



**Matla power station (3 600 MW) in the Eastern Transvaal.  
Cover: Surge chamber at the Drakensberg pumped-  
storage station (1 000 MW).**

# Electricity Supply Commission

Megawatt Park, Maxwell Drive, Sandton

The Minister of  
Mineral and Energy Affairs  
Pretoria

1 April 1981

Sir

*As required by Section 19 of the Electricity Act, 1958, the Commission has the honour of presenting its fifty-eighth Annual Report and Financial Statements covering its work for the financial year ended 31 December 1980.*

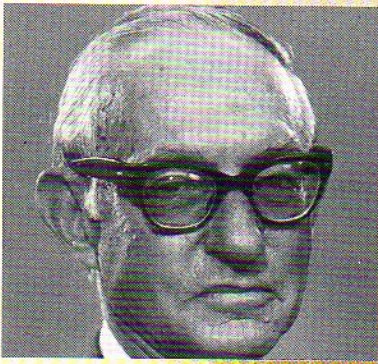
*Jan H. Smith*



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# Members of the Commission



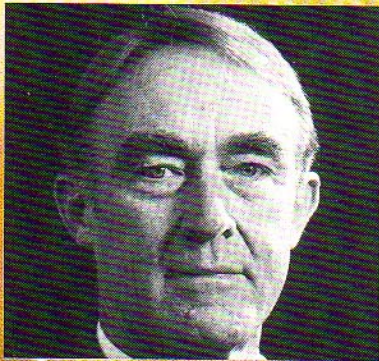
**Dr. R. L. Straszacker**  
(Chairman until 18/2/1980)



*Chairman*, **Jan H. Smith**  
(from 19/2/1980)



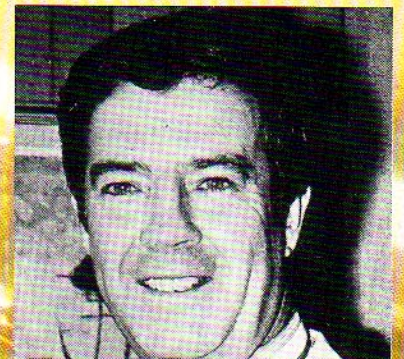
**Dr. A. J. du Toit** (until 31/10/1980)



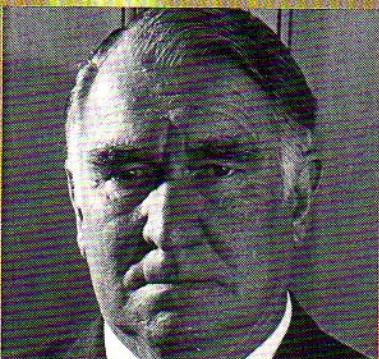
**D. J. Malan**



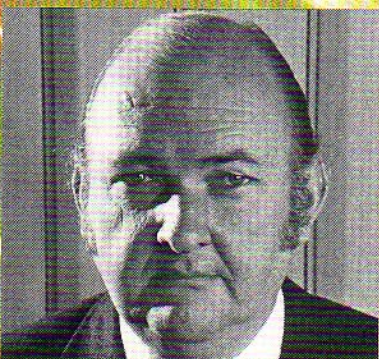
**E. Pavitt**



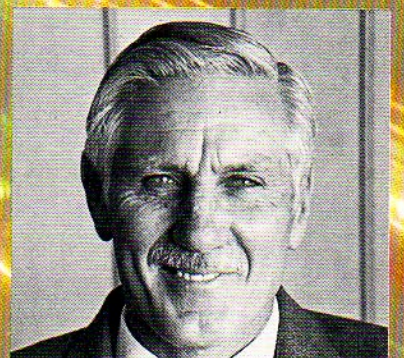
**Prof. G. Marais**



**J. F. W. Haak** (from 1/2/1980)

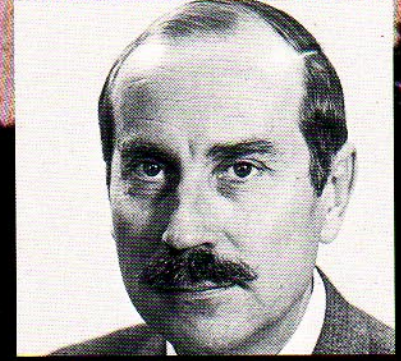
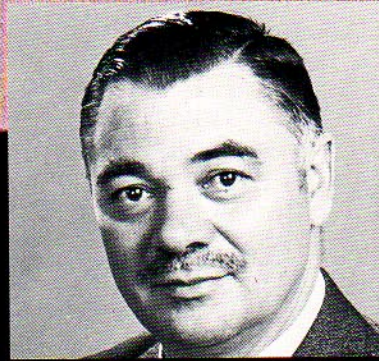
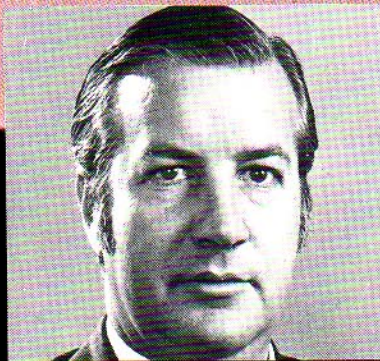
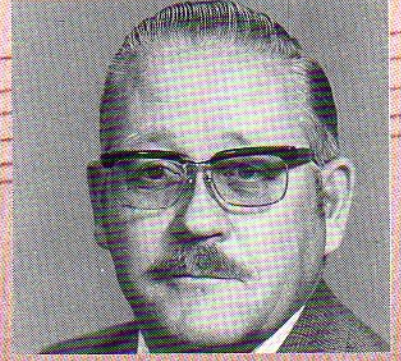
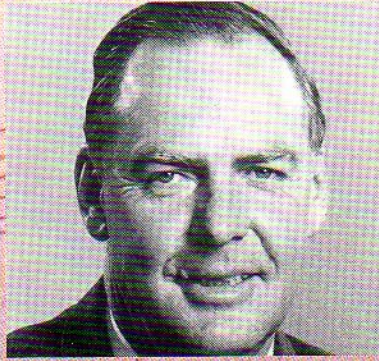
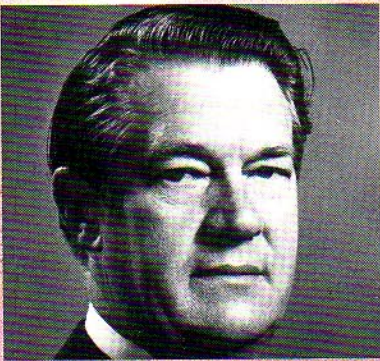


**T. R. Castle** (from 19/2/1980)

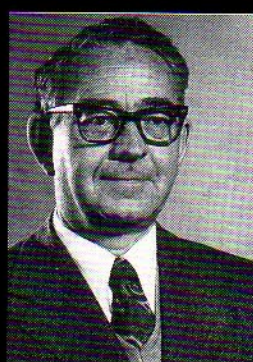
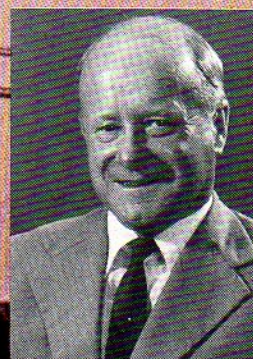


**J. Wilkens** (from 1/11/1980)

# Corporate Management



Top. Senior General Manager: I. D. van der Walt, Pr. Eng., B.Sc. (Elec. Eng.), B.Sc. (Mech. Eng.) (Witwatersrand); General Manager (Operations): I. C. McRae, Pr. Eng., B.Sc. (Eng.) (Witwatersrand); General Manager (New Works): J. L. Rothman, Pr. Eng., B.Sc., B.Sc. (Eng.) (Stellenbosch).  
 Middle. General Manager (Finance): L. te Groen, B.Com. (Witwatersrand), C.A. (S.A.); Legal Manager: P. J. T. Oosthuizen, B.A., LL.B. (U.O.F.S.); Production Assets Manager: G. A. Park, Pr. Eng., B.Sc. (Eng.) (Witwatersrand).  
 Left. Personnel Manager: F. J. W. Barnard, Pr. Eng., B.Sc. (Eng.) (Stellenbosch), M.B.L. (UNISA).



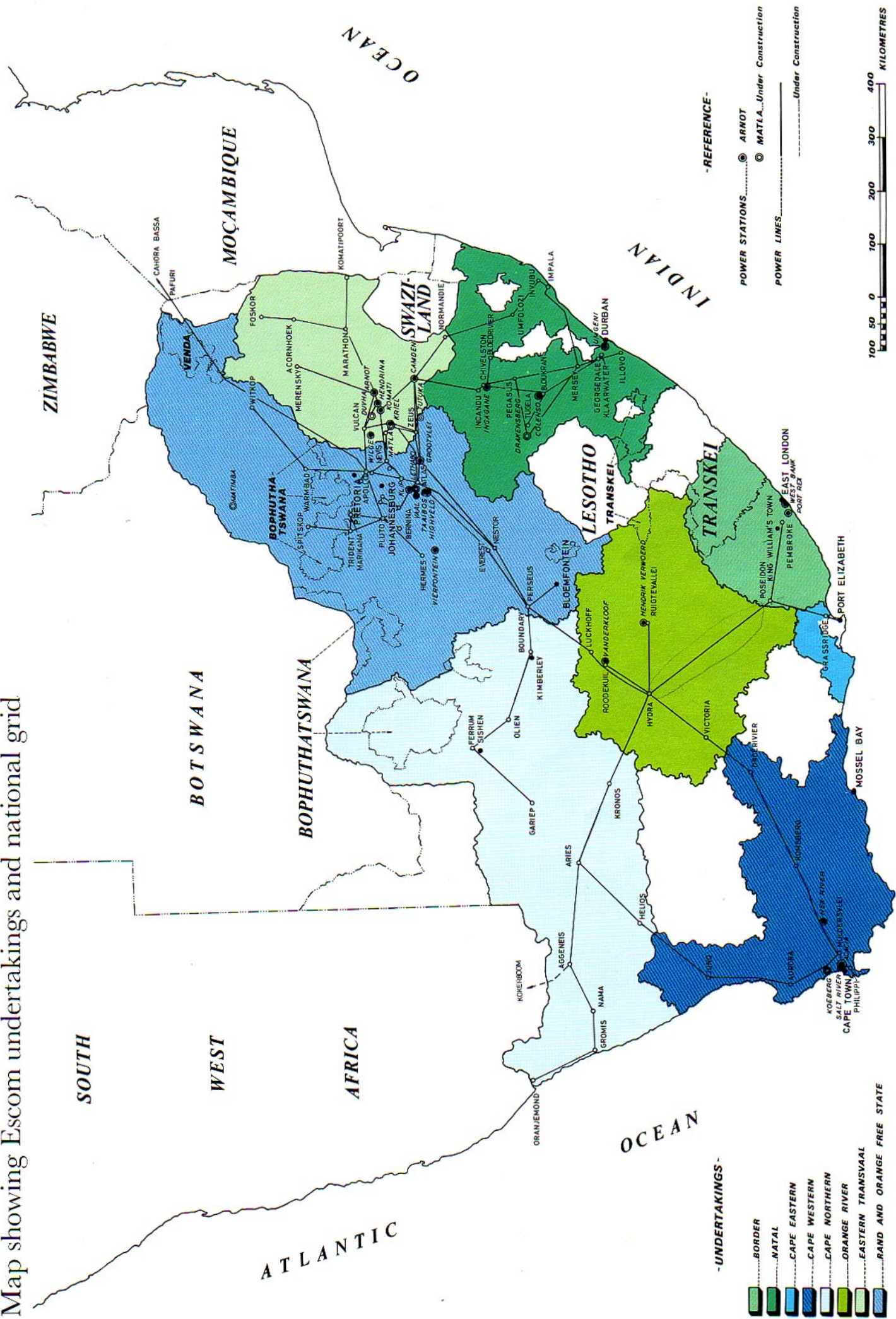
## Regional Managers

Top. Rand and Orange Free State Region: M. W. Walter, Pr. Eng., B.Sc. (Eng.), (Natal); Western Cape Region: R. P. A. Myburgh, Pr. Eng., B.Sc. (Eng.) (Cape Town). Middle. Eastern Transvaal Region: T. P. O'Connor, Pr. Eng., B.Sc. (Eng.) (Natal); Eastern Cape Region (including Border, Cape Eastern and Orange River Undertakings): E. F. Otten, Pr. Eng., B.Sc. (Eng.) (Witwatersrand). Right. Northern Cape Region: J. P. Rodger, Pr. Eng., B.Sc. (Eng.) (Cape Town); Natal Region: H. E. Wohlberg, Pr. Eng., B.Sc. (Eng.) (Stellenbosch).

# Statistical Highlights

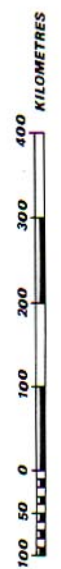
		1980	1979	per cent change
<b>Financial</b>				
Revenue	R(million)	1 772	1 529	15,9
Charges against revenue	R(million)	1 870	1 512	23,7
Expenditure on fixed assets	R(million)	1 447	1 375	5,3
Fixed assets at 31 December	R(million)	8 219	6 794	21,0
Average cost per kW.h sold	cents	2,136	1,876	13,9
Average price per kW.h sold	cents	2,024	1,898	6,6
<b>Operating statistics</b>				
Escom's share of electricity sent out in South Africa	per cent	93,1	92,9	0,2
Total electricity sent out by Escom	million kW.h	93 021	86 037	8,1
From Escom power stations	million kW.h	83 362	75 642	10,2
From other sources	million kW.h	9 659	10 394	-7,1
Electricity sold by Escom	million kW.h	87 539	80 583	8,6
Coal burnt in Escom power stations	million tons	46,8	43,3	8,1
Water consumed in Escom power stations	megalitres	214 813	206 318	4,1
Maximum demand on integrated Escom system	MW	13 668	12 855	6,3
<b>Escom plant in service at 31 December</b>				
Installed capacity	MW	18 349	15 974	14,9
Assigned sent-out rating	MW	17 339	15 056	15,2
<i>Major overhead transmission lines:</i>				
<i>Direct current:</i>				
533 kV (monopolar)	km	1 030	1 030	
<i>Alternating current:</i>				
400-220 kV	km	14 557	14 358	1,4
165 kV and below	km	99 840	95 313	4,7
<i>Underground cables:</i>				
132 kV and below	km	7 687	7 321	5,0
Capacity of transformers	MVA	122 825	114 343	7,4
<b>Staff employed at 31 December</b>		<b>47 490</b>	<b>43 690</b>	<b>8,7</b>

Map showing Escom undertakings and national grid



- UNDERTAKINGS -**
- BORDER
  - NATAL
  - CAPE EASTERN
  - CAPE WESTERN
  - CAPE NORTHERN
  - ORANGE RIVER
  - EASTERN TRANSVAAL
  - RAND AND ORANGE FREE STATE

- REFERENCE -**
- POWER STATIONS
  - ARNOT
  - MATLA...Under Construction
  - POWER LINES
  - Under Construction





# Electricity Supply in South Africa

Escom was established as an electric utility in terms of the Electricity Act No. 42 of 1922. Its objective is to provide an abundant supply of electricity at cost wherever it can be used for the economic advancement of the Republic of South Africa.

The organisation is directed by a Chairman and six other Commissioners, all appointed by the State President for their knowledge of, and experience in, the various sectors of the economy and in electricity supply.

Management vests in the Chairman, who is assisted by the Senior General Manager, three General Managers and other corporate managers. The corporate head office is at Megawatt Park, Sandton.

For administrative purposes, Escom is divided into six regions each headed by a Regional Manager, who is responsible for the operation of power stations and the distribution systems in his region. There are regional head offices in Cape Town, East London, Durban, Witbank, Johannesburg and Kimberley. For accounting purposes the territory served by Escom is divided into seven (previously eight) distribution undertakings, each with an area of supply licensed by the Electricity Control Board.

Escom is required in terms of the Electricity Act to submit a report to the Minister of Mineral and Energy Affairs before the end of April each year. The report is tabled in Parliament.

## Interaction with the economy

Escom's direct contribution to the economy is the provision of over 93 per cent of electricity consumed in the Republic and national states (or just under 60 per cent of the electricity used in Africa). The 7 per cent not supplied by Escom is generated by certain mines and industries, and by a number of municipalities which operate their own power stations but generally buy electricity in bulk from Escom to supplement their own generation.

It is estimated that electrical energy constitutes over 20 per cent of the total net energy usage in South Africa. With the increasing cost of other energy sources, notably oil, it is expected that Escom will have to supply about 40 per cent of the country's total net energy requirement by the turn of the century. This is a considerable increase over the figure of 7,5 per cent in 1950.

In addition to its direct contribution to the economy, Escom indirectly promotes the economic well-being of the country by purchasing goods and services from local suppliers. In so doing it acts as a stimulus to the economy during the cyclical troughs in the business cycle. This is particularly true of the civil and heavy engineering sectors; these can be provided with a reasonably constant amount of work due to the long lead-times associated with Escom's capital projects and the requirement that short-lived economic fluctuations cannot be allowed to affect such projects.

Besides the obvious financial benefits of Escom's capital expenditure programme, employment is provided to thousands of people. The balance of payments is also

favourably affected by the inflow of foreign capital which is used to finance new projects.

In all, an adequate and firm supply of electricity is a factor on which this country's planners have been able to rely.

## Financing of Escom

Escom has no share capital. Capital expenditure and loan repayments are financed from internal and external sources. The manner in which this is done is prescribed by the Electricity Act.

External finance is obtained by raising loans on local and overseas capital markets, and through trade finance arranged in conjunction with suppliers of capital equipment. While most of the external finance is used to fund capital expenditure, a proportion is used to refinance loans which are of too short a duration to be amortised over their lives without undue strain being placed on electricity tariffs.

Internal finance, which is obtained by the retention of tariff income, is the only other source of funds available to Escom.

Escom does not depreciate its fixed assets but instead amortises the loans used to finance them. The amortisation of local loans is achieved on a sinking fund basis through the Redemption Fund. Contributions from tariff income are credited to the Fund and these ensure that sufficient finance is available for the redemption of local loans. Separate provision is made for the repayment of foreign loans. In addition to the Redemption Fund, Escom operates a Capital Development Fund (used to finance part of its capital expenditure) and a Reserve Fund.


The moneys in these three funds are invested either in Escom stock or in other prescribed investments, and the interest earned thereon provides additional finance.

The largest source of internal finance available to Escom is the Capital Development Fund. Amounts of up to 6 per cent of Escom's unredeemed loans at the end of each year may be set aside annually to this Fund or the Reserve Fund.

The Reserve Fund is used for the replacement of obsolete plant and machinery, and generally for the betterment of plant, exceptional repairs or emergencies. It is also used to a limited extent for self-insurance purposes, thereby reducing expenditure on insurance premiums.

Escom is a major borrower in the local and foreign capital markets. It currently undertakes two local public issues a year, usually in April and October. It also makes use of foreign finance in the form of import financing facilities, direct placements and syndicated bank loans.

Over several years Escom has developed and promoted an active secondary market in its local registered stock which is actively traded on the Johannesburg Stock Exchange. Because its internal funds are invested primarily in its own stock, Escom is able to buy and sell such stock on behalf of these funds. In the immediate past years this operation has been an additional source of finance for Escom the internal funds having been net sellers of Escom stock. The proceeds from these sales are reinvested by Escom on behalf of its funds in new issues.



Because of the long lead-times associated with Escom's capital projects its activities act as a stimulus to the economy during troughs in the business cycle.

# Chairman's Review

The past year has been one of sustained growth in the demand for electricity.

Sales reached a record 87 539 million kW.h, an increase of 8,6 per cent over the 1979 figure. Total revenue amounted to R1 772 million (R1 529 million in 1979), while total charges against revenue were R1 870 million (R1 512 million in 1979). This resulted in a deficit for the year of R98 million, slightly higher than the amount budgeted for, to offset the accumulated surplus of R80 million recorded at the end of 1979, leaving an accumulated deficit of R18 million at 31 December 1980.

The average price of electricity was 2,024 cents per kW.h, an increase of 6,6 per cent over the 1979 figure of 1,898 cents per kW.h, whilst the average cost per kW.h rose by 13,9 per cent, from 1,876 cents per kW.h in 1979 to 2,136 cents per kW.h 1980.

During 1980 a net amount of R1 447 million was expended on fixed assets (R1 375 million in 1979). At the year end 31 per cent of the value of Escom's fixed assets were under construction (37 per cent in 1979). Total fixed assets stood at R8 219 million at the year end (R6 794 million in 1979).

The maximum demand at Escom power stations increased by 813 MW to 13 668 MW. New plant with an assigned sent-out rating of 2 300 MW was brought into service, and at the year end Escom's total sent-out capacity stood at 17 339 MW, excluding the contractual firm capacity of 1 379 MW available from Cahora Bassa.

In 1980 Escom provided more than 93 per cent of the electricity consumed in South Africa and neighbouring territories. More than 88 per cent of the electricity sent out by Escom was derived from its coal-fired stations, while about 10 per cent was imported from Cahora Bassa. Escom's own hydro stations contributed 1,07 per cent, and its gas-turbine stations 0,03 per cent.

Some 46,8 million tons of coal were burnt in Escom stations during the year, representing about 42 per cent of South Africa's total coal sales for the year. At the end of 1980, Escom had 10 644 MW of plant on order or under construction.

The Escom supply system was further extended during the year. While most of the increase in the demand for electricity came from consumers in the more established industrial and mining areas of the country, Escom's network was also extended to include new areas and towns, while more farm supplies (3 551) were connected in 1980 than in any previous

year. Similarly good progress was made with providing electricity supplies to Black urban areas and the national states of Transkei, Bophuthatswana and Venda.

Plans for Escom to take over and augment existing bulk supplies to Soweto, South Africa's biggest Black city, are on schedule.

## Implications of growth

The growth in the sales of electricity in 1980 was very close to the 8,8 per cent Escom average over the past 30 years. While our growth rate was probably one of the highest anywhere in the world for 1980, it was lower than the growth rate in 1979 and sales only partially reflected the outstanding buoyancy of the South African economy. In fact, during the first half of 1980 sales grew by 10 per cent, as compared to the same period in 1979. In the second half of the year, however, while the boom continued unabatedly, the growth rate slowed somewhat when the recession in certain overseas countries began to affect a number of electricity-intensive industries serving the export markets. Even so, the net effect was an increase in sales higher than long-range forecasts had indicated.

Generally the Escom system stood up well to the demands made upon it during 1980, but towards the end of the year the combined effect of an exceptionally high-demand economy, frequent interruptions in power imports from Cahora Bassa and our acute shortage of skilled manpower, became noticeable on the Escom system.

The situation was not unforeseen, and remedies have been applied which we believe will reduce the impact of a temporary constraint in electricity supplies. The situation does, however, highlight a number of factors which, although pointed out before, can now be more readily appreciated.

Firstly, Escom's expansion programme is a continuous process and thus the construction of its power stations and their financing should as far as practicable be free from short-term economic events. Expansion therefore should not be slowed down or accelerated as dictated by short-term economic criteria.

Secondly, events last year clearly illustrated that electricity supply in this country should not be over-dependent on imported energy. This has always been Escom's policy.

Thirdly, we must come to terms with the implications of South Africa's manpower shortage. Without suitably qualified manpower, Escom will not be able to reach its objectives,

even though sufficient capacity and adequate financing for expansion may be available.

The present constraints on electricity supply can be attributed partly to the cautious economic thinking which emerged in the late 1960s and which was further influenced by the oil crisis in the early 1970s and the recession of the mid-1970s. As a result, Escom complied with a request made in the interest of the national economy to delay certain capital projects.

In essence we have lost three to four years of generating expansion. But this, in turn, prompted Escom to explore various ways of overcoming the deficiency, and the lost time has now with considerable strain on our resources been reduced to 18 months.

One of the first steps was to become less subject to the effects of short-term economic fluctuations and in 1976 Escom took the bold but unpopular step of increasing

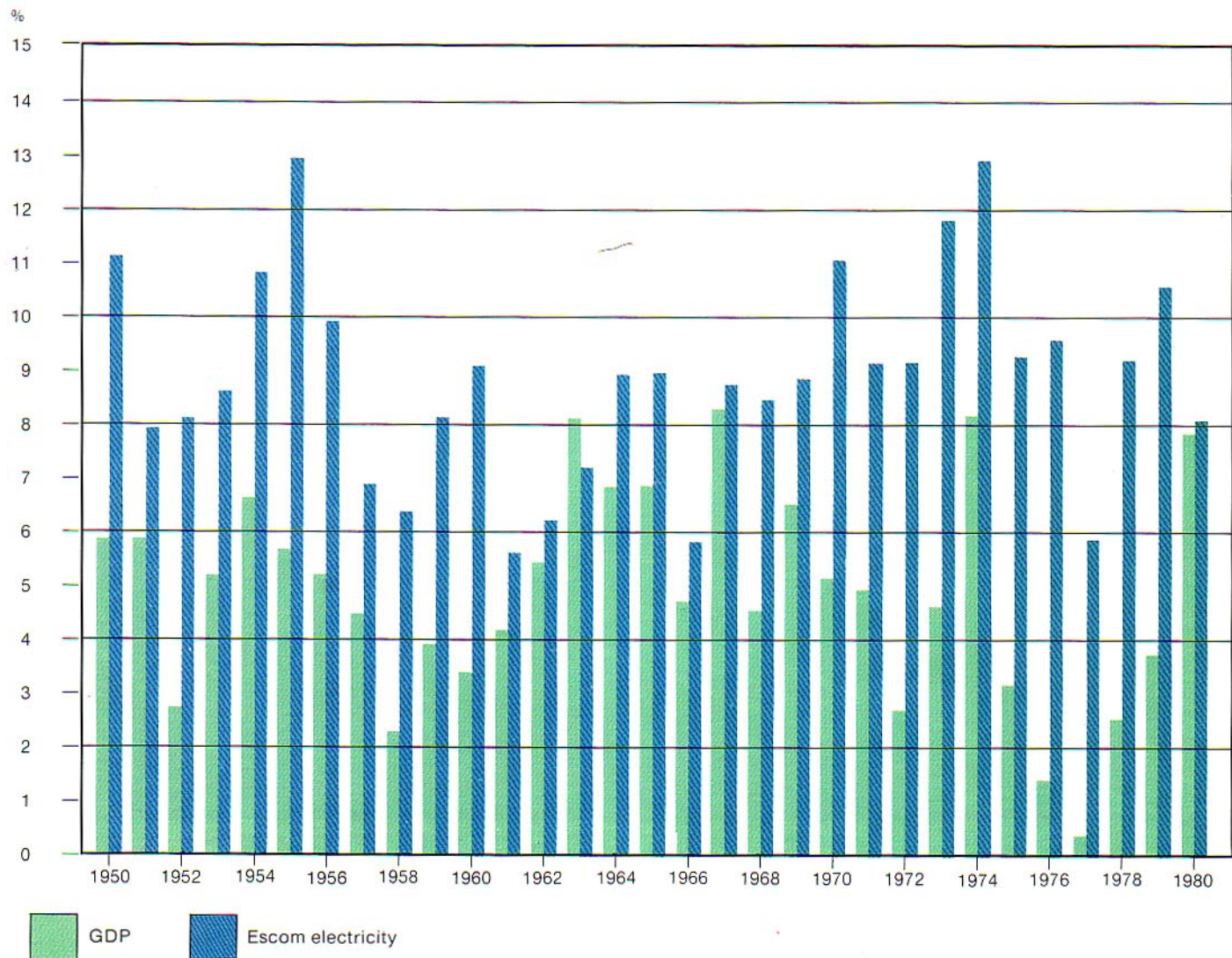
electricity tariffs to provide a greater measure of self-financing. This improved our financial structure and allowed us to continue with our expansion programme.

Other measures necessitated, inter alia, the continued use of old plant which previously would have been regarded as obsolete or uneconomical, and the speeding-up of plant construction.

We should avoid a similar situation developing in future. What is required is bold planning and foresight, not only by Escom but also by the public and private sectors. Fortunately there exists today a much better understanding of the nature and complexity of electricity supply in both spheres.

