Electricity Supply Commission

Megawatt Park, Maxwell Drive, Sandton

The Minister of
Mineral and Energy Affairs
House of Parliament
Cape Town

1 April 1982

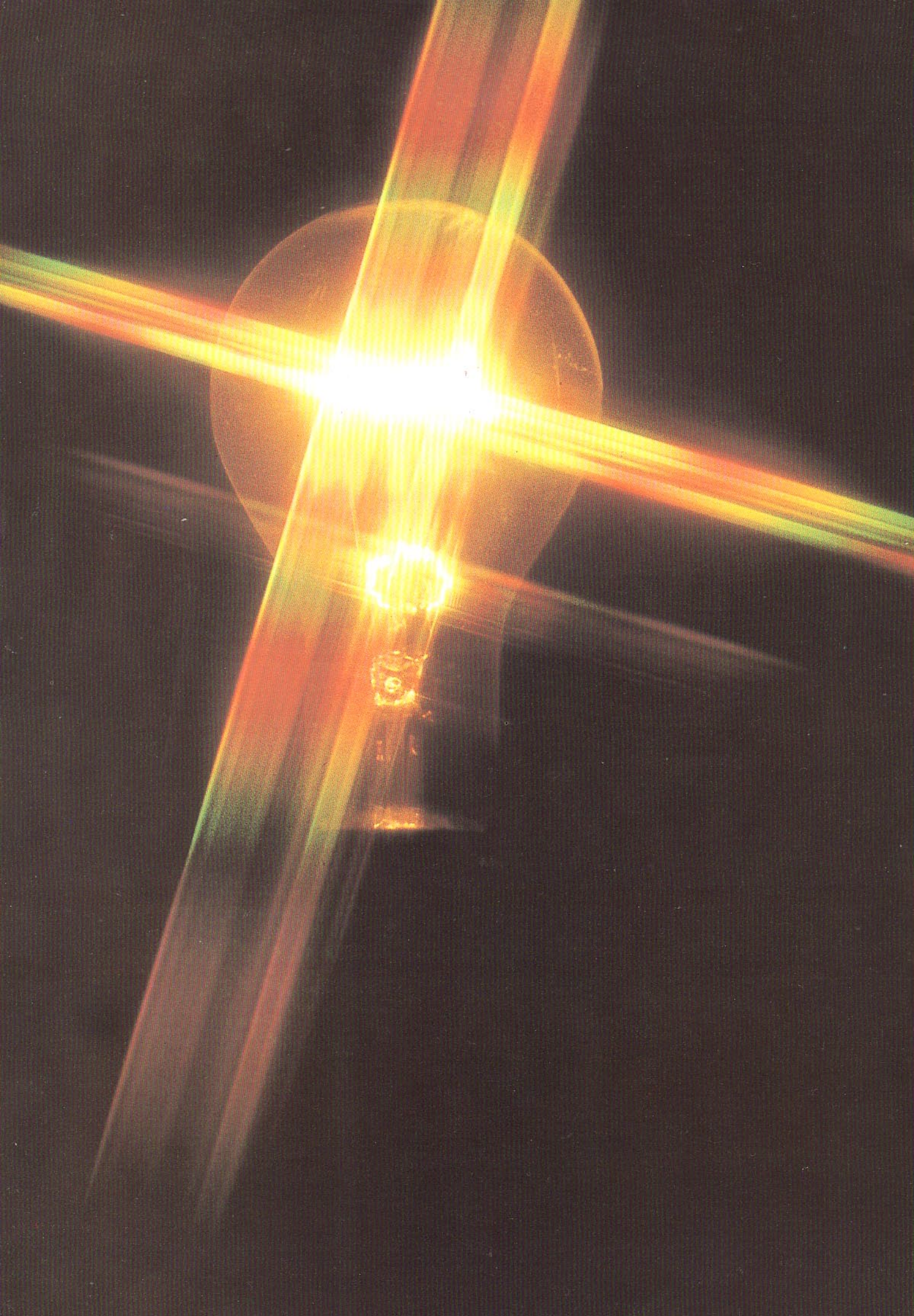
Sir

As required by Section 19 of the Electricity Act, 1958, the Commission has the honour of presenting its fifty-ninth Annual Report and Financial Statements covering its work for the financial year ended 31 December 1981.

Contents

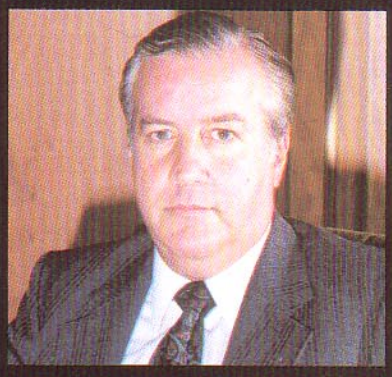
Members of the Commission

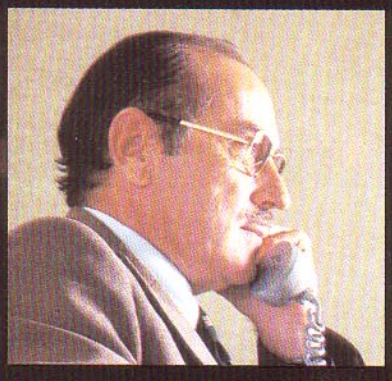
From left to right:
J. F. W. Haak (from 1980), Director of companies.
L. F. Rive (from 1981), Chairman, Greater Soweto Planning Council.
J. Wilkens (from 1980), Vice-President, South African Agricultural Union.
Jan H. Smith (member of the Commission since 1974 and Chairman since 1980).
T. R. Castle (from 1980), Stockbroker.
E. Pavitt (from 1969), Director of companies.
D. J. Malan (from 1968), Director of companies.



Corporate management

Left: Senior General Manager: I. D. van der Walt, Pr. Eng., B.Sc. (Elec. Eng.), B.Sc. (Mech. Eng.) (Witwatersrand).
Below (left to right): 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); General Manager (Finance): L. te Groen, B.Com. (Witwatersrand), C.A. (S.A.).
Bottom (left to right): 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); Personnel Manager: F. J. W. Barnard, Pr. Eng., B.Sc. (Eng.) (Stellenbosch), M.B.L. (UNISA).





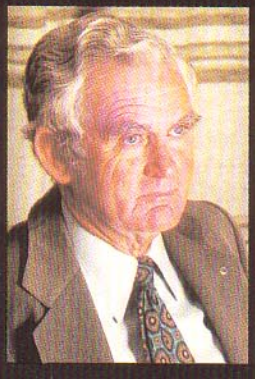
Regional managers

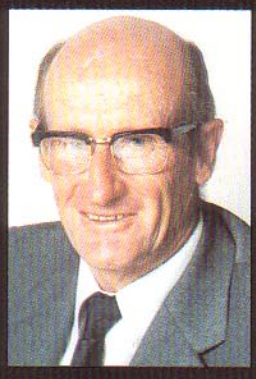
Left:

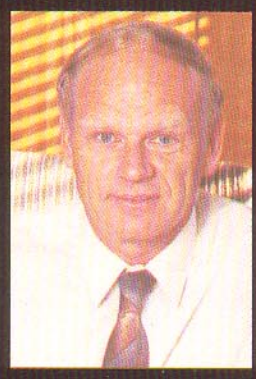
Rand and Orange Free State Region: M. W. Walter, Pr. Eng., B.Sc. (Eng.), (Natal).

Below (left to right):

Eastern Transvaal Region: T. P. O'Connor, Pr. Eng., B.Sc. (Eng.) (Natal);
Eastern Cape Region (including Border and Orange River Undertakings): E. F. Otten, Pr. Eng., B.Sc. (Eng.) (Witwatersrand);
Northern Cape Region: J. P. Rodger, Pr. Eng., B.Sc. (Eng.) (Cape Town);
Natal Region: H. E. Wohlberg, Pr. Eng., B.Sc. (Eng.) (Stellenbosch);
Western Cape Region: G. F. Hellström, Pr. Eng., B.Sc. (Eng.), B.Com. (Stellenbosch).



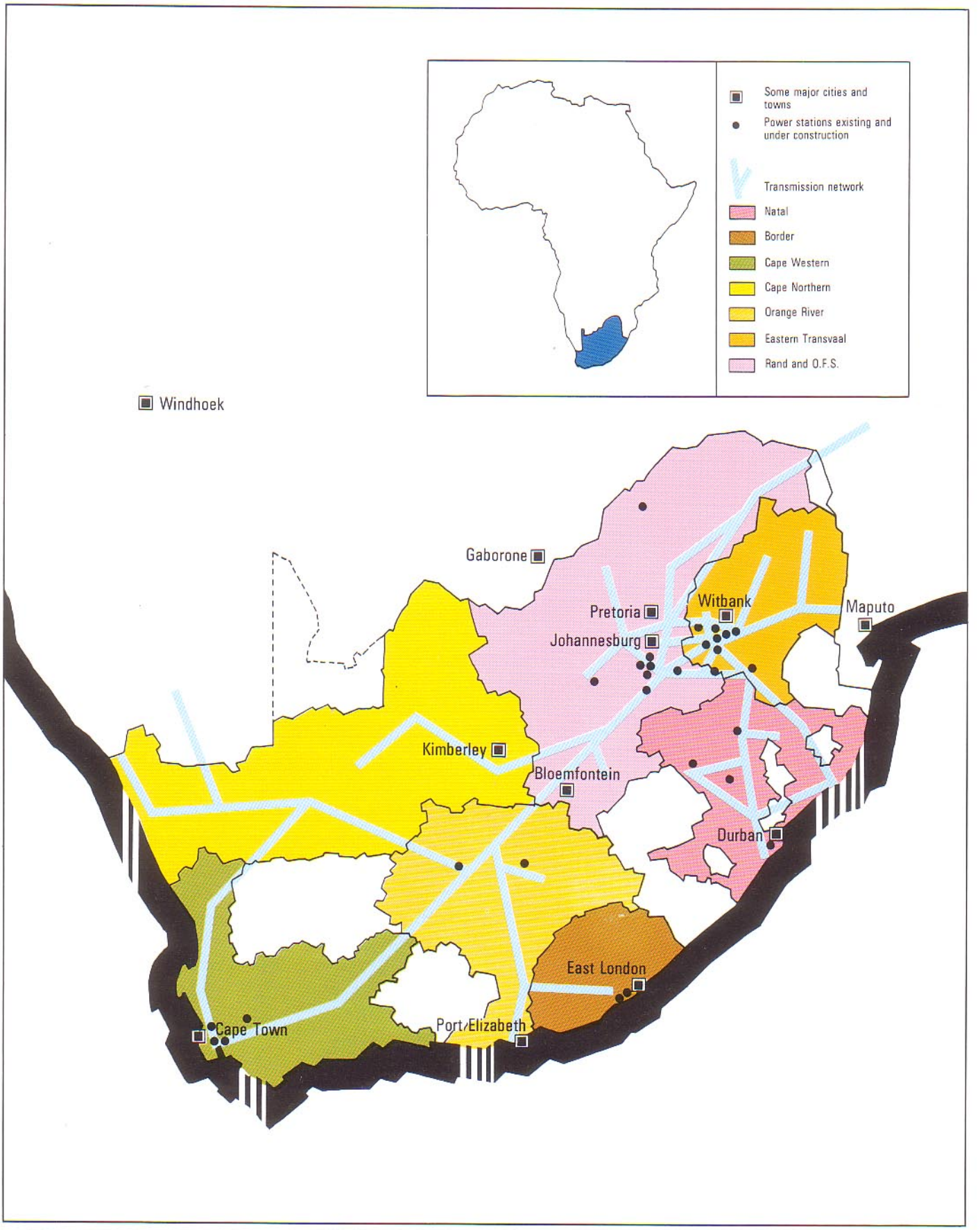




Statistical highlights

		1981	1980	% change
Financial				
Revenue	R(million)	2 141	1 772	20,8
Charges against revenue	R(million)	2 218	1 870	18,6
Expenditure on fixed assets	R(million)	1 951	1 447	34,8
Fixed assets at 31 December	R(million)	10 144	8 219	23,4
Average cost per kW.h sold	cents	2,364	2,136	10,7
Average price per kW.h sold	cents	2,281	2,024	12,7
Average coal cost per ton	Rand	9,71	8,12	19,6
Operating statistics				
Escom's share of electricity sent out in R.S.A. and national states	%	93,3	93,0	0,3
Net electricity sent out by Escom	million kW.h	99 713	92 950	7,3
From Escom power stations	million kW.h	97 824	83 362	17,3
From other sources	million kW.h	2 601	9 659	—73,1
Electricity sold by Escom	million kW.h	93 844	87 539	7,2
Coal burnt in Escom power stations	million tons	53,90	46,76	15,3
Water consumed in Escom power stations	megalitres	235 138	214 813	9,5
Maximum demand on integrated Escom system	MW	14 674	13 668	7,4
Escom plant in service at 31 December				
Installed capacity	MW	20 049	18 349	9,3
Assigned sent-out rating	MW	18 989	17 339	9,5
Major overhead transmission lines:				
Direct current:				
533 kV (monopolar)	km	1 030	1 030	—
Alternating current:				
400-220 kV	km	14 998	14 557	3,0
165 kV and below	km	105 344	99 840	5,5
Underground cables:				
132 kV and below	km	7 191	7 687	—6,5
Capacity of transformers	MVA	126 638	122 825	3,1
Staff employed at 31 December		52 080	47 490	9,7

Escom's undertakings and national grid



Electricity Supply Commission

Objectives

In terms of its establishment as an electricity utility under the Electricity Act No. 42 of 1922, Escom's 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.

Escom therefore measures the success of its performance in terms of its contribution to the economy by virtue of the amount and price of electricity which it provides for consumption. It is estimated that electrical energy constitutes 23% of the total net energy usage in South Africa with Escom providing over 93% of that total. With the increasing cost of other energy sources, notably oil, it is expected that Escom will have to supply about 40% of the country's total net energy requirements by the turn of the century. This is more than three times the figure of 11% supplied in 1961.

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 troughs in the business cycle. This is particularly true of the civil and heavy engineering sectors; these can be provided with a reasonably constant volume 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 expenditure programme, employment is provided to thousands of people.

Financial policy

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 portion 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 other source of funds available to Escom and is controlled by the provisions of the Electricity Act.

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, a Capital Development Fund and a Reserve Fund provide further internal financing. Amounts subject to a limit in terms of the Electricity Act may be credited annually to these funds.

The Capital Development Fund is used to finance part of Escom's capital expansion and the replacement of assets taken out of service. In respect of the latter it provides for the difference between historical cost depreciation as implied by the Redemption Fund operation and replacement cost depreciation.

The Reserve Fund is used to finance expenditure 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.

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

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 project-related facilities, direct placements and syndicated bank loans.

Over several years Escom has developed and promoted a 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 its various funds. It is a net seller of its own stock. Proceeds from sales are reinvested by Escom on behalf of its funds in new issues.

