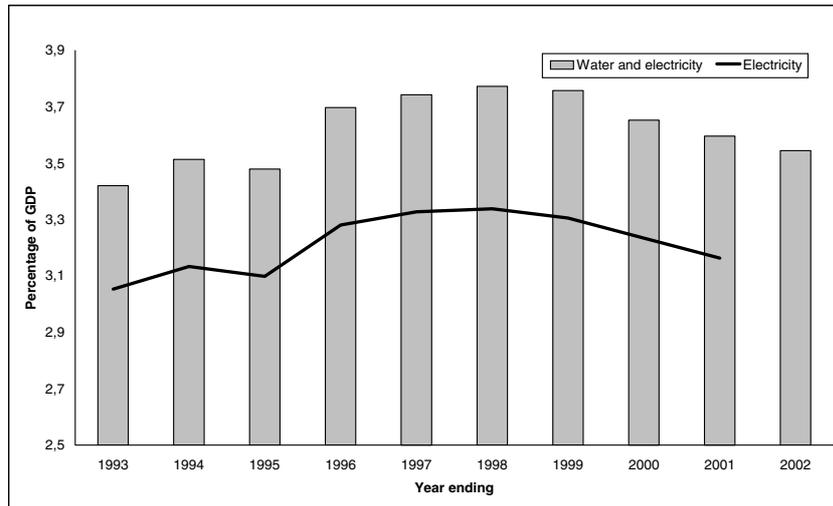
Electricity revenue runs into billions

Eskom recorded electricity revenue of R28 billion in 2002, while municipalities are estimated to generate around R20 billion, or a third of their aggregate budgets.

Historical background to electricity distribution

Historically, municipalities funded the network needed to distribute electricity to both domestic and industrial customers in towns and cities. However, black townships were excluded from municipal distribution, as Eskom, which also serviced peri-urban and rural areas, was responsible for distribution. Eskom played an increasingly important role in distribution through the housing electrification programme in black townships in the late 1980s and 1990s. The assets for electricity generation, transmission and distribution in former homeland areas were also transferred to Eskom. Eskom also provides electricity directly to very large industrial consumers of electricity, such as aluminium smelters and mining.

Figure 12.2 Electricity and water as percentage of GDP



Source: National Treasury derived from Stats SA data

Role of municipalities in electricity distribution

There are currently 177 municipal distributors, of greatly varying sizes. Eskom distributes 60 per cent of the electricity sold to 40 per cent of the total number of electricity customers, while municipalities distribute 40 per cent of electricity to 60 per cent of the customers.

This analysis will not consider the distribution of electricity to large industrial users, but will rather focus on the domestic household and business users. It should be noted, however, that given local Government's constitutional responsibility for electricity reticulation, and the right of municipalities to impose a levy on municipal services, is subject to national regulation. There is a need to clarify how, and to what extent, municipalities can levy taxes on various categories of users of electricity, including major industrial, businesses and domestic consumers. Government is in the process of developing a policy to guide and regulate municipalities in the exercise of this power. This is in the context of the broader economic objective of

supporting industrial growth and businesses, and the need to replace municipal electricity surpluses in future.

Because of the inherited arrangement which existed under apartheid, no municipality in South Africa provides electricity directly to all its residents or businesses in that municipality, as it shares this responsibility with Eskom. In order to give effect to the Constitution, current municipal legislation recognises municipalities as the service authority, and Eskom as a service provider contracted by the municipality to provide electricity within that municipality. This legislative vision will begin to take effect from this financial year onwards. Municipalities and Eskom are to formalise their relationship and sign service level agreements to regulate Eskom's activities within that municipality. Because of the fragmented delivery of electricity within each municipality, comprehensive information on the provision of electricity per municipality, which would include the amount of electricity and retail pricing, is not available. Even major metropolitan municipalities have little information on the provision of electricity in former black townships, which were serviced by Eskom, or even the tariff rates for residents of these areas.

Future role of municipalities envisaged to change

Tariffs and subsidies

One of the most critical areas for reform in the electricity sector is the tariff-setting process. Tariff structures are currently very complicated, inequitable and opaque. Tariff complexity arises from the lack of competition in generation and transmission, the diverse and discriminatory tariff structures between types of users, and exemptions adopted by municipalities.

Uncompetitive industry structure creates inefficiencies

Municipalities face the challenge of providing free basic electricity to poor residents, and affordable and cheap electricity for all other domestic users and businesses. Municipalities are also expected to limit any increases to the below-inflation targets set by national Government, in order to achieve low inflation targets. It is difficult for municipalities to achieve these objectives if bulk suppliers like Eskom continue to increase their prices at rates higher-than-inflation.