When predicting electricity requirements 10 or even 20 years into the future, long-term economic trends form the only acceptable base. As can be seen from the accompanying graphs the annual percentage growth in the demand for Escom electricity has, since 1950 generally exceeded

Annual percentage growth in real GDP and in the demand for Escom electricity



Growth in Escom's electricity sales over the past 30 years contrasted with that of the national economy. On average, Escom's growth is higher by a considerable margin. During the time Escom's share of the electricity market in southern Africa has increased from 71 per cent to over 93 per cent, but the main reason for the sustained growth rate in the demand for electricity is increasing industrialization.

economic growth rates by a considerable margin. This margin has fluctuated between 2 and 4 per cent, and represents an average growth rate of 8,8 per cent in the demand for electricity over the past 30 years. We anticipate that this trend will continue for some years with the growth rate not expected to taper off significantly before the next decade.

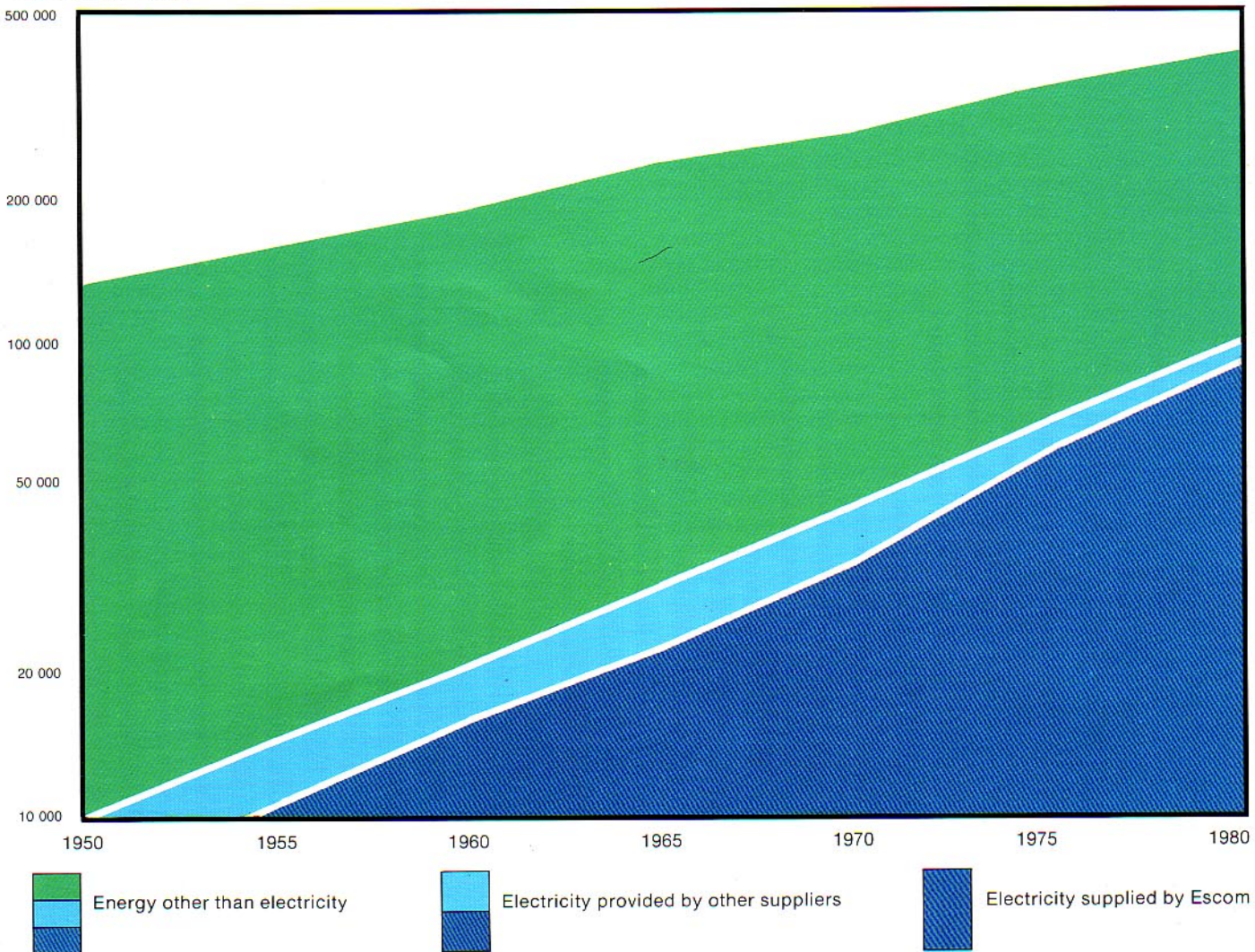
This implies that by the end of the present decade our installed capacity will have increased from the present 17 500 MW to 34 000 MW, and should stand at about 65 000 MW ten years later. Interestingly, by the second half of the 1990s South Africa will have an installed capacity equal to the 57 000 MW presently employed by the Central Electricity Generating Board to serve England and Wales. We would by then have a situation in which a country on one of the least developed continents would have reached a level of electricity usage comparable to that of one of the world's most industrialized countries today.

Our projections are based on conservative estimates, following the growth pattern developed over many years. I would attribute future growth in the demand for electricity mainly to the following three factors:

- South Africa will become increasingly industrialized. Its mineral wealth will continue to provide the economy with great impetus, while the industrial sector will continue to expand and become more electricity-intensive. Escom's sales over the past number of years have registered a slow but marked shift from mining, as its biggest sales category, to the industrial sector. It is estimated that over 50 per cent of the electricity consumed in South Africa at present is used in an industrial and commercial application, as can be seen elsewhere in this report.
- The swing from oil-based energy sources to electricity will continue. It is estimated that at present electricity constitutes just over 20 per cent of South Africa's total net

## Total energy delivered to final user in South Africa

Logarithmic scale  
million kW.h consumed



While the growth in the demand for electricity over the past 30 years has been consistently higher than that of the national economy it also exceeded the growth in South Africa's total net energy consumption. In 1950 Escom provided in about 7,5 per cent of this country's net energy requirements; by 1980 this figure had risen to over 20 per cent and is expected to increase to more than 40 per cent by the end of the century. The trend is expected to continue as electricity replaces more expensive energy sources and South Africa's various population groups become more economically active.

energy usage. This figure will probably increase to 40 per cent before the end of the century.

- South Africa's Black population is rapidly becoming more economically active. Coupled with the electrification of Black towns and areas and the enhanced and more electricity-intensive lifestyle this is bringing about, further Eskom growth will result.

## Financial status

While expansion in electricity supply must be free from the short-term fluctuations of the business cycle, sales are influenced by such conditions.

In 1978 and 1979 higher than expected sales resulted in surpluses. Tariff adjustments for 1980, usually effective from January each year, could therefore be delayed to July, resulting in a loss in income to offset the accumulated surplus. During the second part of the year, however, sales fell below expectations and, together with the forced running of more uneconomic plant, this led to a small but larger than expected accumulated deficit at the end of the year.

Despite the deficit, R671 million internal finance was generated during the year. Even the small increase in the average tariff level managed to account for a satisfactory growth of the Capital Development Fund and a significant internal finance contribution. Although, due to the deficit, the overall percentage level of internal financing declined slightly, it is believed that current tariff levels will provide adequate internal financing in future years.

During the year, despite tightening financial market conditions, Eskom succeeded in obtaining finance for that portion of our financial requirements which was not covered by internal cash generation. The liquidity on the local market permitted Eskom to increase its financing from local sources. In this respect R536 million was channelled to Eskom through the local markets, while R870 million was obtained overseas. A highlight of Eskom's overseas financing activities was a DM 100 million public issue obtained on the Eurobond market which had been closed to South African borrowers since 1976.

Import financing facilities continued their important role as an additional financing source to Eskom, contributing 26 per cent of Eskom's total financing needs. Due to the current competitive nature of the market for power-generation equipment, import financing facilities are being offered at attractive rates and for extended periods.

Local financing reached a new level of sophistication last year when arrangements were concluded to secure local finance for projects well in advance of actual utilization. Similar to import financing facilities these local facilities provide Eskom with secure financing sources while investors and bankers obtain competitive returns on the finance they provide.

I do not expect Eskom's current financing policy, as it has evolved in recent years with the emphasis on a higher proportion of self-financing, to change drastically in the foreseeable future. I believe Eskom's current financing methods are adequate for our expansion programme, although inflation can present a problem. During the past few years Eskom has developed a sound financial basis to meet the challenge of an ever expanding economy.

It is interesting to note then that Eskom had to become financially more self-sufficient before overseas financial institutions were prepared to consider us as an attractive investment opportunity. While overseas finance has again become more readily available in recent years, and on more

favourable terms, I can foresee that once the overseas economies start to recover, such finance may again be less freely available.

This, and the fact that the overseas recession through declining export markets, began to have an effect on our sales last year illustrate, on the one hand, the inter-dependence of our respective economies. Yet, on the other hand, it also shows how strong this country's present economic situation is inasmuch as it continues to expand despite the recession elsewhere.

There is also a further aspect I would like to mention. Eskom's demand for electricity generation equipment has made a large impact on overseas economies. In the electricity supply industry alone our requirements are among the highest in the world. This means that a number of overseas companies are finding South Africa the most lucrative market available to them today. In fact, continued development and expansion in South Africa in general hold out good prospects for many overseas concerns in an otherwise gloomy international economic environment.

## Manpower shortage

The repercussions of the nation-wide shortage of skilled manpower were increasingly being felt by Eskom in 1980. There is a shortage of suitably qualified personnel in virtually all areas of employment inside Eskom.

In the field of plant maintenance, for example, the shortage of skilled manpower at times reached critical proportions. Planned maintenance, already under pressure due to the high demands on the Eskom supply system, could on occasion not be carried out or had to be rescheduled. This began to affect the quality of electricity supply which, in turn, can inconvenience the consumer if timeous action is not taken.

Clearly the skilled manpower problem is experienced everywhere in South Africa, but the very nature of Eskom's activities in providing an essential service could bring an early warning of the very serious repercussion this could have on our economy.

The urgency of the matter has been identified by both the private and public sectors, and the steps taken so far are encouraging. Eskom itself has evolved a comprehensive manpower programme, with increasing emphasis on training and education. The Eskom college announced in 1979 will provide comprehensive in-house training in all fields of Eskom employment from 1982. In the meantime existing facilities are fully exploited and in 1980 more than 13 000 employees were enrolled for internal and external courses.

## Board and management changes

As recorded in the 1979 Annual Report my predecessor, Dr. R.L. Straszacker, retired in February 1980. During the year Dr. A.J. du Toit, on his appointment as Chairman of a major banking group, resigned from the Commission. I should like to record the Commission's appreciation for their valued support and guidance over many years. We wish them every success for the future. I also welcome Messrs. J.F.W. Haak, T.R. Castle and J. Wilkens, who were appointed to the Commission during the year. We look forward to a long and happy association.

In February 1980 Mr. I.D. van der Walt, Assistant General Manager, was appointed Senior General Manager of Eskom, Mr. I.C. McRae, Senior Manager (Operations) was appointed General Manager (Operations), Mr. J.L. Rothman, Senior Manager (New Works) was appointed General Manager (New Works) and Mr. L. te Groen, Financial Manager, was appointed General Manager (Finance).

# Senior General Manager's Report

## Electricity sales

Escom sales totalled 87 539 million kW.h in 1980 (80 583 million kW.h in 1979).

These, divided into consumer categories, are set out in Table 1.

While Escom provides electricity in bulk to municipalities for resale to their own industrial and domestic users, it also serves direct many industrial and mining consumers, the railways and some domestic users.

Sales increased in all categories, except in domestic and street lighting where Escom sales have declined over the past few years as the result of Escom's policy to transfer reticulation systems to municipalities.

The biggest category is the industrial sector which now accounts for 33,6 per cent of Escom's total sales. This is followed by bulk sales to municipalities (30,8 per cent), mining (29,5 per cent), traction (5,1 per cent) and domestic/street lighting (1,0 per cent).

■ In terms of the total electricity usage in South Africa these figures illustrate the increasing industrialization of a developing nation. The shift from mining as the biggest power user to the industrial sector, continued in 1980. The growth in sales to the industrial sector over recent years is in fact more remarkable than portrayed in Table 1 inasmuch as Escom sales do not show the industrial component of its bulk supplies to municipalities.

At the moment, we estimate that about 53 per cent of electricity consumed in this country is used in an industrial and commercial application, 27 per cent in mining, 15 per cent for domestic and street lighting applications and 5 per cent for traction.

The swing towards increased industrial sales is expected to continue, but factors such as the manpower shortage, the availability of production capacity and materials, financial considerations and inflation, could reduce this category's growth rate in the demand for electricity in the short term.

A decline in export markets associated with a general recession overseas, could also affect the demand for electricity.

To a certain extent this occurred in 1980. During the first half of the year electricity sales exceeded sales in the first half of 1979 by about 10 per cent, but in the second half the demand for electricity by some large consumers whose markets are mainly export-orientated, declined as the overseas recession worsened. The present situation can be regarded as being temporary since the relatively low electricity prices prevailing in this country — compared to prices of electricity available to competing suppliers overseas — favour a recovery once the recession is over.

The large increase of 11,6 per cent in sales to municipal supply authorities and to neighbouring territories was due

mainly to municipalities which still generate a part of their needs, taking a greater proportion from Escom. A contributing factor is the progressive transfer of reticulation systems to local authorities.

A feature of sales to mining consumers is the rapidly growing demand for electricity by the coal mining industry. This averaged 15,1 per cent per annum over the past five years, and was 14,3 per cent in 1980. This growth rate is mainly attributable to South Africa's intensified coal export programme to meet the higher foreign demand for coal following increased prices for liquid fuels and uncertainty of supplies from some of the traditional coal-exporting countries.

It is anticipated that this growth rate can be maintained or even raised in future as South Africa's current coal programme provides for a doubling in the export tonnages.

Locally, the coal requirements of the chemical and oil-from-coal industries as well as Escom will add to the demand for coal and electricity.

The growth of sales to the major mining category, gold and uranium, at 7,4 per cent exceeded the 7,1 per cent average for the past five years (See Table 2). This is principally as a result of the high gold price and increased electrification of mining activities as oil-based energy forms are being phased out.

### Sales expressed regionally

Administratively Escom is divided into six geographical regions and, for accounting purposes, into eight distribution undertakings (on 1 January 1981, however, the Cape Eastern Undertaking was incorporated into the Orange River Undertaking). Increased sales were recorded in all of these undertakings. (See Table 3)

In Escom's biggest Undertaking, Rand and O.F.S., responsible for 56,8 per cent of Escom's total sales, sales grew by 8,2 per cent. Because of the size of this Undertaking, serving the majority of gold-mines and the industrial heartland of South Africa, its sales trends largely determine the electricity supply pattern for the entire country. Increased sales were recorded in all three of the Undertaking's principal consumer categories — industrial, mining and municipal.

In the Natal Undertaking, sales increased by 7,7 per cent. Some large industrial users did not call for the power they were expected to draw mainly as the result of the fall in export markets mentioned earlier. This may inhibit growth in the short term, but in the longer term the situation could improve dramatically with an associated surge in the demand for electricity.

Sales grew by 10,2 per cent in the Eastern Transvaal Undertaking. This can be attributed largely to increased industrial and mining activities, particularly at the Sasol plant and mines associated with Kriel, Matla and Duvha power stations.



Growth in this Region is expected to continue at a rate exceeding Escom's average rate.

The Cape Western Undertaking recorded a growth rate of 10,3 per cent. The largest increase in sales was to the railways' suburban supply. Sales to municipalities increased as most of them experienced a higher load growth than expected. Cape Town took 11,3 per cent more energy than in 1979, which was partly due to increased pumping at the City Council's Steenbras pumped-storage station.

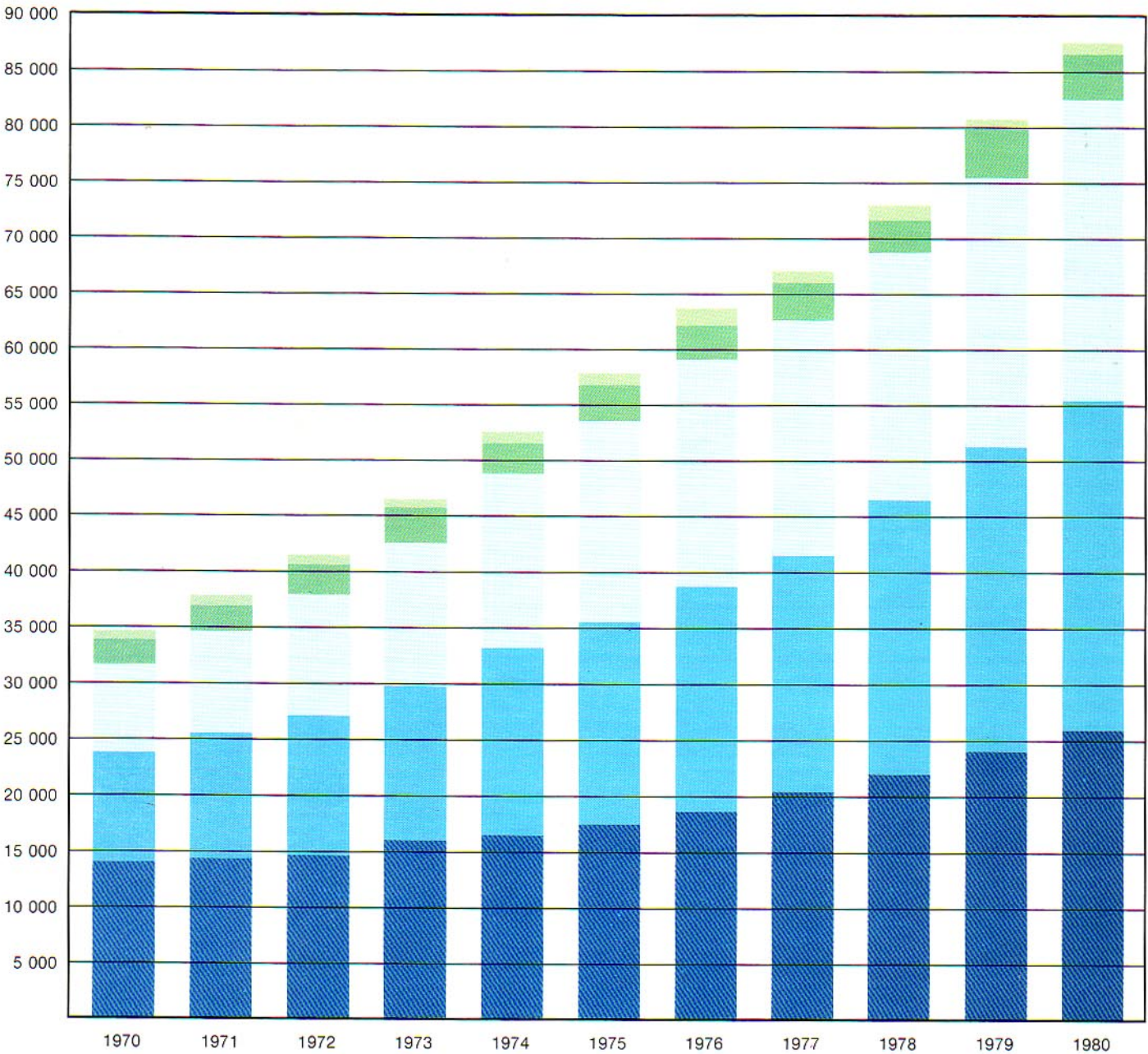
Cape Northern Undertaking experienced an increase of 8,8 per cent. Sales grew by 15,8 per cent in the first five

months of 1980 compared to the same period in 1979, but the growth rate declined in the latter part of the year compared to the corresponding period the year before. This Undertaking serves a predominantly mining region; even traction supplies are mainly mining-related, as are many of the bulk supplies to towns. The overseas recession, and hence declining mineral export markets, had a major effect on the demand for electricity in this Region. While sales to iron ore mines decreased, demands from copper, lead, zinc and diamond mines increased substantially.

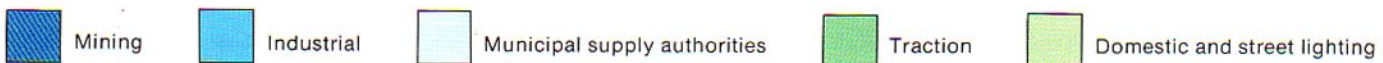
In the Border, Orange River and Cape Eastern

## Electricity sales

million kW.h



Sales to



Undertakings (comprising Escom's Eastern Cape Region) the growth rates in electricity sales — 9,0 per cent, 10,1 per cent, and 13,9 per cent respectively — generally exceeded expectations. This trend is expected to continue as the result of railway electrification and the extension of Escom's system into the Langkloof.

DM 100 million public bond issue in October was a manifestation of the excellent support Escom enjoys from overseas investors.

Import financing facilities in the form of export credits as well as direct loans made up a large portion of the foreign contribution to Escom's finance during the year. Escom managed to renegotiate new loans on the Swiss capital market in substitution for the numerous Swiss loans which it had to repay during 1980. The German capital market played a major role in the year's financing, but due to the relatively high costs of dollar denominated financing few loans from the Euro Dollar Market were obtained. Some dollar loans were arranged but utilization of these loans will occur only when dollar interest rates fall to a more acceptable level.

During 1980 the local money and capital markets changed drastically.

At the beginning of the year there was an abundance of liquidity in the markets which resulted in relatively low interest

## Financial

### Capital expenditure

The net amount of R1 447 million expended on fixed assets during 1980 represented an increase of 5,2 per cent over the 1979 figure of R1 375 million. At 31 December 1980, 31 per cent of the value of fixed assets could be classified as being under construction. This figure is comparable to the 37 per cent in 1979, 34 per cent in 1978 and 32 per cent in 1977. The sophistication of contemporary power station design, long lead-times and two-digit inflation have resulted in costs being much greater than those of older assets which are in commission. In 1980 a substantial portion of new plant was

**Table 1**  
**Sales of electricity to categories of consumers**

Category of supply	1975	1976	1977	1978	1979	1980	Percentage	Average
							increase	yearly
							1980/79	increase
								over 5 years
								per cent
Million kWh								
<b>*Sales to municipal supply authorities (bulk)</b>	18 055	20 096	20 862	21 834	24 133	26 923	11,6	8,3
<b>Direct supplies:</b>								
**Domestic and street lighting	1 014	1 132	***1 030	960	940	906	-3,6	—
Industrial	18 049	19 907	21 586	24 182	27 475	29 423	7,1	10,3
Mining	17 444	18 746	20 139	22 219	24 000	25 832	7,6	8,2
Traction	3 307	3 475	3 508	3 586	4 035	4 455	10,4	6,1
<b>Total</b>	<b>57 869</b>	<b>63 356</b>	<b>67 125</b>	<b>72 780</b>	<b>80 583</b>	<b>87 539</b>	<b>8,6</b>	<b>8,6</b>
Per cent of total								
<b>*Sales to municipal supply authorities (bulk)</b>	31,2	31,7	31,1	30,0	29,9	30,8		
<b>Direct supplies:</b>								
**Domestic and street lighting	1,8	1,8	***1,6	1,4	1,2	1,0		
Industrial	31,2	31,4	32,1	33,2	34,1	33,6		
Mining	30,1	29,6	30,0	30,5	29,8	29,5		
Traction	5,7	5,5	5,2	4,9	5,0	5,1		
<b>Total</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>		

\*This includes sales to electricity undertakings in neighbouring territories.

\*\*Sales in this category have declined as the result of Escom's policy to transfer reticulation systems to municipalities.

\*\*\*Change in definition of domestic use.

taken into service, resulting in a temporary reduction in the percentage of fixed assets classified as being under construction.

### Loans and capital markets

As was the case in the previous year, Escom was successful in raising significant sums of loan finance on both the local and the overseas financial markets. Numerous overseas loans were negotiated including Escom's first foreign public bond issue since 1975. The successful placing of Escom's

rates. Later, the liquidity position changed, resulting in the interest rate on the long-term Escom stock rising from 9,35 per cent at the beginning of the year to 12,25 per cent at the end of the year. During the second half of the year investors' expectations in respect of long-term interest rates changed and they began to withhold funds from long-term investment in anticipation of higher interest rates in the future. Short-term interest rates showed even greater increases, due also to the expectation that 1981 would be a difficult year for South African financial markets.

Escom successfully raised two public loan stock issues on the local market in 1980. It maintained an active secondary market operation, through which Escom sold stock to the value of R513 million (nominal value) whilst an amount of approximately R368 million was purchased from stockholders.

In 1980 Escom's approach to project financing through local financing sources changed. Instead of arranging finance when payments for local project commitments had to be made, Escom decided to ensure the availability of finance at a much earlier stage. Consequently facilities linked to the payment schedules in contracts were arranged. Hence project financing will be available when needed, yet remain flexible enough to ensure that the most advantageous form of financing can be chosen. Agreements were concluded with Standard Bank and Barclays Bank for a facility of R650 million and with the Nedbank Group for R720 million. These facilities will be used for Lethabo and Tutuka power stations

respectively. The provision of facilities of this nature represents a greater degree of sophistication in the local money and capital markets.

### Internal finance

The Capital Development Fund increased from R1 291 million to R1 872 million due to contributions of R426 million from revenue and investment income of R160 million. A R5 million additional provision for differences between book values and proceeds of stock investments sold was also made.

It would not be possible to meet Escom's financial commitments if the facility of a Capital Development Fund did not exist. Currently this Fund provides 40 per cent of Escom's net fixed asset expenditure which cannot be regarded as being too high as this is the most reliable source of long-term finance available to the electricity supply industry. With other long-term financing only being available on the local market and then only in limited quantities, the Capital Development

**Table 2**  
Sales of electricity to sectors of the mining industry, million kW.h

Mining category	1975	1976	1977	1978	1979	1980	Percentage	Average
							increase	yearly
							1980/79	increase
								over 5 years
								per cent
Gold and uranium . . . . .	13 108	13 918	14 708	16 241	17 201	18 477	7,4	7,1
Platinum . . . . .	2 001	2 184	2 287	2 388	2 772	2 973	7,3	8,2
Coal . . . . .	705	812	941	1 078	1 248	1 426	14,3	15,1
Copper . . . . .	679	728	874	1 023	1 042	1 117	7,2	10,5
Diamonds . . . . .	346	343	342	497	596	678	13,8	14,4
Asbestos . . . . .	238	266	275	223	233	242	3,9	0,3
Iron . . . . .	121	180	271	272	334	361	8,1	24,4
Chrome . . . . .	42	61	84	106	126	127	0,8	24,8
Antimony . . . . .	53	61	76	73	67	67	—	4,8
Manganese . . . . .	37	49	62	72	83	94	13,3	20,5
Other . . . . .	114	144	219	246	298	270	-10,4	18,8
<b>Total . . . . .</b>	<b>17 444</b>	<b>18 746</b>	<b>20 139</b>	<b>22 219</b>	<b>24 000</b>	<b>25 832</b>	<b>7,6</b>	<b>8,2</b>

**Table 3**  
Total electricity sales in Escom's undertakings, million kW.h

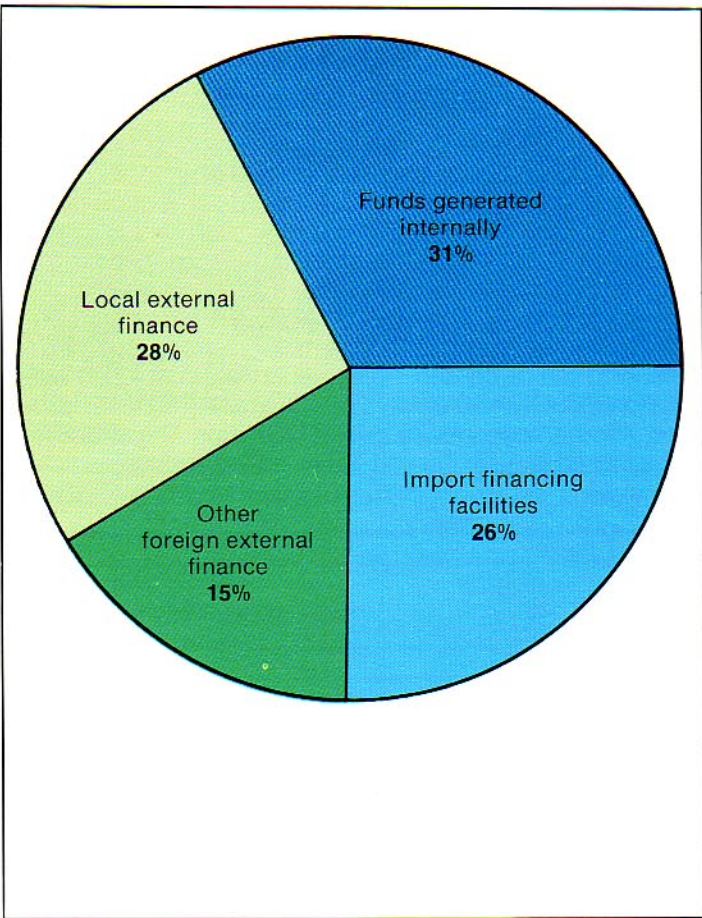
Undertaking	1975	1976	1977	1978	1979	1980	Percentage	Average
							increase	yearly
							1980/79	increase
								over 5 years
								per cent
Border . . . . .	598	675	727	779	826	901	9,0	8,5
Cape Eastern . . . . .	13	14	22	30	30	34	13,9	21,2
Cape Northern . . . . .	1 340	1 507	1 668	1 937	2 368	2 577	8,8	14,0
Cape Western . . . . .	4 656	4 930	5 028	5 216	5 593	6 168	10,3	5,8
Eastern Transvaal . . . . .	7 267	8 028	9 062	10 061	11 698	12 887	10,2	12,1
Natal . . . . .	9 166	9 931	10 747	11 736	12 988	13 989	7,7	8,8
Orange River . . . . .	915	1 035	1 037	1 047	1 173	1 292	10,1	7,1
Rand and O.F.S. . . . .	33 914	37 236	38 834	41 974	45 907	49 691	8,2	7,9
<b>Total . . . . .</b>	<b>57 869</b>	<b>63 356</b>	<b>67 125</b>	<b>72 780</b>	<b>80 583</b>	<b>87 539</b>	<b>8,6</b>	<b>8,6</b>

Fund plays a vital role towards ensuring that the capital costs of plant can be recovered from the consumer over a period of at least 23 years.