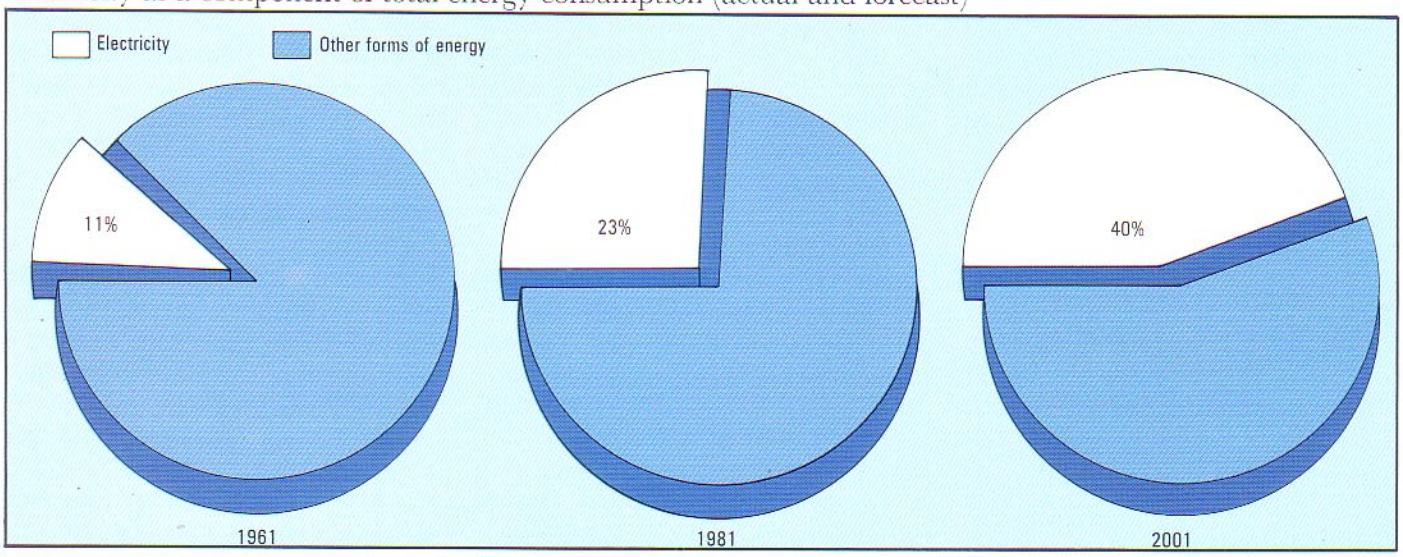
Management

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 system in his region. There are regional head offices in Cape Town, East London, Durban, Witbank, Johannesburg and Kimberley. For accounting purposes the area served by Escom is divided into seven distribution undertakings.

Electricity as a component of total energy consumption (actual and forecast)



Chairman's review

Escom recorded a growth in electricity kilowatt-hour sales of 7,2% in 1981, despite the decline in economic activity which South Africa began to experience in late 1980 after three years of substantial growth.

While this growth rate is probably one of the highest experienced by a major electricity undertaking anywhere in the world last year, it is lower than Escom's 8,2% annual average for the last five years and the 8,6% recorded in 1980. While sales reached a record 93 844 million kW.h (87 539 million kW.h in 1980), it became apparent during the year that South Africa was entering a period of slower economic activity.

Significantly though, sales in 1981 indicate that the lower growth rate in the demand for electricity was mainly attributable to the worsening recession overseas and the impact this has on South Africa's export markets.

Of Escom's three major consumer categories - industrial, mining and bulk sales to municipalities - a very high growth rate in the demand for electricity was recorded in the third category (11,3% in 1981 as opposed to the 8,3% average for the past five years). This was mainly due to some municipalities experiencing difficulties with their own generating plant and as a result purchasing more electricity from Escom.

It should of course be remembered that a substantial proportion of bulk sales to municipalities represents electricity resold to industrial consumers. In the case of Escom's own industrial category, consisting mainly of corporations whose activities are directly influenced by overseas markets, the growth in the demand for electricity was only 5,8% compared to the 9,3% annual average over the past five years. Similarly, the demand from consumers in the mining category grew by only 4,8%, compared to the 7,7% annual average for the past five years.

As a result of this lower overall growth rate, Escom's total revenue in 1981, totalling R2 141 million, was lower than expected. Charges against revenue were R2 218 million, leaving a deficit of R77 million for the year and an accumulated deficit of R96 million.

The lower growth rate in electricity sales was, however, not the only factor responsible for the deficit. Charges against revenue rose sharply as inflation continued unabated and the increase in the cost of borrowing money to finance capital needs reached an unprecedented level. In fact the full impact of the high prevailing interest rates will be increasingly felt in future years.

In addition, operating costs were adversely affected by the reduction in output from Cahora Bassa. Because of the present low plant margin, operation of Escom's older and less efficient power stations had to be continued.

Internal finance generated amounted to R814 million (R671 million in 1980) which represented 30% of Escom's total financial needs and 42% of its net expenditure on fixed assets during 1981. This level of internal finance remains well within the levels that would result if costing principles such as replacement cost depreciation were followed. These implications are discussed in greater detail in the senior general manager's report.

Expenditure on fixed assets amounted to R1 951 million in 1981. This increase of R504 million or 35% over the 1980 figure is mainly attributable to inflation and Escom's accelerated expansion programme. Total fixed assets stood at R10 144 million at the year end, of which R3 721 million (37%) was in respect of works still under construction (31% in 1980).

The maximum hourly demand met by Escom was 14 674 MW, an increase of 7,4% over the 1980 figure. A potential demand in excess of 15 000 MW could not be met due to the shortage of generating capacity.

During the year plant with an assigned sent-out rating of 1 650 MW (2 300 MW in 1980) was taken into service. At the year end, Escom's total sent-out capacity stood at 18 989 MW excluding the capacity from Cahora Bassa, while plant which will increase sent-out capacity by a further 16 000 MW was under construction or had been announced.

Escom's interconnected distribution system was further strengthened and expanded during 1981. More than 20 towns - including Soweto - and numerous farm schemes were connected to the Escom system.

The year's results bring a number of issues vital to electricity supply to the fore. These include Escom's ability to meet the demand for electricity in the short term, its ability to meet the demand in the longer term, its financial position, its productivity and finally, its manpower situation.

Present supply situation

In 1981 supplies to consumers throughout the country were interrupted on a number of occasions because of a lack of generating capacity. The reasons for this shortage of capacity were given in my 1980 review. Briefly, we have lost three to four years of generation expansion as a result of the cautious economic thinking which prevailed in this country during the 1970s. The situation has been aggravated by the manpower shortage and the continued unavailability of power from Cahora Bassa.

The present shortages are temporary, but will continue for some years. The situation should then improve gradually as more and more new plant is brought into service. The emphasis is perhaps on a gradual improvement, since restraints are imposed by the shortage of skilled manpower and hence our inability to carry out all scheduled maintenance on time.

Everything possible is being done to cushion the effect of insufficient supplies of electricity. Recruitment, training, and the construction programme have been stepped up, and

additional maintenance shiftwork is being introduced.

We have also devised a system of voluntary load-shedding. For this we have gained the support of a number of large consumers who, when the demand for electricity at any given time of the day approaches the maximum we can supply, will voluntarily reduce their loads in order to prevent large-scale unscheduled blackouts. Last year we had excellent cooperation in this respect. In the Transvaal, in particular, many blackouts were averted in this way.

Future growth

The growth rate in the demand for electricity in this country remains high, and it is expected to remain so at least until the turn of the century. There will be fluctuations from year to year, but in the longer term an average annual growth rate of more than 7% is expected which will only start tapering off towards the end of the century. Over the past 30 years Escom has recorded an average annual growth rate of 8,8%.

Present indications are that South Africa will need about 35 000 MW of installed capacity by 1990 (nearly double our present capacity), and about 70 000 MW by the year 2000.

Because of the long-term nature of electricity supply, orders are of necessity being placed for power stations which will be phased in during the latter half of this decade and be fully commissioned only towards the middle of the 1990s.

The expected growth over the next 25 years involves a massive expansion programme which will make exceptional demands on this country's resources, its planners and on Escom itself. In this period some 20 base-load stations, the size of a present-day Duvha or Matla, will have to be built as well as some five peaking stations. Within the foreseeable future, the role which nuclear power could play in this programme will have to be indicated; at present it seems that nuclear power will be a real and necessary part of this country's electricity generating mix.

Financial status

As a utility Escom has to match, as far as practicable, revenue with charges against revenue each year. Estimates of the revenue and charges against revenue for a specific year are made up to six months before the beginning of that year - nearly 18 months before the year end - and cannot accommodate unexpected eventualities which may occur later on.

In the present economic environment of high inflation and high interest rates, accurate predictions of revenue and charges against revenue become difficult. This is particularly so in the case of an organisation like Escom with a significant annual growth rate which is normally higher than the increase in the gross domestic product. While both factors - high inflation and high interest rates - could in the longer term have an influence on the demand for electricity, the immediate impact on costs is of particular concern.

In 1980, as interest rates began to rise, the cost of loans increased correspondingly. In such fluid circumstances deficits on the electricity supply account can arise at the year end, and adjustments to the tariff have to be made. The 1981 deficit represents only 3,6% of income.

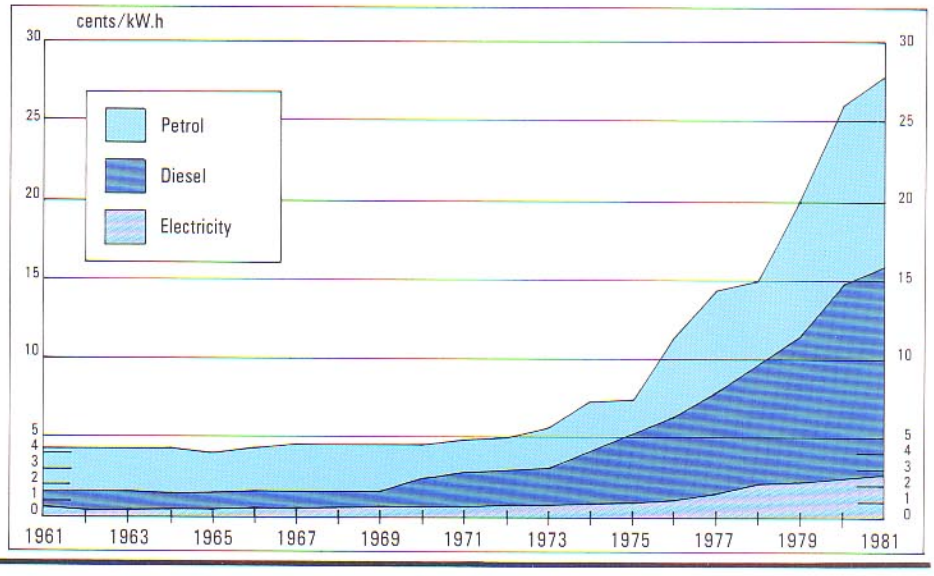
With the current high inflation and interest rates, the modest tariff increases of the recent past which were well below the prevailing inflation rate - on average 7,3% in 1980 and 5,5% in 1981 - have been inadequate to cover rising costs. Indeed the 13,1% average increase effective from January 1982 is indicative of what may be expected in future, unless conditions change.

I should, however, like to give electricity consumers the undertaking that Escom will do its utmost to keep the price of electricity as low as possible.

The basis of financing Escom's capital needs is sound. The goal of financing 50% of these capital requirements from internal sources is being approached steadily.

Cost of a kW.h of output

In comparing the cost of petrol, diesel and electricity in an industrial application, the relative efficiencies of these sources of energy - and the impact these have on costs - are often overlooked. In the graph this aspect has been taken into consideration, and the cheapness of electricity compared to petrol and diesel is further underlined. The efficiency of a petrol engine and a diesel engine have been taken as being 22% and 34% respectively. This compares with an efficiency of 90% for an electrical motor. Witwatersrand prices for petrol, diesel and industrial electricity have been used as a base.



Funds for Escom's financial needs not covered by self-financing were obtained from the local and foreign capital markets at satisfactory terms. On the local markets financing was readily available and provided in 1981 60% or R1 071 million of our external requirements. The balance of the external financing, namely R722 million, was obtained from foreign sources.

Productivity

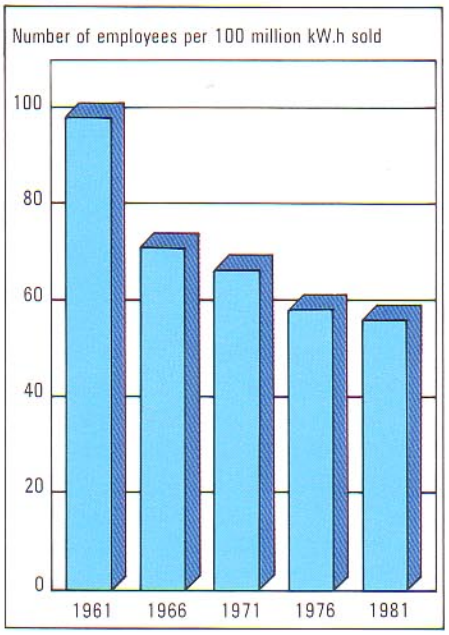
Escom has set itself a major aim of continuing to reduce the cost of electricity in real terms.

Towards this end, Escom's management endeavours to improve cost efficiencies in all sectors of operations. The emphasis is on improving the productivity of both human and other resources.

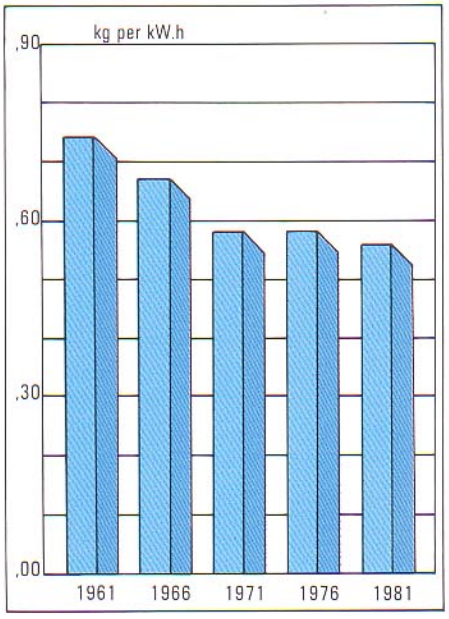
It is not easy to define and measure productivity in terms of a utility which operates virtually without competition in supplying over 93% of South Africa's electricity. The very size of our operations and the impact these have on this country's economy and well-being, necessitate coordinated and realistic productivity measures to indicate to what extent we are meeting our objectives and how effectively we are using our resources.