Provision of free electricity is a challenge for municipalities

Municipalities have also inherited antiquated and discriminatory pricing policies, which tend to undermine national economic objectives. For example, under apartheid municipalities, businesses generally paid higher tariffs than residents, and thus effectively cross-subsidised residents. This policy did not impose an undue burden on businesses, as the subsidy was targeted at a relatively small number of domestic users, drawn from minority communities. However, now that services have been expanded to majority and poor communities, this policy potentially imposes very high costs on businesses. This, in effect, undermines one of Government's objectives of promoting job-creation through greater business activity.

Extent of cross-subsidisation has implications for economic activity

There are several forms of cross-subsidies inherent in the tariff system. The most significant are cross-subsidies between different types of customers, while there are also cross-subsidies within customer classes. In general, cross subsidies arise in different ways: in

Different forms of cross-subsidies

some areas domestic and agricultural customers are cross-subsidised by industrial customers; and in other areas the system operates in the opposite way. For example, there are special arrangements with large industrial users that can negotiate quantity discounts and other incentives.

There are also geographic cross-subsidies, emanating from two sources. Eskom has uniform tariffs across the country, although the cost of running a distribution network in one area will not be equal to that of another area, leading to cross-subsidisation. There are also cross-subsidies paid through the transmission network. Transmission prices do not reflect the true cost of carrying electricity to the areas of the country that are far from generators, in particular the Western Cape, Northern Cape and Eastern Cape. These areas are therefore effectively subsidised by those close to the generators, Mpumalanga, Gauteng and Limpopo in particular.

Pricing behaviour varies widely across municipalities

There is a very wide range of tariffs between different municipalities. In some cases tariffs for low-use domestic consumers range from 23c per kWh to 120c per kWh. This, in part, reflects the different levels of the municipal surpluses, but also different tariff structures (the levels of cross subsidies) and the effect of very different customer bases and networks. Some municipalities will have to have relatively high tariffs due to the high costs of running their networks. *Annexure C* contains electricity charges on two types of households for a selection of municipalities.

Table 12.5 Sample of municipal tariffs on electricity - 2002

	Residential			Business
	Basic tariff per month	Residential	Free service	
Johannesburg	-	0,233 r/kwh	50 kwh	R500 basic tariff per month and 0,114 r/kwh
Tshwane (Pretoria)	-	0,343r/kwh	50 kwh	-
Musina (Messina)	-	0,306 r/kwh	-	0,358 r/kwh
Nkomazi (Malelane)	-	0,297 r/kwh	-	R59,70 basic tariff and 0,285 r/kwh
Emthanjeni	R26,63	0,346 r/kwh	-	R42,62 basic tariff and 0,346 r/kwh

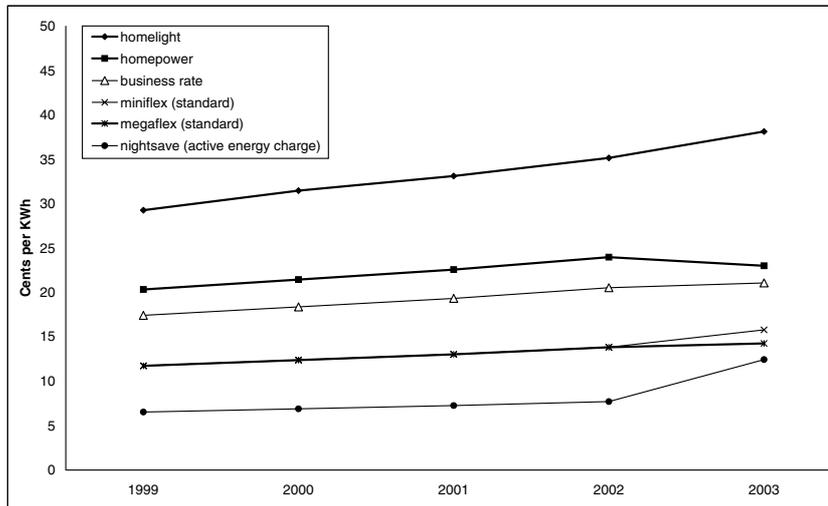
Source: National Treasury Survey.

Pricing system is not transparent

Bulk pricing strategies are also opaque and not disclosed. The latest annual report of Eskom for 2002, provides no information on bulk prices per municipality, nor on its pricing strategy. Municipalities with their own alternative generating capacity claim that they have been able to negotiate better prices from Eskom than those for municipalities with no alternative. Figure 12.3 shows the paths of different Eskom tariffs over time. The homelight tariff is used by small domestic grid-connected consumers; homepower applies to larger domestic customers; and the remaining tariffs apply to businesses, with the largest customers using megaflex.