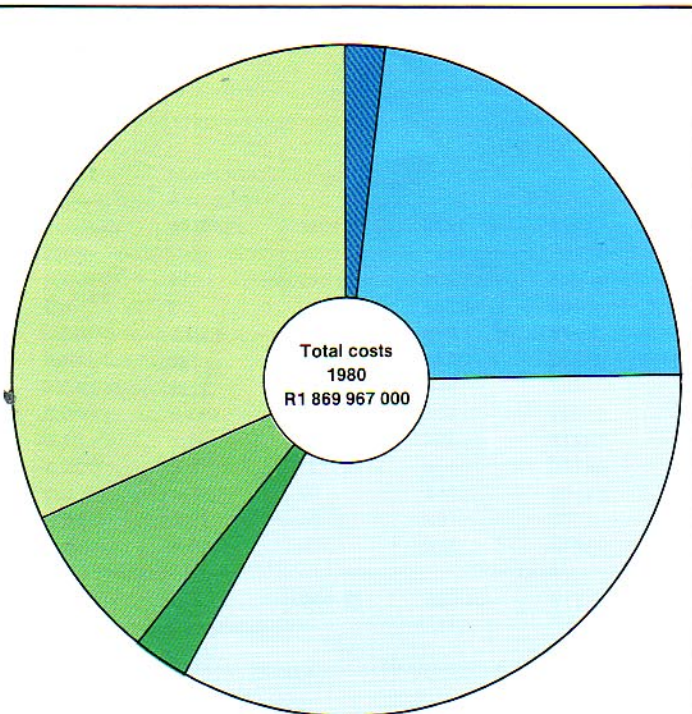
Reserve Fund contributions amounted to just under R1 million whilst its income totalled R18 million. Expenditure to replace and improve plant amounting to R19 million was financed from the Fund.

The Redemption Fund registered a R68 million increase comprising R56 million contributions, R49 million investment income and R32 million utilized to finance loan repayments. As with the Capital Development Fund, a further provision of R5 million was made for the difference between book values and proceeds of the Redemption Fund's stock investments sold during 1980. Details of the three internal Funds are contained in Schedules 7, 8 and 9 and Note 7 of the financial statements provided later in the Report.

## Source of funds

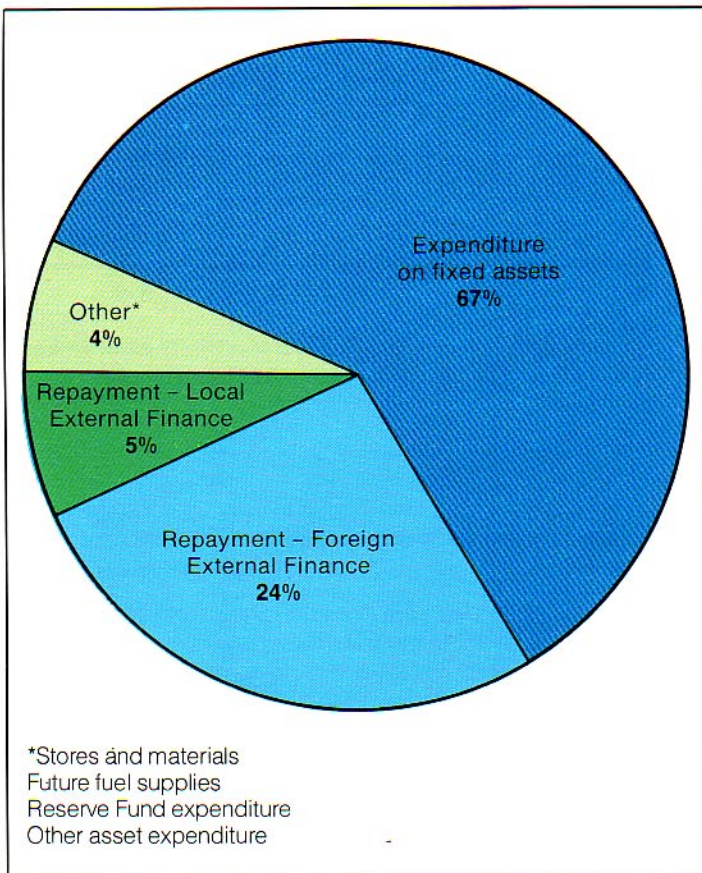


## Breakdown of costs for the year



<b>Electricity purchased</b>	<b>1,915%</b>	<b>Corporate management</b>	<b>2,595%</b>
<b>Contributions to funds</b>	<b>22,851%</b>	<b>Distribution costs</b>	<b>6,748%</b>
Capital development	22,803%	Operation	0,099%
Reserve	0,048%	Maintenance	1,870%
		Administration and general	4,779%
<b>Generation costs</b>	<b>33,465%</b>	<b>Loan charges</b>	<b>32,426%</b>
Operation: Coal cost	19,118%	Interest: Generation	20,245%
Railage on coal	1,200%	Distribution	6,338%
Other costs	4,238%	Corporate services	0,408%
Total	24,556%	Total	26,991%
Maintenance	3,392%	Redemption: Generation	4,348%
Administration and general	5,517%	Distribution	1,042%
		Corporate services	0,045%
		Total	5,435%

## Application of funds



## Tariffs

In an era of unavoidable cost increases, it is Escom's practice to favour regular annual tariff increases rather than larger increases at longer or irregular intervals. Normally tariff adjustments are effected each January.

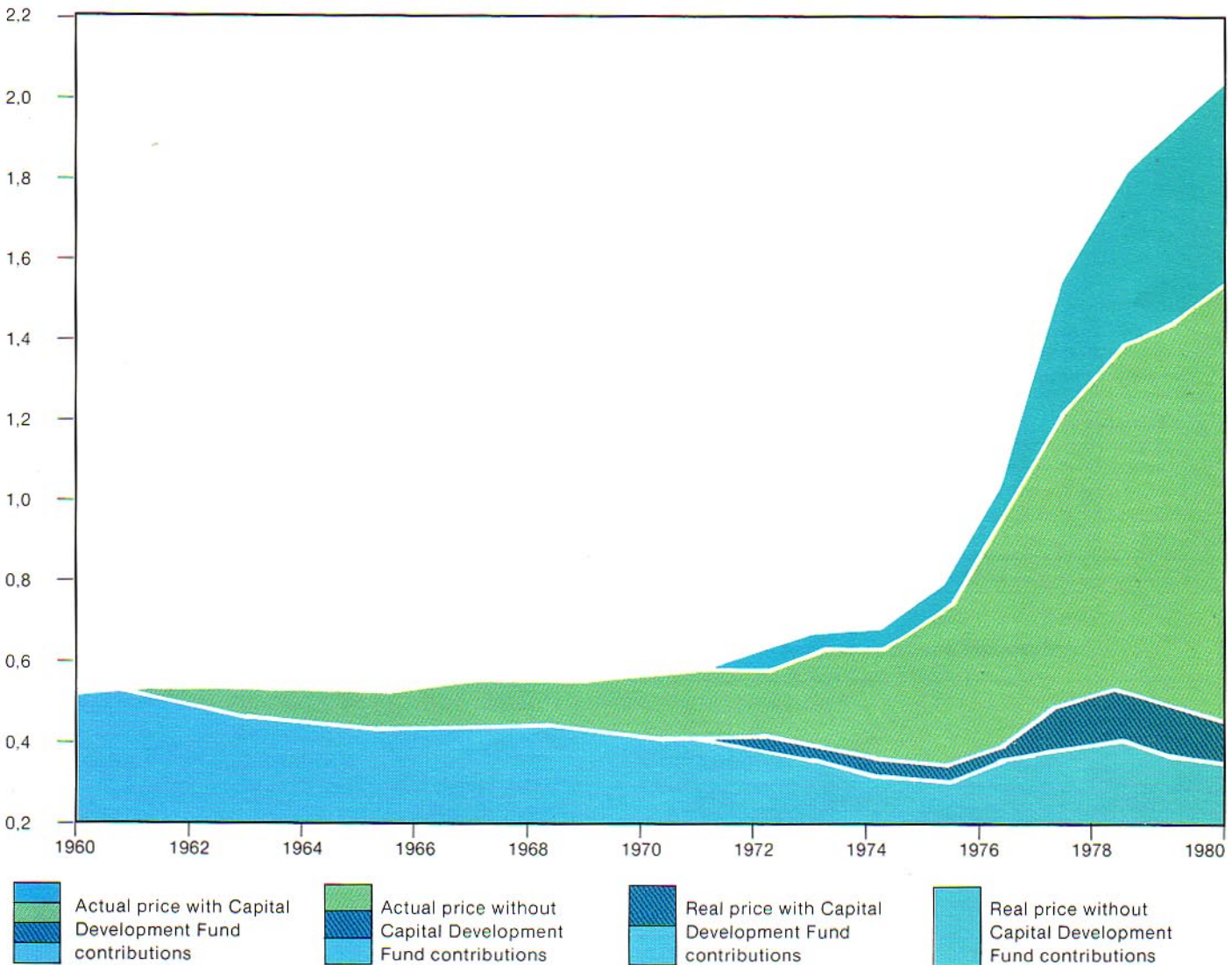
As the result of higher than expected sales in 1978 and 1979 the Electricity Supply Account showed an accumulated surplus of R80 million at the end of 1979. Escom decided to offset the surplus during 1980. This was achieved by deferring the 1980 tariff increase from January to July 1980 for all Undertakings except the Orange River Undertaking which on its own had shown an accumulated deficit. A decline in

sales during the latter half of the year and the higher operating costs of the more uneconomic plant which had to be run, however, led to a slightly larger deficit than planned for the year. The net result at the end of 1980 was therefore an accumulated deficit of R18 million, after offsetting the 1979 surplus.

The July 1980 tariff increases averaged 7,3 per cent for Escom as a whole, while increases in the price of coal added a further 2,5 per cent for the full year (the average cost of coal increased from R6,96 per ton to R8,12 per ton). The overall effect was that the average price of electricity, at 2,024 cents per kW.h, was only 6,6 per cent higher than the corresponding figure for 1979.

## Average selling price of electricity

cents per kW.h



This graph places the tariff increases which have occurred since 1975 in perspective. Using 1960 as a base and the wholesale price index as a deflator, the price of electricity in 1980 was less than the price ruling 20 years ago. In 1960 the actual average selling price of a kW.h of electricity was 0,508 cents, in 1970 it was 0,555 cents and in 1980, 2,024 cents. In real terms the price declined from 0,508 cents in 1960 to 0,446 cents in 1970 and rose slightly to 0,481 cents in 1980. The 1980 real price includes contributions to the Capital Development Fund which did not exist in 1960 and 1970. If these contributions were excluded, the 1980 price in real terms would have been 0,365 cents per kW.h. This price reduction represents productivity improvement.

The graph also indicates that any attempt to keep down electricity prices artificially, as was done in the early 1970s, results in a need to recover increased costs at a later stage. Tariff increases after 1975, apart from providing additional Capital Development Fund contributions, had to recover losses incurred between 1973 and 1975 during which period it was felt that increases in the price of electricity would be inflationary.

# System operation

## Plant capability and loading

Technical details of the equipment installed in Escom's power stations and of its transmission system are shown in Statements 1 and 3 on pages 49 and 51 respectively.

In 1980, 83 362,2 million kW.h of energy was sent out by Escom power stations, while 9 594,7 million kW.h was imported from Cahora Bassa.

Escom's sent-out capacity increased from 15 056 MW in 1979 to 17 339 MW, excluding the 1 379 MW firm capacity normally available from Cahora Bassa. During the year plant

with a sent-out capacity of 2 300 MW was taken into service.

The one-hour maximum demand on the interconnected Escom system was 13 668 MW, 813 MW higher than the figure for 1979 (Table 5). The available plant sent-out capacity at the time of this maximum demand was 15 517 MW.

The reliability of electricity supply from Cahora Bassa during the year was poor. This supply is being hampered by damage to transmission lines on the Mozambique side of the border and the unsettled conditions there have made it difficult for maintenance and repair work to be carried out. Contingency plans, involving the rescheduling of planned maintenance, have been prepared to meet the demand if little or no supply is received from Cahora Bassa.

**Table 4**  
**Electricity sent out to Escom's undertakings, million kW.h**

Undertaking	1975	1976	1977	1978	1979	1980	Percentage increase 1980/79	Average yearly increase over 5 years per cent
Border . . . . .	648,2	734,0	790,1	844,6	894,9	968,4	8,2	8,4
Cape Eastern . . . . .	18,5	20,7	25,2	33,0	34,0	37,8	11,2	15,4
Cape Northern . . . . .	1 494,9	1 674,6	1 832,4	2 170,7	2 647,1	2 882,9	8,9	14,0
Cape Western . . . . .	5 098,6	5 402,8	5 555,9	5 817,7	6 138,7	6 807,0	10,9	6,0
Eastern Transvaal . . . . .	7 309,6	8 122,1	9 400,4	10 358,1	12 190,4	13 346,0	9,5	12,8
Natal . . . . .	9 671,5	10 471,1	11 319,8	12 457,8	13 899,5	14 812,4	6,6	8,9
Orange River . . . . .	968,3	1 086,1	1 096,2	1 097,6	1 238,1	1 368,3	10,5	7,2
Rand and O.F.S. . . . .	36 304,4	39 902,3	41 244,7	44 994,2	48 935,9	52 728,0	7,7	7,7
Central Generating Undertaking own consumption . . . . .	19,3	—	**26,8	52,6	58,0	70,8	22,1	29,7
<b>Total supplied . . . . .</b>	<b>61 533,3</b>	<b>67 413,7</b>	<b>71 291,5</b>	<b>77 826,3</b>	<b>86 036,6</b>	<b>93 021,6</b>	<b>8,1</b>	<b>8,6</b>

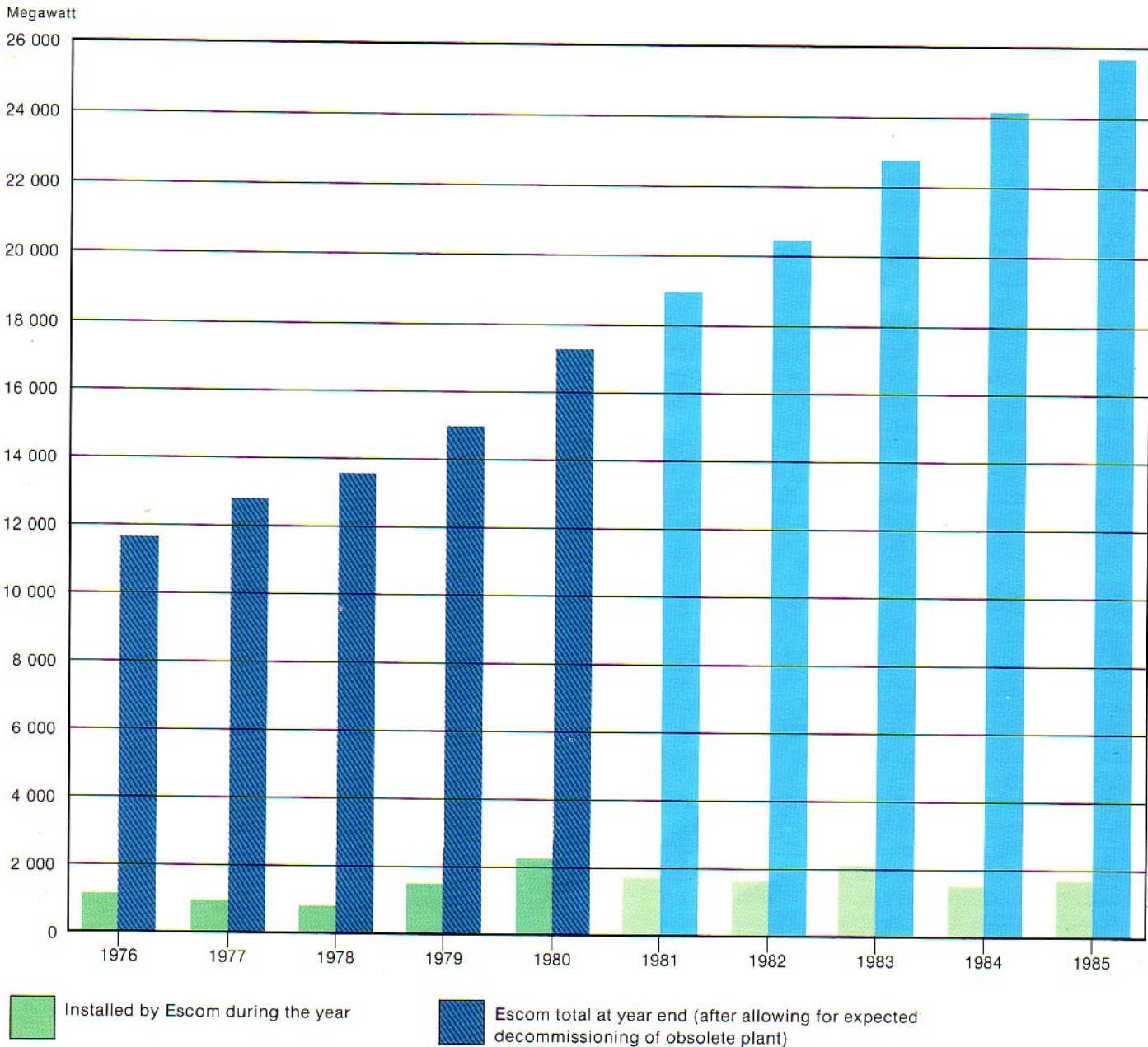
\*Extraneous supplies, such as river pumps, townships, workshops, etc., previously regarded as Central Generating Undertaking's own consumption, are now included in the distribution undertakings' supplies and treated as sales to Central Generating Undertaking.

\*\*Energy consumed at Hendrik Verwoerd, Vanderkloof, Acacia and Port Rex power stations when operated in the synchronous condenser mode.

**Table 5**  
**Maximum one-hour demand on the respective systems of Escom's undertakings, megawatt**

Undertaking	1975	1976	1977	1978	1979	1980	Percentage increase 1980/79	Average yearly increase over 5 years per cent
Border . . . . .	127,0	145,0	152,2	168,0	175,3	176,6	0,7	6,8
Cape Eastern . . . . .	5,2	5,7	6,8	7,0	7,2	7,7	6,9	8,2
Cape Northern . . . . .	249,5	273,2	299,4	363,0	432,6	464,9	7,5	13,3
Cape Western . . . . .	807,0	882,0	890,0	943,0	922,3	1 005,2	9,0	4,5
Eastern Transvaal . . . . .	1 019,8	1 197,1	1 316,3	1 464,7	1 715,9	2 047,8	19,3	15,0
Natal . . . . .	1 498,0	1 618,0	1 761,0	1 962,0	2 167,4	2 211,0	2,0	8,1
Orange River . . . . .	135,2	179,9	160,2	157,0	184,0	199,7	8,5	8,1
Rand and O.F.S. . . . .	5 455,5	6 074,8	6 363,2	6 720,0	7 468,3	7 965,4	6,7	7,9
<b>Aggregate of non-simultaneous maximum demands . . . . .</b>	<b>9 297,2</b>	<b>10 375,7</b>	<b>10 949,1</b>	<b>11 784,7</b>	<b>13 073,0</b>	<b>14 078,3</b>	<b>7,7</b>	<b>8,7</b>
<b>Maximum simultaneous one-hour demand on total Escom system MW . . . . .</b>	<b>1975 09h00 24/7/75</b>	<b>1976 09h00 23/6/76</b>	<b>1977 09h00 12/8/77</b>	<b>1978 09h00 23/6/78</b>	<b>1979 09h00 26/7/79</b>	<b>1980 09h00 18/7/80</b>	<b>6,3</b>	<b>8,3</b>
	9 185	10 085	10 735	11 490	12 855	13 668		

# Sent-out capacity of Escom power stations



## Performance and maintenance

The average availability of generating plant decreased from 78,8 per cent in 1979 to 74,7 per cent in 1980. This was mainly the result of commissioning problems with the new 600 MW sets at Matla and Duvha power stations. Some technical problems were also encountered at the older power stations, Arnot and Kriel. Although plant availabilities in South Africa still compare favourably with those of electric power utilities elsewhere in the world, planned maintenance lags behind. The situation is further aggravated by a skilled manpower shortage, as reported elsewhere.

The overall thermal efficiency of the coal-fired power stations was 29,6 per cent in 1980, compared to 29,2 per cent in 1979. This improvement arises mainly from the introduction of new, more efficient plant.

Kriel power station (completed in 1979) sent out a record 16 428 million kWh of electricity during the year representing about 20 per cent of the total output of the system. Two other stations — Arnot and Hendrina — produced more than 10 000 million kWh each.

## Coal supplies

Coal supplies to Escom's power stations generally remained at a satisfactory level during the year. About 46,8 million tons of coal were burnt in 1980, an increase of 8,1 per cent over the consumption for 1979. The energy sent out from the coal-fired power stations increased by 10,5 per cent in 1980, which met 88,5 per cent of the gross energy demand on the entire Escom power system.

The average cost of coal consumed in Escom power stations during 1980 increased to R8,12 per ton, 16,7 per cent higher than in 1979.

The 50 per cent reduction in power import from Cahora Bassa from mid-June to the end of September, and the subsequent total loss during December 1980 as well as problems at newly commissioned plant, placed an extra burden on all coal-fired power stations. The higher merit stations had to burn 3,9 million tons (9,7 per cent) more coal and the lower merit stations 0,5 million tons (21 per cent) more than planned.



The big new collieries most recently brought into production achieved the following outputs during 1980:

Kriel 8,5 million tons

Matla 2,6 million tons

Duvha 1,8 million tons.

At full production, each of these collieries is expected to produce between 8 and 10 million tons of coal annually.

Coal quality is an important aspect when considering security of supply. Escom is actively exploring ways in which to enable its new power stations to consume lower quality coal and thus to improve its utilization of the country's prime source of energy. However, existing power stations are sensitive to deterioration in quality below design standards. Reference to Statement 4 (pages 52-53) will show that coal with a heat content of less than 17 MJ/kg was burnt in two stations, namely Highveld and Taaibos. The abrasiveness of the coal supplied to Arnot has caused several problems. Other stations have experienced difficulties from time to time when either the volatile content or the ash fusion temperature of the coal has fallen below design levels.

Despite this the average heat content of all coal used in Escom power stations increased marginally during 1980 to 21,34 MJ/kg when compared with the 1979 average of 21,22 MJ/kg. The contribution made to this situation by Duvha colliery was significant.

## **Water supplies**

The overall specific water consumption by Escom power stations in 1980 was 2,61 litres per kW.h sent out as compared to 2,77 in 1979. This improvement of more than 6 per cent is mainly due to the increased electricity output of new power stations which operate at higher water usage efficiencies. Successful measures to recirculate water to a greater degree in the older stations also contributed to the reduced water usage.

Although generation from the Orange River hydro stations was lower than in 1979 (the level of the Hendrik Verwoerd Dam during December was considerably lower than it had been for the last five years), their contribution during peak periods remained significant.

The advantage of the country's large water schemes was highlighted when operating conditions required the transfer of water between Kriel and Matla during the winter. This was feasible as the cross-connection between the Usutu and Vaal Rivers had been effected earlier in the year.

With the multipurpose water schemes the utilization of South Africa's meagre water resources is greatly improved. Even so, water supplies are limited and Escom will in future have to look increasingly to dry-cooling as a means to conserve this scarce commodity.

## Power stations under construction

Plant with a generating capacity of 2 400 MW (1 600 MW in 1979) was taken into service during 1980. Escom's total generating capacity is now 18 349 MW (sent-out capacity 17 339 MW).

## **Drakensberg pumped-storage scheme**

This four-set station with an ultimate capacity of 1 000 MW, construction of which started in January 1975, is a joint project by Escom and the Department of Water Affairs, Forestry and Environmental Conservation. In addition to pumped-storage duties for Escom, water will be pumped for the Department from the Tugela River over the Drakensberg mountain range to supplement the water supply of the Vaal River.

During the year the concreting operations of the waterway

tunnels and grouting of the pressure tunnel supplying sets 1 and 2 were completed. The erection of the first pump-turbine is complete and the installation of the associated direct-coupled generator-motor is under way. Progress on the other three sets and associated equipment is on schedule.

During the year, the Department completed the construction of the Kilburn and Driekloof Dams for the lower and upper reservoirs. Building of the Kilburn low-lift pumping station was also completed.

Commissioning of the waterways will take place in January 1981 and the first set is scheduled for commercial service in May 1981, the other three sets following at four-monthly intervals.

### **Matla power station**

Construction of this station, situated in the Bethal area, started in October 1974. It will ultimately comprise six 600 MW sets.

The first three sets are now in commercial operation (sets 2 and 3 having been completed in 1980). The last three sets are on programme and should be operational in 1981, 1982 and 1983 respectively.

In August 1980, the flue for the sixth boiler, contained in a multi-flue chimney serving the second half of the station, collapsed killing two persons and hospitalizing seven. The other two flues were also damaged. The cause of failure has not yet been finally established but from exhaustive investigations it appears unlikely that it was due to faulty design. Inspection of the rubble and testing of cores taken from the structure is continuing while, in the meantime, a temporary mild steel chimney is being erected for set 4. Commissioning dates have not been affected.

### **Duvha power station**

Construction of this six-set 3 600 MW power station started in November 1975 and good progress has been made. During the year under review two 600 MW sets were taken into commercial service. Set 1, scheduled for completion in September 1979, was delayed by technical problems and did not enter commercial operation until August 1980. However, set 2 duly met its commercial operation date of October 1980.

The construction work on the remaining sets is proceeding ahead of programme and it is expected that set 3 will be commissioned two months ahead of the contractual completion date of September 1981. Following increased load requirements, it has been necessary to accelerate the completion dates of sets 4, 5 and 6 by three, six and seven months respectively.

### **Koeberg power station**

Construction of Koeberg, South Africa's first nuclear power station, started in August 1976. It is situated some 30 km north of Cape Town and its two sets have a combined capacity of 1 844 MW. Progress has been satisfactory and impressive when viewed against world experience. Four years after the main contractor moved onto site, the work is still according to programme. This achievement can be attributed partly to the policy of acquiring plant which is largely identical to units previously manufactured and commissioned in the supplier's own country.

During 1980 large quantities of mechanical plant were delivered. The civil works is nearing completion and will be largely finished by the end of 1981. Dredging of the cooling-water basin is under way and the first cooling-water tests are due in the middle of 1981.