One of the more obvious measures would be the cost of electricity - but an assessment will have to be relative since there is only one electric utility in this country and different conditions in other countries make comparison difficult. Even so, a recent independent survey of electricity prices in 34 countries shows that the price in South Africa was the fifth cheapest and that the generation in all four countries with cheaper rates was derived predominantly from

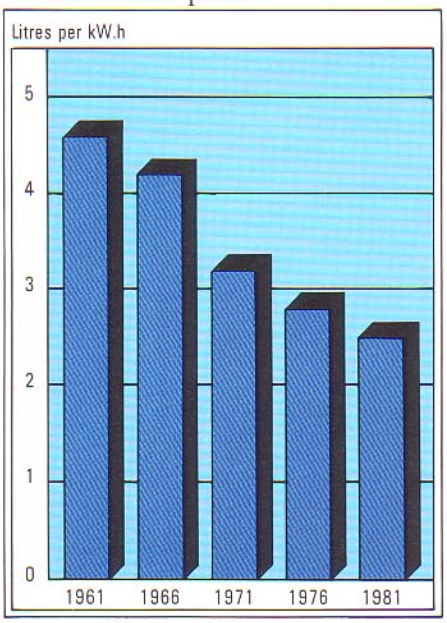
Employee productivity



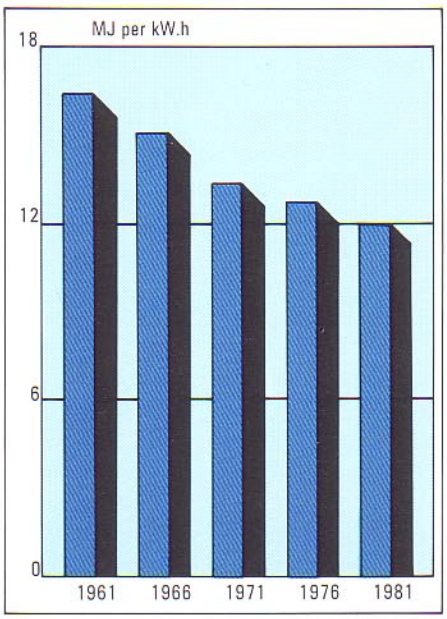
Coal consumption



Water consumption

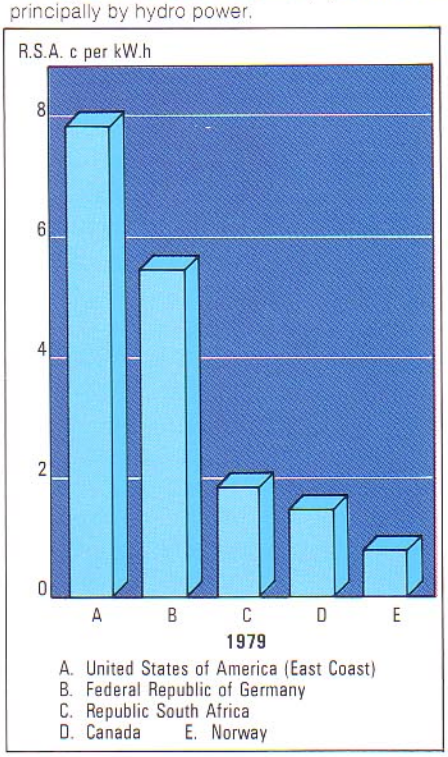


Energy conversion



Average selling price of electricity

A recent independent survey of electricity prices in 34 countries shows Escom power as being the fifth cheapest. In the four countries in which cheaper electricity is available - Iceland, Turkey, Norway and Canada - electricity generation is principally by hydro power.



hydro-electric stations where fuel costs are not a factor.

The cost of electricity alone is not in itself the overriding consideration. Cheaper electricity is possible, but at the expense of items such as quality of supply, adequate security measures, the availability of electricity in less densely populated areas, and pollution. In addition, we must use natural resources sparingly and intelligently. Costly measures are often necessary to help conserve the country's scarce water resources. Similarly, we do not burn high-quality coal, which has valuable uses elsewhere in industry. Virtually discard grades are used, which necessitates more costly plant.

In the end the aim is to strike an acceptable balance, taking all aspects into consideration.

Escom keeps extensive statistics of its operations and these provide a basis for identifying trends and setting objectives. The areas covered include power station operation, power distribution, manpower, fixed assets under construction, inventories and finance. Information of this kind enables Escom's management to improve cost efficiencies in all sectors of its operations.

Manpower

In line with changes in South Africa's social structure towards a policy of equal opportunity for all, Escom is advancing towards becoming an equal opportunity employer.

The acceptance of this policy within Escom has been very good and differences that have arisen have been minimal and were easily overcome.

We have, in common with other large employer organisations, had to take special note of the growing desire of employees to have their trade unions act on their behalf. We have negotiated with unions and other employee organisations on a large range of matters with considerable success.

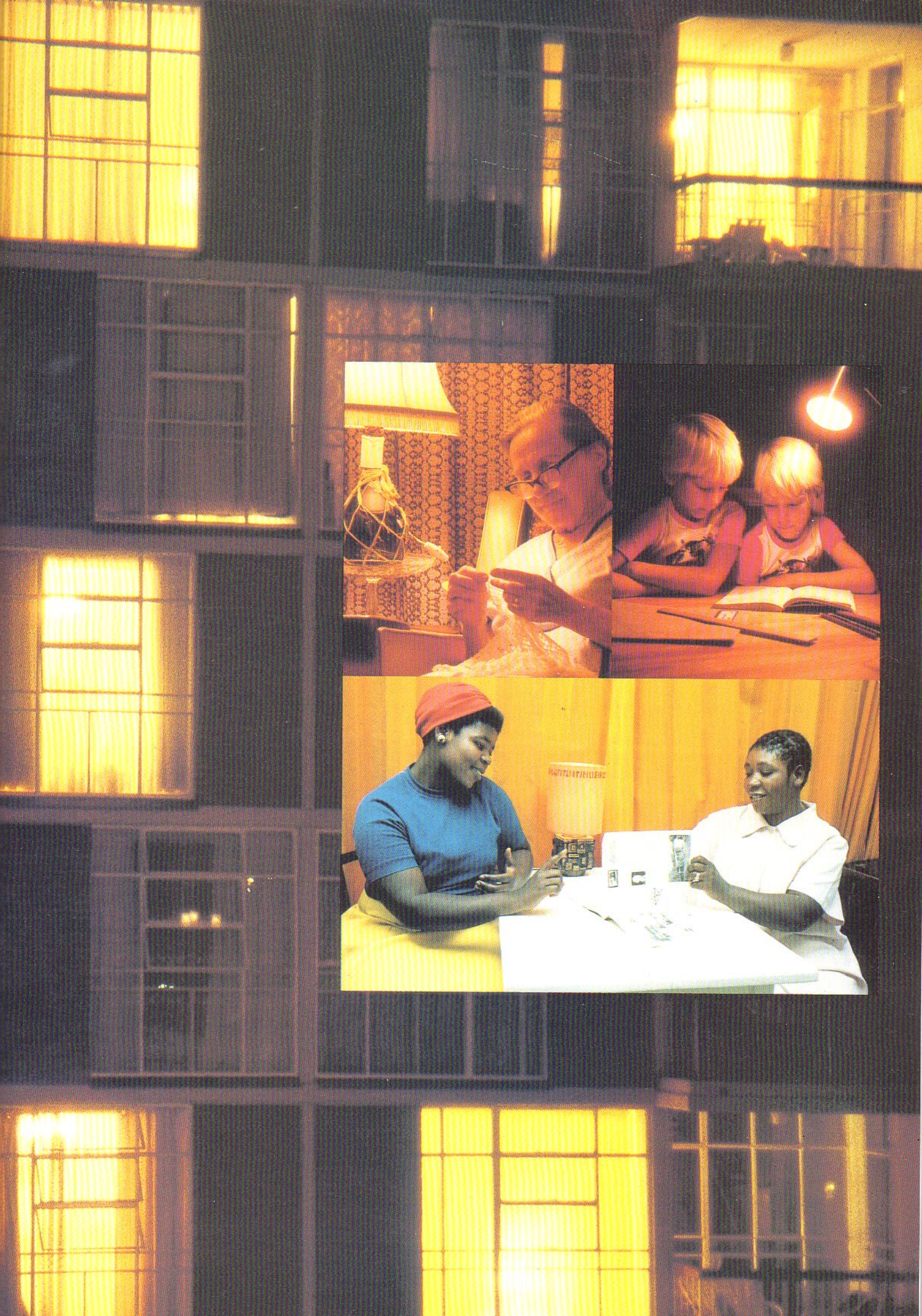
Board and management changes

A member of the commission, Dr. G. Marais, resigned in September on his becoming a member of Parliament. The commission joins me in thanking him for his valuable contribution to Escom and we wish him success with his new career. A sincere welcome is extended to Mr. L. F. Rive who was subsequently appointed to the commission. His expertise and knowledge will be a valuable asset to the commission.

We wish the regional manager of the Western Cape Region, Mr. R. P. A. Mýburgh, a long and happy retirement and extend a welcome to his successor, Mr. G. F. Hellström.

To all employees of the commission, I express my appreciation for their sustained efforts to help us meet our objectives, often under difficult circumstances.

Jan H. Smith
Chairman



Senior general manager's report

Electricity sales

Escom sold 93 844 million kW.h in 1981 compared to 87 539 million kW.h in 1980, a growth of 7,2%. This growth rate was lower than the 8,2% average for the last five years, but it is still well above the 1981 gross domestic product growth of 4,7%.

Sales, divided into consumer categories, are set out in the accompanying table.

Electricity sold by Escom directly to industry forms the largest category and comprises over 33% of Escom's total sales. In addition, a large part of the supplies sold in bulk to municipalities is resold to industrial consumers. About half of Escom's electricity is used by industry.

The effect of the overseas recession on Escom's direct industrial sales, which became apparent during the second half of 1980, increased in severity. At 5,8% the growth rate in this category was well below the average 9,3% per annum for the five years 1976-1981. The full effect on Escom of the reduction in South African exports was moreover masked by the rapid growth of the supply to Sasol 2 during 1981.

Sales in bulk to municipalities and to neighbouring territories on the other hand increased by 11,3% (average annual rate over the past five years was 8,3%) and comprised about 32% of total sales. This very high increase was due in part to municipalities reducing the use of their own aging power stations and taking bigger supplies from Escom.

Mining supplies, Escom's third major category of use, increased by 4,8%. This is less than the 7,7% average annual growth rate for the last five years. Mining now represents only 29% of Escom's total sales compared to 58% in 1951. This shift from mining to industry as the biggest power user, illustrates how our economy has moved from a primary industry base to secondary industry.

Sales expressed regionally

Administratively Escom is divided into six geographical regions and for accounting purposes, into seven distribution undertakings (see map on page 7). In January 1981 the Cape Eastern Undertaking was incorporated into the Orange River Undertaking.

Kilowatt-hour sales in the Rand and Orange Free State Undertaking (about 56% of Escom's total sales) increased by 5,9%. Sales to mining consumers grew by 4,6% (compared to the five-year annual average of 7,0%) and to industrial consumers by 2,0% (five-year annual average, 6,2%). However, bulk sales to municipalities increased by 12,1% (five-year annual average, 8,9%).

The Eastern Transvaal Under-

Sales of electricity to categories of consumers

Category of supply	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
				Million kW.h				
***Sales to municipal supply authorities (bulk)**	20 096	20 862	21 834	24 133	26 923	29 961	11,3	8,3
Direct supplies:								
**Domestic and street lighting	1 093	***1 030	960	940	906	1 002	10,5	—1,7
Industrial	19 946	21 586	24 182	27 475	29 373	31 091	5,8	9,3
Mining	18 746	20 139	22 219	24 000	25 882	27 131	4,8	7,7
Traction	3 475	3 508	3 586	4 035	4 455	4 659	4,6	6,0
Total	63 356	67 125	72 780	80 583	87 539	93 844	7,2	8,2
				% of total				
***Sales to municipal supply authorities (bulk)**	31,7	31,1	30,0	29,9	30,8	31,9		
Direct supplies:								
**Domestic and street lighting	1,8	***1,6	1,4	1,2	1,0	1,1		
Industrial	31,4	32,1	33,2	34,1	33,6	33,1		
Mining	29,6	30,0	30,5	29,8	29,5	28,9		
Traction	5,5	5,2	4,9	5,0	5,1	5,0		

*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.

taking showed a growth in sales of 13,2%. This is largely ascribed to a sales growth of 14,3% to industrial consumers which, in turn, was due to the rapid growth in the supply to Sasol 2.

For 1982 a growth rate of about 6% is expected in this undertaking. Much will depend on a recovery of the steel and ferro-alloy export markets. In subsequent years growth will be stimulated by Sasol 3, increased production from the pulp and paper installation at Ngodwana, the steel industry in the Witbank area and the growth point in the Bronkhorstspruit area.

Despite the depressed export markets, kilowatt-hour sales in the Cape Northern Undertaking, which supplies electricity mainly to mines and mining-related consumers such as traction supplies and towns in the mining areas, rose by 5,9%. The lower increase of only 0,2% in sales to the railways reflects the reduction in mineral exports from this region. Nevertheless sales to the diamond mines increased by 6%. At the Sishen mine a large in-pit crusher and an electric trolley system are being installed whereby millions of litres of diesel fuel will be saved annually.

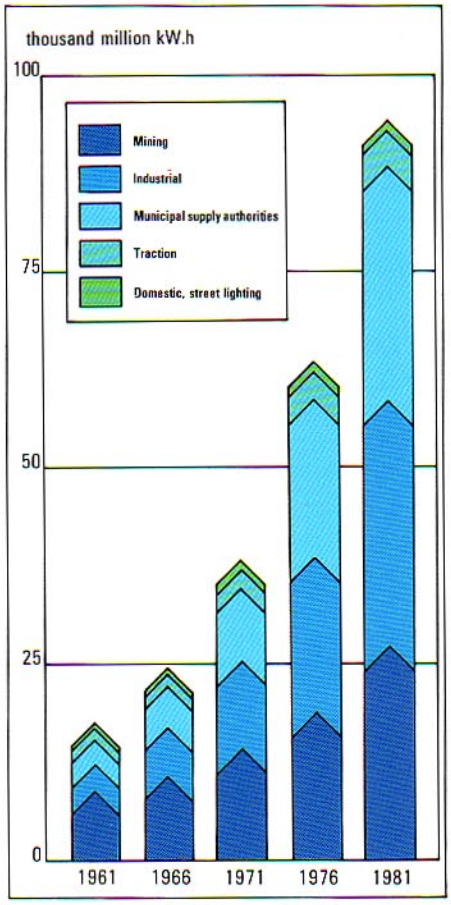
The Natal Undertaking sold 6,4% more electricity than in 1980. Kilowatt-hour sales in the industrial section increased by 1,6% while bulk consumers took 10,1% more electricity than in 1980. The latter figure is well above the annual average rate for the past five years and was principally due to an increase of over 11% in sales to Durban Corporation.

The low increase in sales in the industrial category resulted mainly from export sales constraints experienced by the suppliers of ferrous products. It is expected that total sales in this region will increase by about 9% in 1982.

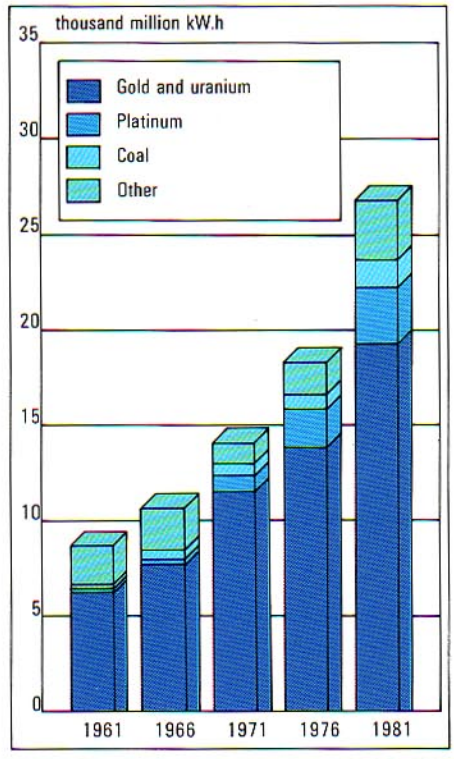
The Cape Western Undertaking sold 8,3% more electricity in 1981 than in 1980. Bulk kilowatt-hour sales to municipalities increased by 8,5%, the larger portion of which was taken up by the Cape Town City Council. The increase of 10,4% in sales to the railways is partly the result of more goods being railed to the western Cape.