The chart shows that domestic tariffs are higher than business tariffs, and also that tariffs tend to fall as customers get larger. This is in part due to the use of the standard tariff for miniflex and megaflex, whose peak time tariffs are higher than those for domestic consumers. It also reflects the higher costs of delivering electricity to domestic customers and the economies of scale achieved larger consumers.

Figure 12.3 Eskom tariffs - 1999 to 2003



Source: Eskom

Cross-subsidies are rarely efficient, as the true cost of electricity is not reflected in the price. This leads to inefficient allocation of resources. Where there are social benefits from lower electricity prices these should ideally be funded from external direct subsidies (as with free basic electricity), or at least be set out in a clear and transparent policy.

Cross-subsidies should not lead to inefficiencies

The current tariff setting process is not ideal. Eskom tariffs are actively regulated by the National Electricity Regulator (NER). However, this is within a limited overall framework, done annually and based on Eskom's rate of return on assets. The regulation of municipal tariffs is also limited, if only because it is not possible for the Regulator to actively regulate so many varied tariffs. Very little consideration is given to government's inflation targets and on the impact on consumers.

The NER regulates Eskom's pricing

During 2002, the NER approved a general price increase of 8,4 per cent for 2003 (6,0 per cent in 2002), which is above the South African Reserve Bank's inflation target for 2003. Such increases are of great concern to Government, as it is unclear to what extent this impacts on efficiency, and cross-subsidisation of non-core activities.

Government is seeking to expand both the authority and capacity of the NER to regulate effectively and prudently. The Energy Regulation Bill proposes a regulatory regime that would enable the NER to regulate all electricity tariffs that it believes are in need of its oversight. Government is also working to unravel the tangle of cross-subsidies and to set out a clear policy on their use. It is also in the process of assessing how regulatory agencies like the NER take into

Plans are afoot to expand the role of the regulator

account broader economic objectives, such as inflation targets, competitiveness and consumer interests. Regulatory agencies are more effective in regulating monopolistic pricing practices and forcing efficiency gains by suppliers. It is also imperative that regulators fully comprehend the fiscal transfer system, and that redistribution for basic services is better effected through national transfers than through cross-subsidisation.

Government's role in redistribution

The critical issue is how best to fund services for poor communities, and to what extent a sector like electricity should be self-sufficient. It is desirable to have a system that is transparent and well targeted to ensure effective policy outcomes, whether through a taxation system or transfer system. There is limited scope for cross-subsidisation at the level of local Government due to its limited geographical and fiscal base. National Government therefore plays a more critical role in redistributing resources.

National grants are the best form of subsidisation

It is the view of national Government that poor households are best subsidised through national grants, rather than cross-subsidisation between consumers. The current local government equitable share formula is designed to provide funding for these services. To the extent that there are subsidies, these must be transparent. In spite of national Government confirming this approach in the last budget, key price-setters such as Eskom, municipalities and the NER appear to focus only on the rate of return for the sector. This is why they argue for higher prices, and higher levels of cross-subsidisation between consumers. This approach has tended to undermine national Government's macroeconomic objectives. In this context, the Governor of the Reserve Bank has warned against the adverse effect of administered prices, as in the electricity sector.

Municipal and Eskom budgets for electricity

R20 billion budgeted for electricity

The municipal budgets for electricity are estimated to be at least R20 billion. The biggest municipalities alone project to purchase R8,2 billion of electricity in 2002-03, with their electricity budgets totalling R13,2 billion. Electricity comprises the largest component of municipalities' budgets.

Larger municipalities derive significant income from electricity distribution

Table 12.6 shows the operating and capital budgets of a sample of selected municipalities. These budgets show the extent of spending in these areas. Generally, the larger municipalities are more financially reliant on the distribution of electricity for both their operating expenditure and income budgets. Electricity income of about R2 billion comprises 33 per cent of the Tshwane budget. For Nelson Mandela Metropole, this amount is just over R800 million. These amounts exclude annual maintenance spending.

Capital funding is also sizeable, at R89 million for Tshwane, R82 million for Nelson Mandela Metropole and R58 million for Mangaung.