The reactor pressure vessel for the first set was delivered some months late after small defects were found between the base metal and cladding of the vessel. An extensive

**Table 6**  
**Plant taken into service and on order**

Name of power station	Plant taken into service in 1980		Plant under construction or on order at 31 December 1980		Year of completion	
	Boilers kg/s	Generators MW	Boilers kg/s	Generators MW	First set	Last set
<b>Coal-fired steam plant:</b>						
Duvha . . . . .	1 014	1 200	2 028	2 400	1980	1984
Lethabo . . . . .	—	—	1 524	1 800	1985	*1987
Matla . . . . .	1 016	1 200	1 524	1 800	1979	1983
Tutuka . . . . .	—	—	1 521	1 800	1985	*1986
<b>Pumped-storage hydro-plant:</b>						
Drakensberg . . . . .	—	—	—	1 000	1981	1982
<b>Nuclear plant:</b>						
Koeberg . . . . .	—	—	—	1 844	1982	1983

\*Date for third set.

programme of study, detection and repair of the defects was undertaken by the contractor, with substantial involvement by both Escom and the Atomic Energy Board. The result was satisfactory to all parties and the delay has been absorbed by a rearrangement of the construction sequence.

### **Tutuka power station**

This station (near Standerton) is designed for six 600 MW sets. The first three sets are scheduled to be taken into commercial operation in March 1985, December 1985 and September 1986 respectively.

Contracts for site terracing, control and instrumentation, as well as the boiler and turbo-generator units were placed in 1980. Site construction started in August 1980 and good progress with terracing has been achieved. Piling of foundations will start in February 1981, main civil works in April 1981 and erection of the structural steelwork in October 1981.

### **Lethabo power station**

This newly-announced station, to be built between Sasolburg and Vereeniging, will consist of 600 MW sets.

In July 1980 contracts were placed for boilers and turbine-generators almost identical to those of Matla power station. The first three sets are scheduled to go into commercial operation in September 1985, June 1986 and March 1987.

For this power station, eight possible sites were investigated in the region south of Vereeniging. Aspects such as potential air and water pollution in the area, geological and foundation conditions, proximity of the coal mine and various localities for the housing of employees were considered. A site in the Maccauvlei area, 8 km south of Vereeniging, was finally selected. The power station will use the conventional wet-cooling system and will draw water from the Vaal Dam.

Terracing of the site should commence in March 1981.

### **Matimba power station**

This new power station, formerly called Ilanga, will initially have a capacity of 2 400 MW which can be extended to 3 600 MW. It will be sited at Ellisras and supplied with coal from Iscor's Grootegeluk coal mine, after extraction of the metallurgical fraction of the coal. Water supplies in the area are limited and the station will be dry-cooled, reducing water

consumption by about two-thirds of the usual figure. Dry-cooling, however, results in a lower overall efficiency and coal consumption is therefore higher.

Boiler and turbine enquiries have been issued and contracts are to be placed in September 1981. The completion dates for the first three sets are September 1986, September 1987, and September 1988 respectively.

Terracing works will commence in May 1981 and construction of the foundations for the boiler house in June 1982.

# Transmission

## **Rand and O.F.S. Region**

To strengthen and consolidate the supply to the East Rand the 275/88 kV Pieterboth substation near Springs was taken into service, while the Meyerton area was reinforced by the commissioning of a 400/275 kV extension to Glockner substation.

The supply to the far West Rand was reinforced by the commissioning of the 275/132 kV Carmel substation near Welverdiend, together with two 34 km long 275 kV transmission lines from Pluto substation to Carmel.

The supply to the North Western Cape was improved by the installation of an additional 400/275 kV 400 MVA transformer at Perseus substation.

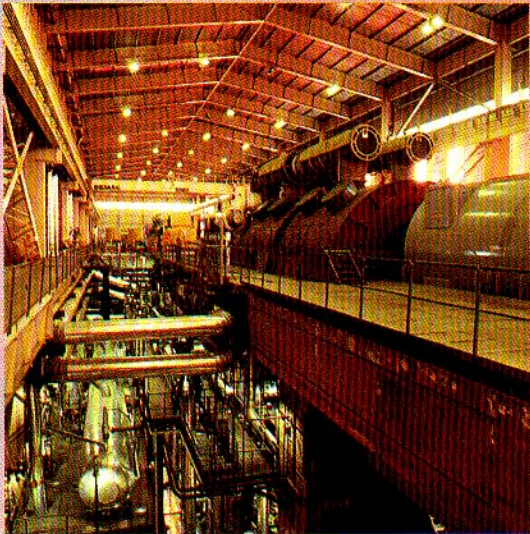
In this Region work on distribution lines and associated substations continued throughout the year and a total of 1 620 MVA of distribution transformers (2,5 MVA to 80 MVA) was installed, compared to 500 MVA added during 1979.

A large extension to Nevis substation is being constructed to integrate Matla power station into the 275 kV system.

## **Eastern Transvaal Region**

A start was made with the extensions to Sol substation which will supply the Sasol III project during 1982. The nearby 400 kV Zeus switching station was commissioned during September 1980.

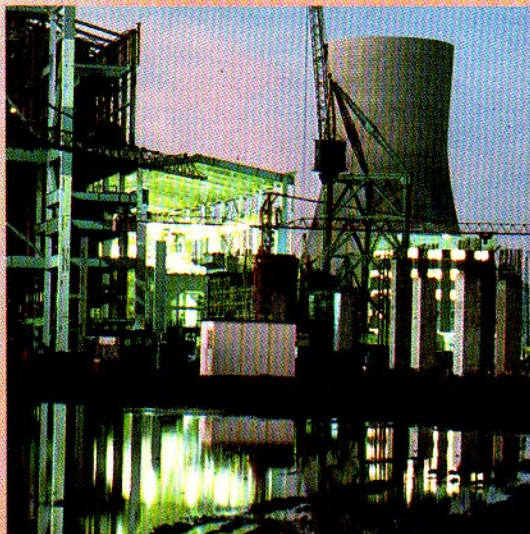
The Marble Hall and Groblersdal areas will benefit from the new Selons River 88/21 kV substation, south of Groblersdal, the reinforcement of Toitskraal 22/11 kV substation and the new 22 kV line between Toitskraal and Marble Hall.



A new turbine hall.



Koeberg nuclear power station.



Duvha power station.



Simulator at Koeberg.





**Matla power station.**

Two 160 MVA 275/88 kV transformers were installed at Camden to augment traction supplies for the South African Railways whose needs will increase after expanding the capacity of the Ermelo-Richards Bay coal line.

### Western Cape Region

In this Region numerous reticulation projects were carried out and six rural schemes were completed. The number of applications for electricity has increased steadily, both as a result of the building trade having moved out of its recession and the change-over of farmers from the use of diesel engines to Escom power.

Construction of the Droërivier-Hydra 132 kV line will start in 1981 to provide the Railways with an adequate supply for the extensive electrification of the Beaufort West-De Aar rail section. In 1981 the 128 km long, 66 kV Helios-Loeriesfontein-Calvinia transmission line will be completed which will supply these two towns.

### Natal Region

To enable the Drakensberg pumped-storage scheme to be connected into the 400 kV network, Pegasus switching station was completed as well as the 150 km long 400 kV transmission line linking the two stations. A further 160 km long 400 kV transmission line was completed which links the Scheme with Mersey substation near Pietermaritzburg.

The latter transmission line will supply Pietermaritzburg and Durban when Drakensberg is commissioned in March. During the construction of this line, the Karkloof forest had to be crossed and in order to preserve the indigenous flora, unusual construction techniques, including the services of a helicopter were used.

An additional point of supply for Durban Corporation, Escom's largest consumer, was established during the year at Illovo substation.

### Northern Cape Region

Work on a project to provide a 220 kV double circuit transmission line from Aggeneis to the SWA Namibian border

on the Orange River, capable of delivering 200 MW to Swawek, is now in progress.

Carnarvon Municipality with a present demand of about 500 kVA will take supply during April 1981 over a new 66 kV extension from a 132/66 kV substation to be built at Cuprum substation near Copperton.

### Eastern Cape Region

The Border Undertaking previously had furnished individual supplies to the municipalities of Umtata, Butterworth and Idutywa and to other consumers in the Transkei, but from July 1980 the newly formed Transkei Electricity Supply Corporation (Tescor) took a bulk supply while Escom's assets in the Transkei were transferred to it. Tescor has completed the first phase of its hydro generation scheme near Umtata and with the expansion of this scheme, Escom's sales to them will be reduced.

Supplies were also made available to the Black townships of Mdantsane near East London and Ntselemanzi near Alice.

In the Orange River Undertaking supplies were made available to the municipalities of Dordrecht, Strydenburg and Aberdeen in 1980. Supplies will also be given to the municipalities of Indwe, Ugie and Maclear.

### Rural supplies

As a result of the increase in the price of liquid fuels the pressure from farmers wishing to convert to electricity continued in 1980. Despite acute shortages of personnel, particularly for investigation and planning new schemes, Escom connected a total of 3 551 new farming supplies during 1980 compared with 1 818 in 1979. At present 45 156 farm supplies are connected to the Escom system. A number of new schemes have not yet been investigated, while many farmers who have accepted Escom's terms will not receive supply for some time, in some cases well in excess of a year. During the year 640 Escom offers of supply were refused.

**Table 7**  
**Total number of farm supplies at the year end**

Undertaking	1975	1976	1977	1978	1979	1980	Percentage increase 1980/79	Average yearly increase over 5 years per cent
Border . . . . .	805	864	940	1 000	1 054	1 135	7,7	7,1
Cape Eastern . . . . .	511	525	512	521	535	561	4,9	1,9
Cape Northern . . . . .	2 336	2 497	2 614	2 831	3 149	3 801	20,7	10,2
Cape Western . . . . .	7 533	7 959	9 158	9 246	9 473	10 017	5,7	5,9
Eastern Transvaal . . . . .	4 474	4 864	5 284	5 608	5 906	6 495	10,0	7,7
Natal . . . . .	6 150	6 752	7 280	7 700	8 034	8 571	6,7	6,9
Orange River . . . . .	173	197	207	225	234	328	40,2	13,6
Rand and O.F.S. . . . .	10 065	11 003	12 015	12 656	13 220	14 248	7,8	7,2
<b>Total . . . . .</b>	<b>32 047</b>	<b>34 661</b>	<b>38 010</b>	<b>39 787</b>	<b>41 605</b>	<b>45 156</b>	<b>8,5</b>	<b>7,1</b>

Farm supplies include supplies which are furnished to agricultural holdings and small holdings and which are primarily used for farming purposes.

**Table 8**  
**Average monthly employee complements**

	1979	Percentage increase during 1979	1980	Percentage increase during 1980
Salaried . . . . .	9 320	4,8	10 429	11,9
Monthly paid . . . . .	6 030	0,5	6 232	3,3
Hourly paid . . . . .	26 960	5,1	29 189	8,3
<b>Total . . . . .</b>	<b>42 310</b>	<b>4,3</b>	<b>45 850</b>	<b>8,4</b>

# Manpower

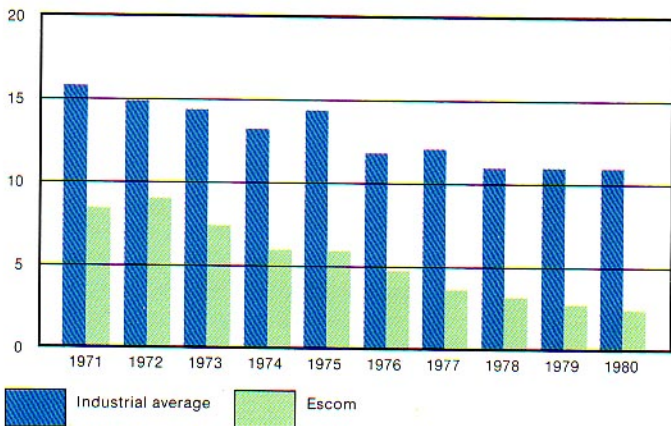
In 1980 Escom continued to experience serious manpower shortages virtually in all skilled categories of employment. The general manpower shortage in South Africa and vigorous competition among employers considerably restricted recruitment.

To alleviate the situation, Escom's manpower plan was extended, refined and further integrated with other planning actions in Escom. This includes strategies such as intensified recruitment, accelerated training programmes, career and succession planning, better utilization of manpower, sound labour relations and a competitive remuneration package.

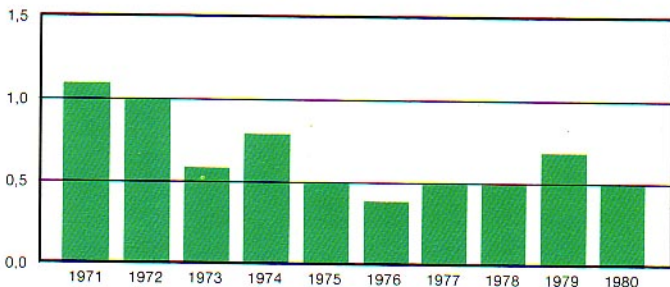
Escom has to rely increasingly on the education and training of its own personnel and during the year new courses for inter alia supervisors, plant operators, line workers and substation erectors were developed. The number of employees who were enrolled for training courses increased substantially. There were also more full-time trainees such as pupil technicians and apprentices, and university bursars.

Escom continued its negotiations with trade unions to accomplish better utilization of manpower of all population

**Number of disabling injuries per million man-hours worked**



**Number of fatal accidents per five million man-hours worked**



groups, more specifically in respect of maintenance, operations and construction personnel.

Sound labour relations prevailed during the year. Communication between Escom, the trade unions, employees in general and individual workers in particular was streamlined to keep pace with the latest developments on the labour front.

## **Housing**

Future provision of accommodation for power station employees will, as far as practicable, be within the municipal boundaries of nearby towns. Not only will this contribute to the development of such towns and strengthen the infrastructure of the country, but unnecessary duplication of services will be eliminated.

The new power stations Tutuka, Lethabo and Matimba will each require about 600 houses for operating staff.

It has always been Escom's policy to provide, as far as possible, single and married quarters for all its operating staff. During the past year 272 houses were constructed of which 92 were erected in the Scottsdene Coloured township in the Cape. Coloured employees will have the opportunity of purchasing these houses under Escom's Home Ownership Scheme.

The first stage of Koeberg township is nearing completion and will comprise 349 houses, flats, single quarters and recreational facilities.

## **Occupational accident prevention**

The past year saw the lowest injury rate ever experienced by Escom, i.e. 2,7 disabling injuries per million manhours worked. This is approximately 25 per cent of the national industrial average for the Republic of 11,1 per million manhours.

The number of fatal occupational accidents experienced by Escom decreased from 0,7 in 1979 to 0,5 fatal accidents per five million manhours worked.

The reduction in the occupational accidents rate experienced by contractors engaged in the construction of new power stations and facilities was not maintained during 1980. The rate increased from 5,6 to 7,6 lost time injuries per million manhours worked. This rate however still compares favourably with the national construction average of 18,3.

## Environment

Escom is paying continued attention to the reduction of air pollution at its existing power stations. The only modern pulverised fuel power stations not yet fully equipped with electrostatic precipitators are Ingagane and Komati, but both will be fully converted by 1983 and 1984 respectively. Smoke opacity monitors will be installed at all power stations to provide a continuous check on smoke emission.

Special environmental impact studies are undertaken before selecting a new power station site. In this manner sites were chosen during the year for Escom's proposed Tutuka, Lethabo and Matimba power stations in co-operation with appropriate statutory and other interested bodies. Attention is also given to the visual impact of the power station once construction work has been completed. Studies are now under way in respect of master landscaping plans and other rehabilitation procedures.

Progress with strip mine rehabilitation has been good. For the first time a larger area has been restored than has been disturbed by strip mining in the corresponding period. To date approximately 550 hectares of rehabilitated land have

been successfully transformed into permanent pastures. Sheep, cattle, goats and game have been introduced to these rehabilitated areas and together with the sale of hay will ensure optimum utilization of such areas until private farming operations can be reverted to. Regulatory measures introduced during March 1980 requiring higher rehabilitation standards, have increased the cost of rehabilitation by 20 per cent.

Instead of disposing of ash resulting from the burning of coal in the conventional manner by deposition in the form of a slurry, Escom is investigating means for handling the ash in a semi-dry state and returning it to the open-cast mining areas at the Lethabo and Matimba power stations.

## **Technical advances**

The high growth rate in the demand for electricity and the obvious parameters within which this has to be achieved, have given rise to numerous research and development projects to rationalize future electricity supply, reduce costs and increase efficiency and productivity. Escom not only keeps abreast of international technological development in power supply, but is, by virtue of its rapid growth, developing techniques and expertise which make it one of the world's leading power utilities.

## **Standardization**

Civil engineering designs, layouts and specifications are being standardized wherever possible. This means greater efficiency in the draughting and design areas, while feedback from site as to the strengths or shortcomings of the design allows refinement within the overall standard concept. This results not only in more efficient designs, but contributes to a saving in manpower. Computer-aided design helps engineers in both the reinforced concrete and structural steel groups to utilize their time to the best advantage.

## **Dry cooling**

Escom is one of the world's acknowledged leaders in the field of applied dry cooling, and the new multi-600 MW set Matimba power station will be the largest single dry-cooled installation in the world. This method increases both power station and operating costs by about 7 per cent, and is only adopted where there is insufficient water for wet cooling.

Because of South Africa's limited water resources, Escom has since the 1960s improved dry-cooling techniques to such an extent that the latter can be used successfully for future power stations. In this respect our first 200 MW dry-cooled sets installed at Grootvlei some years ago have played a dominant part.

## **Fuel-oil conservation programme**

All major power stations operated by Escom burn pulverised coal as the main fuel, but a certain amount of fuel oil is still used to light up the boilers and stabilize the combustion when required. Until 1978 diesel fuel oil was used almost exclusively for this purpose. Steps were initiated in the same year to reduce the consumption of diesel fuel oil and a saving of some 35 per cent has so far been achieved.

In 1979 an intensive investigation was undertaken and is currently in progress to modify the existing oil plant at most of the stations to permit instead the use of a distilled coal tar fuel available from Sasol, referred to as light oil 6, as well as a full range of fuels derived from imported crude, including medium and heavy bunker fuel oils.



With a local boiler manufacturer Escom has also developed an experimental ignition burner firing pulverised coal rather than fuel oil. If successful, this burner will virtually eliminate the use of liquid fuels. The first such burner has been installed at Kriel power station and tests are currently being conducted.

### **800 kV transmission**

With the introduction of an 800 kV transmission system in the mid-1980s sulphur hexafluoride ( $\text{SF}_6$ ) gas-insulated switchgear of a size and with features as yet in the development stage, will be used extensively. The associated transformers will have ratings of 2 000 MVA, twice the size of the largest units in service on the 400 kV system.

The new 800 kV transmission lines will require novel approaches to some of the traditional methods used in the past. For example, guyed towers and synthetic insulation systems are being studied. Research is being carried out to assess the effects of high altitude operation on insulation strength, corona, audible noise and radio and television interference.

### **Static compensators**

Valuable experience has been gained with a static compensator installed in 1978 on the 132 kV system near Sishen. Devices such as this are used for voltage control purposes and to correct for voltage imbalances caused by uneven loading of the system by certain large consumers. It is proposed to make far greater use of these devices in future on the 132 kV and 400 kV systems to further improve the quality of supply.

### **Power station auxiliaries**

Greater use of  $\text{SF}_6$  switchgear is also expected at the lower voltages. In power stations, along with vacuum circuit breakers and contactors, it will largely displace air-break switchgear.

Concern over the fire hazard of oil as an insulating medium will lead to the replacement of oil-filled transformers inside power station buildings by dry epoxy-resin insulated transformers. Paper-insulated cable, too, is likely to disappear in favour of dry dielectrics such as PVC and cross-linked polyethylene, coupled with fire-retardant sheaths.

### **Protection**

In the field of electrical protection and metering an increase in electronic devices and systems as well as the introduction of microprocessors are foreseen. The use of individual relays and meters largely of the electro-mechanical type will be discontinued in favour of complete schemes fully designed, equipped and supplied by manufacturers to Escom specifications.

### **Control and instrumentation**

Control and instrumentation have become increasingly complex and sophisticated.

Electronic control systems employing large-scale integrated circuits are now the order of the day with computers used for plant monitoring and as operator aids. The most up-to-date systems employ distributed hierarchical systems using microprocessors, where analogue and sequence control and plant monitoring are completely integrated, but structured to maintain plant integrity at the highest possible level. It is anticipated that this type of system will feature in Escom's Matimba power station.

Auditors' Report  
and Financial  
Statements

# Report of the auditors

The Chairman and Members  
Electricity Supply Commission  
Sandton

We have examined the financial statements of the Commission set out on pages 31 to 35 and 46. Our examination was made in accordance with generally accepted auditing standards and, accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements fairly present the financial position of the Electricity Supply Commission at 31 December 1980 and the results of its operations for the year then ended in conformity with generally accepted accounting principles applied on a consistent basis and in the manner required by the Electricity Act of 1958.

We further report that, in terms of the Electricity Act:

- (i) due provision has been made for the redemption and repayment of monies borrowed by or advanced to the Commission and the Redemption Fund has been properly maintained, and
- (ii) sums fixed by the Commission have been set aside to the Reserve Fund and Capital Development Fund.

Alex. Aiken & Carter  
Deloitte Haskins & Sells  
*Chartered Accountants (S.A.)*

Johannesburg  
25 March 1981

# Balance sheet

at 31 December 1980

		R000	
		1980	1979
<b>Fixed assets</b>	Notes		
<b>Stores and materials</b>	2	8 219 195	6 793 699
<b>Other non-current assets</b>	3	245 147	223 726
<b>Current assets</b>	4	312 548	287 829
		195 883	257 067
Accounts receivable and payments in advance		176 099	157 502
Moneys at call		19 784	94 980
Bank balances and cash		—	4 585
		8 972 773	7 562 321
<b>Financed by</b>			
<b>Loans and extended credit</b>	5	5 329 790	4 558 520
Local registered stock, bond issues and direct placings (Schedule 2)		6 424 899	5 537 564
less Escom Stock held internally	8	2 655 913	2 080 888
Import financing facilities and extended credit		3 768 986	3 456 676
Revolving credits and short-term advances		1 200 267	888 712
		360 537	213 132
<b>Current liabilities</b>		437 352	425 476
Creditors and accrued liabilities		295 051	318 546
Interest accrued		127 207	106 930
Bank overdrafts		15 094	—
<b>Total net debt</b>		5 767 142	4 983 996
<b>Statutory funds and reserves</b>		3 205 631	2 578 325
Capital reserve	6	457 138	396 834
Capital Development Fund	7	1 872 134	1 291 349
Reserve Fund	7	212 145	210 351
Redemption Fund	7	551 426	483 458
Other reserves	9	131 153	116 731
Accumulated surplus/(deficit)	10	(18 365)	79 602
		8 972 773	7 562 321

# Income statement

for the year ended 31 December 1980

		R000	
		1980	1979
Sales of electricity	Notes	1 772 000	1 529 474
Operating expenditure	11	836 306	668 268
Net operating income		935 694	861 206
less Loan charges		606 361	462 518
Loan amortisation charges		152 535	134 644
External interest and finance charges		278 411	199 123
Interest on Escom Stock held as investments of Capital Development and Reserve Funds		175 415	128 751
Amounts set aside to Capital Development and Reserve Funds in terms of Section 13 of the Electricity Act, 1958		329 333	398 688
		427 300	380 900
Net surplus/(deficit) for the year as shown in the Electricity Supply Account	10	(97 967)	17 788
Accumulated surplus at beginning of year		79 602	61 814
Accumulated surplus/(deficit) at end of year	10	(18 365)	79 602

# Statement of source and application of funds

for the year ended 31 December 1980

	R000	
	1980	1979
<b>Source of funds</b>		
<b>Funds generated internally</b>	<b>671 404</b>	<b>672 058</b>
Net surplus/(deficit)	(97 967)	17 788
Add Items not affecting the flow of funds		
Depreciation on equipment, vehicles and furniture	14 121	9 975
Loan amortisation charges	152 535	134 644
Repayment of foreign loans	45 466	44 722
Redemption of local loans	56 163	44 078
Interest on internal investments of Redemption Fund	50 906	45 844
Amounts credited to Capital Development and Reserve Funds	602 715	509 651
Contributions	427 300	380 900
Interest on internal investments	175 415	128 751
<b>Net proceeds of external finance</b>	<b>788 341</b>	<b>739 731</b>
Loans and extended credit	1 275 953	1 022 758
Repayments	(617 260)	(476 193)
Sale of Escom Stock on secondary market	506 441	533 320
Purchase of Escom Stock on secondary market	(376 793)	(340 154)
<b>Increase in net current liabilities</b>	<b>73 060</b>	<b>68 597</b>
<b>Other</b>	<b>3 028</b>	<b>6 736</b>
	<b>1 535 833</b>	<b>1 487 122</b>
<b>Application of funds</b>		
Fixed assets, net	1 446 928	1 374 559
Increase in stores and materials	21 421	28 453
Deferred expenditure and deposits to secure future fuel supplies	41 465	63 356
Increase in housing loans to employees	6 626	4 370
Reserve Fund expenditure	19 393	16 384
	<b>1 535 833</b>	<b>1 487 122</b>

## Notes to the financial statements

for the year ended 31 December 1980

### 1. Accounting policies

The principal accounting policies adopted by the Commission are consistent with the previous year.

#### 1.1 Fixed assets

##### (a) Fixed assets in commission

Fixed assets in commission are not depreciated but are reflected at historical cost. Long-term loans are raised to finance these assets. Because of the correlation between the loans so raised and fixed assets, the charge to revenue for loan amortisation takes the place of depreciation.

##### (b) Works under construction

Interest and a charge for corporate overhead expenses are capitalised during the period of construction.

##### (c) Equipment, vehicles and furniture

Equipment, vehicles and furniture are depreciated at rates considered appropriate to reduce original cost to estimated residual value over the useful lives of the assets.

Certain expenditure on fixed assets as provided for in Section 13(1)(a) of the Electricity Act, 1958 is written off in full against the Reserve Fund.

**Notes (continued)**

**1.2 Stores and materials**

The basis of valuation of stores and materials excluding fuel is the lower of cost, determined on the last-in-first-out-basis, and replacement value. A provision for obsolescence is made where appropriate. Fuel stocks are valued at the three-monthly moving average delivered cost.

**1.3 Foreign currencies**

Foreign currency liabilities covered by forward exchange contracts are translated to Rand at the protected rates of exchange. Liabilities not covered by forward exchange contracts and foreign assets are translated to Rand at the rates of exchange ruling at the balance sheet date. The currencies most favourable to bondholders are used to translate loans raised in European Units of Account.

Net gains or losses arising from the translation of uncovered foreign loan balances at the rates of exchange ruling at the balance sheet date are deferred and accounted for over the remaining periods of the loans by way of a charge or credit to the income statement, whereas gains or losses on the translation of other uncovered liabilities and assets are recognised immediately as income or expense.

Premiums, net of discounts, on forward exchange cover are deferred and accounted for over the periods of the cover.

**1.4 Deferred expenditure**

Discount on loans issued is written off over the periods of the relevant loans.

Expenditure incurred to secure future fuel supplies is accumulated for amortisation once deliveries commence.

**1.5 Amortisation of borrowings**

A Redemption Fund has been established in terms of the Electricity Act, 1958 and provision for the redemption of local loans is made over periods not exceeding 25 years.

The State President, in terms of Section 10(2) of the Act, has directed that the provisions relating to the establishment of the Redemption Fund should not apply to foreign loans. Provision for repayment of such loans is made over periods not exceeding 25 years.

The Redemption Fund provisions are not applied to revolving credits and short-term advances, as these are made under the provisions of paragraph 1(3) of the Schedule to the Act.

**1.6 Operating revenue and expenses**

Meters are read on a cyclical basis and sales of electricity are accounted for concurrently. The revenue related to supplies between the date of the last reading and the end of the accounting period is not included in sales, whereas the related expenses are charged as incurred.