In the Border Undertaking the 1981 total sales exceeded the 1980 figure by 7,8%. Bulk supplies to municipal undertakings and the Transkei Electricity Supply Corporation account for 88% of the total kilowatt-hour sales in this region and growth of these loads was largely responsible for the increase.

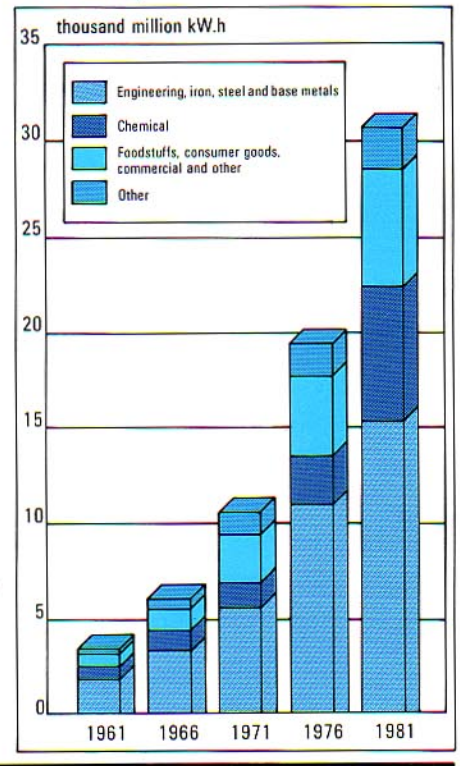
Electricity sales to different consumer categories



Electricity sales to sectors of the mining industry



Electricity sales to sectors of industry



In the Orange River Undertaking total kilowatt-hour sales increased by 3,2%. This can mainly be attributed to the higher demand from the municipality of Port Elizabeth.

Financial

Capital expenditure

Expenditure on expansion of fixed assets during 1981 amounted to R1 951 million - an increase of R504 million or 35% over 1980. Assets costing R4 million were taken out of service or sold. Total expenditure to date on fixed assets is R10 144 million comprising capital works at cost of R10 044 million, of which R3 721 million or 37% is still under construction. The percentage of capital expenditure classified as works under construction has been as follows in previous years: 31% in 1980, 37% in 1979 and 34% in 1978. Plant to the value of R723 million was placed in commercial operation during the year. Other fixed assets totalled R100 million at the year end after an allowance for depreciation.

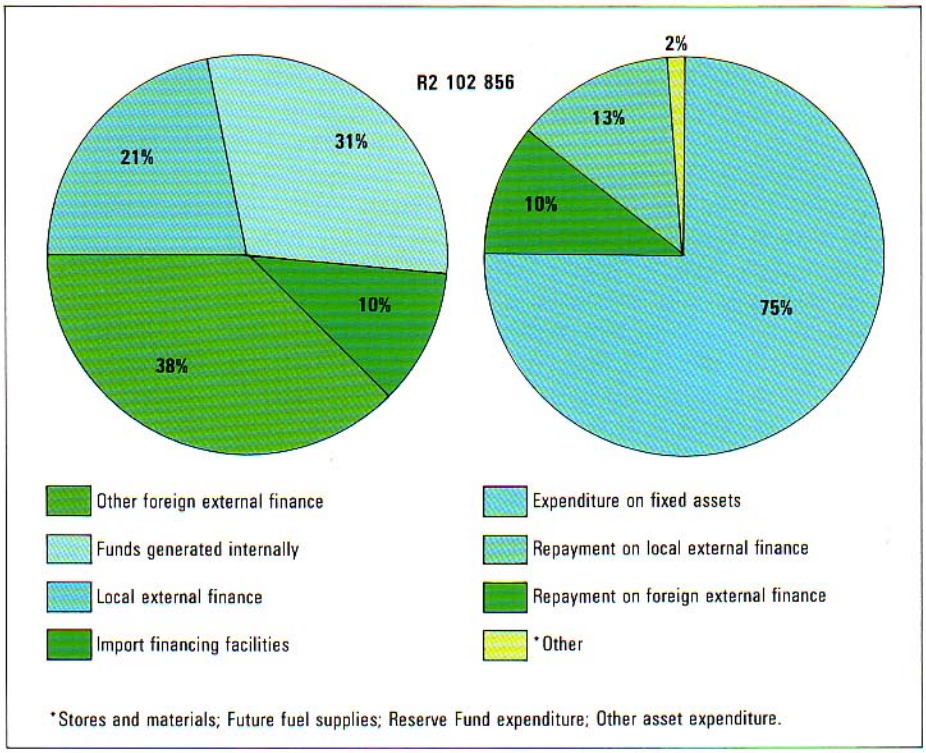
Loans and capital markets

As in the previous year Escom was successful in obtaining sufficient funds from local and foreign capital markets. Because of the high level of liquidity on local markets financing was freely available, and provided 60% of Escom's external financing requirements for the year. The other 40% was obtained from foreign sources. The accompanying diagrams illustrate contributions from these sources.

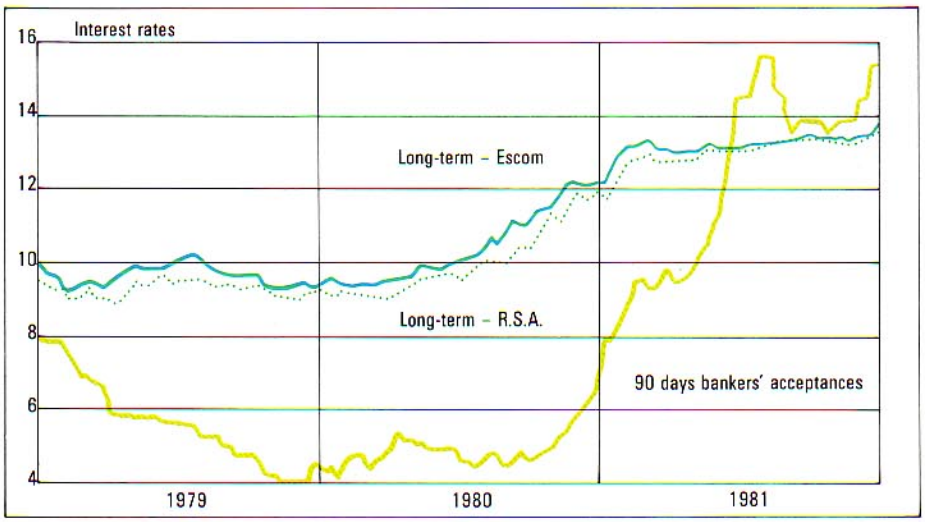
Local as well as foreign capital markets were characterised by high interest rates during 1981. The yield on local Escom stocks rose steeply at the beginning of 1981, but increased only marginally towards the end of the year.

Long-term Escom stocks, which traded at 12,25% at the beginning of the year, were trading at 13,09% in April and at 13,40% at the year end. The trends in local long-term and short-term interest rates are shown in the accompanying graph. The foreign financial markets continued to experience wide interest rate fluctuations with American interest rates reaching new peaks during the year. The relatively high levels of American interest rates together with the South African Reserve Bank's reduction of the 2,5% discount rate on dollar forward cover have markedly increased Escom's cost of foreign financing.

Source and application of funds

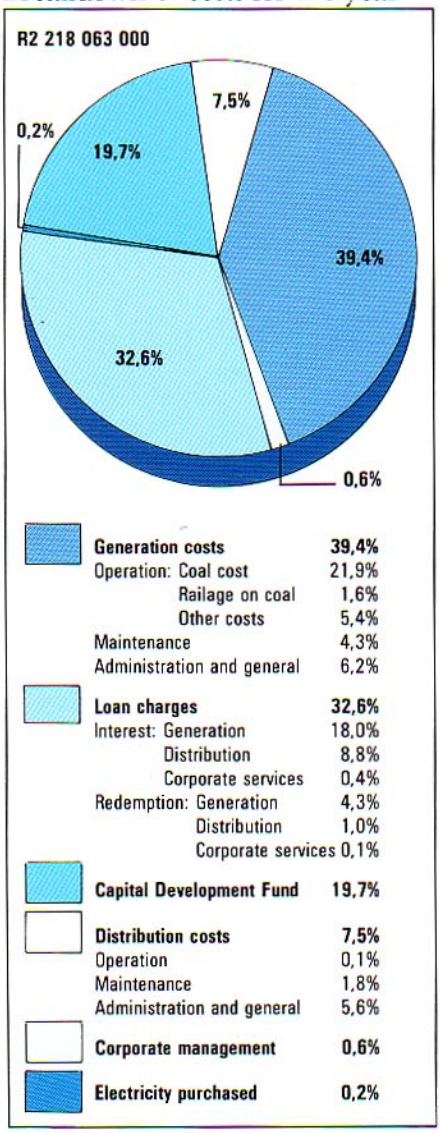


Interest rates



After an initial sharp increase at the beginning of 1981, long-term interest rates increased marginally to about 13,4% towards the end of the year. Since the beginning of 1981 short-term rates increased sharply from 7,0% to levels exceeding 15,0%. These increases were the result of a more stringent monetary policy and a draining of domestic liquidity brought about by the weakening of the balance of payments.

Breakdown of costs for the year



Generation costs	**39,4%**
Operation: Coal cost	21,9%
Railage on coal	1,6%
Other costs	5,4%
Maintenance	4,3%
Administration and general	6,2%
Loan charges	**32,6%**
Interest: Generation	18,0%
Distribution	8,8%
Corporate services	0,4%
Redemption: Generation	4,3%
Distribution	1,0%
Corporate services	0,1%
Capital Development Fund	**19,7%**
Distribution costs	**7,5%**
Operation	0,1%
Maintenance	1,8%
Administration and general	5,6%
Corporate management	**0,6%**
Electricity purchased	**0,2%**

With the greater availability of capital from local sources Escom made use of both the primary and secondary markets to obtain long-term financing by means of its local registered stock. Net sales of local registered stock on the secondary market provided R553 million, while R187 million was received by way of primary issues. The loan issues in March and October proved very popular and long-term loans in particular received strong support. In October Escom offered a reissuable deep discount loan on the primary market that encouraged further interest in Escom stock. Bankers' acceptances and capital project bills were the main sources of short-term financing. A major portion of these was taken up in terms of existing credit facilities for local financing of capital projects. Credit agreements were concluded with two local financial institutions during the year. An agreement worth R625 million was concluded with the Bankorp Group to finance the local portion of the boiler contract for Matimba power station. A further agreement worth R525 million was finalised whereby Escom stock will be sold to the S.A. Mutual Life Assurance Society over an extended period.

Foreign financing sources accounted for R722 million (1980: R870 million) and consisted mainly of project-related loans. Export financing, arranged in conjunction with foreign suppliers of capital equipment, was a further source of financing. The terms of this financing source remain attractive since they include facilities subsidised by the export promotion programmes of supplier countries.

Only two new private placings were negotiated, one with a local banking institution for $100 million and the other on the Swiss capital market for SF100 million.

During the year a loan agreement was concluded with a group of American banks. The loan will be used for the construction of boilers for Khutala power station. This is the first sizeable loan transaction to be concluded with American banks since 1976.

Internal finance

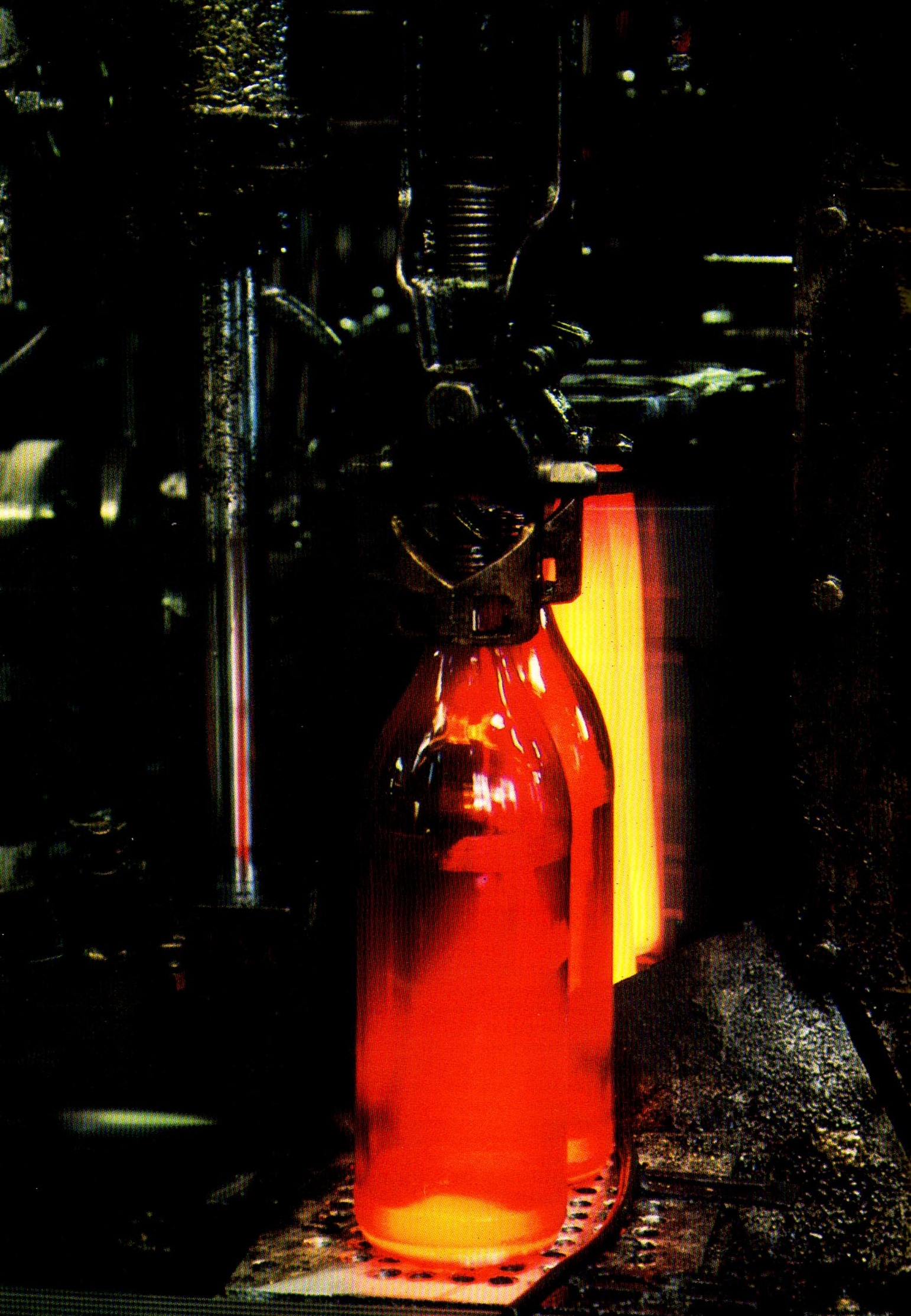
Internal finance generated in the year amounted to R814 million which represented 30% of Escom's total capital needs (inclusive of loan repayments) and 42% of its net expenditure on fixed assets. Details of how the internal finance amount is arrived at can be obtained from the source and application of funds statement and the individual internal fund accounts included in the financial statements.

The internal financing level realised in 1981 was not as high as desired, primarily due to the deficit on the supply account. However, the increase of R142 million over the amount of internal financing raised in 1980 displays a satisfactory trend of increasing self-financing. It would not be possible for Escom to meet its financing commitments without the Capital Development, Reserve and Redemption Funds. In 1981 the Capital Development Fund played a particularly significant role providing 34% of the financing for expansion and replacement of fixed assets. Long-term finance is required for the financing of fixed assets and neither the foreign nor local financial markets are able to meet all requirements. Internal finance provides permanent long-term capital and therefore is able to make good the shortfall of long-term financing. This relieves the refinancing burden.