Table 12.6 Electricity income and expenditure in selected municipalities: 2002-03

R thousand	Operating expenditure	Operating income	Maintenance expenditure	Capital expenditure
Mangaung (Bloemfontein)	358 159	382 326	44 722	58 093
Tshwane (Pretoria)	1 716 198	1 999 351	192 794	88 659
Nelson Mandela (Port Elizabeth)	826 281	826 281	14 083	81 617
George	93 030	98 832	5 340	4 934
Knysna	36 266	47 721	1 974	4 761
Middelburg	79 284	88 232	3 622	3 536

Source: National Treasury Survey.

Table 12.7 shows the number of connections, cut-offs, billings and tariffs in different Eskom sales areas. A major challenge facing both Eskom and municipalities is the collection of revenue. Municipalities are struggling to collect all billed revenue. Neither is Eskom doing any better. Eskom's 2002 annual report indicated a total of R4,2 billion in local debtors, including rising levels of outstanding bills in its central region, mainly in Soweto. Reports indicate a decreasing compliance from 61 per cent in 2001 to 36 per cent in 2002. Bad and doubtful debtors amounted to R337 million in 2002, compared to R169 million in 2001. Significantly, Eskom's attempts to write off such arrears will create expectations for municipalities to do the same. It is important that Eskom and municipalities co-ordinate how they manage and execute write-offs.

Collection of revenue remains a major challenge

Table 12.7 Eskom electricity sales per selected municipality

Region	Area	No. of connections		No. of cut-offs		Total billed (R'm)		Rate (R/kwh)		Payment levels (%)	
		2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
Western	Cape Town	60 477	56 345	24 491	30 465	186	206	0,29	0,32	98	100
Southern	Buffalo City	84 511	75 427	31 142	34 399	58	81	0,32	0,34	100	100
North Eastern	Tshwane	50 081	47 733	33 381	61 804	117	127	0,33	0,33	79	60
Northern	Polokwane	142 136	146 113	52 212	55 053	153	204	0,34	0,36	92	98
Central	Randfontein, Benoni, Vereninging, Soweto	235 665	222 090	164 602	67 197	524	611	0,27	0,29	61	57
	<i>Soweto (ring-fenced)</i>	<i>117 952</i>	<i>117 420</i>	<i>86 734</i>	<i>33 242</i>	<i>188</i>	<i>217</i>	<i>0,29</i>	<i>0,31</i>	<i>61</i>	<i>36</i>
North Eastern	Mangaung	26 413	18 498	2 126	3 191	88	74	0,28	0,30	100	100
Eastern	eThekweni	56 125	49 404	1 851	4 521	174	223	0,29	0,31	98	100

Source: Eskom.

Table 12.8 indicates the extent of bulk purchases, sales and estimated losses in the larger municipalities. The losses range from 13 per cent in the case of Nelson Mandela Metropole to 7 per cent in Middelburg.

Table 12.8 Budget (GWhs): 2002-03

	Total bulk purchases	Total sales to all customers	Estimated technical losses
Mangaung (Bloemfontein)	1 248	1 175	73
Tshwane (Pretoria)	7 899	6 921	978
Nelson Mandela (Port Elizabeth)	3 098	2 915	412
George	362	349	19
Knysna	165	150	2
Middelburg	304	282	22

Source: National Treasury Survey.

Cost of employment to the sector

Table 12.9 shows the employee costs for a sample of municipalities. The average cost per employee in Johannesburg is R148 000, R123 250 in Tshwane Metropole, R110 678 in Nelson Mandela Metropole, R113 525 in Mangaung, and R83 055 in George. These differences will pose a challenge for the restructuring process, as wages from the different municipalities are to be standardised. Regional electricity distributors will need to contain the share of personnel costs, by ensuring that wages and salaries do not tend towards the highest salaries in the highest-paying municipalities.

Table 12.9 Employee costs: 2002-03

	No. of employees	Total cost of employees	Average costs
		R'000	R'000
Johannesburg	1 970	291 562	148
Mangaung (Bloemfontein)	518	58 806	114
Tshwane (Pretoria)	2 092	257 838	123
Nelson Mandela (Port Elizabeth)	747	82 677	111
George	117	9 717	83
Knysna	43	3 944	92
Middelburg	75	6 661	89

Source: National Treasury Survey.

Through municipalities and Eskom, the electricity sector is a large employer. Different municipalities show varying average salary costs and conditions of service. Eskom employed 29 359 people in 2002. The average salary of Eskom employees to be transferred to regional distributors is not known, but is probably higher than most municipalities. Exact personnel numbers for municipalities are not available, though they are estimated to be in the region of 25 000 employees nationally.