	R000		
	1980	1979	
<b>2. Fixed assets</b>			
Assets in commission, at cost			
Land and rights	78 300	71 893	
Buildings and facilities	475 624	380 829	
Production plant	5 050 114	3 802 780	
Total in commission	5 604 038	4 255 502	
Works under construction	2 544 790	2 481 627	6 737 129
Equipment, vehicles and furniture, at cost	132 001	105 844	
less Accumulated depreciation	61 635	70 367	49 274
	8 219 195	6 793 699	
<b>3. Stores and materials</b>			
Construction material	99 367		100 871
Maintenance and consumable stores	75 672		59 682
Fuel	70 108		63 173
	245 147		223 726
<b>4. Other non-current assets</b>			
Listed investments held for			
Reserve Fund (Schedule 4)	6 380		7 789
Redemption Fund (Schedule 5)	790	7 170	863
Housing loans to employees secured by first mortgage		45 759	39 133
Amounts owing in respect of reticulation systems sold		4 195	2 012
Deferred expenditure			
Discount on loans issued	75 427		71 460
Unrealised exchange losses on foreign liabilities	—		28 040
Expenditure and deposits to secure future fuel supplies	179 997	255 424	138 532
	312 548		287 829

	1980	R000	1979
<b>5. Loans and extended credit</b>			
The current portion (excluding revolving credits) included in loans and extended credit amounts to approximately	<b>316 000</b>		<b>371 000</b>
Borrowings in the following currencies are not covered by forward exchange contracts:			
	1980		1979
European units of account	8 030 000		10 560 000
Maltese Pounds	5 000 000		5 000 000
Deutsche Marks	8 689 000		479 000
Pounds Sterling	142 000		—
USA Dollars	32 092 000		—
French Francs	8 142 000		—
Swiss Francs	5 574 000		—
Japanese Yen	162 811 104		—
In accordance with the provisions of the Electricity Act, stock issued in respect of local loans raised, together with interest thereon, has a first charge on all the assets of the Commission.			
<b>6. Capital reserve</b>			
Loans repaid	550 692		483 325
Production plant financed from Reserve Fund	10 360		10 360
	<b>561 052</b>		<b>493 685</b>
less Cost of commissioned assets scrapped or sold	103 914		96 851
	<b>457 138</b>		<b>396 834</b>

**7. Statutory funds**

The statutory funds are credited with amounts as provided for in the Electricity Act. These amounts are invested mainly in Escom Stock and the interest accrues to the respective funds.

The Redemption Fund provides, on a sinking fund basis, for the repayment of local loans.

The Reserve Fund is used, when required, for the replacement of obsolete machinery or plant and generally for the betterment of plant or for or in lieu of insurance, or for exceptional repairs or emergencies.

The Capital Development Fund provides internal financing for capital expansion.

Dealings in Escom Stock, held as investments for the Funds, at prices based on interest pattern rates above coupon rates result in certain stocks being sold at less than book value. The difference on such transactions is set-off against the higher future earnings on the re-invested proceeds over the period to maturity of the original investment.

To the extent that the difference has been deferred, the amounts available for investment are reduced as follows:

	1980	R000	1979
Capital Development Fund (Schedule 7)	1 886 333		1 300 406
Difference between book value and proceeds of stock sold	14 199		9 057
	<b>1 872 134</b>		<b>1 291 349</b>
Reserve Fund (Schedule 8)	224 081		224 151
Difference between book value and proceeds of stock sold	11 936		13 800
	<b>212 145</b>		<b>210 351</b>
Redemption Fund (Schedule 9)	583 791		510 318
Difference between book value and proceeds of stock sold	32 365		26 860
	<b>551 426</b>		<b>483 458</b>

## Notes (continued)

		R000			
		1980		1979	
8. Escom Stock held for	Schedule	Book Value	Nominal Value	Book Value	Nominal Value
Capital Development Fund . . . . .	3	1 867 148	1 889 226	1 354 845	1 367 864
Reserve Fund . . . . .	4	197 705	207 113	202 843	212 286
Redemption Fund . . . . .	5	547 051	551 287	486 674	495 270
Repayment of foreign loans . . . . .	6	8 332	8 287	4 822	5 468
		<u>2 620 236</u>	<u>2 655 913</u>	<u>2 049 184</u>	<u>2 080 888</u>
Excess of nominal over book value . . . . .			<u>35 677</u>		<u>31 704</u>
<b>9. Other reserves</b>					
Amounts set aside for repayment of foreign loans . . . . .			88 981		83 015
Difference between nominal and book values of Escom Stock held internally . . . . .			35 677		31 704
Deferred proceeds of reticulation systems sold . . . . .			4 195		2 012
Unrealised exchange profits on foreign liabilities . . . . .			2 300		—
			<u>131 153</u>		<u>116 731</u>
<b>10. Accumulated surplus/(deficit)</b>					
In terms of the Electricity Act, 1958, electricity is supplied at prices calculated to cover operating expenditure, loan amortisation charges and amounts to be set aside to the Capital Development and Reserve Funds. The surplus or deficit in any financial year is carried forward and taken into account when charges are adjusted from time to time.					
A detailed analysis of the revenue and charges for each undertaking of the Commission is given in the Electricity Supply Account (Schedule 1).					
<b>11. Operating expenditure includes</b>					
Leasing charges on equipment . . . . .			4 685		5 451
Commitment fees with regard to overdrafts and other credit facilities . . . . .			3 637		2 932
Depreciation of equipment, vehicles and furniture . . . . .			14 121		9 975
<b>12. Commitments</b>					
The Commission is committed for					
1. Capital expenditure contracted for, excluding contract price adjustments and general sales tax, amounting to approximately . . . . .			2 782 000		1 539 000
This expenditure will be financed from external borrowings and from cash generated internally.					
2. Payment in respect of housing loans granted to employees of approximately . . . . .			3 500		1 926
3. Payment to the Electricity Supply Commission Pension and Provident Fund, in addition to the normal contributions, of R191 000 p.a. to 1985 . . . . .			955		1 146
4. The purchase of R2 000 000 - 6,75 per cent 1991 Electricity Supply Commission Local Registered Stock at the option of the stockholder for . . . . .			1 940		1 940
<b>13. Contingent liabilities</b>					
The Commission has indemnified the Electricity Supply Commission Pension and Provident Fund against any loss resulting from the negligence, dishonesty or fraud of the Fund's officers or of the Trustees.					
<b>14. Post balance sheet events</b>					
Subsequent to 31 December 1980 arrangements have been made for the refund to the Commission of an amount of R37 371 000 in respect of expenditure incurred to secure future fuel supplies. The Commission has the right, at any mutually agreeable time, to revert to the original financial arrangements under the agreement concerned.					



# Electricity supply account

for the year ended 31 December 1980

R000

1979		1980							
		Total	Corporate Services	Central Generating	Distribution				
						Total	Cape Western	Cape Northern	Cape Eastern
<b>1 529 474</b>	<b>Electricity sold</b>	<b>1 772 000</b>	—	—	<b>1 772 000</b>	<b>159 977</b>	<b>81 034</b>	<b>1 767</b>	<b>29 206</b>
519 943	Industrial	594 985	—	—	594 985	54 901	6 780	1 092	4 018
451 642	Bulk	539 187	—	—	539 187	63 103	11 696	521	23 734
415 469	Mining	479 855	—	—	479 855	—	45 632	—	—
104 984	Traction	119 238	—	—	119 238	18 957	15 303	—	—
37 436	Domestic and lighting	38 735	—	—	38 735	23 016	1 623	154	1 454
<b>668 268</b>	<b>Operating expenditure</b>	<b>836 306</b>	<b>48 525</b>	<b>661 590</b>	<b>126 191</b>	<b>23 471</b>	<b>8 296</b>	<b>521</b>	<b>5 373</b>
352 117	Operations	461 592	543	459 189	1 860	194	141	—	77
91 887	Maintenance	98 830	439	63 427	34 964	5 366	1 592	238	1 338
36 061	Electricity purchased	35 806	—	35 806	—	—	—	—	—
188 203	Administration and general expenses	240 078	47 543	103 168	89 367	17 911	6 563	283	3 958
<b>462 518</b>	<b>Loan charges</b>	<b>606 361</b>	<b>8 459</b>	<b>459 897</b>	<b>138 005</b>	<b>20 640</b>	<b>17 048</b>	<b>461</b>	<b>4 783</b>
373 718	Interest and finance charges	504 732	7 624	378 586	118 522	18 008	15 270	413	4 294
44 078	Redemption of local loans	56 163	835	35 995	19 333	2 632	1 778	48	489
44 722	Repayment of foreign loans	45 466	—	45 316	150	—	—	—	—
<b>380 900</b>	<b>Contributions to funds</b>	<b>427 300</b>	—	<b>895</b>	<b>426 405</b>	<b>30 047</b>	<b>12 550</b>	<b>166</b>	<b>4 390</b>
900	Reserve Fund	900	—	895	5	1	—	1	1
380 000	Capital Development Fund	426 400	—	—	426 400	30 046	12 550	165	4 389
—	<b>Distribution of costs</b>	—	(56 984)	(1 122 382)	<b>1 179 366</b>	<b>99 431</b>	<b>45 659</b>	<b>690</b>	<b>14 831</b>
—	Corporate burden	—	(56 984)	41 427	15 557	2 148	1 436	40	405
—	Interconnectors	—	—	2 698	(2 698)	—	—	—	—
—	Use of circuits	—	—	—	—	—	320	18	99
—	Transmission costs	—	—	(34 172)	34 172	15 708	7 373	77	1 050
—	Pooled generation	—	—	(1 132 335)	1 132 335	81 575	36 530	555	13 277
<b>1 511 686</b>	<b>Total charges against revenue</b>	<b>1 869 967</b>	—	—	<b>1 869 967</b>	<b>173 589</b>	<b>83 553</b>	<b>1 838</b>	<b>29 377</b>
17 788	Surplus/(Deficit) for the year	(97 967)	—	—	(97 967)	(13 612)	(2 519)	(71)	(171)
61 814	Accumulated surplus/(deficit) at beginning of year	79 602	—	—	79 602	8 656	6 049	(16)	1 201
<b>79 602</b>	<b>Accumulated surplus/(deficit) at end of year</b>	<b>(18 365)</b>	—	—	<b>(18 365)</b>	<b>(4 956)</b>	<b>3 530</b>	<b>(87)</b>	<b>1 030</b>

## R000

1979

Undertakings				Corporate Services	Central Generating	Distribution Undertakings								
Orange River	Natal	Eastern Transvaal	Rand and O.F.S.			Total	Cape Western	Cape Northern	Cape Eastern	Border	Orange River	Natal	Eastern Transvaal	Rand and O.F.S.
29 930	272 671	252 678	944 737	—	—	1 529 474	138 950	71 983	1 513	25 745	23 842	241 490	219 440	806 511
1 892	96 653	161 766	267 883	—	—	519 943	49 614	5 334	928	3 322	1 177	87 076	136 714	235 778
28 018	131 397	22 323	258 395	—	—	451 642	52 662	10 328	443	21 098	22 655	115 490	20 359	208 607
—	7 439	52 755	374 029	—	—	415 469	—	39 627	—	—	—	6 374	46 577	322 891
—	32 306	14 816	37 856	—	—	104 984	16 362	15 312	—	—	—	27 623	14 884	30 803
20	4 876	1 018	6 574	—	—	37 436	20 312	1 382	142	1 325	10	4 927	906	8 432
3 117	23 064	19 116	43 233	34 177	534 851	99 240	18 572	6 627	410	4 388	2 487	17 654	14 163	34 939
75	366	280	727	538	350 313	1 266	135	117	—	65	63	280	161	445
725	5 447	7 986	12 272	196	64 268	27 423	4 309	1 374	182	1 217	550	4 713	5 344	9 734
—	—	—	—	—	36 061	—	—	—	—	—	—	—	—	—
2 317	17 251	10 850	30 234	33 443	84 209	70 551	14 128	5 136	228	3 106	1 874	12 661	8 658	24 760
4 134	14 963	23 726	52 250	7 846	324 268	130 404	17 221	15 478	388	4 282	3 793	15 563	21 925	51 754
3 695	12 362	20 378	44 102	7 092	253 391	113 235	15 051	13 838	344	3 838	3 378	13 053	19 074	44 659
439	2 451	3 348	8 148	754	26 305	17 019	2 170	1 640	44	444	415	2 360	2 851	7 095
—	150	—	—	—	44 572	150	—	—	—	—	—	150	—	—
6 294	68 141	62 773	242 044	—	—	380 900	26 375	11 166	140	4 097	5 732	61 746	55 165	216 479
1	1	—	—	—	—	900	—	—	—	200	200	500	—	—
6 293	68 140	62 773	242 044	—	—	380 000	26 375	11 166	140	3 897	5 532	61 246	55 165	216 479
16 374	192 299	164 928	645 154	(42 023)	(859 119)	901 142	77 247	36 371	511	12 034	12 486	147 631	120 795	494 067
365	1 903	2 467	6 793	(42 023)	28 500	13 523	1 774	1 294	34	395	315	1 748	2 206	5 757
(930)	—	(182)	(1 586)	—	2 623	(2 623)	—	—	—	—	(933)	—	(182)	(1 508)
(117)	—	—	(320)	—	—	—	—	320	18	121	(140)	—	(2)	(317)
1 628	7 614	18	704	—	(28 893)	28 893	13 855	7 264	64	1 287	1 740	3 853	27	803
15 428	182 782	162 625	639 563	—	(861 349)	861 349	61 618	27 493	395	10 231	11 504	142 030	118 746	489 332
29 919	298 467	270 543	982 681	—	—	1 511 686	139 415	69 642	1 449	24 801	24 498	242 594	212 048	797 239
11	(25 796)	(17 865)	(37 944)	—	—	17 788	(465)	2 341	64	944	(656)	(1 104)	7 392	9 272
(9 324)	53 617	10 334	9 085	—	—	61 814	9 121	3 708	(80)	257	(8 668)	54 721	2 942	(187)
(9 313)	27 821	(7 531)	(28 859)	—	—	79 602	8 656	6 049	(16)	1 201	(9 324)	53 617	10 334	9 085

# Borrowings

at 31 December 1980

Schedule 2

R000						R000					
Loan	R000	Per cent	Repayment date/s	Out-standing	1979	Loan	R000	Per cent	Repayment date/s	Out-standing	1979
<b>Internal registered stock</b>						<b>Brought forward</b>					
33	16 000	4,625	1975/80	—	16 000	103	24 000	8	1998	24 000	24 000
34	16 000	4,875	1975/80	—	16 000	104	6 000	7,625	1998	6 000	6 000
35	16 500	5,125	1976/81	16 500	16 500	106	45 000	8	1998	45 000	45 000
36	20 000	5,125	1977/82	20 000	20 000	107	27 000	9	1999	27 000	27 000
37	22 000	5,125	1976/82	22 000	22 000	108	3 000	8,5	1999	3 000	3 000
38	24 000	5,125	1977/83	24 000	24 000	110	30 000	9,5	1999	30 000	30 000
39	24 000	5,375	1978/83	24 000	24 000	111	11 000	10,75	2000	11 000	11 000
40	22 000	5,625	1979/84	22 000	22 000	112	29 000	10,75	2000	29 000	29 000
42	20 000	5,375	1979/84	20 000	20 000	113	40 000	10,75	2000	40 000	40 000
43	16 000	5,375	1979/85	16 000	16 000	114	25 000	10,75	2000	25 000	25 000
44	16 000	5,375	1980/85	16 000	16 000	115	5 000	10,25	2000	5 000	5 000
45	17 000	5,5	1980/86	17 000	17 000	116	30 000	10,75	2000	30 000	30 000
46	16 000	5,875	1981/86	16 000	16 000	117	5 000	10,875	1985	5 000	5 000
47	18 000	6,25	1981/86	18 000	18 000	118	55 000	11	2000	55 000	55 000
49	18 000	6,125	1982/87	18 000	18 000	119	10 000	10,75	1980/95	10 000	10 000
50	22 000	5,25	1982/87	22 000	22 000	120	4 000	11	1986	4 000	4 000
51	29 000	5	1983/88	29 000	29 000	121	40 000	11,4	2001	40 000	40 000
52	40 000	5	1980/83	40 000	40 000	122	6 000	11,1	1981/96	6 000	6 000
53	20 000	5	1982/84	20 000	20 000	123	40 000	12,75	1996	40 000	40 000
54	20 000	5,5	1982/84	20 000	20 000	124	10 000	12,65	1986	10 000	10 000
55	32 000	5,875	1983/85	32 000	32 000	125	20 000	12,45	1981	20 000	20 000
56	38 000	6,5	1983/85	38 000	38 000	126	40 000	12,5	2001	40 000	40 000
58	30 000	6,5	1989/91	30 000	30 000	127	150 000	12,6	1999	150 000	150 000
60	35 000	6,75	1991	35 000	35 000	128	20 000	12,45	1987	20 000	20 000
61	35 000	6,875	1992	35 000	35 000	129	80 000	12,15	1982	80 000	80 000
64	12 000	6,5	1992	12 000	12 000	130	50 000	11,5	1989	50 000	50 000
65	37 000	6,875	1992	37 000	37 000	131	250 000	11,15	2002	250 000	250 000
70	10 000	6,5	1993	10 000	10 000	132	250 000	11,75	2002	250 000	250 000
71	70 000	6,875	1993	70 000	70 000	133	60 000	10,9	1988	60 000	60 000
75	22 000	6,5	1993	22 000	22 000	134	170 000	10,75	2003	170 000	170 000
76	48 000	6,875	1993	48 000	48 000	135	270 000	11,3	2003	270 000	270 000
78	20 000	6,5	1994	20 000	20 000	136	7 800	7,25	1985/87	7 800	7 800
79	30 000	6,875	1994	30 000	30 000	137	60 000	9,7	1986	60 000	60 000
81	10 000	6,5	1994	10 000	10 000	138	150 000	9,7	2003	150 000	150 000
82	25 000	6,875	1994	25 000	25 000	139	340 000	10,25	2003	340 000	340 000
83	18 000	7,5	1995	18 000	18 000	140	120 000	8	1986	120 000	120 000
84	3 000	7	1995	3 000	3 000	141	130 000	8,65	2004	130 000	130 000
85	35 000	8,75	1995	35 000	35 000	142	350 000	9,15	2004	350 000	350 000
86	10 000	8,5	1995	10 000	10 000	143	50 000	7,55	1985	50 000	50 000
87	45 000	9,25	1996	45 000	45 000	144	130 000	9,05	2005	130 000	130 000
88	10 000	8,75	1996	10 000	10 000	145	270 000	9,55	2005	270 000	270 000
89	20 000	9,25	1996	20 000	20 000	146	70 000	8,1	1987	70 000	—
90	30 000	9,25	1996	30 000	30 000	147	100 000	9,05	1992	100 000	—
91	10 000	8,75	1996	10 000	10 000	148	100 000	9,05	2005	100 000	—
92	20 000	9,25	1997	20 000	20 000	149	230 000	9,55	2005	230 000	—
93	22 000	9,125	1997	22 000	22 000	150	150 000	10,25	1990	150 000 (a)	—
94	5 000	8,75	1997	5 000	5 000	151	275 000	10,95	2004	275 000 (b)	—
95	25 000	8,5	1997	25 000	25 000						
96	28 000	8,25	1997	28 000	28 000						
97	7 000	8	1997	7 000	7 000						
98	45 000	8,25	1997	45 000	45 000						
99	30 000	8,25	1998	30 000	30 000						
100	20 000	8,375	1998	20 000	20 000						
101	5 000	8	1998	5 000	5 000						
Carried forward				1 222 500	1 254 500	Carried forward				5 560 300	4 667 300
						Less payable by stockholders . . . . .				92 156	—
						150 not later than 16 January 1981 . . . . .				1 349 (a)	—
						151 not later than 16 January 1981 . . . . .				90 807 (b)	—
Carried forward				1 222 500	1 254 500	Carried forward				5 468 144	4 667 300

**Borrowings (continued)**
**R000**

Loan	Foreign currency	R000	Per cent	Repayment date/s	Out-standing	1979	
Brought forward					5 468 144	4 667 300	
<b>Foreign bond issues</b>							
001	DM	50 000 000	(8 291)	6,5	1971/80	—	892
004	DM	100 000 000	(18 034)	6,5	1974/83	5 410	7 213
005	DM	100 000 000	(19 583)	8,5	1976/85	9 791	11 750
006	UA	12 000 000	(8 263)	9,25	1971/80	—	2 536
007	DM	100 000 000	(19 556)	8	1977/86	11 734	13 689
009	UA	20 000 000	(14 210)	8,25	1972/86	13 847	19 782
013	US\$	20 000 000	(14 304)	8,5	1974/86	6 794	7 867
017	DM	100 000 000	(25 132)	6,25	1977/87	17 592	20 106
020	SF	50 000 000	(8 293)	6,5	1979/88	8 293	8 293
023	DM	100 000 000	(24 975)	7	1979/88	20 154	22 589
027	US\$	15 000 000	(10 080)	9,25	1975/89	8 064	8 400
034	US\$	25 000 000	(17 028)	10	1980	—	17 028
035	DM	100 000 000	(27 851)	9,25	1980	—	27 851
037	US\$	30 000 000	(26 119)	10,25	1979/83	8 371	12 289
123	DM	50 000 000	(24 102)	9	1984/87	25 075	—
129	DM	100 000 000	(37 682)	9,25	1987	37 682	—
<b>Direct placings</b>							
008	DM	10 000 000	(2 054)	8	1977/86	1 233	1 438
010	DM	20 000 000	(3 644)	8,5	1977/86	2 186	2 551
011	DM	20 000 000	(4 016)	8,5	1977/86	2 410	2 811
012	DM	40 000 000	(9 437)	8,5	1976/83	3 539	4 719
021	SF	50 000 000	(8 324)	6,75	1980	—	8 324
024	SF	75 000 000	(16 304)	6,5	1980	—	16 304
029	US\$	35 000 000	(23 839)	11,875	1975/82	13 311	17 879
032	SF	30 000 000	(8 003)	9	1982	8 003	8 003
033	US\$	40 000 000	(27 244)	16,125	1978/80	—	19 411
036	SF	50 000 000	(13 298)	9	1980	—	13 298
040	M£	5 000 000	(10 743)	10	1981	10 499	11 976
042	SF	50 000 000	(17 185)	7,75	1980	—	17 185
043	DM	75 000 000	(25 351)	9,75	1980	—	25 351
054	US\$	10 000 000	(8 718)	9,5625	1978/83	3 074	4 965
067	DM	30 000 000	(11 758)	8,25	1980	—	11 758
069	DM	25 000 000	(10 290)	8,25	1981	10 290	10 290
070	DM	20 000 000	(7 773)	8	1979/80	—	3 887
075	DM	20 000 000	(8 251)	8	1980/81	4 125	8 251
076	DM	20 000 000	(8 208)	8	1980/81	4 104	8 208
077	SF	80 000 000	(36 347)	7	1981	36 347	36 347
078	SF	35 000 000	(16 253)	6,75	1978/81	16 253	16 253
082	DM	101 500 000	(41 648)	11,1875	1983	41 648	41 648
084	US\$	4 000 000	(3 483)	14,125	1980	—	3 482
087	US\$	31 545 250	(27 500)	6,5	1979/81	9 000	18 000
Carried forward					5 806 973	5 159 924	

**Borrowings (continued)**
**R000**

Loan	Foreign currency	R000	Per cent	Repayment date/s	Out-standing	1979	
Brought forward					5 806 973	5 159 924	
<b>Direct placings (continued)</b>							
088/01	SF	5 000 000	(2 648)	5	1980/83	2 280	2 659
088/02	SF	4 500 000	(2 191)	5,5	1981/84	2 456	2 456
090	SF	120 000 000	(68 278)	6,25	1982	68 650	68 650
091	DM	40 000 000	(20 192)	10,5	1981/84	20 192	20 192
092	DM	20 000 000	(10 096)	8	1984	10 096	10 096
093	DM	68 500 000	(30 690)	10,875	1983	30 690	30 690
094	SF	9 000 000	(4 616)	5	1983	5 262	5 262
094A	DM	17 000 000	(7 747)	9,5	1983	8 559	8 559
095	DM	40 000 000	(18 687)	7,7	1982/83	18 748	18 748
096	SF	9 000 000	(4 644)	4,25	1982	4 661	4 661
097	DM	60 000 000	(27 641)	9,4375	1982	31 481	31 481
098	SF	60 000 000	(30 071)	5,5	1984	35 457	35 457
099	DM	23 000 000	(11 087)	11,6875	1984/85	10 050	—
100	DM	13 144 937	(5 894)	10,125	1984	6 549	6 549
101	SF	20 000 000	(10 061)	2,25	1980	—	10 373
102	SF	8 500 000	(4 163)	4,25	1983	4 741	4 741
103	SF	20 000 000	(10 147)	3,375	1980	—	10 510
104	SF	20 000 000	(10 516)	4,25	1980	—	10 516
105	SF	9 000 000	(5 230)	5	1983	5 229	5 229
106	SF	9 000 000	(5 003)	5	1982	5 003	5 003
107	DM	20 000 000	(10 215)	8,75	1984	10 215	10 215
108	DM	20 000 000	(10 160)	8,75	1984	10 160	10 160
109	US\$	11 000 000	(9 003)	12,0625	1980	—	9 003
110	US\$	33 000 000	(30 231)	18,4375	1983/84	24 450	24 450
111A	US\$	13 000 000	(11 845)	11,25	1983/84	9 932	11 845
111B	US\$	5 000 000	(4 648)	11,75	1983/86	3 820	4 648
112	US\$	12 000 000	(10 097)	13,4375	1982	8 927	9 886
113	SF	9 500 000	(5 601)	5,25	1983	5 601	5 601
114	SF	50 000 000	(23 329)	6,25	1982	—	—
115	US\$	25 000 000	(19 213)	13,2	1981	18 636	—
116	SF	100 000 000	(47 590)	6,75	1984	47 590	—
117	US\$	25 000 000	(18 653)	13,25	1981	18 652	—
118/01	SF	20 000 000	(9 567)	5,6875	1981	9 567	—
118/02	SF	20 000 000	(9 530)	5,5	1981	9 530	—
119	US\$	25 000 000	(16 716)	17,8125	1984/85	16 716	—
121	SF	20 000 000	(9 577)	5,9375	1981	9 577	—
124	SF	28 500 000	(14 867)	6,5	1983	13 925	—
124B	SF	21 500 000	(11 215)	6,5	1983	11 494	—
125	US\$	50 000 000	(34 648)	12,6875	1985	34 648	—
128	SF	50 000 000	(26 082)	6,125	1983	26 872	—
132	US\$	50 000 000	(33 463)	17,875	1984/85	33 463	—
133	SF	50 000 000	(24 048)	6,5	1984	24 047	—
<b>Total borrowings</b>					<b>6 424 899</b>	<b>5 537 564</b>	

# Investments of the Capital Development Fund

at 31 December 1980

Schedule 3

Description	Loan	R000	
		Nominal value	Book value
<b>Escom internal registered stock</b>			
5,125 per cent	1976/81	35	199
5,125 per cent	1977/82	36	343
5,125 per cent	1976/82	37	136
5,125 per cent	1977/83	38	1 026
5,375 per cent	1978/83	39	78
5,625 per cent	1979/84	40	1 072
5,375 per cent	1979/84	42	166
5,375 per cent	1979/85	43	71
5,375 per cent	1980/85	44	452
5,500 per cent	1980/86	45	516
5,875 per cent	1981/86	46	237
6,250 per cent	1981/86	47	1 568
6,125 per cent	1982/87	49	326
5,250 per cent	1982/87	50	54
5,000 per cent	1983/88	51	1 152
5,000 per cent	1980/83	52	338
5,000 per cent	1982/84	53	807
5,500 per cent	1982/84	54	271
5,875 per cent	1983/85	55	927
6,500 per cent	1983/85	56	4 865
6,500 per cent	1989/91	58	753
6,750 per cent	1991	60	1 157
6,875 per cent	1992	61	1 437
6,875 per cent	1992	65	865
6,875 per cent	1993	71	4 464
6,875 per cent	1993	76	277
6,500 per cent	1994	78	344
6,875 per cent	1994	79	834
6,500 per cent	1994	81	1 111
6,875 per cent	1994	82	158
7,500 per cent	1995	83	515
8,750 per cent	1995	85	1 203
8,500 per cent	1995	86	171
9,250 per cent	1996	87	1 183
8,750 per cent	1996	88	88
9,250 per cent	1996	89	313
9,250 per cent	1996	90	1 056
8,750 per cent	1996	91	818
9,250 per cent	1997	92	805
9,125 per cent	1997	93	1 494
8,750 per cent	1997	94	149
8,500 per cent	1997	95	4 922
8,250 per cent	1997	96	1 015
8,000 per cent	1997	97	2
8,250 per cent	1997	98	4 354
8,250 per cent	1998	99	961
8,375 per cent	1998	100	673
8,000 per cent	1998	101	24
Carried forward		52 426	45 750