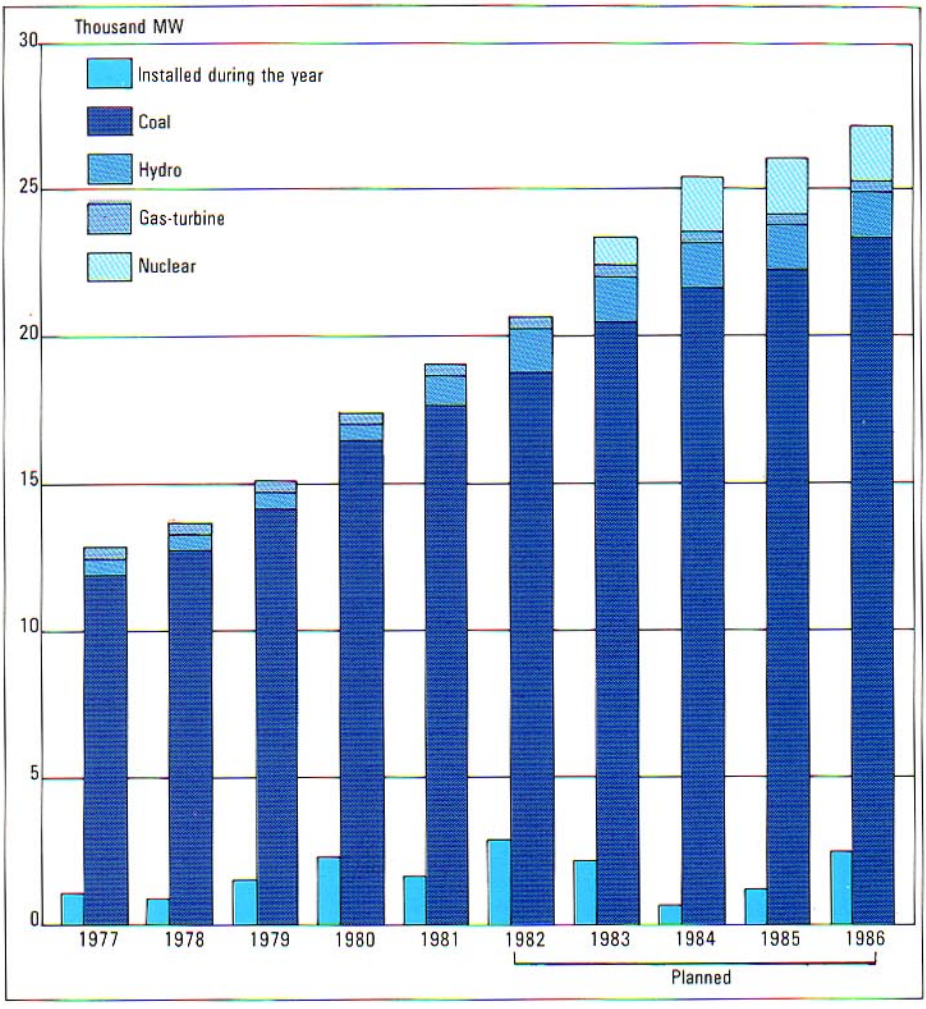
Escom intends eventually to finance half of its capital needs internally. This can be achieved over a period of time without changing the provisions of the Electricity Act pertaining to the Capital Development Fund.

Escom makes use of current costing principles to formulate its internal financing policy and the tariff levels needed to meet the required internal financing amount. The tariff implications of Escom having to acquire its assets, in their actual condition of being partly used, at current prices and of having to finance this operation at the ruling rate of interest have been calculated. To do this, the following assumptions have been made:

- The average useful life of assets in use is 30 years after which time they have negligible residual value.
- The current (1981) total capital cost (generation, transmission and distribution) of installing 1 kW of capacity is R815.
- The average cost of finance raised in 1981 was 13%. It is assumed that the interest burden would therefore have been 13% of the replacement value of the assets in service in their present condition.



Sent-out capacity of Escom power stations



- Straight line depreciation is a reasonable measure of the cost of using the assets in the production of electricity.

The income statement would then read as follows:

	R000
Sales of electricity	2 140 689
Less operating costs	1 061 051
	1 079 638
Less depreciation	524 969
Less interest	1 325 259
Loss for year	770 590

If the above "loss" of R771 million were to have been avoided, Escom would have had to raise its tariffs to a level of 36% above those actually charged in 1981.

Tariffs

The tariff adjustments for 1981 were implemented in January 1981 and the effective tariff increases ranged between 4,4% in the Cape Northern Undertaking and 6,5% in the Orange River Undertaking. The weighted mean of this increase was 5,5%. This was the third consecutive year in which average tariff increases were considerably below the prevailing inflation rate.

Escom's tariff adjustments are aimed at balancing revenue and charges against revenue. Electricity sales during the year were, however, lower than forecast and cost increases higher than estimated. The January 1981 tariff increases were therefore insufficient to cover costs and the electricity supply account

shows a deficit of R77 million.

It is evident that future tariff increases will have to be larger than the modest increases of recent years to cope with persistent inflation. It would be unwise to delay such increases as this could lead to problems in subsequent years.

System operation

Plant capability and loading

At the end of the year, Escom operated 22 fully commissioned and three partially commissioned power stations with a combined sent-out capacity of 18 989 MW. Power station and transmission details are shown on pages 52, 53 and 55).

In 1981, gross energy of 100 425 million kW.h was sent out by Escom power stations, while only 2 601 million kW.h was imported. Of the gross energy sent out, 99 713 million kW.h was available for distribution. The bulk of the difference was absorbed by the Drakensberg pumped-storage scheme, which commenced operation during the year.

Escom's sent-out capacity increased by 9,5% in 1981, excluding the 1 373 MW firm contractual capacity from Cahora Bassa. During the year, new plant with a total sent-out capacity of 1 650 MW was taken into service.

The one-hour maximum demand met on the interconnected Escom system was 14 674 MW, 7,4% higher than the 1980 figure (see page 66). Potential maximum demands in excess of 15 000 MW could not be met.

The reliability of supply from Cahora Bassa continued to be poor and is still being hampered by alleged sabotage to the transmission lines in Mozambique. Conditions there have delayed maintenance and repair work. Contingency plans, including the rescheduling of planned maintenance, were put into operation during the year and further plans have been prepared to meet the demand even if no supply is received

from Cahora Bassa.

The quality of supply was further hampered by the poor initial performance of the large new generating sets. These problems are now being examined to improve both the availability and reliability of these sets. To assist in meeting the high demand for electricity, Escom is postponing the decommissioning of some older generating sets.

Plant performance and maintenance

The average availability of Escom's generating plant decreased from 74,7% in 1980 to 74,2% in 1981. This was mainly the result of the poor performance of the larger sets. Boiler-tube leaks, electrical plant failures and feed-heating plant problems were the main reasons for forced shutdowns. Milling-plant and feed-pump problems were also significant contributors.

The supply situation was aggravated by a continued shortage of skilled manpower. Consequently it was not possible to carry out the maximum amount of planned maintenance during the summer off-peak periods. Extensive use of shiftwork is now being introduced to achieve this objective wherever the requisite manpower can be obtained.

The overall thermal efficiency of Escom's coal-fired power stations was 30,0% in 1981 compared to 29,6% in 1980. This improvement arose mainly from the introduction of newer and more efficient generating sets.

Coal supplies

Coal burnt in Escom power stations represented more than 40% of all the coal mined in South Africa in 1981. Escom's coal consumption increased by 15,2% from 46,8 million tons in 1980 to 53,9 million tons in 1981. Of the coal consumed by Escom 50,9 million tons was obtained from collieries tied to Escom.

The energy sent out on the Escom system from coal-fired power stations increased by 16,2% in 1981, although the total increase in energy sent out on the whole system was only 8%. The increased demand on these stations resulted from the need to replace shortfalls in energy received from Cahora Bassa, placing a heavy burden on Escom's coal suppliers. The more efficient stations had to burn 1,5 million tons (4,2%) more coal than planned and the less efficient ones 0,4 million tons (31,4%) more.

A number of tied collieries experienced production problems and virtually all of them had a severe shortage of skilled personnel.

This, and the high coal consumption rates, forced Escom to bring in large quantities of coal from other sources at high cost. This resulted in a 50% increase in purchases from other sources during 1981 and contributed to the average price of coal rising by 19,6% from R8,12 a ton in 1980 to R9,71 a ton in 1981.

The heat content of Escom's coal purchases decreased marginally from 21,34 MJ/kg in 1980 to 21,25 MJ/kg in 1981.

During the year new coal supplies for additional generating capacity were arranged. The coal supplies for Tutuka and Lethabo power stations were uprated to match the increase in the generating capacity of these stations from the original 1 800 to 3 600 MW. A 12 million ton a year coal supply for the new 3 600 MW Khutala power station was arranged.

Escom continued its efforts during the year to optimise the use of coal in South Africa. Discussions on the possibility of multiproduct mines progressed and further attention was given to the possible use by Escom of discard coal produced by exporting collieries.

Water supplies

Although Escom uses less than 2% of South Africa's total water resources for power generation, every effort is being made to reduce consumption per kW.h sent out.

The overall specific consumption by Escom power stations in 1981 was 2,46 litres per kW.h sent out - a 6% improvement compared to the 1980 figure of 2,61 litres. This improvement was mainly due to the increased output of new power stations which operate at better water usage efficiencies. The programme to recycle effluents and eliminate wastage at the older stations also contributed to the lower consumption rate and should have a further positive effect in future. Two of Escom's new coal-fired stations, Matimba and Khutala, will be dry cooled, reducing water consumption by about two-thirds.

Escom's use of its hydro potential is largely determined by the height of the water levels in the associated dams. In 1981 generation from the two Orange River hydro-electric power stations was increased - from 992 million kW.h sent out in 1980 to 1 653 in 1981 - as the dam levels were generally higher than in 1980.

Power stations under construction

Plant with a sent-out capacity of 1 650 MW was taken into service during 1981. At the end of the year eight power stations were under construction or had been announced. The total sent-out capacity not yet commissioned in these stations amounts to over 16 000 MW (see page 67).

Matla power station

This station is in the Bethal area and will ultimately comprise six 600 MW sets. Construction began in October 1974.

Coal is obtained from General Mining's Matla colliery and water is supplied from the Usutu River and the Usutu-Vaal water scheme.

By the end of 1981 four sets were in commercial operation. The last two sets are slightly ahead of programme and should be in operation in 1982 and 1983 respectively.

The concrete multi-flue chimney serving the second half of the station was severely damaged in August

1980 when one of the flues collapsed. Following detailed investigations, the windshield and remaining flues were demolished in July 1981.

A contract for the new chimney will be placed early in 1982. A temporary steel chimney serving the fourth boiler is in operation and a further temporary steel chimney to serve boilers 5 and 6 is under construction. Commissioning dates for the remaining sets have not been affected.

Duvha power station

Duvha is in the Witbank area and will eventually contain six 600 MW sets. Construction was started in November 1975.

Coal is obtained from Rand Mines' Duvha open-cast colliery and water is supplied from the Komati River water scheme (85%) and the Witbank Dam (15%).

By the end of 1981 three sets were in commission, one of which was taken into commercial operation during the year. Good progress is being made on the construction of the remaining sets. Indications are that the accelerated commissioning dates will be met, i.e. set 4 in June 1982, set 5 in March 1983 and set 6 in February 1984.

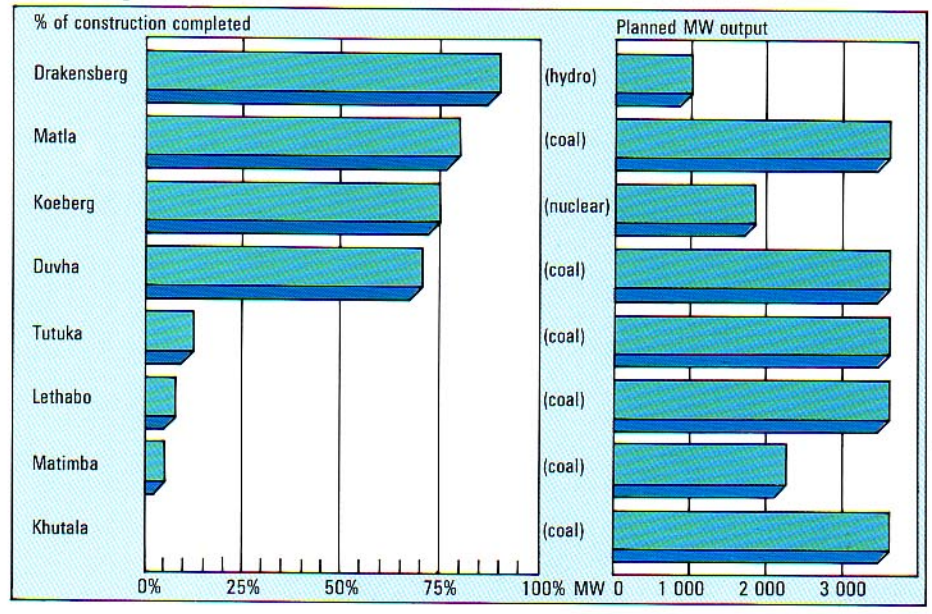
Drakensberg pumped-storage scheme

This 1 000 MW underground power station (started in 1975) in the Drakensberg mountains near Bergville in Natal provides peaking and standby power for the Escom system. It is part of a joint scheme pumping water from the Tugela River over the escarpment to supplement water requirements in the Witwatersrand area.

During the year two of the four 250 MW reversible pump-generator sets were commissioned and put into commercial operation. Commissioning of the other sets should take place in 1982.

Environmental restoration of the site has started and construction scars are being removed. The most significant visible evidence of the underground power station will be the surface transmission lines carrying power to and from the network.

Escom's power stations under construction



Koeberg power station

After five years of construction, Koeberg nuclear power station is still on schedule. It is expected that the first set will be in commercial operation early in 1983 with the second set following nine to twelve months later.

During 1981 the 400 kV national transmission system was coupled to the station. The cooling-water intake basin was taken into service, and the cold hydraulic test of the primary circuit of set 1 was successfully performed. The containment pressure test of set 1 was completed successfully.

Tutuka power station

This station, north of Standerton, is designed for six 600 MW sets. The first set is scheduled for commercial operation in March 1985 with the other sets following at nine-monthly intervals.

Coal will be supplied from Anglo-American Corporation's New Denmark colliery and water from the Grootdraai Dam on the Vaal River.