Reforms in the distribution industry

Challenges in reforming the industry

The current electricity distribution industry is fragmented, with one very large distributor, several medium-sized players, and many very small players. This diffuses skills, reduces efficiencies and puts small municipal distributors under significant pressure. These distributors often have overlapping boundaries, like between Eskom and the municipalities, with consequent inefficiencies. Coupled with this are wide variations in tariffs within and across municipalities.

In restructuring of the distribution industry, Government's aim is to create economically viable, efficient service providers capable of contributing to local economic development.

In reforming the industry, benefits should accrue from increased efficiency and more coherent pricing. Eliminating overlaps increases efficiency – for example, through sharing facilities – and creates economies of scale; and rationalising tariffs ensures that prices are consistent across different classes of consumers, which sends out the right economic signals.

Industry reforms aimed at improving efficiency

However, there are also significant risks and costs involved in the move to regional distribution. Perhaps the largest is the risk that these do not become effective and financially sustainable operations. If the regional distributors do not function properly, the quality of service delivery will fall and they will be financially unsustainable.

Regional distributors will also need to have comprehensive and coherent tariff structures, as this will help both maintain financial sustainability and realise some of the potential gains from moving to regional operations.

Finally, the costs of creating the regional distributors will need to be minimised. Much of this is related to the costs of transferring assets, liabilities and staff, but there are also costs associated with the new regional structure and their treatment of facilities. It will be particularly important that the implementation of regional distributors seeks to minimise these costs by making as much use as possible of existing infrastructure.

The restructuring process is now moving into the implementation phase. Restructuring begins with the creation of the EDI Holding Company, wholly owned by national Government. The Company will essentially be a project company, with its core mandate to achieve the restructuring of the industry and the creation of financially viable regional distributors.

Restructuring moves to implementation phase

The regional distributors are to be built up in an organic manner, through Eskom distribution divisions, consisting of the individual ring-fenced entities, and the large municipal distributors. This is set to happen by the end of 2004. The remaining municipal distributors will be incorporated over the following 18 months, and setting up the regional distributors should be completed by mid-2006.

A key role of the EDI Holding Company will be to oversee the ring fencing of electricity businesses, particularly within municipalities, which will have to ensure that their electricity businesses can be transferred as stand-alone entities. Similarly, the Eskom distribution business will need to be ring fenced as stand-alone entities.

The proposed regional geographical boundaries have been determined according to a number of criteria. The underlying aim has been to create financially viable regional distributors, with tariffs that do not vary too much across the supply area. The final boundaries will be subject to a very detailed analysis of the individual networks and financial viability. It is proposed that the new areas contain a good

Creation of financially viable regions central to reforms

mix of areas with high and low concentrations of electricity consumption, in order to provide a sound base. The challenge facing such regional distributors is that the local level of cross-subsidies should be sustainable and reflect little variance in user tariffs. The capacity of regional distributors to raise revenue does not depend only on its customer mix, but is directly related to tariff levels. This is constrained by the objective of having similar tariffs between the different regional distributors.

Future role of Eskom might change

An important factor will be how the ownership of the regional distributors will be determined. It may be based on the ownership of assets or the extent to which the asset base is aligned to customers and income-generation potential. Given local Government's constitutional mandate, it is probable that Eskom will not play a role as service authority for electricity distribution, particularly for households and businesses. This may mean the complete divestiture of Eskom in the distribution business and all assets being transferred to municipalities so it can be owned and operated at local government level. This option will greatly enhance local accountability and strengthen local governance and customer relationships.

However, the regional distributors face the further challenge of ensuring effective governance as they will be co-owned by many municipalities. Recent parliamentary hearings on the Municipal Finance Management Bill have outlined some of the difficulties of effective governance when a municipal entity ownership is shared between two or more municipalities.

Further challenges of restructuring

The transfer of staff will be a major challenge for restructuring, as conditions of service need to be harmonised. The lessons from the transfer of staff from former R293 towns must be utilised, as well as the lessons from amalgamating various parts of previous municipalities after the demarcation process. It is critical that all support staff are also transferred to the new institution if municipalities are not to be left with surplus staff after the restructuring. In addition, apart from asset transfers, an even more difficult challenge is to identify what liabilities incurred for electricity in the past will be transferred, including loans, and medical and pension liabilities.

Effects of restructuring on municipal revenues

One of the biggest challenges facing the creation of regional electricity distributors is the effect on the finances of municipalities. Municipalities currently earn significant amounts of surplus income from their electricity function, which they use to fund general municipal expenditure. This surplus is earned through municipal distributors charging significantly more for their electricity than it costs them to deliver it. It is in effect a local levy on electricity, but one that is not consistently applied across a municipality, as Eskom customers do not pay such a tax to the municipality (though they may do to Eskom). Imposing this levy would not necessarily be harmful to the sector or economy, especially if it is regulated by national legislation.