Description	Loan	R000	
		Nominal value	Book value
Brought forward		52 426	45 750
8,000 per cent	1998	103	266
8,000 per cent	1998	106	5 032
9,000 per cent	1999	107	1 309
8,500 per cent	1999	108	525
9,500 per cent	1999	110	1 633
10,750 per cent	2000	111	83
10,750 per cent	2000	112	1 176
10,750 per cent	2000	113	1 048
10,750 per cent	2000	114	3 580
10,250 per cent	2000	115	18
10,750 per cent	2000	116	663
10,875 per cent	1985	117	1 184
11,000 per cent	2000	118	619
11,000 per cent	1986	120	100
11,400 per cent	2001	121	730
12,750 per cent	1996	123	16
12,650 per cent	1986	124	10
12,500 per cent	2001	126	572
12,600 per cent	1999	127	15 013
12,450 per cent	1987	128	64
12,150 per cent	1982	129	1 833
11,500 per cent	1989	130	3 130
11,150 per cent	2002	131	143 706
11,750 per cent	2002	132	139 128
10,900 per cent	1988	133	33 724
10,750 per cent	2003	134	3 237
11,300 per cent	2003	135	203 853
9,700 per cent	2003	137	27 463
9,700 per cent	2003	138	7 318
10,250 per cent	2003	139	193 303
8,000 per cent	1986	140	16 013
8,650 per cent	2004	141	92 468
9,150 per cent	2004	142	184 553
7,550 per cent	1985	143	3 345
9,050 per cent	2005	144	54 928
9,550 per cent	2005	145	137 528
8,100 per cent	1987	146	15 160
9,050 per cent	1992	147	77 527
9,050 per cent	2005	148	82 426
9,550 per cent	2005	149	204 790
10,250 per cent	1990	150	40 176
10,950 per cent	2004	151	137 550
<b>Total (Note 8)</b>		<b>1 889 226</b>	<b>1 867 148</b>
Interest accrued			39 642
			<b>1 906 790</b>
Market value		1 597 696	

# Investments of the Reserve Fund

at 31 December 1980

Schedule 4

Description	Loan	R000	
		Nominal value	Book value
<b>Escom internal registered stock</b>			
5,125 per cent 1976/81	35	308	304
5,125 per cent 1977/82	36	5 296	5 077
5,125 per cent 1976/82	37	6 267	5 913
5,125 per cent 1977/83	38	7 020	6 678
5,375 per cent 1978/83	39	11 409	10 764
5,625 per cent 1979/84	40	9 969	9 291
5,375 per cent 1979/84	42	7 855	7 213
5,375 per cent 1979/85	43	5 533	4 928
5,375 per cent 1980/85	44	3 827	3 356
5,500 per cent 1980/86	45	3 599	3 162
5,875 per cent 1981/86	46	5 370	4 717
6,250 per cent 1981/86	47	2 709	2 374
6,125 per cent 1982/87	49	2 458	2 135
5,250 per cent 1982/87	50	2 216	1 738
5,000 per cent 1983/88	51	1 840	1 390
5,000 per cent 1980/83	52	14 264	13 395
5,000 per cent 1982/84	53	3 818	3 457
5,500 per cent 1982/84	54	3 922	3 543
5,875 per cent 1983/85	55	3 617	3 322
6,500 per cent 1983/85	56	5 545	5 102
6,500 per cent 1989/91	58	6 865	5 873
6,750 per cent 1991	60	202	184
6,875 per cent 1992	61	1 691	1 620
6,500 per cent 1992	64	20	15
6,875 per cent 1992	65	679	649
6,500 per cent 1993	70	17	12
6,875 per cent 1993	71	750	711
6,875 per cent 1993	76	131	109
6,875 per cent 1994	79	34	24
6,500 per cent 1994	81	66	48
6,875 per cent 1994	82	37	26
7,500 per cent 1995	83	678	671
7,000 per cent 1995	84	15	14
8,750 per cent 1995	85	1 016	1 008
8,500 per cent 1995	86	97	94
9,250 per cent 1996	87	173	148
8,750 per cent 1996	88	4	3
9,250 per cent 1996	90	86	70
9,125 per cent 1997	93	28	23
8,750 per cent 1997	94	57	55
8,500 per cent 1997	95	44	34
8,250 per cent 1997	96	9	7
8,000 per cent 1998	103	30	22
9,000 per cent 1999	107	40	33
9,500 per cent 1999	110	2	1
10,750 per cent 2000	112	13	12
10,750 per cent 2000	113	33	30
10,750 per cent 2000	114	3	3
10,250 per cent 2000	115	6	5
10,750 per cent 2000	116	1	1
10,875 per cent 1985	117	403	441
10,750 per cent 1995	119	2	1
11,000 per cent 1986	120	68	70
11,100 per cent 1996	122	128	128
12,750 per cent 1996	123	10	10
Carried forward		120 280	110 014

Description	Loan	R000	
		Nominal value	Book value
Brought forward		120 280	110 014
12,650 per cent 1986	124	22	25
12,450 per cent 1981	125	1 368	1 411
12,500 per cent 2001	126	32	32
12,500 per cent 1999	127	48	49
12,450 per cent 1987	128	811	949
12,150 per cent 1982	129	7 186	7 583
11,500 per cent 1989	130	1 537	1 650
11,150 per cent 2002	131	16	14
11,750 per cent 2002	132	3	3
10,900 per cent 1988	133	1 718	1 849
10,750 per cent 2003	134	12	11
11,300 per cent 2003	135	9 460	9 460
9,700 per cent 1986	137	4 258	4 293
9,700 per cent 2003	138	2	2
7,550 per cent 1985	143	34 880	34 880
8,100 per cent 1987	146	25 478	25 478
9,550 per cent 2005	149	2	2
<b>Total (Note 8)</b>		207 113	197 705
<b>Municipal stock</b>			
Cape Town			
5,375 per cent 1980/85	203	600	557
5,500 per cent 1981/86	208	850	778
5,500 per cent 1983/88	219	610	542
6,500 per cent 1981	240	210	210
Durban			
5,000 per cent 1984	84	500	461
5,500 per cent 1982	87	450	437
6,000 per cent 1981	91	1 000	993
6,500 per cent 1981	93	1 000	996
Germiston			
5,375 per cent 1985	16	150	137
Pretoria			
5,000 per cent 1961/81	7	246	246
6,250 per cent 1977/82	49	200	197
5,500 per cent 1980/83	56	200	191
6,500 per cent 1981/84	59	200	195
<b>Rand Water Board</b>			
6,500 per cent 1984	33	250	243
7,000 per cent 1987	35	200	197
<b>External investments</b>		6 666	6 380
		213 779	204 085
Interest accrued			3 299
			207 384
Market value		186 862	

# Investments of the Redemption Fund

at 31 December 1980

Schedule 5

Description	R000		
	Loan	Nominal value	Book value
<b>Escom internal registered stock</b>			
5,125 per cent	1976/81	35	694
5,125 per cent	1977/82	36	322
5,125 per cent	1976/82	37	420
5,125 per cent	1977/83	38	1 540
5,375 per cent	1978/83	39	130
5,625 per cent	1979/84	40	1 648
5,375 per cent	1979/84	42	2 859
5,375 per cent	1979/85	43	4 727
5,375 per cent	1980/85	44	2 867
5,500 per cent	1980/86	45	3 583
5,875 per cent	1981/86	46	765
6,250 per cent	1981/86	47	1 045
6,125 per cent	1982/87	49	507
5,250 per cent	1982/87	50	1 591
5,000 per cent	1983/88	51	1 360
5,000 per cent	1980/83	52	804
5,000 per cent	1982/84	53	1 481
5,500 per cent	1982/84	54	372
5,875 per cent	1983/85	55	2 858
6,500 per cent	1983/85	56	1 842
6,500 per cent	1989/91	58	277
6,750 per cent	1991	60	255
6,875 per cent	1992	61	25
6,500 per cent	1992	64	612
6,875 per cent	1992	65	416
6,500 per cent	1993	70	1 892
6,875 per cent	1993	71	10 694
6,500 per cent	1993	75	1 052
6,875 per cent	1993	76	1 683
6,500 per cent	1994	78	2 674
6,875 per cent	1994	79	10 091
6,500 per cent	1994	81	1 440
6,875 per cent	1994	82	6 139
7,500 per cent	1995	83	1 230
7,000 per cent	1995	84	550
8,750 per cent	1995	85	11 974
8,500 per cent	1995	86	2 967
9,250 per cent	1996	87	1 804
8,750 per cent	1996	88	1 200
9,250 per cent	1996	89	1 888
9,250 per cent	1996	90	1 023
8,750 per cent	1996	91	6 550
9,250 per cent	1997	92	463
9,125 per cent	1997	93	2 538
8,750 per cent	1997	94	871
8,500 per cent	1997	95	4 889
8,250 per cent	1997	96	2 761
8,000 per cent	1997	97	7
8,250 per cent	1997	98	1 092
8,250 per cent	1998	99	3 971
8,375 per cent	1998	100	1 541
8,000 per cent	1998	101	356
8,000 per cent	1998	103	274
7,625 per cent	1998	104	1 231
8,000 per cent	1998	106	1 973
9,000 per cent	1999	107	1 006
8,500 per cent	1999	108	726
9,500 per cent	1999	110	658
10,750 per cent	2000	111	3 893
Carried forward		126 101	115 761

Description	R000		
	Loan	Nominal value	Book value
Brought forward		126 101	115 761
10,750 per cent	2000	112	683
10,750 per cent	2000	113	1 144
10,750 per cent	2000	114	31
10,250 per cent	2000	115	307
10,750 per cent	2000	116	678
10,875 per cent	1985	117	237
11,000 per cent	2000	118	2 318
10,750 per cent	1995	119	45
11,000 per cent	1986	120	218
11,400 per cent	2001	121	4 243
12,750 per cent	1996	123	1
12,650 per cent	1986	124	50
12,450 per cent	1981	125	1 492
12,500 per cent	2001	126	10 453
12,600 per cent	1999	127	699
12,450 per cent	1987	128	748
12,150 per cent	1982	129	12 993
11,500 per cent	1989	130	2 006
11,150 per cent	2002	131	22 949
11,750 per cent	2002	132	26 025
10,900 per cent	1988	133	1 131
10,750 per cent	2003	134	29 243
11,300 per cent	2003	135	13 652
9,700 per cent	2003	137	166
9,700 per cent	2003	138	13 960
10,250 per cent	2003	139	43 858
8,000 per cent	1986	140	33 293
8,650 per cent	2004	141	21 071
7,550 per cent	1985	143	10 131
9,550 per cent	2005	144	37 608
9,550 per cent	2005	145	14
8,100 per cent	1987	146	20 253
9,050 per cent	1992	147	1 160
9,050 per cent	2005	148	15 000
10,250 per cent	1990	150	78 326
10,950 per cent	2004	151	19 000
<b>Total (Note 8)</b>		551 287	547 051
<b>Republic of South Africa</b>			
6,000 per cent		500	493
<b>Municipal stock</b>			
Cape Town			
5,375 per cent	1980/85	203	300
Germiston			
5,375 per cent	1985	16	20
<b>External investments</b>		820	790
		552 107	547 841
Interest accrued			9 339
			557 180
Market value		467 607	



# Investments in Escom foreign loan bonds

at 31 December 1980

Schedule 6

**R000**

Description	Loan	Foreign currency	Nominal value	Book value
German	6,5 per cent 1968/83	FF004 DM 1 594 000	287	257
German	8,5 per cent 1970/85	FF005 DM 1 130 000	221	205
German	8 per cent 1971/86	FF007 DM 3 365 000	658	577
Euro-dollar	8,15 per cent 1971/86	FF013 \$ 267 000	191	174
German	6,25 per cent 1972/87	FF017 DM 5 003 000	1 257	1 036
German	7 per cent 1973/88	FF023 DM 4 855 000	1 213	1 009
Euro-dollar	9,25 per cent 1974/89	FF027 \$ 1 303 000	876	808
Euro-dollar	10,25 per cent 1975/83	FF037 \$ 375 000	326	323
German	8 per cent 1978/84	FF092 DM 135 000	68	65
German	8,75 per cent 1979/84	FF108 DM 145 000	74	72
German	9,25 per cent 1980/87	FF129 DM 8 157 000	3 116	3 806
<b>Total (Note 8)</b>			<b>8 287</b>	<b>8 332</b>
Interest accrued				263
				8 595
Market value		9 735		

# Capital Development Fund Account

for the year ended 31 December 1980

Schedule 7

	R000	
	1980	1979
<b>Amounts set aside</b>	<b>426 400</b>	<b>380 000</b>
Cape Western Undertaking	30 046	26 375
Cape Northern Undertaking	12 550	11 166
Cape Eastern Undertaking	165	140
Border Undertaking	4 389	3 897
Orange River Undertaking	6 293	5 532
Natal Undertaking	68 140	61 246
Eastern Transvaal Undertaking	62 773	55 165
Rand & Orange Free State Undertaking	242 044	216 479
Central Generating Undertaking	—	—
<b>Investment income</b>	<b>159 527</b>	<b>111 408</b>
Interest earned	159 171	111 264
Adjustments of investment values	356	144
<b>Balance at beginning of year</b>	<b>1 300 406</b>	<b>808 998</b>
<b>Balance at end of year (Note 7)</b>	<b>1 886 333</b>	<b>1 300 406</b>

# Reserve Fund Account

for the year ended 31 December 1980

Schedule 8

	R000	
	1980	1979
<b>Amounts set aside</b>	<b>900</b>	<b>900</b>
Cape Western Undertaking	1	—
Cape Northern Undertaking	—	—
Cape Eastern Undertaking	1	—
Border Undertaking	1	200
Orange River Undertaking	1	200
Natal Undertaking	1	500
Eastern Transvaal Undertaking	—	—
Rand & Orange Free State Undertaking	—	—
Central Generating Undertaking	895	—
<b>Investment income</b>	<b>18 423</b>	<b>19 519</b>
Interest earned	16 460	17 395
Adjustments of investment values	1 963	2 124
<b>Expenditure</b>	<b>19 323</b>	<b>20 419</b>
Cape Western Undertaking	130	—
Cape Northern Undertaking	369	187
Cape Eastern Undertaking	—	—
Border Undertaking	15	3
Orange River Undertaking	53	2
Natal Undertaking	998	770
Eastern Transvaal Undertaking	345	75
Rand & Orange Free State Undertaking	534	294
Central Generating Undertaking	16 949	15 053
<b>Balance at beginning of year</b>	<b>(70)</b>	<b>4 035</b>
<b>Balance at end of year (Note 7)</b>	<b>224 151</b>	<b>220 116</b>
<b>Balance at end of year (Note 7)</b>	<b>224 081</b>	<b>224 151</b>

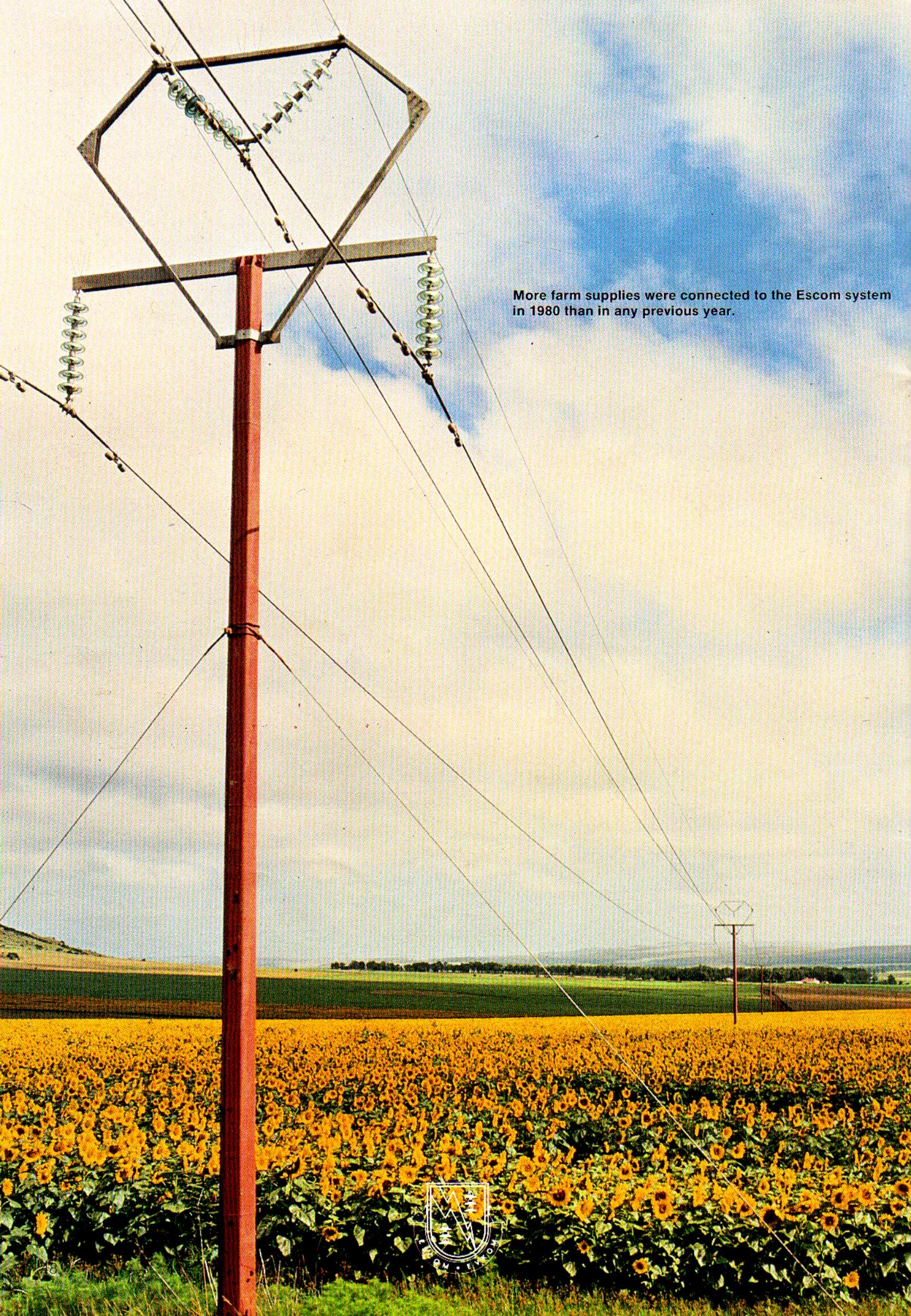
# Redemption Fund Account

for the year ended 31 December 1980

Schedule 9

	R000	
	1980	1979
<b>Amounts contributed</b>	<b>55 328</b>	<b>43 324</b>
Cape Western Undertaking	2 632	2 170
Cape Northern Undertaking	1 778	1 640
Cape Eastern Undertaking	48	44
Border Undertaking	489	444
Orange River Undertaking	439	415
Natal Undertaking	2 451	2 360
Eastern Transvaal Undertaking	3 348	2 851
Rand & Orange Free State Undertaking	8 148	7 095
Central Generating Undertaking	35 995	26 305
<b>Other contributions</b>	<b>835</b>	<b>754</b>
<b>Proceeds of sales of fixed property</b>	<b>721</b>	<b>4 124</b>
<b>Investment income</b>	<b>48 589</b>	<b>43 467</b>
Interest earned	48 393	43 689
Adjustments of investment values	196	(222)
	<b>105 473</b>	<b>91 669</b>
<b>Repayment of internal registered stock</b>		
7,250 per cent 1979 (Loan 105)	—	30 000
4,625 per cent 1980 (Loan 33)	16 000	—
4,875 per cent 1980 (Loan 34)	16 000	—
	<b>73 473</b>	<b>61 669</b>
<b>Balance at beginning of year</b>	<b>510 318</b>	<b>448 649</b>
<b>Balance at end of year (Note 7)</b>	<b>583 791</b>	<b>510 318</b>

# Statistical and other Statements



More farm supplies were connected to the Escom system in 1980 than in any previous year.



# Power stations: principal equipment installed

at 31 December 1980

Statement No. 1

Power station	Station capacity			Boilers		Main turbo-generators		Steam conditions at turbine inlet	
	Boilers kg/s	Generators MW	Assigned sent-out rating MW	No.	Maximum continuous rating each kg/s	No.	Nominal rating each MW	Pressure MPa (abs)	Temperature °C
<b>Coal-fired station, Eastern Cape</b>									
West Bank 2 . . . . .	85,6	45,0		4	21,4	3	15,0	2,9	427
	53,0	40,0		2	26,5	2	20,0	2,9	427
<b>Sub-total . . . . .</b>	<b>138,6</b>	<b>85,0</b>	<b>80</b>	<b>6</b>		<b>5</b>			
<b>Coal-fired stations, Natal</b>									
Colenso . . . . .	90,8	50,0		4	22,7	2	25,0	2,0	385
	50,4	30,0		2	25,2	1	30,0	2,0	385
	141,2	80,0	70	6		3			
Ingagane . . . . .	567,0	500,0	465	5	113,4	5	100,0	8,4	510
Umgeni . . . . .	181,6	120,0		8	22,7	4	30,0	4,2	454
	164,0	120,0		5	32,8	2	60,0	4,2	454
	345,6	240,0	222	13		6			
<b>Sub-total . . . . .</b>	<b>1 053,8</b>	<b>820,0</b>	<b>757</b>	<b>24</b>		<b>14</b>			
<b>Coal-fired stations, Transvaal and O.F.S.</b>									
Arnot . . . . .	1 998,6	2 100,0	1 980✓	6	333,1	6	350,0	15,9/3,98	510/510
Camden . . . . .	1 814,4	1 600,0	1 520✓	8	226,8	8	200,0	10,3	538
Duvha . . . . .	1 014,0	1 200,0	1 150✓	2	507,0	2	600,0	16,1/3,55	535/535
Grootvlei . . . . .	1 071,0	1 200,0		5	214,2	6	200,0	10,3	538
	230,6			1	230,6			10,3	538
	1 301,6	1 200,0	1 140	6		6			
Hendrina . . . . .	2 142,0	2 000,0	1 900✓	10	214,2	10	200,0	10,3	538
Highveld . . . . .	554,4	480,0	440	8	69,3	8	60,0	6,3	482
Klip . . . . .	567,5	396,0		25	22,7	12	33,0	2,5	390
		*28,0							
	567,5	424,0	372	25		12			
Komati . . . . .	567,0	500,0		5	113,4	5	100,0	8,4	510
	566,8	500,0		4	141,7	4	125,0	8,4	510
	1 133,8	1 000,0	925✓	9		9			
Kriel . . . . .	2 640,0	3 000,0	2 850✓	6	440,0	6	500,0	16,0/3,17	510/510
Matla . . . . .	1 524,6	1 800,0	1 725✓	3	508,2	3	600,0	16,1/3,68	535/535
Taaibos . . . . .	584,0	480,0	440	8	73,1	8	60,0	4,2	441
Vaal . . . . .	430,2	297,0		18	23,9	9	33,0	2,5	427
		§21,0							
	430,2	318,0	282	18		9			
Vierfontein . . . . .	503,5	360,0	336	19	26,5	12	30,0	4,2	441
Wilge . . . . .	62,8			4	15,7				
	201,6	60,0		4	50,4	2	30,0	4,2	454
	73,1	180,0		1	73,1	3	60,0	4,2	454
	337,5	240,0	221✓	9		5			
<b>Sub-total . . . . .</b>	<b>16 546,1</b>	<b>16 202,0</b>	<b>15 281</b>	<b>137</b>		<b>104</b>			

Power station	Station capacity			Boilers		Main turbo-generators		Steam conditions at turbine inlet	
	Boilers kg/s	Gene- rators MW	Assigned sent-out rating MW	No.	Maximum continuous rating each kg/s	No.	Nominal rating each MW	Pressure MPa (abs)	Tempera- ture °C
<b>Coal-fired stations, Western Cape</b>									
Hex River . . . . .	100.8	60.0		4	25.2	3	20.0	4.2	427
	69.2	60.0		2	34.6	2	30.0	4.2	482
	170.0	120.0	111	6		5			
Salt River 2 . . . . .	328.0	120.0		10	32.8	4	30.0	4.2	482
		120.0				2	60.0	4.2	482
	328.0	240.0	228	10		6			
<b>Sub-total . . . . .</b>	498.0	360.0	342	16		11			
<b>Total, coal-fired stations . . . . .</b>	18 236.5	17 467.0	16 457	183		134			
<b>Gas turbine stations</b>									
Acacia (Western Cape) . . . . .		171.0	171			3	57.0		
Port Rex (Eastern Cape) . . . . .		171.0	171			3	57.0		
<b>Total, gas turbine stations . . . . .</b>		342.0	342			6			
<b>Hydro-electric stations</b>									
Hendrik Verwoerd . . . . .		320.0	320			4	80.0		
Vanderkloof . . . . .		220.0	220			2	110.0		
<b>Total hydro stations . . . . .</b>		540.0	540			6			
<b>Total, all Escom . . . . .</b>	18 236.5	18 349.0	17 339	183		146			
<b>Other power sources</b>									
			Firm capacity available to Escom MW						
Cahora Bassa . . . . .			1 379						

\*Four 7 MW house sets installed at Klip.

§Three 7 MW house sets installed at Vaal.