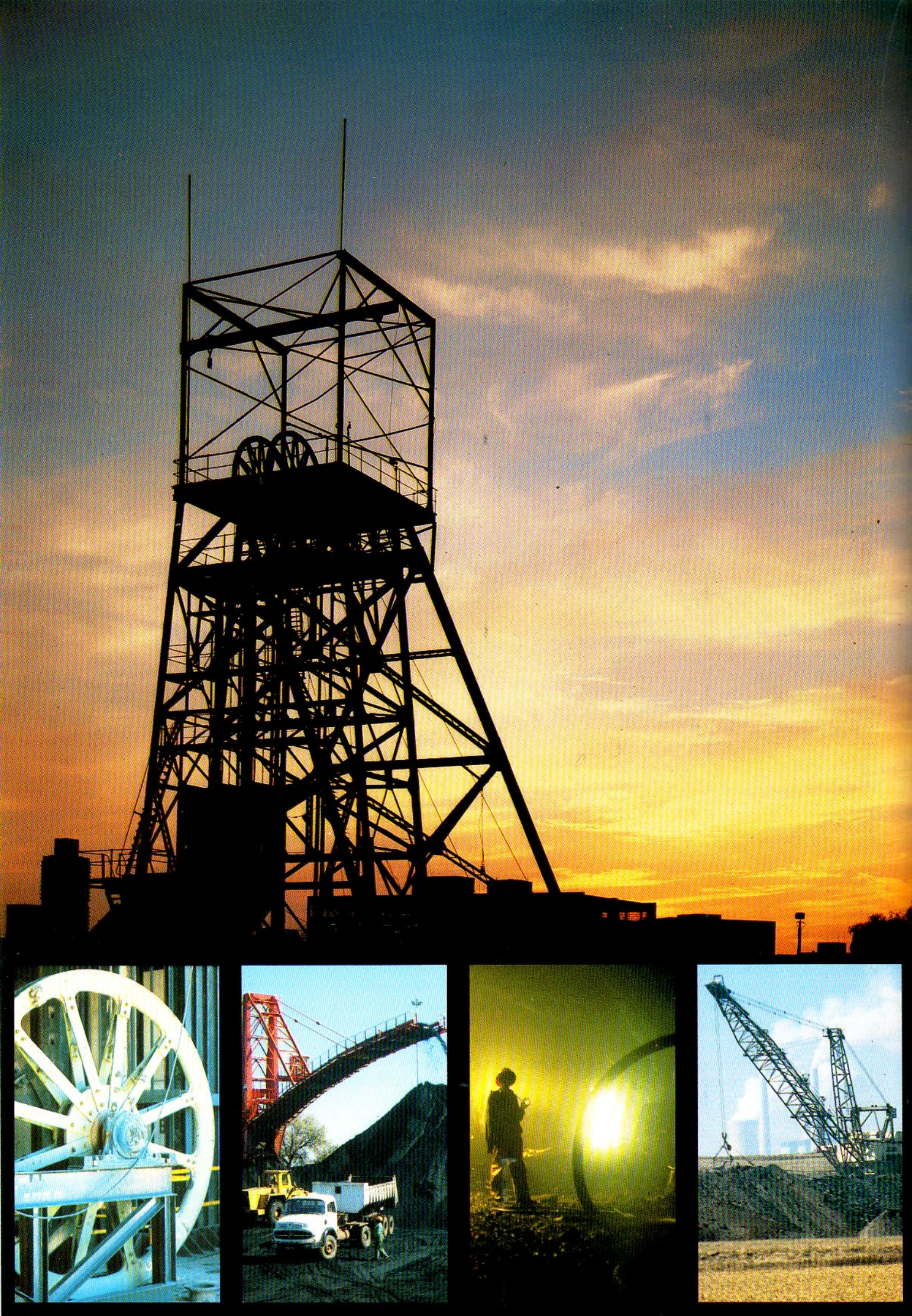
Site terracing took 12 months and was completed in August 1981. Piling for the first three sets was completed during November 1981. The main civil works started in April and erection of structural steelwork in October 1981.

Lethabo power station

Lethabo, near Deneysville in the Orange Free State, is designed for six 600 MW sets. Coal will be supplied from Anglo American Corporation's New Vaal colliery and water will be pumped from the Vaal River.

Construction work started in 1981. The first set should be in commercial operation in 1985 and the last in 1989.

During the first half of 1981 the site was cleared. Terracing work started in April and access was given to the piling contractor before July. The station will have a reinforced concrete boiler house structure. By the end of 1981 the concrete columns for the first boiler house had reached a height of 14 metres and installation of the cooling-water duct liners had started.



Matimba power station

This dry-cooled station, near Ellisras in the Northern Transvaal, is planned initially for four 600 MW sets, but can readily be extended to six sets. Coal, from Iscor's Grootegeluk colliery, will be the residue after Iscor has extracted the coking coal component necessary for its steel production. Water will be supplied from the Strydom Dam.

Levelling of the terrace started in September 1981. Measures have been taken to conserve the natural features of this scenically attractive bushveld area, particularly the indigenous trees.

Contracts for the supply and installation of the boilers and turbines were signed during the last quarter of 1981. The commissioning date for the first set is September 1986 and subsequent sets will follow approximately every 12 months.

Khutala power station

This power station is near Kendal in the Eastern Transvaal.

The station will comprise six 600 MW sets, all dry-cooled and similar to those of Matimba.

The Bombardie-Cologne coalfield, owned by Transvaal Consolidated Land and Exploration, will supply the coal with Rand Mines providing a mining management service.

Commercial operation for the first set is scheduled for September 1987 with the subsequent sets following approximately every 12 months.

Transmission

During the year Escom's interconnected distribution system was strengthened and expanded (see page 55).

The 400 kV network was extended by 309 km and now stands at 7 880 km, while the 275 kV network was increased by 132 km to 6 153 km. The 220 kV network now has 965 km of lines. In the range 165 kV and below, more than 5 000 km of lines and cables was added.

In all, Escom's transmission and distribution system now consists of 128 563 km of overhead lines and underground cables. The total capacity of transformers amounts to 126 638 MVA, an increase of more than 3% or 3 813 MVA over 1980.

A high-voltage testing facility for conductor bundle configurations was commissioned in 1981. This equipment is capable of simulating up to 800 kV potentials. By measuring audible noise, radio interference and corona losses, optimal conductor sizes and configurations for the proposed 800 kV transmission system can be established.

Rand and O.F.S. Region

A supply at 132 kV was provided for Botswana and traction supplies at 88 kV were made available for the new railway marshalling complex at Bapsfontein. A supply at 132 kV was provided for the electrification of Soweto.

More than one hundred new supplies were made available to large power users. This, and the increased demand from existing consumers, necessitated the addition of 450 km of overhead line and over 1 000 MVA of transformer capacity to the main system (33-132 kV). Major reinforcements included a 400 kV substation and two 275 kV substations as well as the construction of 275 kV lines.

About 1 800 km of overhead line was constructed in the rural supply programme and 65 MVA of transformers were installed during the year. Planning is also in hand for a further 2 500 km of overhead lines to supply 1 600 prospective rural consumers. Almost 1 500 supplies were connected during the year. The number of consumers awaiting supply at the end of 1982 is expected to exceed 5 000.

Eastern Transvaal Region

A 400 kV line from Duvha power station was completed to reinforce supplies to the Witwatersrand. Work has started on projects to establish a 400 kV and 275 kV supply system between the Eastern Transvaal power stations and Steelpoort and Phalaborwa to reinforce the existing system supplying these areas. A 275 kV supply to Rockdale substation at Middelburg is under construction to meet the increased demand from steel plants in the area.

The 88 kV line feeding the initial supply for the Bronkhorstspruit growth point at Ekangala was brought into service and the rest of the project will be completed early in 1982. The new 88 kV line between Normandie and Paul Pietersburg was commissioned in May. New supply points for coal mines near Witbank were established off the 22 kV system.

More than 500 farm supplies were connected during the year.

Western Cape Region

New consumers were connected to existing schemes in Blanco/George, Heidelberg/Riversdale, Vredendal and Het Kruis. In 1981 Loeriesfontein municipality was connected to the 66 kV system from Helios, and Great Brak River municipality to the south Cape system. Early in 1982 Calvinia municipality will be connected.

There has been an increase in the number of applications for new supplies and increased demand at existing supply points. The bulk of the applications originated from the southern Cape in the area between Caledon and Plettenberg Bay and the majority of applications came from areas where no lines existed.

Various farm schemes were completed in 1981 and about 600 new farm supplies were connected in 1981.

Natal Region

Supplies to Durban were reinforced during the year. To meet the increased demand from Durban Corporation additions were made to the supply system, principally the installation of a 132 kV capacitor bank at Klaarwater substation.

A new substation, to the north of


BLOUTREIN BLUE TRAIN

Durban, is being planned for an infeed from that direction to meet future increases in demand. Strengthening of the 400 kV grid is also being planned to meet increased electricity demand (mainly from industrial users) for Natal in general and the Pietermaritzburg, Durban and Richards Bay area in particular.

Nearly 800 farm supplies were connected during the year.

Northern Cape Region

Work has started on a second 275 kV transmission line to reinforce and increase the reliability of the power supply to the Sishen-Saldanha railway line and to the mining industry in the Sishen and Hotazel areas. Sishen's load will increase as a result of the use of electricity instead of expensive diesel fuel for quarrying and haulage operations. Near Hotazel, the mining of high-grade manganese in the Kalahari fields requires more electricity.

Swawek is to receive a bulk supply at the SWA/Namibian border in 1982. This supply will be transmitted over a 220 kV double-circuit line from Aggeneis to Windhoek over a distance of about 800 km.

In 1981 more than 500 farm supplies were connected to the Escom system.

Eastern Cape Region

This region comprises the Border and Orange River undertakings.

Construction work is under way to provide supplies for the electrification of the railway lines between De Aar and Beaufort West, De Aar and Port Elizabeth and Springfontein and East London.

Supplies were made available to about 20 towns and farm schemes in the area. About 150 farm supplies were connected during the year.

Rural electrification

In the year under review 4 185 farm supplies were connected compared with 3 551 in 1980 (see page 67). This compares very favourably with

the average of 2 976 for the past five years and is even more impressive if the shortage of personnel and materials are taken into account. As from January 1982 a new tariff system will become effective which will make supply conditions more attractive to prospective rural consumers.

Personnel

Manpower

During the year under review, Escom's total average employee complement grew by 8,5% from 45 850 in 1980 to 49 770 in 1981. It is expected that this growth rate will have to be maintained for some time to meet Escom's expansion plan and eliminate the backlog.

With a shortage of skilled manpower on most levels, Escom intensified its recruitment campaign in 1981. Considerable success was achieved with overseas and local recruitment in the face of strong competition in the labour market. Despite these efforts, Escom's manpower shortage remains serious, particularly in respect of engineers, technicians, artisans and operators.

Training activities were intensified and the intake of apprentices and pupil technicians was increased. Escom also awarded more bursaries to engineering students.

The operation of modern power stations has reached such a complex level that the use of in-service equipment for training has become impractical, uneconomical and dangerous. Escom is therefore acquiring further power station simulators to facilitate training. The management training school, the first phase of the Escom college, will be completed by mid-1982. The second phase will comprise workshops and hostels.

While Escom's overall labour turnover rate was reduced, turnover in critical employee categories is still high. To help counteract this, career path and succession planning are being developed. Sound labour relations were maintained with the trade

unions and improved communications with employees resulted from a restructured liaison committee system.

Occupational accident prevention

During 1981 the injury rate was reduced to 2,5 disabling injuries per million man-hours worked. This compares extremely well with the national average of about 9,6 per million man-hours.

The number of fatal occupational accidents in 1981 was 0,4 per five million man-hours worked.

The occupational accident rate experienced by contractors engaged in the construction of new power stations and facilities was 4,8 lost time injuries per million man-hours worked. The national average for construction work is about 16 lost time injuries per million man-hours worked.

Community affairs

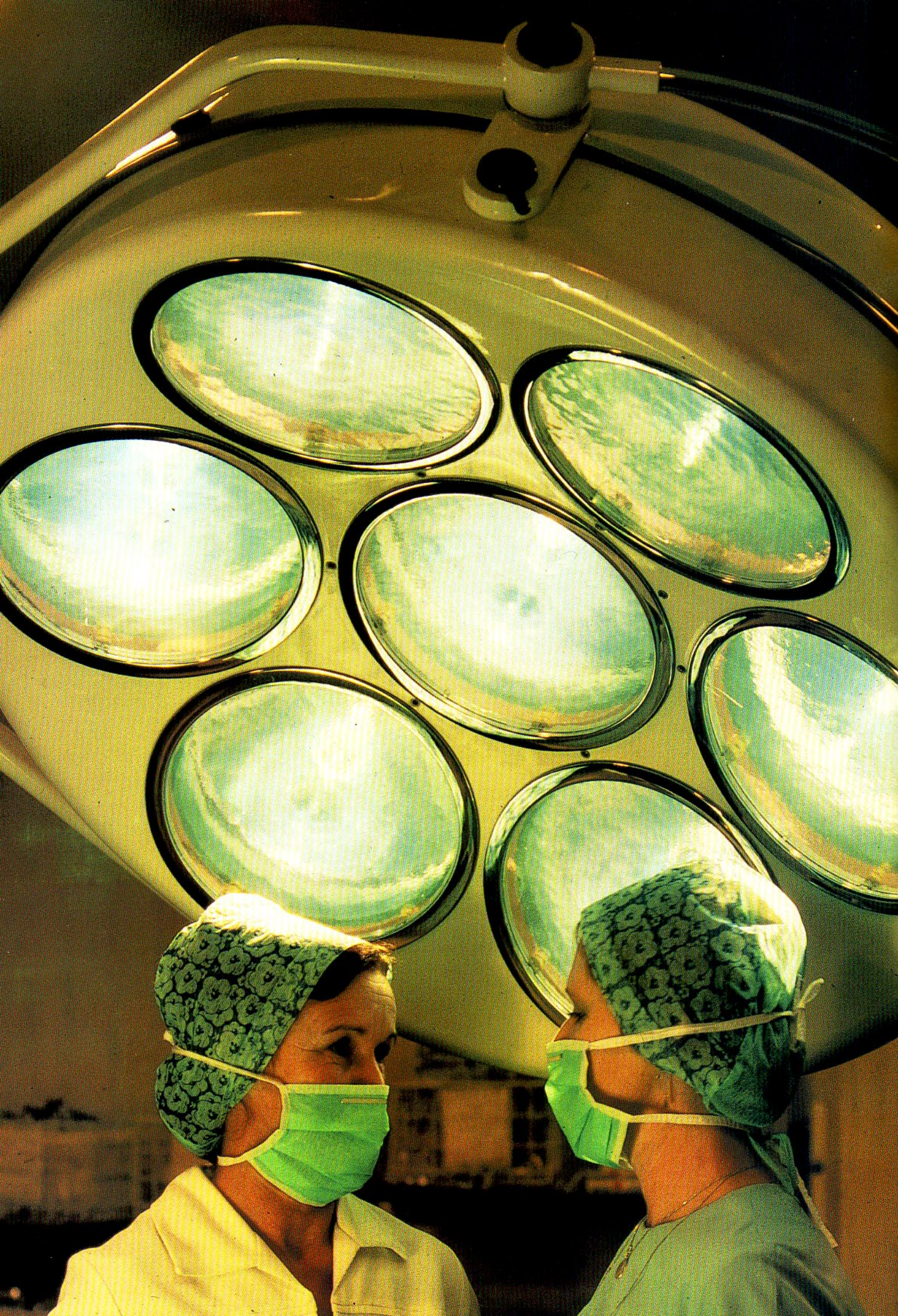
Housing

One feature of Escom's expansion programme is the provision of housing for its staff so as not to deplete existing accommodation in an area. Wherever possible, houses are now being built in existing towns closest to power stations, so that Escom staff can enjoy established municipal amenities and help build up existing communities.

Escom will be building a substantial number of houses in Standerton for Tutuka power station, in Sasolburg for Lethabo power station and in Ellisras for Matimba power station. During the past year 750 houses were provided in various areas. Where Escom-owned houses are not provided, Escom employees are assisted to buy their own homes.