Case study: Johannesburg – City Power

Johannesburg is one of the few municipalities to ring-fence electricity revenue and expenditure. Table 12.10 outlines the budget of the municipal entity, City Power.

Table 12.10 Multi-year Budget for City Power: 2002-03

Total Income and Expenditure	2001/02	2002/03	2003/04	2004/05
R million	Revised	Budget	Forecast	
Income	2 458	2 620	2 873	3 142
Expenditure	2 814	2 856	3 007	3 163
Income				
User Charges for Services	2 410	2 569	2 820	3 087
Other Income	48	51	53	55
Total operating income	2 458	2 620	2 873	3 142
Expenditure				
Employee Costs - Wages & Salaries	186	236	240	237
Employee Costs - Social Contributions	44	55	56	56
Bad Debts	153	167	183	201
Depreciation	150	144	153	162
Repairs and Maintenance	63	73	68	64
Interest Expense - External borrowings	152	114	135	160
Bulk Purchases	1 550	1 661	1 769	1 884
Contracted Services	181	82	78	70
General Expenses - Other	108	97	98	102
Direct operating expenditure	2 587	2 629	2 780	2 936
Internal Transfers	–	–	–	–
Contributions to Johannesburg	227	227	227	227
Total operating expenditure	2 814	2 856	3 007	3 163
Operating deficit/(surplus)	357	236	134	21
Less Tax	-8	–	–	–
Deficit/(surplus)	349	236	134	21

Source: City of Johannesburg Medium Term Budget 2002/03 to 2004/05.

Table 12.11 is a further study and uses two sources of data: the work carried out by Price Waterhouse Coopers (PwC) for the EDI restructuring in 2000, and a South African Local Government Association (Salga) survey in 2001. The results vary somewhat, but they are broadly similar, suggesting that the orders of magnitude are correct. The results show that the surpluses are large, and that they vary significantly across the municipalities. For example, the Salga survey suggests that the surplus ranges from 2.7 per cent in uMhlathuze to 37.1 per cent in Khara Hais. Other research also puts the surplus as significantly above 10 per cent of sales, but below 15 per cent.

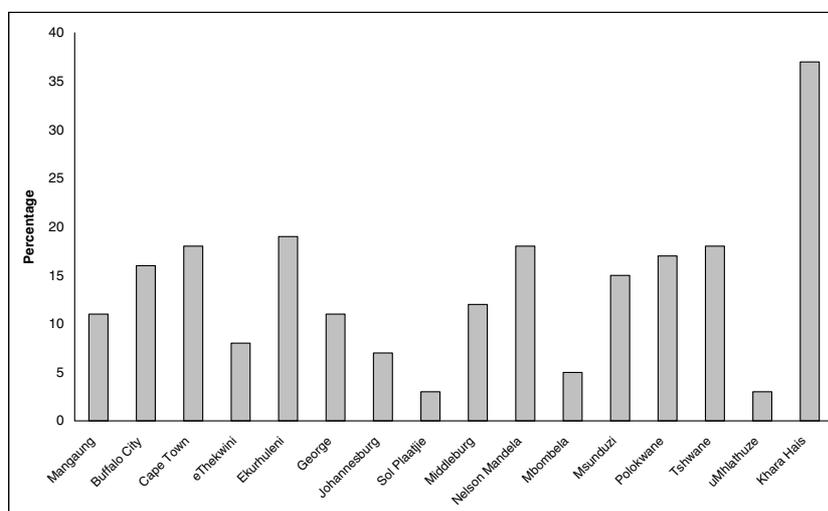
Survey of electricity surpluses

Table 12.11 Ring-fenced sample study

Municipality	2000		2001	
	PwC Historic Surplus		SALGA survey - Ringfenced Surplus	
R thousand				
Mangaung (Bloemfontein)	35 137	12,70%	40 831	11,25%
Buffalo City (East London)	36 812	15,90%	n/a	n/a
Cape Town	306 824	18,20%	n/a	n/a
eThekweni (Durban)	70 950	3,30%	170 483	7,54%
Ekurhuleni (East Rand)	246 174	14,10%	402 494	19,23%
George	8 784	11,50%	10 210	11,92%
Johannesburg	245 650	11,60%	164 309	6,82%
Sol Plaatje (Kimberley)	3 127	3,40%	n/a	n/a
Middelburg	13 231	19,40%	9 588	12,01%
Nelson Mandela	107 403	16,60%	129 493	17,81%
Mbombela (Nelspruit)	3 784	4,70%	n/a	n/a
Msunduzi (Pietermaritzburg)	14 268	4,90%	50 638	14,60%
Polokwane (Pietersburg)	20 891	16,60%	n/a	n/a
Tshwane (Pretoria)	211 881	13,00%	306 436	18,34%
uMhlathuze (Richardsbay)	6 204	3,20%	4 576	2,64%
Khara Hais (Upington)	11 605	28,00%	16 871	37,11%

Source: PwC (2000) and SALGA survey (2001).