# Immovable property and rights acquired

during the year ending 31 December 1980

Statement No. 2

Undertakings	Immovable property acquired for considerations amounting to	Servitudes and other interest in or over land or other property acquired or hired
Cape Western Undertaking	R457 927	R404 202
Cape Northern Undertaking	R507 435	R19 784 690
Orange River Undertaking	R456 940	R14 159
Border Undertaking	R114 112	R8 644
Natal Undertaking	R194 575	R395 798
Eastern Transvaal Undertaking	R2 250	R185 205
Rand and O.F.S. Undertaking	R920 100	R669 494
Head Office	R3 819 808	R171 015
Cape Eastern Undertaking	R2 000	R5 215

## Transmission system: principal equipment installed

Circuit kilometres (excluding service connections on reticulation systems) of lines and cables and capacity of transformers in service at 31 December 1980

Statement No. 3

Undertaking	Transmission lines							Total	Capacity of transformers MVA
	533 kV DC (Mono-polar)	400 kV	275 kV	220 kV	165 kV to 132 kV	88 kV to 33 kV	22 kV and below		
Border				160	169	906	2 715	3 950	1 704
Cape Eastern							640	640	45
Cape Northern		196	580	305	2 442	981	4 486	8 990	4 069
Cape Western		24			1 346	2 288	11 244	14 902	8 711
Eastern Transvaal			1 263		2 762	1 850	14 052	19 927	12 093
Natal			1 380		1 327	3 409	11 960	18 076	13 354
Orange River				392	153	759	1 754	3 058	3 786
Rand and O.F.S.		433	2 798		4 294	10 533	19 753	37 811	50 491
Central Generating	1 030	6 918		108	17			8 073	28 572
<b>Total</b>	<b>1 030</b>	<b>7 571</b>	<b>6 021</b>	<b>965</b>	<b>12 510</b>	<b>20 726</b>	<b>66 604</b>	<b>115 427</b>	<b>122 825</b>

Undertaking	Underground cables							Total
Border							125	125
Cape Eastern							3	3
Cape Northern							40	40
Cape Western					22	126	3 836	3 984
Eastern Transvaal							327	327
Natal						2	781	783
Orange River					1		2	3
Rand and O.F.S.						293	2 129	2 422
<b>Total</b>					<b>23</b>	<b>421</b>	<b>7 243</b>	<b>7 687</b>

	Total lines and cables							Total	Total capacity of transformers MVA
1980	1 030	7 571	6 986	12 533	21 147	73 847	123 114	122 825	
1979	1 030	7 412	6 946	12 441	20 569	69 624	118 022	114 343	
Additions	—	159	40	92	578	4 223	5 092	8 482	



# Power station operating statistics, 1980

Statement No. 4

Power station	Sent-out rating on 31 December 1980 MW	Energy sent out million kW.h	Maximum demands 1 hour sent out MW	Station load factors per cent	
				*A	**B
<b>Coal-fired station, Eastern Cape</b>					
West Bank . . . . .	80	224,1	90	31,9	39,9
<b>Coal-fired stations, Natal</b>					
Colenso . . . . .	570	171,8	74	26,2	35,8
Ingagane . . . . .	465	2 668,6	483	65,3	86,2
Umgeni . . . . .	222	821,0	232	42,1	51,3
<b>Sub-total</b> . . . . .	<b>757</b>	<b>3 661,4</b>	<b>—</b>	<b>54,9</b>	<b>71,3</b>
<b>Coal-fired stations, Transvaal and O.F.S.</b>					
Arnot . . . . .	1 980	10 537,6	1 677	60,6	91,1
Camden . . . . .	1 520	8 210,7	1 341	61,5	87,2
Duvha (under construction) . . . . .	\$1 150	3 196,4	1 156	59,2	75,7
Grootvlei . . . . .	1 140	5 370,3	1 114	53,7	86,3
Hendrina . . . . .	1 900	12 601,8	1 940	75,5	87,0
Highveld . . . . .	440	2 176,1	463	56,4	70,0
Klip . . . . .	372	1 347,5	340	41,4	50,6
Komati . . . . .	925	4 520,3	732	55,8	91,0
Kriel . . . . .	2 850	16 427,7	2 989	65,6	91,2
Matla (under construction) . . . . .	\$1 725	5 889,8	1 745	53,8	90,5
Taaibos . . . . .	440	2 402,9	478	62,3	70,9
Vaal . . . . .	282	1 709,3	282	69,4	78,8
Vierfontein . . . . .	336	1 621,3	354	55,0	59,2
Wilge . . . . .	221	1 439,0	231	74,5	90,6
<b>Sub-total</b> . . . . .	<b>15 281</b>	<b>77 450,7</b>	<b>—</b>	<b>61,6</b>	<b>84,4</b>
<b>Coal-fired stations, Western Cape</b>					
Hex River . . . . .	111	290,5	115	29,1	35,1
Salt River . . . . .	228	715,7	253	35,7	39,2
<b>Sub-total</b> . . . . .	<b>339</b>	<b>1 006,2</b>	<b>—</b>	<b>33,5</b>	<b>37,9</b>
<b>Total for all coal-fired stations</b> . . . . .	<b>16 457</b>	<b>82 342,4</b>	<b>—</b>	<b>60,5</b>	<b>82,2</b>
<b>Gas turbine stations</b>					
Acacia (Western Cape) . . . . .	171	15,3	173	1,0	1,1
Port Rex (Eastern Cape) . . . . .	171	12,3	151	0,8	1,0
<b>Total for gas turbine stations</b> . . . . .	<b>342</b>	<b>27,6</b>	<b>—</b>	<b>0,9</b>	<b>1,0</b>
<b>Hydro-electric stations</b>					
Hendrik Verwoerd . . . . .	320	397,5	391	14,2	14,4
Vanderkloof . . . . .	220	594,8	282	30,8	31,7
<b>Total for hydro-stations</b> . . . . .	<b>540</b>	<b>992,3</b>	<b>—</b>	<b>21,0</b>	<b>21,4</b>
<b>Total/weighted average</b> . . . . .	<b>17 339</b>	<b>83 362,3</b>	<b>—</b>	<b>57,8</b>	<b>77,4</b>

\*Station load factors A =  $\frac{\text{kW.h s.o.} \times 100}{(\text{assigned s.o. rating}) \times \text{hours in year}}$

\*\*Station load factors B =  $\frac{\text{Station load factors A} \times 100}{\text{Availability}}$

Overall thermal efficiency per cent	°Availability per cent	Fuel burnt tons	kg of coal/kW.h sent out	Heat content of coal (as received) MJ/kg	Station heat rate MJ/kW.h sent out
22,1	80,0	138 727	0,619	26,36	16,32
18,8	73,1	128 061	0,746	25,72	19,18
28,2	75,8	1 452 972	0,544	23,34	12,76
21,6	82,1	566 734	0,690	24,12	16,65
25,8	77,4	2 147 767	0,586	23,69	13,93
33,1	66,5	5 107 099	0,485	22,38	10,87
29,1	70,6	4 390 467	0,534	23,13	12,38
33,0	78,2	1 404 674	0,439	23,61	10,90
29,7	62,2	3 004 113	0,559	21,65	12,14
30,7	86,8	6 371 985	0,506	23,15	11,72
26,6	80,4	1 747 297	0,801	16,83	13,53
17,2	81,8	1 523 646	1,127	18,55	20,91
26,4	61,4	2 748 221	0,606	22,50	13,66
34,6	72,0	8 328 098	0,507	20,47	10,41
34,1	59,5	2 936 972	0,499	20,90	10,56
25,2	87,9	2 056 945	0,854	16,67	14,27
19,3	88,1	1 788 135	1,040	17,96	18,68
21,1	92,9	1 485 442	0,915	18,66	17,07
24,2	82,2	1 003 738	0,644	21,39	14,88
29,9	73,0	43 896 832	0,566	21,15	12,03
22,3	82,8	179 822	0,619	26,07	16,14
25,4	91,3	391 832	0,547	25,87	14,16
24,4	88,5	571 654	0,568	25,93	14,73
29,6	73,6	46 754 980	0,568	21,34	12,16
—	94,4	4 974	—	—	—
—	77,9	4 768	—	—	—
—	86,2	9 742	—	—	—
—	98,5	—	—	—	—
—	97,2	—	—	—	—
—	98,0	—	—	—	—
—	74,7	—	—	—	—

§Operating statistics are based on average capacity during the year.

°Availability =  $\frac{\text{Capacity hours available} \times 100}{\text{Total capacity hours in year}}$

Summary of operating statistics

Calendar year	Coal-fired power stations						
	Coal used				Coal cost		
	Thousands of tons	Average heat content (as received) MJ/kg	kg per kW.h sent out	Average heat rate MJ/kW.h sent out	Overall thermal efficiency sent-out basis per cent	Total R000	Average rand/ton
1950	6 323.4	22.72	0.869	19.74	18.2	5 302	0.84
1951	6 662.9	22.72	0.855	19.43	18.5	6 553	0.98
1952	7 113.4	22.75	0.865	19.68	18.3	8 520	1.20
1953	7 393.9	23.08	0.837	19.32	18.6	9 862	1.33
1954	8 024.9	23.06	0.805	18.56	19.4	11 329	1.41
1955	8 999.7	22.89	0.788	18.04	20.0	13 709	1.52
1956	9 688.5	22.96	0.765	17.56	20.5	13 653	1.62
1957	10 220.6	22.79	0.750	17.09	21.1	17 256	1.69
1958	10 784.1	22.73	0.743	16.89	21.3	19 039	1.77
1959	11 548.7	22.44	0.732	16.43	21.9	20 970	1.82
1960	12 512.6	22.52	0.723	16.28	22.1	25 373	2.03
1961	13 194.9	22.39	0.722	16.17	22.3	27 713	2.10
1962	13 955.5	22.22	0.719	15.98	22.5	29 230	2.09
1963	14 721.1	22.15	0.708	15.68	23.0	31 009	2.11
1964	15 654.7	22.15	0.692	15.33	23.5	32 367	2.07
1965	16 726.7	22.39	0.680	15.23	23.6	34 986	2.09
1966	16 982.3	22.20	0.666	14.79	24.4	37 901	2.23
1967	18 307.7	22.44	0.645	14.47	24.9	42 053	2.30
1968	19 133.9	22.63	0.620	14.03	25.6	44 604	2.33
1969	19 982.9	22.73	0.595	13.52	26.6	47 453	2.37
1970	21 630.6	22.97	0.580	13.32	27.0	48 807	2.26
1971	23 416.2	23.30	0.576	13.42	26.8	52 705	2.25
1972	24 952.8	22.89	0.571	13.07	27.5	56 113	2.25
1973	27 907.9	22.47	0.563	12.65	28.5	66 837	2.39
1974	30 891.4	22.42	0.560	12.56	28.7	90 269	2.92
1975	34 231.7	22.21	0.567	12.59	28.6	138 592	4.05
1976	37 257.4	21.87	0.579	12.66	28.4	200 781	5.39
1977	37 505.6	21.78	0.576	12.55	28.7	233 229	6.22
1978	39 589.5	21.61	0.574	12.44	28.9	263 880	6.67
1979	43 264.9	21.22	0.580	12.33	29.2	301 273	6.96
1980	46 755.0	21.34	0.568	12.16	29.6	379 942	8.12

Cents per kW.h sent out	Total power stations million kW.h sent out				Total power station capacity assigned sent-out rating MW as at 31 December	Average power station plant load factor sent-out basis per cent
	Coal-fired stations	Hydro-electric stations	Diesel and gas turbine stations	Total power station output		
0.072 9	7 276.4	6.6	3.5	7 286.5	1 290	64.7
0.084 0	7 797.2	6.3	3.3	7 806.8	1 361	66.1
0.103 7	8 219.7	6.4	1.2	8 227.3	1 454	66.9
0.111 6	8 838.2	6.6	0.6	8 845.4	1 635	65.5
0.113 6	9 971.5	5.7	0.2	9 977.4	1 846	66.4
0.120 1	11 419.1	5.8	0.2	11 425.1	2 145	65.9
0.123 6	12 663.2	6.4	0.3	12 669.9	2 498	61.2
0.126 6	13 633.5	6.3	0.2	13 640.0	2 555	61.1
0.131 2	14 510.5	4.8	0.5	14 515.8	2 748	62.0
0.132 9	15 774.5	2.5	0.1	15 777.1	2 983	62.6
0.146 6	17 305.5	2.0	—	17 307.5	3 091	65.2
0.151 6	18 282.2	1.8	—	18 284.0	3 226	66.2
0.150 7	19 401.2	2.8	0.1	19 404.1	3 406	65.8
0.149 2	20 789.2	4.3	0.1	20 793.6	3 788	65.7
0.143 0	22 634.1	4.5	—	22 638.6	4 077	65.2
0.142 3	24 582.6	—	0.1	24 582.7	4 181	67.4
0.148 6	25 504.1	—	—	25 504.1	4 377	67.1
0.148 2	28 370.9	—	—	28 370.9	5 328	66.8
0.144 6	30 843.5	—	—	30 843.5	5 800	62.9
0.141 2	33 598.2	—	—	33 598.2	6 441	62.1
0.130 8	37 320.8	—	—	37 320.8	7 060	62.9
0.129 7	40 645.8	93.6	—	40 739.4	8 373	61.3
0.128 5	43 662.2	812.9	—	44 475.1	8 849	59.6
0.134 8	49 569.8	189.3	—	49 759.1	9 482	62.5
0.163 7	55 140.9	1 110.3	—	56 251.2	10 002	66.3
0.229 5	60 399.7	1 098.7	—	61 498.4	10 522	68.6
0.312 2	64 309.2	1 853.0	25.9	66 188.1	11 688	66.8
0.358 2	65 113.8	1 924.6	12.1	67 050.5	12 756	61.9
0.382 4	69 004.2	1 887.1	11.1	70 902.4	13 595	60.7
0.404 5	74 484.7	1 143.6	14.4	75 642.7	15 056	60.9
0.461 4	82 342.3	992.3	27.6	83 362.3	17 339	57.8

# Integrated Escom system: electricity sent out and sold

Statement No. 6

Calendar year	Escom's share in national electricity supply		Electricity sent out				
	Republic of S.A. total mill. kW.h sent out	*Escom mill. kW.h sent out as % of Republic	mill. kW.h sent out from Escom power stations	mill. kW.h purchased from other sources	mill. kW.h sent out Escom system	Peak demand on integrated Escom system MW	Integrated Escom system load factor per cent
1950	†10 437	71,1	7 286,5	131,4	7 417,8	†1 182	71,6
1951	†11 098	72,1	7 806,8	194,6	8 001,3	†1 212	75,4
1952	†11 678	74,1	8 227,3	423,9	8 651,3	†1 265	77,9
1953	†12 823	73,3	8 845,4	550,4	9 395,8	†1 394	76,9
1954	†14 167	73,5	9 977,4	437,3	10 414,7	†1 570	75,7
1955	†16 021	73,4	11 425,1	339,3	11 764,4	†1 806	74,4
1956	†17 293	74,8	12 669,9	257,2	12 927,0	†2 001	73,5
1957	18 720	73,7	13 640,0	162,8	13 802,9	†2 151	73,3
1958	19 765	74,3	14 515,8	164,1	14 679,9	†2 249	74,5
1959	21 051	75,4	15 777,1	93,6	15 870,7	†2 429	74,6
1960	22 717	76,3	17 307,5	15,3	17 322,8	†2 605	75,7
1961	23 760	77,0	18 284,0	8,4	18 292,4	†2 733	76,4
1962	25 599	75,8	19 404,1	12,6	19 416,7	†2 925	75,3
1963	27 335	76,1	20 793,6	18,6	20 812,2	†3 183	74,6
1964	†29 547	76,8	22 638,6	41,0	22 679,6	†3 460	74,6
1965	31 939	77,4	24 582,7	126,6	24 709,3	3 669	76,9
1966	†33 929	77,0	25 504,1	†629,9	26 134,0	3 906	76,4
1967	36 897	77,1	28 370,9	69,6	28 440,5	4 227	76,8
1968	†39 761	77,6	30 843,5	7,9	30 851,4	4 658	75,4
1969	42 847	78,4	33 598,2	8,0	33 606,2	5 055	75,9
1970	47 456	77,7	37 320,8	7,3	37 328,1	5 622	75,8
1971	51 081	79,8	40 739,4	8,3	40 747,7	6 115	76,1
1972	55 298	80,4	44 475,1	9,7	44 484,7	6 630	76,4
1973	60 080	82,8	49 759,1	11,3	49 770,4	7 350	77,3
1974	†65 498	85,9	56 251,2	7,9	56 259,1	8 552	75,1
1975	69 883	88,1	61 498,4	34,9	61 533,3	9 185	76,5
1976	75 381	89,4	66 188,1	1 225,5	67 413,7	10 085	76,1
1977	79 491	89,7	67 050,5	4 241,0	71 291,5	10 735	75,8
1978	84 954	91,6	70 902,4	6 923,9	77 826,3	11 490	77,3
1979	92 613	92,9	75 642,3	10 394,3	86 036,6	12 855	76,4
1980	99 967	93,1	83 362,3	9 659,4	93 021,6	13 668	77,5

\*Includes Escom electricity sent out to neighbouring territories.

†Estimates based on limited information.

‡Includes purchases from City of Johannesburg during serious drought.

Electricity sales				Employees		Assets in commission at 31 December	
Ratio mill. kW.h sold / mill. kW.h s.o.	mill. kW.h sold	Growth for the year per cent	Average selling price cents/kW.h	Total number as at 31 December	Number per mill. kW.h sold	R000	R000/mill. kW.h sold
0,932	6 910,6	11,1	0,274 1	9 352	1,353	0	—
0,932	7 456,5	7,9	0,292 2	10 336	1,386	—	—
0,934	8 080,6	8,4	0,311 5	10 889	1,348	—	—
0,929	8 732,2	8,1	0,354 2	11 518	1,319	—	—
0,929	9 676,6	10,8	0,380 8	12 317	1,273	—	—
0,932	10 964,0	13,3	0,413 9	12 490	1,139	—	—
0,930	12 019,5	9,6	0,428 5	12 977	1,080	—	—
0,925	12 763,1	6,2	0,447 8	13 421	1,052	—	—
0,927	13 602,1	6,6	0,473 3	14 312	1,052	370 030	27,20
0,928	14 724,5	8,3	0,495 1	13 947	0,947	428 183	29,08
0,929	16 094,1	9,3	0,507 9	14 654	0,911	450 853	28,01
0,930	17 013,2	5,7	0,515 5	15 441	0,908	468 416	27,53
0,933	18 121,0	6,5	0,516 4	16 467	0,909	518 722	28,63
0,937	19 500,0	7,6	0,517 7	16 804	0,862	577 530	29,62
0,937	21 247,5	9,0	0,510 1	17 172	0,808	639 639	30,10
0,937	23 143,3	8,9	0,507 6	17 851	0,771	673 626	29,11
0,940	24 554,3	6,1	0,525 4	18 579	0,757	714 213	29,09
0,937	26 657,1	8,6	0,546 7	19 817	0,743	846 818	31,77
0,936	28 885,0	8,4	0,555 0	20 893	0,723	911 479	31,56
0,937	31 505,6	9,1	0,556 5	21 644	0,687	1 074 503	34,11
0,935	34 890,6	10,7	0,554 5	22 700	0,651	1 180 860	33,84
0,934	38 040,0	9,0	0,577 2	25 050	0,659	1 390 095	36,54
0,936	41 648,9	9,5	0,610 8	26 937	0,647	1 526 697	36,66
0,936	46 578,4	11,8	0,648 4	28 559	0,613	1 699 279	36,48
0,935	52 585,1	12,9	0,682 2	29 891	0,568	1 847 484	35,13
0,940	57 869,2	10,0	0,795 0	33 999	0,588	2 008 917	34,71
0,940	63 355,7	9,5	1,036 0	36 915	0,583	2 311 725	36,49
0,942	67 125,4	5,9	1,535 3	39 112	0,583	2 851 103	42,47
0,935	72 780,4	8,4	1,788 7	41 040	0,564	3 564 600	48,98
0,937	80 582,8	10,7	1,898 0	43 690	0,542	4 255 502	52,81
0,941	87 539,3	8,6	2,024 2	47 490	0,542	5 604 038	64,02

°Figures not available.

# Summary of consolidated revenue and expenditure account

Statement No. 7

Year	Total Escom mill. kW.h sold	Total Escom costs				
		Interest	Redemption and other provision for loan repayment	Reserve Fund	Capital Development Fund	
1967	26 657.1	R(000)	24 536	9 912	—	
		c/kW.h sold	0,092 0	0,037 2	—	
		% of total cost	25,39	16,70	6,75	—
1968	28 885.0	R(000)	23 884	12 300	—	
		c/kW.h sold	0,082 7	0,042 6	—	
		% of total cost	26,72	14,74	7,59	—
1969	31 505.6	R(000)	20 809	13 605	—	
		c/kW.h sold	0,066 0	0,043 2	—	
		% of total cost	29,05	11,87	7,76	—
1970	34 890.6	R(000)	23 654	15 202	—	
		c/kW.h sold	0,067 8	0,043 6	—	
		% of total cost	30,37	12,08	7,76	—
1971	38 040.0	R(000)	30 928	8 568	—	
		c/kW.h sold	0,081 3	0,022 5	—	
		% of total cost	31,99	14,08	3,90	—
1972	41 648.9	R(000)	30 575	3 056	13 596	
		c/kW.h sold	0,073 4	0,007 3	0,032 6	
		% of total cost	33,58	11,85	1,18	5,27
1973	46 578.4	R(000)	34 200	3 760	15 366	
		c/kW.h sold	0,073 4	0,008 1	0,033 0	
		% of total cost	33,27	11,17	1,23	5,02
1974	52 585.1	R(000)	27 151	66	28 114	
		c/kW.h sold	0,051 6	0,000 1	0,053 5	
		% of total cost	31,40	7,46	0,02	7,72
1975	57 869.2	R(000)	30 814	1 400	40 730	
		c/kW.h sold	0,053 2	0,002 4	0,070 4	
		% of total cost	28,12	6,33	0,29	8,36
1976	63 355.7	R(000)	41 470	1 700	53 584	
		c/kW.h sold	0,065 5	0,002 7	0,084 6	
		% of total cost	26,49	6,32	0,26	8,16
1977	67 125.4	R(000)	63 403	900	224 000	
		c/kW.h sold	0,094 5	0,001 3	0,333 7	
		% of total cost	22,51	6,36	0,09	22,47
1978	72 780.4	R(000)	76 036	900	300 000	
		c/kW.h sold	0,104 4	0,001 2	0,412 1	
		% of total cost	25,03	6,16	0,07	24,30
1979	80 582.8	R(000)	88 800	900	380 000	
		c/kW.h sold	0,110 1	0,001 1	0,471 5	
		% of total cost	24,72	5,87	0,06	25,14
1980	87 539.3	R(000)	101 629	900	426 400	
		c/kW.h sold	0,116 1	0,001 0	0,487 1	
		% of total cost	26,99	5,44	0,05	22,80

Total Escom costs												
Sub-total capital related costs	Purchase of electricity	Fuel	Other power station operating and maintenance costs	Distribution, operation and maintenance costs	General expenses	Total costs	Total revenue					
71 760	313	42 488	14 618	7 146	10 603	146 928	146 783					
0,269 2	0,001 2	0,159 4	0,054 8	0,026 8	0,039 8	0,551 2	0,550 6					
48,84	0,21	28,92	9,95	4,86	7,22	100,00	99,90					
79 466	121	45 117	17 016	8 097	12 176	161 993	161 475					
0,275 1	0,000 4	0,156 2	0,058 9	0,028 0	0,042 2	0,560 8	0,559 0					
49,06	0,07	27,85	10,50	5,00	7,52	100,00	99,68					
85 357	102	48 035	19 038	9 264	13 578	175 374	176 106					
0,270 9	0,000 3	0,152 5	0,060 4	0,029 4	0,043 1	0,556 6	0,559 0					
48,67	0,06	27,39	10,86	5,28	7,74	100,00	100,42					
98 340	89	49 440	21 955	10 594	15 448	195 866	193 475					
0,281 9	0,000 3	0,141 7	0,062 9	0,030 4	0,044 3	0,554 4	0,554 5					
50,21	0,05	25,24	11,21	5,41	7,89	100,00	98,78					
109 762	82	53 587	26 276	11 492	18 440	219 639	219 584					
0,288 5	0,000 2	0,140 9	0,069 1	0,030 2	0,048 5	0,577 4	0,577 2					
49,97	0,04	24,40	11,96	5,23	8,40	100,00	99,97					
133 858	95	57 259	31 586	13 486	21 737	258 021	254 394					
0,321 4	0,000 2	0,137 5	0,075 8	0,032 4	0,052 2	0,619 5	0,610 8					
51,88	0,04	22,19	12,24	5,23	8,42	100,00	98,59					
155 184	117	68 634	38 685	17 082	26 460	306 162	302 034					
0,333 2	0,000 3	0,147 4	0,083 1	0,036 7	0,056 8	0,657 3	0,648 4					
50,69	0,04	22,42	12,64	5,58	8,64	100,00	98,65					
169 639	86	92 530	48 572	20 617	32 611	364 055	358 768					
0,322 6	0,000 2	0,176 0	0,092 4	0,039 2	0,062 0	0,692 3	0,682 2					
46,60	0,02	25,42	13,34	5,66	8,96	100,00	98,55					
209 907	114	141 913	*44 980	*18 477	*71 758	487 149	460 073					
0,362 7	0,000 2	0,245 2	0,077 7	0,031 9	0,124 0	0,841 8	0,795 0					
43,09	0,02	29,13	9,23	3,79	14,73	100,00	94,44					
270 583	2 399	208 316	62 477	19 712	92 835	656 322	656 381					
0,427 1	0,003 8	0,328 8	0,098 6	0,031 1	0,146 5	1,036 0	1,036 0					
41,23	0,37	31,74	9,52	3,00	14,14	100,00	100,01					
512 721	15 501	239 228	76 294	19 859	133 494	997 097	1 030 552					
0,763 8	0,023 1	0,356 4	0,113 7	0,029 6	0,198 9	1,485 4	1,535 3					
51,42	1,55	23,99	7,65	1,99	13,39	100,00	103,36					
685 906	26 364	271 222	89 193	23 677	138 106	1 234 468	1 301 829					
0,942 4	0,036 2	0,372 6	0,122 5	0,032 5	0,189 7	1,696 1	1,788 7					
55,56	2,14	21,97	7,22	1,92	11,19	100,00	105,46					
843 418	36 061	319 428	95 887	28 689	188 203	1 511 686	1 529 474					
1,046 6	0,044 7	0,396 3	0,118 9	0,035 6	0,233 5	1,875 9	1,898 0					
55,79	2,39	21,13	6,34	1,90	12,45	100,00	101,18					
1 033 661	35 806	405 630	117 968	36 824	240 078	1 869 967	1 772 000					
1,180 8	0,040 9	0,463 3	0,134 8	0,042 1	0,274 2	2,136 1	2,024 2					
55,28	1,91	21,69	6,31	1,97	12,84	100,00	94,76					

\*Basis of allocation changed in 1975.

# Distribution undertakings

consumer details, sales of electricity

## Border Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kW.h sold	
Category	Number		Per cent of total		kW.h sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	22	23	88,35	88,11	730 111 358	793 996 369	5,84	8,75	21 098 041	23 733 702	2,889 7	2,989 1
Direct supplies:												
Domestic and street lighting	3 639	3 907	3,18	3,01	26 313 006	27 112 594	3,45	3,04	1 325 249	1 454 286	5,036 5	5,363 9
Industrial	1 786	1 884	8,47	8,88	70 000 066	80 043 334	10,20	14,35	3 321 508	4 018 227	4,745 0	5,020 1
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Traction	—	—	—	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>5 447</b>	<b>5 814</b>	<b>100,00</b>	<b>100,00</b>	<b>826 424 430</b>	<b>901 152 297</b>	<b>6,12</b>	<b>9,04</b>	<b>25 744 799</b>	<b>29 206 215</b>	<b>3,115 2</b>	<b>3,241 0</b>

## Cape Eastern Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kW.h sold	
Category	Number		Per cent of total		kW.h sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	2	3	48,61	47,99	14 467 360	16 263 520	0,21	12,41	442 872	521 632	3,061 2	3,207 4
Direct supplies:												
Domestic and street lighting	287	290	5,18	4,80	1 541 248	1 624 523	-0,28	5,40	142 322	153 704	9,234 2	9,461 5
Industrial	665	703	46,21	47,21	13 752 180	16 000 190	0,85	16,35	928 180	1 091 707	6,749 3	6,823 1
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Traction	—	—	—	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>954</b>	<b>996</b>	<b>100,00</b>	<b>100,00</b>	<b>29 760 788</b>	<b>33 888 233</b>	<b>0,48</b>	<b>13,87</b>	<b>1 513 374</b>	<b>1 767 043</b>	<b>5,085 1</b>	<b>5,214 3</b>

## Cape Northern Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kW.h sold	
Category	Number		Per cent of total		kW.h sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	33	35	17,59	17,30	416 546 742	445 667 325	7,59	6,99	10 328 330	11 696 328	2,479 5	2,624 5
Direct supplies:												
Domestic and street lighting	3 529	4 257	1,38	1,38	32 757 289	35 481 480	9,58	8,32	1 382 053	1 623 145	4,219 1	4,574 6
Industrial	1 048	1 397	6,49	7,07	153 702 271	182 159 783	10,29	18,51	5 334 458	6 779 869	3,470 6	3,721 9
Mining	86	93	57,32	58,48	1 357 176 529	1 506 795 725	21,05	11,02	39 627 064	45 632 142	2,919 8	3,028 4
Traction	5	5	17,22	15,77	407 755 800	406 492 913	57,30	-0,31	15 311 601	15 302 749	3,755 1	3,764 6
<b>Total</b>	<b>4 701</b>	<b>5 787</b>	<b>100,00</b>	<b>100,00</b>	<b>2 367 938 631</b>	<b>2 576 597 226</b>	<b>22,26</b>	<b>8,81</b>	<b>71 983 506</b>	<b>81 034 233</b>	<b>3,039 9</b>	<b>3,145 0</b>

## Cape Western Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kW.h sold	
Category	Number		Per cent of total		kW.h sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	64	64	52,75	53,91	2 950 336 701	3 325 479 503	9,34	12,72	52 661 718	63 103 074	1,784 9	1,897 6
Direct supplies:												
Domestic and street lighting	66 704	71 384	8,03	7,92	449 186 253	488 463 082	3,35	8,74	20 312 024	23 016 101	4,522 0	4,711 9
Industrial	16 769	17 554	30,15	28,83	1 686 537 850	1 778 275 262	3,82	5,44	49 614 498	54 901 070	2,941 8	3,087 3
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Traction	9	9	9,07	9,34	507 064 676	576 091 626	10,50	13,61	16 361 392	18 956 831	3,226 7	3,290 6
<b>Total</b>	<b>83 546</b>	<b>89 011</b>	<b>100,00</b>	<b>100,00</b>	<b>5 593 125 480</b>	<b>6 168 309 473</b>	<b>7,23</b>	<b>10,28</b>	<b>138 949 632</b>	<b>159 977 076</b>	<b>2,484 4</b>	<b>2,593 5</b>

\*Supplies to municipal and other supply authorities.