Environment

The impact of power stations on the environment is under continuous investigation. For example, a research project is being carried out in conjunction with the Council for Scientific



and Industrial Research (CSIR) on air pollution. Concurrently mechanical dust collectors at older power stations are being replaced by highly efficient electrostatic ones at considerable cost.

Environmental and physical problems associated with the removal, transport and disposal of huge quantities of ash and precipitator dust were investigated during 1981. Until now ash has been removed intermittently by hydraulic means and disposed of in ash dams. In future ash will be removed continuously from the bottom of the boiler furnace by submerged scraper conveyors, and dust from the precipitator hoppers by mechanical or pneumatic means. Ash and dust will be transported by conveyor belts to disposal sites.

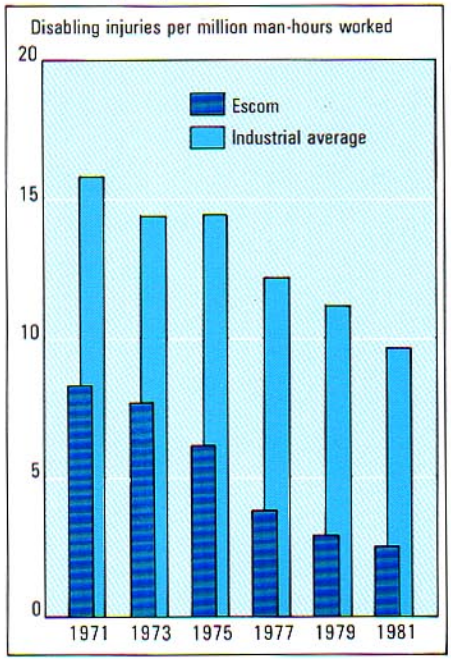
The disposal of ash in opencast areas to eliminate unsightly ash dams was further investigated, and it is likely that this method will be used for power stations now being planned.

During the past year the disposal of liquid effluent was the subject of a detailed study. Escom's intention is to achieve zero liquid effluent discharge from power stations by successive treatment and re-use of effluent. The residual effluent will be disposed of with the ash.

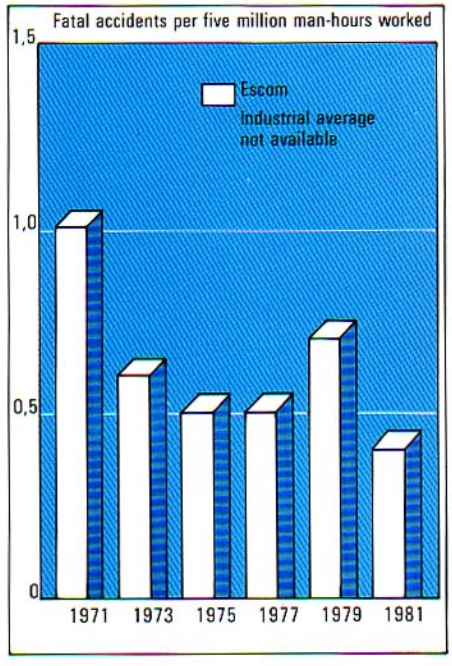
Escom conducts extensive environmental studies before deciding on a site for a power station. For example, at Matimba power station, in the north-western Transvaal, Escom has adopted a policy whereby indigenous trees more than 200 mm in diameter may not be felled. At Lethabo power station, near Vereeniging, Escom consulted landscape architects before removing exotic trees of poor quality.

A special bird committee established some years ago is doing valuable research to prevent birds from electrocuting themselves. Particular attention is given to the Cape vulture, an endangered species which has developed the habit of building nests on power pylons. Sticks from the nests are cut back by maintenance staff without upsetting the vultures or their nests, while cross-beams are fitted to some pylons to provide perches.

Disabling injuries



Fatal accidents



I. D. van der Walt
Senior General Manager

Auditors' report and financial statements

The Chairman and Members
Electricity Supply Commission
Sandton

We have examined the financial statements of the Commission set out on pages 32 to 38 and 50. 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 1981 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 moneys 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.

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

Johannesburg
24 March 1982

Electricity Supply Commission

Balance sheet

at 31 December 1981

	Notes	1981	1980
		R000	
Fixed assets	2	10 143 668	8 219 195
Stores and materials	3	306 079	245 147
Other non-current assets	4	362 401	294 780
Current assets		208 863	195 883
Accounts receivable and payments in advance		198 863	176 099
Moneys at call		10 000	19 784
		11 021 011	8 955 005
Financed by			
Loans and extended credit	5	6 715 459	5 329 790
Local registered stock, bond issues and direct placings (Schedule 2)		8 155 498	6 424 899
less Escom Stock held internally	8	3 212 764	2 655 913
		4 942 734	3 768 986
Import financing facilities and extended credit		1 427 380	1 200 267
Revolving credits and short-term advances		345 345	360 537
Current liabilities		490 532	437 352
Creditors and accrued liabilities		326 743	295 051
Interest accrued		160 961	127 207
Bank overdrafts		2 828	15 094
Total net debt		7 205 991	5 767 142
Statutory funds and reserves		3 815 020	3 187 863
Capital reserve	6	504 611	457 138
Capital Development Fund	7	2 365 571	1 872 134
Reserve Fund	7	191 038	212 145
Redemption Fund	7	592 539	533 658
Other reserves	9	257 000	131 153
Accumulated deficit	10	(95 739)	(18 365)
		11 021 011	8 955 005

Income statement

for the year ended 31 December 1981

	Notes	R000 1981	1980
Sales of electricity		2 140 689	1 772 000
Operating expenditure	11	1 061 051	836 306
Net operating income		1 079 638	935 694
less Loan charges		720 634	606 361
Loan amortisation charges		181 863	152 535
External interest and finance charges		287 928	278 411
Interest on Escom Stock held as investments of Capital Development and Reserve Funds		250 843	175 415
		359 004	329 333
Amounts set aside to Capital Development and Reserve Funds in terms of Section 13 of the Electricity Act, 1958		436 378	427 300
Net deficit for the year as shown in the Electricity Supply Account	10	(77 374)	(97 967)
Accumulated surplus/(deficit) at beginning of year		(18 365)	79 602
Accumulated deficit at end of year	10	(95 739)	(18 365)

Statement of source and application of funds

for the year ended 31 December 1981

	R000	
	1981	1980
Source of funds		
Funds generated internally	813 641	671 404
Net deficit	(77 374)	(97 967)
Add Items not affecting the flow of funds		
Depreciation on equipment, vehicles and furniture	21 931	14 121
Loan amortisation charges	181 863	152 535
Repayment of foreign loans	46 595	45 466
Redemption of local loans	70 493	56 163
Interest on internal investments of Redemption Fund	64 775	50 906
Amounts credited to Capital Development and Reserve Funds	687 221	602 715
Contributions	436 378	427 300
Interest on internal investments	250 843	175 415
Net proceeds of external finance	1 198 885	788 341
Loans and extended credit	1 250 427	1 275 953
Repayments	(604 929)	(617 260)
Sale of Escom Stock on secondary market	932 808	506 441
Purchase of Escom Stock on secondary market	(379 421)	(376 793)
Refund on deferred expenditure to secure future fuel supplies	43 556	—
Increase in net current liabilities	40 200	73 060
Other	6 574	3 028
	2 102 856	1 535 833
Application of funds		
Fixed assets, net	1 950 645	1 446 928
Increase in stores and materials	60 932	21 421
Deferred expenditure and deposits to secure future fuel supplies	40 373	41 465
Increase in housing loans to employees	19 690	6 626
Reserve Fund expenditure	31 216	19 393
	2 102 856	1 535 833

Notes to the financial statements

for the year ended 31 December 1981

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.

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 is amortised on a sinking fund basis over the period of each loan through the full provision for redemption of the relevant loans. The amortised portion of the discount is set off against the Redemption Fund and is transferred to the Capital Reserve on repayment of the 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.

Notes (continued)

	R000			
2. Fixed assets		1981		1980
Assets in commission, at cost				
Land and rights	84 648		78 300	
Buildings and facilities	509 494		475 624	
Production plant	5 728 906		5 050 114	
Total in commission	6 323 048		5 604 038	
Works under construction	3 720 640	10 043 688	2 544 790	8 148 828
Equipment, vehicles and furniture, at cost	179 892		132 002	
less Accumulated depreciation	79 912	99 980	61 635	70 367
		10 143 668		8 219 195
3. Stores and materials				
Construction material		133 982		99 367
Maintenance and consumable stores		88 449		75 672
Fuel		83 648		70 108
		306 079		245 147
4. Other non-current assets				
Listed investments held for				
Reserve Fund (Schedule 4)	3 546		6 380	
Redemption Fund (Schedule 5)	301	3 847	790	7 170
Housing loans to employees secured by first mortgage		65 449		45 759
Amounts owing in respect of reticulation systems sold		3 957		4 195
Deferred expenditure				
Discount on loans issued	112 334		57 659	
Expenditure and deposits to secure future fuel supplies	176 814	289 148	179 997	237 656
		362 401		294 780
5. Loans and extended credit				
The current portion (excluding revolving credits) included in loans and extended credit amounts to approximately		381 468		316 000

Borrowings in the following currencies are not covered by forward exchange contracts:

	1981	1980
European units of account	6 700 000	8 030 000
Deutsche Marks	6 839 000	8 689 000
Maltese Pounds	—	5 000 000
Pounds Sterling	3 280 000	142 000
USA Dollars	14 924 000	32 092 000
French Francs	524 000	8 142 000
Swiss Francs	1 683 000	5 574 000
Japanese Yen	—	162 811 000

In accordance with the provisions of the Electricity Act, every loan raised or security issued, together with interest thereon, is a first charge against all the revenues and assets of the Commission.

6. Capital reserve				
Loans repaid		602 196		550 692
Production plant financed from Reserve Fund		10 360		10 360
		612 556		561 052
less Cost of commissioned assets scrapped or sold		107 945		103 914
		504 611		457 138

Notes (continued)

7. Statutory funds

7.1 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.

7.2 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:

	R000	
	1981	1980
Capital Development Fund	191 289	14 199
Reserve Fund	22 693	11 936
Redemption Fund	69 543	32 365

7.3 The statutory funds at the year-end are stated as follows:

Capital Development Fund (Schedule 7)	2 556 860	1 886 333
Difference between book value and proceeds of stock sold	191 289	14 199
	2 365 571	1 872 134
Reserve Fund (Schedule 8)	213 731	224 081
Difference between book value and proceeds of stock sold	22 693	11 936
	191 038	212 145
Redemption Fund (Schedule 9)	683 052	583 791
Difference between book value and proceeds of stock sold	69 543	32 365
	613 509	551 426
Amortised portion of discount on loans	20 970	17 768
	592 539	533 658

8. Escom Stock held for

	Schedule	1981 Book Value	1981 Nominal Value	1980 Book Value	1980 Nominal Value
Capital Development Fund	3	2 243 244	2 291 488	1 867 148	1 889 226
Reserve Fund	4	225 784	248 581	197 705	207 113
Redemption Fund	5	619 743	664 171	547 051	551 287
Repayment of foreign loans	6	8 498	8 524	8 332	8 287
		3 097 269	3 212 764	2 620 236	2 655 913
Excess of nominal over book value			115 495		35 677

9. Other reserves

Amounts set aside for repayment of foreign loans	118 724	88 981
Difference between nominal and book values of Escom Stock held internally	115 495	35 677
Deferred proceeds of reticulation systems sold	3 957	4 195
Unrealised exchange profits on foreign liabilities	18 824	2 300
	257 000	131 153

Notes (continued)

10. Accumulated surplus/(deficit)

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).

	R000	
	1981	1980
11. Operating expenditure includes:		
Leasing charges on equipment	6 000	4 600
Commitment fees in respect of overdrafts and other credit facilities	5 700	3 600
Depreciation of equipment, vehicles and furniture	22 000	14 100

12. Commitments

The Commission is committed for

1. Capital expenditure contracted for, excluding contract price adjustments and general sales tax, amounting to approximately — 2 830 000 — 2 782 000

   This expenditure will be financed from external borrowings and from cash generated internally, and is expected to be incurred as follows:-

	R000
1982	628 000
1983	537 000
1984	451 000
1985	428 000
1986	377 000
1987 onwards	409 000

2. Payment in respect of housing loans granted to employees of approximately — 3 600 — 3 500
3. Payment to the Electricity Supply Commission Pension and Provident Fund, in addition to the normal contributions, of R191 000 p.a. to 1985 — 764 — 955
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

13. Contingent liabilities

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.