Figure 12.4 shows the variation in size of the implicit levy on electricity. Figure 12.5 sets out the contribution to income that the electricity distribution function provides, compared to rates income.

Figure 12.4 Historic Municipal Sales as a percentage of sales

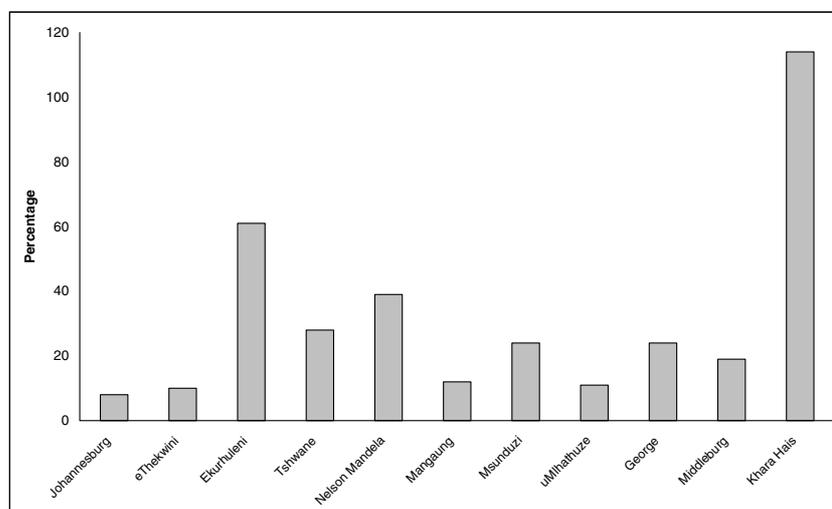
Source: PDG study on Electricity Distribution Reform 2002

EDI restructuring will affect income stream of municipalities

The proposed EDI reforms to the electricity function will have a negative effect on this income stream for municipalities, unless this is made good through another mechanism. Government recognises the importance of this and has stated that lost income will be replaced. There are two main options for an alternative: a local government levy on electricity sales within its jurisdiction, or a specific grant from national Government. National Government will therefore carry out a comprehensive review during 2003 of the local government fiscal

system. This will investigate whether a levy on electricity should be introduced, and the extent to which additional national grants may have to compensate municipalities for the loss of electricity.

Figure 12.5 Surplus as a percentage of rates income



Source: PDG study on Electricity Distribution Reform 2002

Municipalities electricity distribution functions also have important indirect influences on municipal finances. Currently, almost all municipalities run joint billing systems for their services. When the reforms are implemented electricity could be billed separately. This could potentially do two things: first, reduce the efficiencies of the system and increase costs; and second, lead to reduced payment for other municipal services as municipalities used to apply electricity as a credit control mechanism. However, the reforms may provide an opportunity for improving the efficiency of municipal billings systems, and be a force for positive change.

A further potential financial impact on municipalities is the weakening of their balance sheets and the consequent implications for credit ratings. If municipalities are perceived to be in a weaker financial position, this will lower their credit rating, thus increasing their costs of borrowing for other capital investments and reducing their access to private sector financing. This in turn would place a heavier reliance on national grants to fund infrastructure backlogs.

The overall impact of EDI reform is therefore still unclear, as it can be a source of potential liabilities, particularly in relation to future investment and unpaid consumer bills. This is because of the potentially negative impact on municipal credit ratings and the removal of electricity as a credit control mechanism.

A key transition cost in the establishment of regional distributors will be the ring-fencing of municipal electricity distribution functions. All assets, liabilities, employees and functions linked to municipalities' electricity distribution function must be identified for transfer. Where distributors are ring fenced, such as in Mangaung and Johannesburg, this is relatively simple, as they can be transferred as a complete

Associated effects of restructuring on municipalities

Ring fencing of electricity functions in municipal budgets

operation. However, where this is not the case the functions and associated assets, liabilities and employees need to be identified and valued before they can be transferred. The setting up of City Power in Johannesburg as a separate entity highlights the challenges faced by municipalities to completely separate electricity from other activities of the municipality.