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kWh sold	
Category	Number		Per cent of total		kWh sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	30	31	9,10	8,57	1 064 546 350	1 105 227 820	24,61	3,82	20 359 038	22 323 018	1,912 5	2,019 8
Direct supplies:												
Domestic and street lighting	2 567	2 656	0,22	0,22	25 904 941	28 122 986	25,94	8,56	906 256	1 017 563	3,498 4	3,618 3
Industrial	7 997	8 472	65,64	66,07	7 578 690 702	8 514 017 803	18,87	12,34	136 714 423	161 766 795	1,780 4	1,900 0
Mining	128	138	20,91	20,67	2 445 851 659	2 663 591 724	7,12	8,90	46 576 772	52 754 921	1,904 3	1,980 6
Traction	5	5	4,13	4,47	483 180 000	576 213 200	9,06	19,25	14 883 446	14 816 160	3,080 3	2,571 3
<b>Total</b>	<b>10 727</b>	<b>11 302</b>	<b>100,00</b>	<b>100,00</b>	<b>11 598 173 652</b>	<b>12 887 173 533</b>	<b>16,26</b>	<b>10,16</b>	<b>219 439 935</b>	<b>252 678 457</b>	<b>1,875 8</b>	<b>1,960 7</b>

## Natal Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kWh sold	
Category	Number		Per cent of total		kWh sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	35	35	50,30	50,82	6 532 193 296	7 109 290 798	7,14	8,83	115 490 353	131 397 158	1,768 0	1,848 2
Direct supplies:												
Domestic and street lighting	15 585	16 373	0,99	0,90	128 450 749	125 356 810	8,84	-2,41	4 932 353	4 875 895	3,839 9	3,889 6
Industrial	12 890	13 768	37,21	36,51	4 832 107 954	5 107 700 346	16,64	5,70	87 070 175	96 653 324	1,801 9	1,892 3
Mining	33	39	2,24	2,23	291 024 060	312 488 540	9,71	7,38	6 374 163	7 438 728	2,190 3	2,380 5
Traction	10	10	9,27	9,54	1 203 978 456	1 334 210 684	8,12	10,82	27 622 706	32 305 828	2,294 3	2,421 3
<b>Total</b>	<b>28 553</b>	<b>30 225</b>	<b>100,00</b>	<b>100,00</b>	<b>12 987 754 515</b>	<b>13 989 047 178</b>	<b>10,66</b>	<b>7,71</b>	<b>241 489 750</b>	<b>272 670 933</b>	<b>1,859 4</b>	<b>1,949 2</b>

## Orange River Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kWh sold	
Category	Number		Per cent of total		kWh sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	40	44	98,24	97,42	1 152 477 930	1 258 562 198	12,11	9,20	22 655 341	28 017 429	1,990 4	2,226 1
Direct supplies:												
Domestic and street lighting	30	34	0,01	0,02	123 626	184 887	523,55	49,55	9 837	20 322	7,957 1	10,991 6
Industrial	299	408	1,75	2,56	20 551 538	33 126 415	6,51	61,19	1 176 892	1 891 782	5,726 5	5,710 8
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Traction	—	—	—	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>369</b>	<b>486</b>	<b>100,00</b>	<b>100,00</b>	<b>1 173 153 094</b>	<b>1 291 873 500</b>	<b>12,02</b>	<b>10,12</b>	<b>23 842 070</b>	<b>29 929 533</b>	<b>2,056 5</b>	<b>2,316 8</b>

## Rand and O.F.S. Undertaking

Consumer details			Sales of electricity						Revenue from sales in Rand		Average price in cents per kWh sold	
Category	Number		Per cent of total		kWh sold		Per cent change		1979	1980	1979	1980
	1979	1980	1979	1980	1979	1980	79/78	80/79				
Bulk supplies	178	184	24,56	25,90	11 273 071 710	12 868 282 784	12,01	14,15	208 607 054	258 395 252	1,850 5	2,008 0
Direct supplies:												
Domestic and street lighting	9 451	10 657	0,60	0,40	275 396 650	199 646 540	-16,39	-27,51	8 432 402	6 574 101	3,061 9	3,292 9
Industrial	24 202	25 293	28,36	27,49	13 019 488 553	13 662 175 861	11,09	5,32	235 777 965	267 883 284	1,811 0	1,960 8
Mining	110	116	43,36	43,06	19 905 631 305	21 398 666 493	7,31	7,25	322 890 796	374 028 727	1,622 1	1,747 9
Traction	2	2	3,12	3,15	1 432 923 901	1 562 458 888	9,27	9,04	30 802 773	37 855 326	2,149 6	2,422 8
<b>Total</b>	<b>33 943</b>	<b>36 252</b>	<b>100,00</b>	<b>100,00</b>	<b>45 906 512 119</b>	<b>49 691 230 566</b>	<b>9,37</b>	<b>8,24</b>	<b>806 510 990</b>	<b>944 736 690</b>	<b>1,756 9</b>	<b>1,901 2</b>

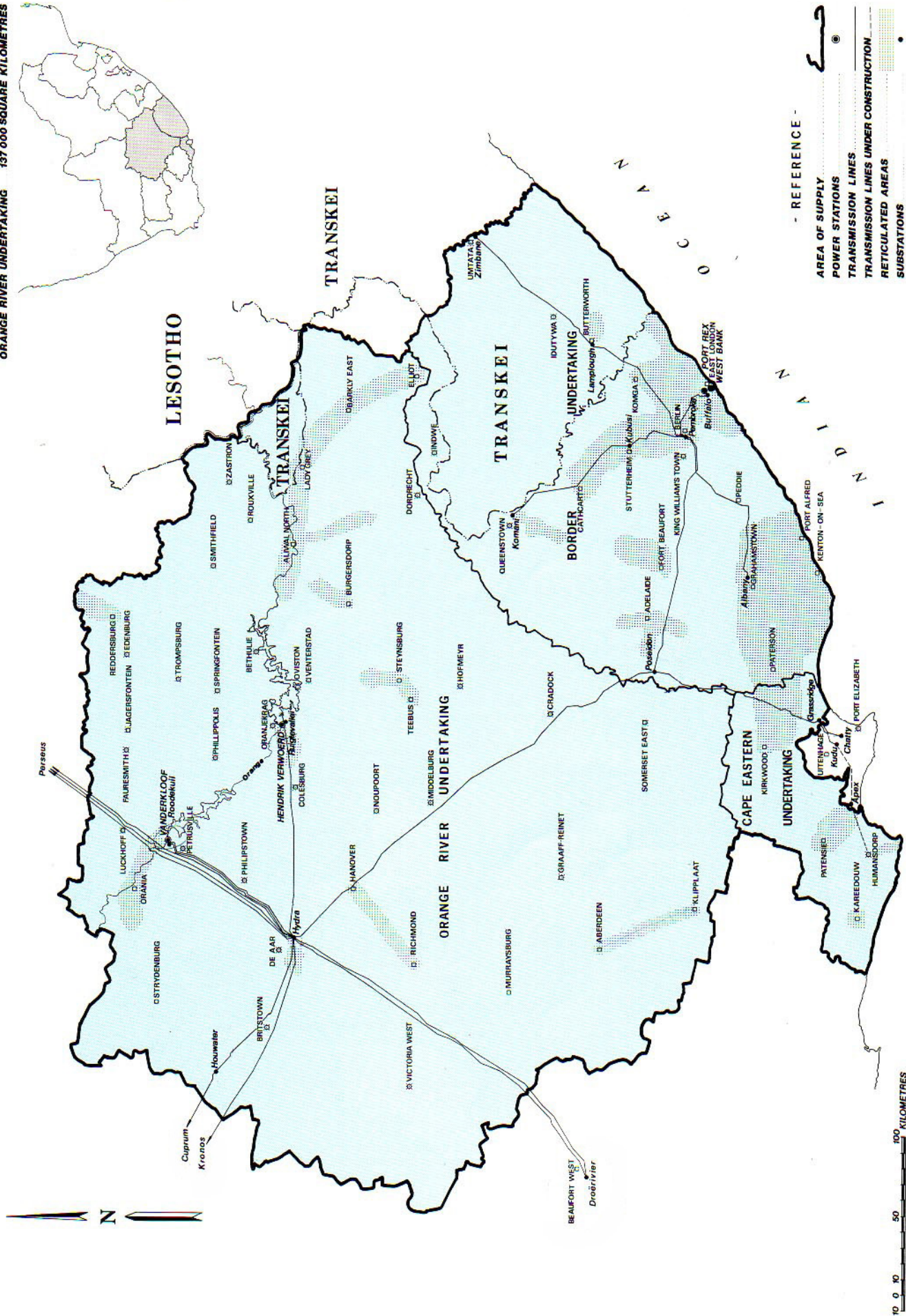
\*Supplies to municipal and other supply authorities.

Maps showing  
Licenced Areas  
of Supply

# Border, Cape Eastern and Orange River Undertakings

AREA OF SUPPLY

- BORDER UNDERTAKING 55 400 SQUARE KILOMETRES
- CAPE EASTERN UNDERTAKING 8 000 SQUARE KILOMETRES
- ORANGE RIVER UNDERTAKING 137 000 SQUARE KILOMETRES



**REFERENCE**

- AREA OF SUPPLY
- POWER STATIONS
- TRANSMISSION LINES
- TRANSMISSION LINES UNDER CONSTRUCTION
- RETICULATED AREAS
- SUBSTATIONS

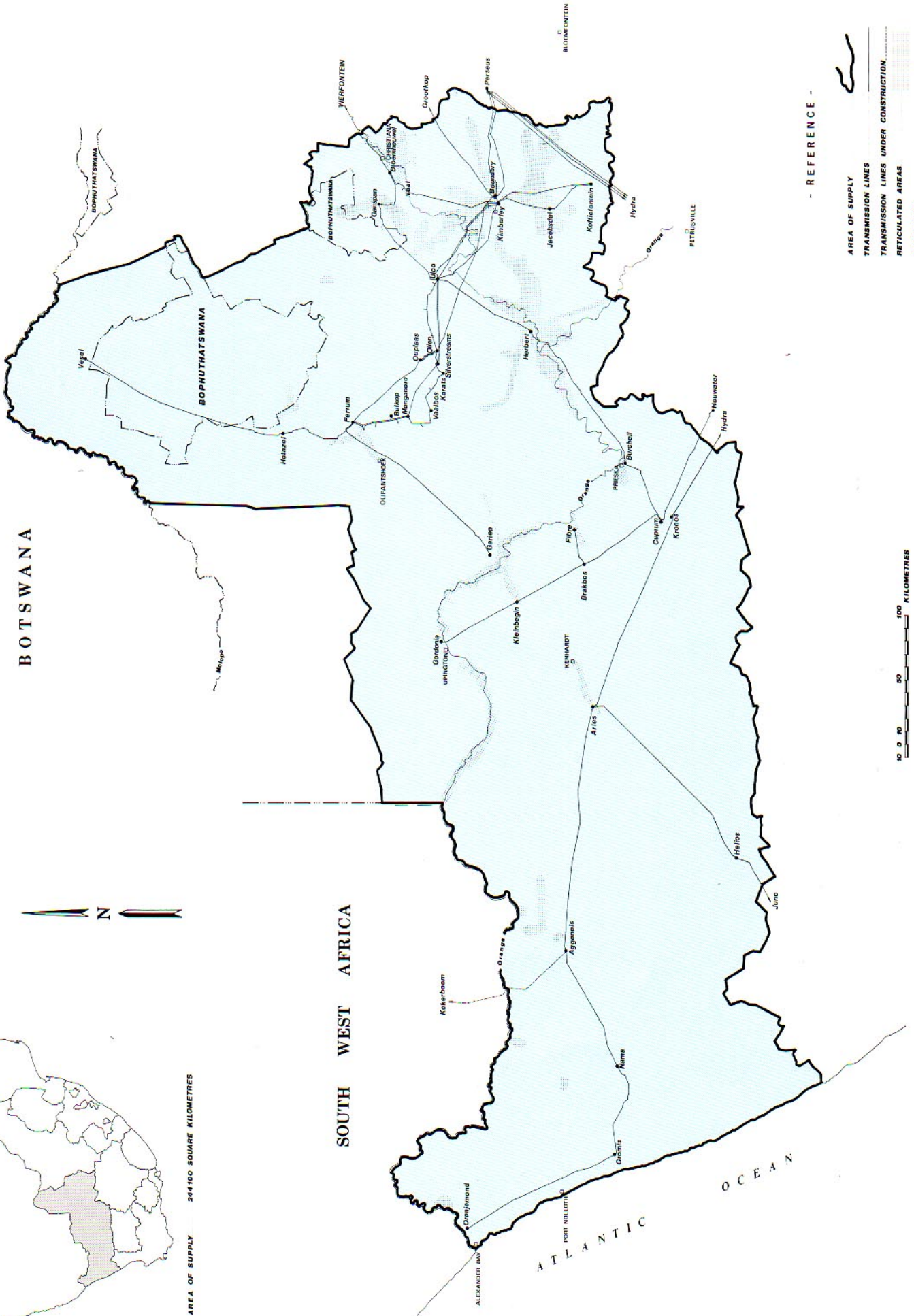




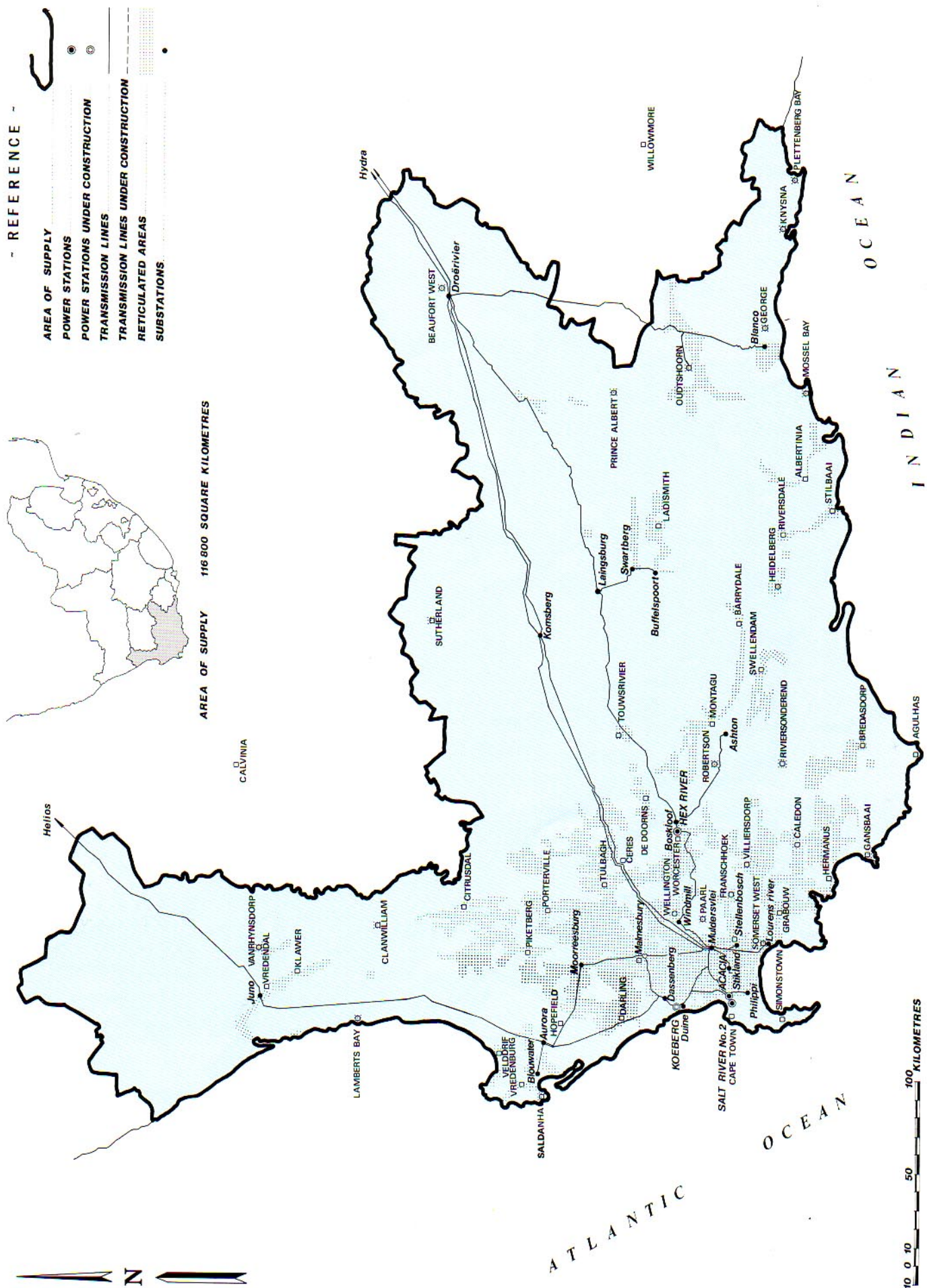
# Cape Northern Undertaking



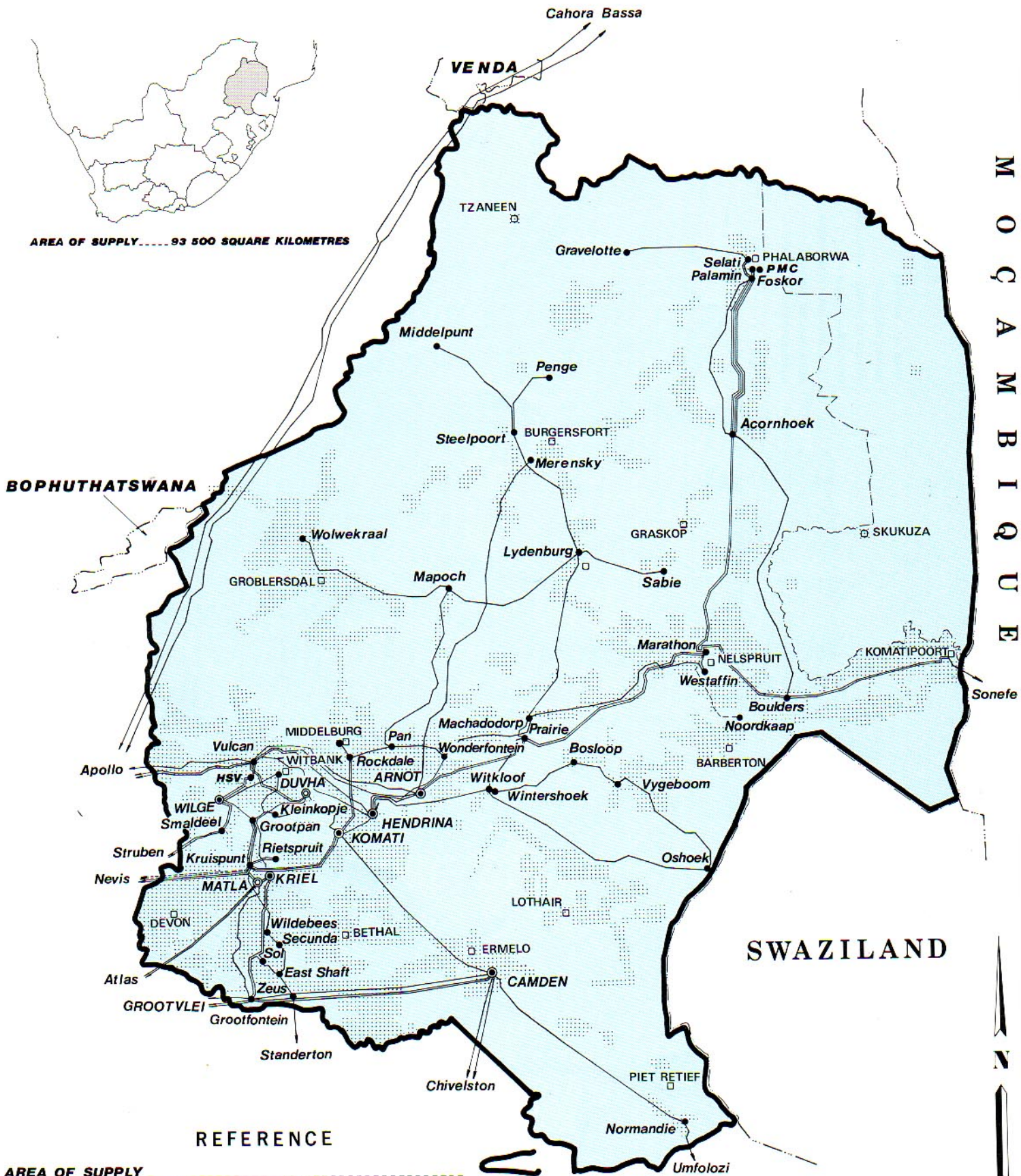
AREA OF SUPPLY 244 100 SQUARE KILOMETRES



# Cape Western Undertaking



# Eastern Transvaal Undertaking



AREA OF SUPPLY ..... 93 500 SQUARE KILOMETRES

BOPHUTHATSWANA

M O Q A M B I Q U E

SWAZILAND

## REFERENCE

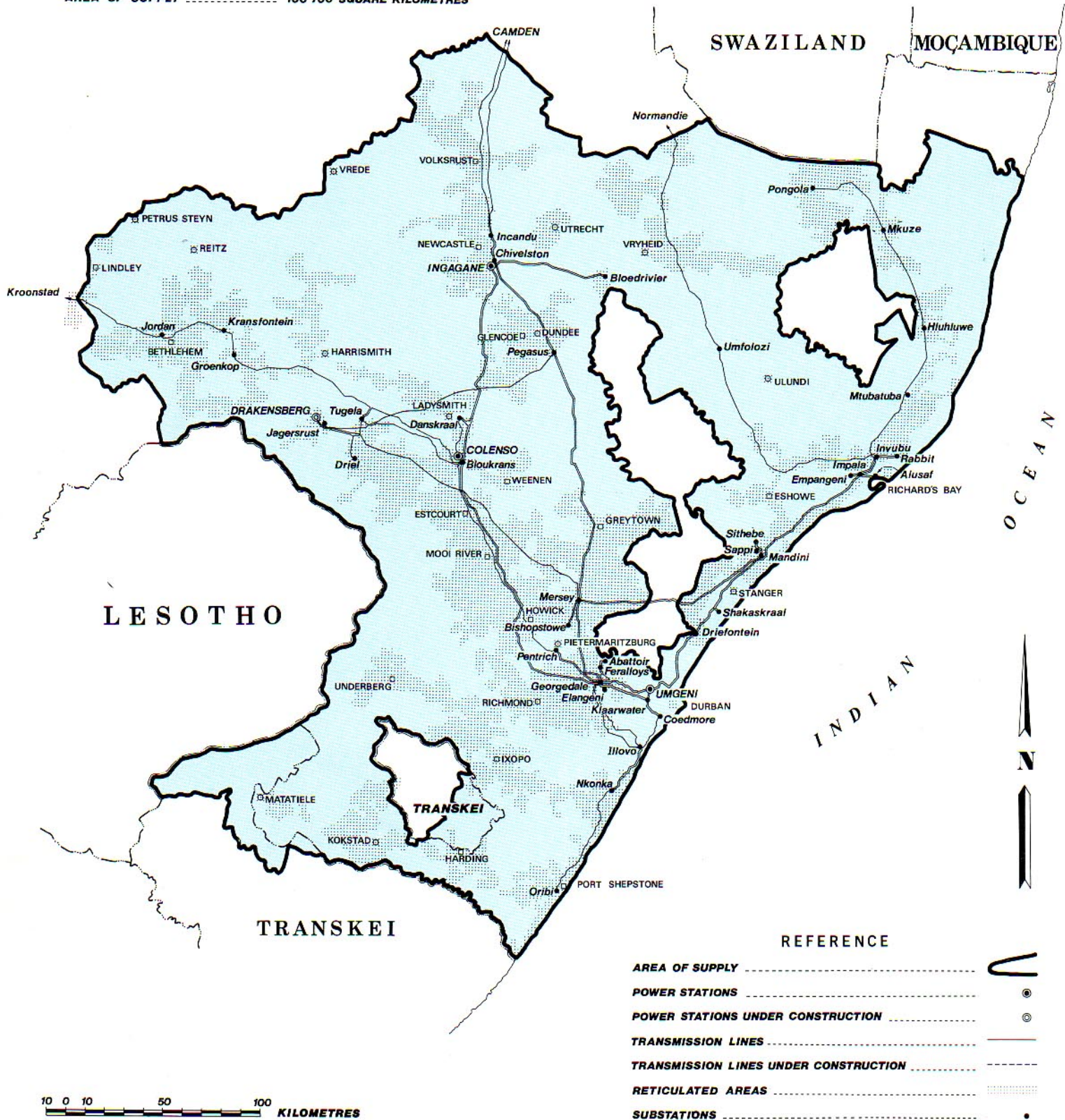
- AREA OF SUPPLY ..... [dotted pattern]
- POWER STATIONS ..... [solid circle]
- POWER STATIONS UNDER CONSTRUCTION ..... [circle with dot]
- TRANSMISSION LINES ..... [solid line]
- TRANSMISSION LINES UNDER CONSTRUCTION ..... [dashed line]
- RETICULATED AREAS ..... [dotted pattern]
- SUBSTATIONS ..... [solid circle]



# Natal Undertaking

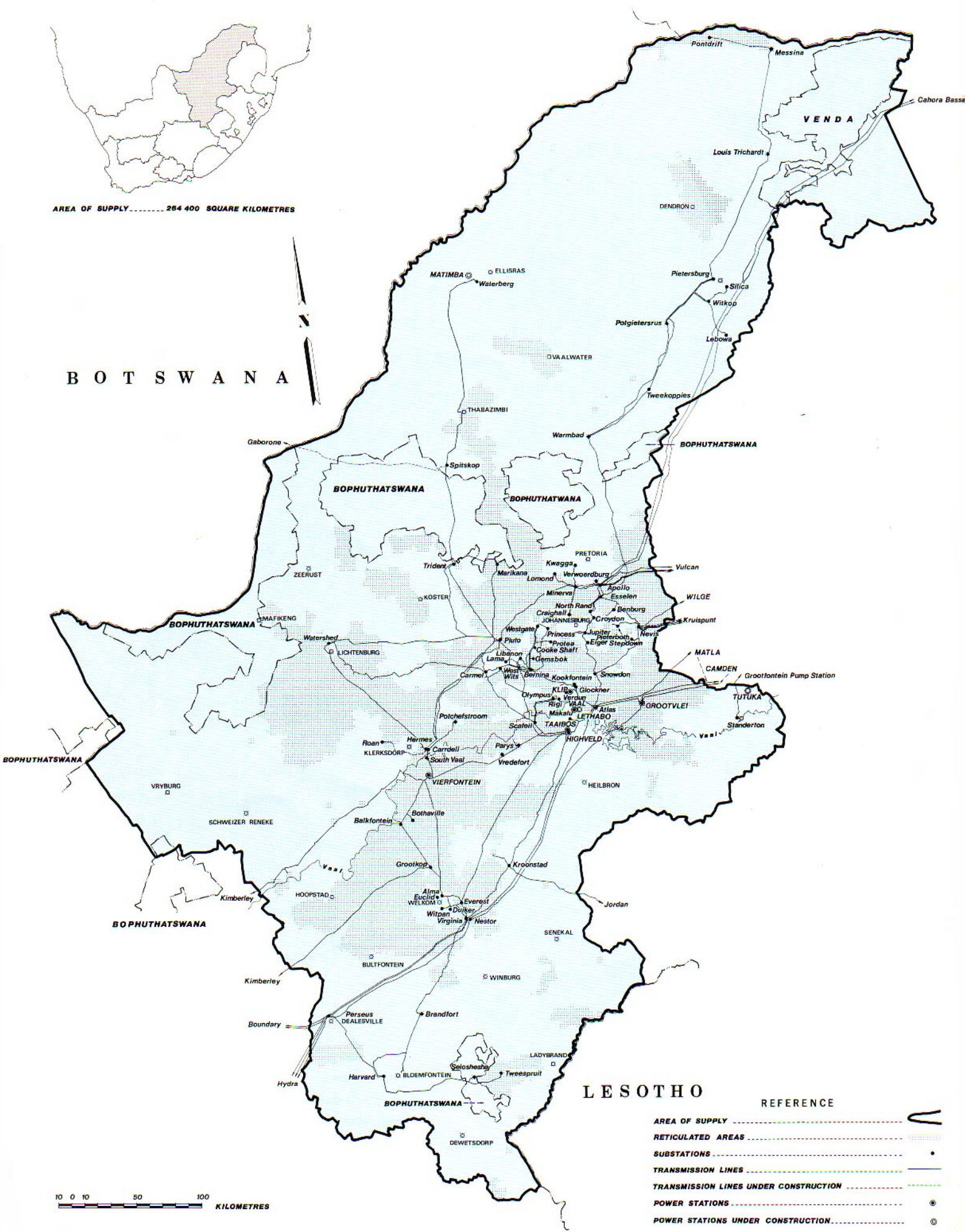


AREA OF SUPPLY ..... 106 700 SQUARE KILOMETRES





AREA OF SUPPLY ..... 284 400 SQUARE KILOMETRES



B O T S W A N A

LESOTHO REFERENCE

- AREA OF SUPPLY .....
- RETICULATED AREAS .....
- SUBSTATIONS .....
- TRANSMISSION LINES .....
- TRANSMISSION LINES UNDER CONSTRUCTION .....
- POWER STATIONS .....
- POWER STATIONS UNDER CONSTRUCTION .....