Implications for budgets, income, expenditure, assets, liabilities and staff

In summary, the impact of restructuring will have significant implications for municipalities, including assets and liabilities, which remain to be quantified.

Other implications include:

- Six metro budgets reduced by at least R12,5 billion
- Municipal budgets reduced from R74 billion to an estimated R45 billion
- Municipal employees reduced by an estimated 25 000 staff.

The impact of supply and transmission restructuring

This chapter has focused on the distribution aspects of the electricity industry, and the establishment of regional distributors, as this will have the most direct impact on municipalities. However, the wider restructuring of the electricity sector will play a significant role in the pricing of electricity.

Effect of competition on cost of supply and transmission

The creation of an electricity market, accompanied by increased competition in the provision of generation capacity and a separate regulated transmission network, will lead to more efficient use of the country's economic resources. Competition between generators, coupled with market forces, will help ensure that generation is as efficient as possible, and that the regional distributors purchase least-cost electricity. A stand-alone regulated transmission network will also ensure costs are contained, through the use of regulated charges. Finally, and perhaps critically, the market will help ensure that decisions about investment in new generation and transmission capacity are driven by economic considerations.

The creation of a more efficient electricity sector will lead to lower prices for electricity being paid by regional distributors, and therefore lower consumer prices.

Electricity generation

Imbalances in supply and demand

Electricity is currently very cheap in South Africa due to significant overcapacity in generation, coupled with the age of generation plants. The overcapacity leads to low prices because of a supply and demand imbalance. Excess supply implies low prices, as it is often cheaper to run the generating plants than to shut them down.

Linked to oversupply lowering prices is the age of generation plants and the use of historical cost pricing in determining costs. Many of the costs of building generators, which led to the very steep increases in electricity prices in the 1980s, have been written down through

depreciation. The NER's use of these depreciated historical costs in setting Eskom's rate of return and prices leads to lower tariffs. If much higher replacement costs were used, tariffs would be significantly higher, to reflect the cost of replacing the generating assets.

While the oversupply of generation and the use of historical cost pricing leads to the very low current prices, this situation is not expected to continue. Electricity demand is increasing rapidly, at an estimated 3 per cent a year, due to economic growth, electrification and the expansion of electricity-intensive industries. In the next few years this growth will lead to a need for new generating capacity which will have implications for future tariffs.

Electricity demand increasing at 3 per cent per annum

Much of Eskom's current generating capacity consists of very large coal-fired plants. While a new plant on this scale will not need to be built, it does provide an idea of the cost of generating new capacity. It is estimated that to build a plant of a similar size would cost R32 billion, and the cost will have to be passed on to electricity consumers. This is regardless of whether the investment is made by the private sector or Eskom.

The bulk of the electricity supplied by Eskom is produced by coal-powered stations. The challenge for Eskom is to produce electricity cost-effectively, while maintaining appropriate environmental standards. Through improved technology, more than 99 per cent of ash is extracted from the combustion gas before it is released into the atmosphere.

Challenge to produce cost-effective electricity

It is inevitable that electricity tariffs will rise over the coming years, as there will be an increasing need to pay for new generating and transmission capacity. However, the restructuring of the industry should help mitigate some of the need for these price rises. This will be effected through the more efficient use of resources, both in regional distributors by limiting the current duplication, and in generation, by increasing competition and the efficiency of investment decisions.

Conclusion

The electricity sector needs reform. The future is to be built around regional distributors, coupled with a competitive generation sector. Competitive generation will lead to increased efficiency and relatively lower prices for energy. However, the extent to which final consumers see improved service delivery, implementation of free basic services and greater efficiency will depend on the performance of the regional distributors and their accountability to their customers.

The current distribution industry suffers from fragmentation, and there is significant room for improvement in the industry's efficiency and effectiveness. A less fragmented and more efficient industry should be able to provide better service delivery. The key to achieving this lies in the oversight role of key stakeholders, the governance framework of the regional distributors and the effectiveness of the NER.

The NER will need to report regularly and publicly on the progress of the regional distributors in achieving service delivery targets, cost containment measures, tariffs for different users and financial sustainability. These could act as a trigger for outside intervention in the regional distributors, to ensure that the quality of the supply of electricity is maintained at acceptable levels. In addition, regional distributors will need to have effective governance arrangements. The most critical issue for the restructuring is in managing the impact on local government and ensuring that services are not adversely affected during the transition.

Achieving all this will depend on the efficiency of the transition process, and the completion of several key policies. Three key remaining policies need to be finalised: the regulation framework for regional distributors; the tariff regime for regional distributors; and the replacement of the municipal electricity surplus.