Schedules to the financial statements

Electricity supply account

for the year ended 31 December 1981

Schedule 1

1980		R000			1981									1980								
						Distribution Undertakings											Distribution Undertakings							
Total		Total	Corporate Services	Central Generating	Total	Cape Western	Cape Northern	Border	Orange River	Natal	Eastern Transvaal	Rand and O.F.S.	Corporate Services	Central Generating	Total	Cape Western	Cape Northern	Border	Orange River	Natal	Eastern Transvaal	Rand and O.F.S.
1 772 000	**Electricity sold**	2 140 689	—	—	2 140 689	197 005	92 637	35 277	38 740	325 615	316 915	1 134 500	—	—	1 772 000	159 977	81 034	29 206	31 697	272 671	252 678	944 737
594 985	Industrial	710 025	—	—	710 025	66 708	9 370	4 754	3 478	111 002	205 032	309 681	—	—	594 985	54 901	6 780	4 018	2 984	96 653	161 766	267 883
539 187	Bulk	680 031	—	—	680 031	79 211	14 149	28 729	35 045	161 621	32 314	328 962	—	—	539 187	63 103	11 696	23 734	28 539	131 397	22 323	258 395
479 855	Mining	563 983	—	—	563 983	—	51 189	—	—	9 003	62 020	441 771	—	—	479 855	—	45 632	—	—	7 439	52 755	374 029
119 238	Traction	139 261	—	—	139 261	22 913	16 717	—	—	37 921	16 369	45 341	—	—	119 238	18 957	15 303	—	—	32 306	14 816	37 856
38 735	Domestic and lighting	47 389	—	—	47 389	28 173	1 212	1 794	217	6 068	1 180	8 745	—	—	38 735	23 016	1 623	1 454	174	4 876	1 018	6 574
836 306	**Operating expenditure**	1 061 051	14 419	879 750	166 882	30 727	10 991	6 191	5 484	29 950	22 699	60 840	48 525	661 590	126 191	23 471	8 296	5 373	3 638	23 064	19 116	43 233
461 592	Operations	645 270	782	642 225	2 263	233	199	74	74	416	355	912	543	459 189	1 860	194	141	77	75	366	280	727
98 830	Maintenance	137 919	712	96 436	40 771	6 637	2 378	1 606	1 363	6 261	7 973	14 553	439	63 427	34 964	5 366	1 592	1 338	963	5 447	7 986	12 272
35 806	Electricity purchased	4 106	—	4 106	—	—	—	—	—	—	—	—	—	35 806	—	—	—	—	—	—	—	—
240 078	Administration and general expenses	273 756	12 925	136 983	123 848	23 857	8 414	4 511	4 047	23 273	14 371	45 375	47 543	103 168	89 367	17 911	6 563	3 958	2 600	17 251	10 850	30 234
606 361	**Loan charges**	720 634	8 738	494 800	217 096	28 475	19 938	5 744	5 714	27 727	35 277	94 221	8 459	459 897	138 005	20 640	17 048	4 783	4 595	14 963	23 726	52 250
504 732	Interest and finance charges	603 546	7 869	399 834	195 843	25 558	18 014	5 261	5 168	24 938	31 700	85 204	7 624	378 586	118 522	18 008	15 270	4 294	4 108	12 362	20 378	44 102
56 163	Redemption of local loans	70 493	869	48 522	21 102	2 917	1 924	483	546	2 638	3 577	9 017	835	35 995	19 333	2 632	1 778	489	487	2 451	3 348	8 148
45 466	Repayment of foreign loans	46 595	—	46 444	151	—	—	—	—	151	—	—	—	45 316	150	—	—	—	—	150	—	—
900	**Contribution to Reserve Fund**	900	—	900	—	—	—	—	—	—	—	—	—	895	5	1	—	1	2	1	—	—
—	**Distribution of costs**	—	(23 157)	(1 375 450)	1 398 607	115 933	51 807	17 739	19 715	229 079	199 078	765 256	(56 984)	(1 122 382)	1 179 366	99 431	45 659	14 831	17 064	192 299	164 928	645 154
—	Corporate burden	—	(23 157)	17 051	6 106	854	565	158	169	757	933	2 670	(56 984)	41 427	15 557	2 148	1 436	405	405	1 903	2 467	6 793
—	Interconnectors	—	—	2 970	(2 970)	—	—	—	(1 202)	—	(182)	(1 586)	—	2 698	(2 698)	—	—	—	(930)	—	(182)	(1 586)
—	Use of circuits	—	—	—	—	—	296	91	(91)	—	—	(296)	—	—	—	—	320	99	(99)	—	—	(320)
—	Transmission costs	—	—	(35 254)	35 254	15 408	7 451	1 011	1 813	8 951	33	587	—	(34 172)	34 172	15 708	7 373	1 050	1 705	7 614	18	704
—	Pooled generation	—	—	(1 360 217)	1 360 217	99 671	43 495	16 479	19 026	219 371	198 294	763 881	—	(1 132 335)	1 132 335	81 575	36 530	13 277	15 983	182 782	162 625	639 563
1 443 567	**Total charges against revenue**	1 782 585	—	—	1 782 585	175 135	82 736	29 674	30 913	286 756	257 054	920 317	—	—	1 443 567	143 543	71 003	24 988	25 299	230 327	207 770	740 637
328 433	**Operating surplus for the year**	358 104	—	—	358 104	21 870	9 901	5 603	7 827	38 859	59 861	214 183	—	—	328 433	16 434	10 031	4 218	6 398	42 344	44 908	204 100
426 400	**Amount set aside to Capital Development Fund**	435 478	—	—	435 478	30 986	12 667	4 507	6 346	69 073	67 678	244 221	—	—	426 400	30 046	12 550	4 389	6 458	68 140	62 773	242 044
(97 967)	**Surplus/(Deficit) for the year**	(77 374)	—	—	(77 374)	(9 116)	(2 766)	1 096	1 481	(30 214)	(7 817)	(30 038)	—	—	(97 967)	(13 612)	(2 519)	(171)	(60)	(25 796)	(17 865)	(37 944)
79 602	**Accumulated surplus/(deficit) at beginning of year**	(18 365)	—	—	(18 365)	(4 956)	3 530	1 030	(9 400)	27 821	(7 531)	(28 859)	—	—	79 602	8 656	6 049	1 201	(9 340)	53 617	10 334	9 085
(18 365)	**Accumulated surplus/(deficit) at end of year**	(95 739)	—	—	(95 739)	(14 072)	764	2 126	(7 919)	(2 393)	(15 348)	(58 897)	—	—	(18 365)	(4 956)	3 530	1 030	(9 400)	27 821	(7 531)	(28 859)

Borrowings

at 31 December 1981

Schedule 2

Loan	R000	Per cent	Repayment date/s	R000 Out-standing	R000 1980
Internal registered stock					
35	16 500	5,125	1976/81	—	16 500
36	20 000	5,125	1977/82	20 000	20 000
37	22 000	5,125	1976/82	22 000	22 000
38	24 000	5,125	1977/83	24 000	24 000
39	24 000	5,375	1978/83	24 000	24 000
40	22 000	5,625	1979/84	22 000	22 000
42	20 000	5,375	1979/84	20 000	20 000
43	16 000	5,375	1979/85	16 000	16 000
44	16 000	5,375	1980/85	16 000	16 000
45	17 000	5,5	1980/86	17 000	17 000
46	16 000	5,875	1981/86	16 000	16 000
47	18 000	6,25	1981/86	18 000	18 000
49	18 000	6,125	1982/87	18 000	18 000
50	22 000	5,25	1982/87	22 000	22 000
51	29 000	5	1983/88	29 000	29 000
52	40 000	5	1980/83	40 000	40 000
53	20 000	5	1982/84	20 000	20 000
54	20 000	5,5	1982/84	20 000	20 000
55	32 000	5,875	1983/85	32 000	32 000
56	38 000	6,5	1983/85	38 000	38 000
58	30 000	6,5	1989/91	30 000	30 000
60	35 000	6,75	1991	35 000	35 000
61	35 000	6,875	1992	35 000	35 000
64	12 000	6,5	1992	12 000	12 000
65	37 000	6,875	1992	37 000	37 000
70	10 000	6,5	1993	10 000	10 000
71	70 000	6,875	1993	70 000	70 000
75	22 000	6,5	1993	22 000	22 000
76	48 000	6,875	1993	48 000	48 000
78	20 000	6,5	1994	20 000	20 000
79	30 000	6,875	1994	30 000	30 000
81	10 000	6,5	1994	10 000	10 000
82	25 000	6,875	1994	25 000	25 000
83	18 000	7,5	1995	18 000	18 000
84	3 000	7	1995	3 000	3 000
85	35 000	8,75	1995	35 000	35 000
86	10 000	8,5	1995	10 000	10 000
87	45 000	9,25	1996	45 000	45 000
88	10 000	8,75	1996	10 000	10 000
89	20 000	9,25	1996	20 000	20 000
90	30 000	9,25	1996	30 000	30 000
91	10 000	8,75	1996	10 000	10 000
92	20 000	9,25	1997	20 000	20 000
93	22 000	9,125	1997	22 000	22 000
94	5 000	8,75	1997	5 000	5 000
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
103	24 000	8	1998	24 000	24 000
104	6 000	7,625	1998	6 000	6 000
106	45 000	8	1998	45 000	45 000
107	27 000	9	1999	27 000	27 000
Carried forward				1 308 000	1 324 500

Loan	R000	Per cent	Repayment date/s	R000 Out-standing	R000 1980
Brought forward				1 308 000	1 324 500
108	3 000	8,5	1999	3 000	3 000
110	30 000	9,5	1999	30 000	30 000
111	11 000	10,75	2000	11 000	11 000
112	29 000	10,75	2000	29 000	29 000
113	40 000	10,75	2000	40 000	40 000
114	25 000	10,75	2000	25 000	25 000
115	5 000	10,25	2000	5 000	5 000
116	30 000	10,75	2000	30 000	30 000
117	5 000	10,875	1985	5 000	5 000
118	55 000	11	2000	55 000	55 000
119	10 000	10,75	1980/95	10 000	10 000
120	4 000	11	1986	4 000	4 000
121	40 000	11,4	2001	40 000	40 000
122	6 000	11,1	1981/96	6 000	6 000
123	40 000	12,75	1996	40 000	40 000
124	10 000	12,65	1986	10 000	10 000
125	20 000	12,45	1981	—	20 000
126	40 000	12,5	2001	40 000	40 000
127	150 000	12,6	1999	150 000	150 000
128	20 000	12,45	1987	20 000	20 000
129	80 000	12,15	1982	80 000	80 000
130	50 000	11,5	1989	50 000	50 000
131	250 000	11,15	2002	250 000	250 000
132	250 000	11,75	2002	250 000	250 000
133	60 000	10,9	1988	60 000	60 000
134	170 000	10,75	2003	170 000	170 000
135	270 000	11,3	2003	270 000	270 000
136	7 800	7,25	1985/87	7 800	7 800
137	60 000	9,7	1986	60 000	60 000
138	150 000	9,7	2003	150 000	150 000
139	340 000	10,25	2003	340 000	340 000
140	120 000	8	1986	120 000	120 000
141	130 000	8,65	2004	130 000	130 000
142	350 000	9,15	2004	350 000	350 000
143	50 000	7,55	1985	50 000	50 000
144	130 000	9,05	2005	130 000	130 000
145	270 000	9,55	2005	270 000	270 000
146	70 000	8,1	1987	70 000	70 000
147	100 000	9,05	1992	100 000	100 000
148	100 000	9,05	2005	100 000	100 000
149	230 000	9,55	2005	230 000	230 000
150	150 000	10,25	1990	150 000	150 000 (a)
151	275 000	10,95	2004	275 000	275 000 (b)
152	100 000	12,8	1993	100 000	—
153	400 000	12,95	2006	400 000	—
154	250 000	10	2007	250 000 (c)	—
155	700 000	13,2	2007	700 000 (d)	—
				6 973 800	5 560 300
Less payable by stockholders				31 136	92 156
150 not later than 16 January 1981				—	1 349 (a)
151 not later than 16 January 1981				—	90 807 (b)
154 not later than 15 January 1982				28 860 (c)	—
155 not later than 15 January 1982				2 276 (d)	—
Carried forward				6 942 664	5 468 144

Borrowings (continued)

Loan	Foreign currency		R000	Per cent	Repayment date/s	R000 Out-standing	1980
Brought forward						6 942 664	5 468 144
Foreign bond issues							
004	DM	100 000 000	(18 034)	6,5	1974/83	3 607	5 410
005	DM	100 000 000	(19 583)	8,5	1976/85	7 833	9 791
007	DM	100 000 000	(19 556)	8	1977/86	9 778	11 734
009	UA	20 000 000	(14 210)	8,25	1972/86	14 522	13 847
013	US$	20 000 000	(14 304)	8,5	1974/86	5 722	6 794
017	DM	100 000 000	(25 132)	6,25	1977/87	15 079	17 592
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	17 636	20 154
027	US$	15 000 000	(10 080)	9,25	1975/89	7 392	8 064
037	US$	30 000 000	(26 119)	10,25	1979/83	4 453	8 371
123	DM	50 000 000	(24 102)	9	1984/87	21 407	25 075
129	DM	100 000 000	(37 682)	9,25	1987	38 695	37 682
Direct placings							
008	DM	10 000 000	(2 054)	8	1977/86	1 027	1 233
010	DM	20 000 000	(3 644)	8,5	1977/86	1 822	2 186
011	DM	20 000 000	(4 016)	8,5	1977/86	2 008	2 410
012	DM	40 000 000	(9 437)	8,5	1976/83	2 359	3 539
029	US$	35 000 000	(23 839)	19,875	1975/82	12 062	13 311
032	SF	30 000 000	(8 003)	9	1982	8 003	8 003
040	M£	5 000 000	(10 743)	10	1981	—	10 499
054	US$	10 000 000	(8 718)	12	1978/83	—	3 074
069	DM	25 000 000	(10 290)	8,25	1981	—	10 290
075	DM	20 000 000	(8 251)	8	1980/81	—	4 125
076	DM	20 000 000	(8 208)	8	1980/81	—	4 104
077	SF	80 000 000	(36 347)	7	1981	—	36 347
078	SF	35 000 000	(16 253)	6,75	1978/81	—	16 253
082	DM	101 500 000	(41 648)	11,9375	1983	41 648	41 648
087	US$	31 545 250	(27 500)	7,45	1979/81	—	9 000
088/01	SF	5 000 000	(2 648)	5	1980/83	1 520	2 280
088/02	SF	4 500 000	(2 191)	5,5	1981/84	1 783	2 456
090	SF	120 000 000	(68 278)	6,25	1982	68 650	68 650
091	DM	40 000 000	(20 192)	13,125	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)	11,5625	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)	14,125	1983	8 559	8 559
095	DM	40 000 000	(18 687)	7,7	1982/83	18 748	18 748
Carried forward						7 331 510	5 973 906

Borrowings (continued)

Loan	Foreign currency		R000	Per cent	Repayment date/s	Out-standing	R000 1980
Brought forward						7 331 510	5 973 906
Direct placings (continued)							
096	SF	9 000 000	(4 644)	4,25	1982	4 661	4 661
097	DM	60 000 000	(27 641)	14	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)	12,25	1984/85	13 199	10 050
100	DM	13 144 937	(5 894)	13,75	1984	6 549	6 549
102	SF	8 500 000	(4 163)	4,25	1983	4 741	4 741
105	SF	9 000 000	(5 229)	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
110	US$	33 000 000	(30 231)	15,625	1983/84	24 450	24 450
111A	US$	13 000 000	(11 845)	11,75	1983/84	12 896	9 932
111B	US$	5 000 000	(4 648)	12	1983/86	4 960	3 820
112	US$	12 000 000	(10 097)	19,75	1982	11 272	8 927
113	SF	9 500 000	(5 601)	5,25	1983	5 601	5 601
115	US$	25 000 000	(19 213)	13,2	1981	—	18 636
116	SF	100 000 000	(47 590)	6,75	1984	48 508	47 590
117	US$	25 000 000	(18 652)	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)	13,75	1984/85	16 716	16 716
120	US$	200 000 000	(188 044)	14	1984/87	173 050	—
121	SF	20 000 000	(9 577)	5,9375	1981	—	9 577
122	DM	80 000 000	(34 312)	13,6875	1985/87	34 312	—
124	SF	28 500 000	(14 867)	6,5	1983	10 745	13 925
124B	SF	21 500 000	(11 215)	6,5	1983	10 239	11 494
125	US$	50 000 000	(34 648)	18,5	1985	33 829	34 648
127	US$	100 000 000	(88 331)	14,25	1985/87	88 331	—
128	SF	50 000 000	(26 082)	6,125	1983	23 772	26 872
132	US$	50 000 000	(33 463)	14,1875	1984/85	33 463	33 463
133	SF	50 000 000	(24 047)	6,5	1984	25 952	24 047
135	US$	30 000 000	(21 873)	16,875	1985/86	21 873	—
137	SF	100 000 000	(48 092)	6,75	1981/85	48 092	—
138	US$	100 000 000	(69 232)	17,1875	1987/88	69 232	—
Total borrowings						8 155 498	6 424 899

Investments of the Capital Development Fund

at 31 December 1981

Schedule 3

Description		Loan	R000 Nominal value	R000 Book value
Escom internal registered stock				
5,125 per cent	1977/82	36	1 050	1 042
5,125 per cent	1976/82	37	2 052	2 002
5,125 per cent	1977/83	38	1 487	1 436
5,375 per cent	1978/83	39	408	379
5,625 per cent	1979/84	40	1 550	1 441
5,375 per cent	1979/84	42	1 205	1 083
5,375 per cent	1979/85	43	151	133
5,375 per cent	1980/85	44	799	687
5,500 per cent	1980/86	45	777	689
5,875 per cent	1981/86	46	283	243
6,250 per cent	1981/86	47	2 017	1 763
6,125 per cent	1982/87	49	516	434
5,250 per cent	1982/87	50	73	56
5,000 per cent	1983/88	51	2 072	1 574
5,000 per cent	1980/83	52	1 222	1 157
5,000 per cent	1982/84	53	983	909
5,500 per cent	1982/84	54	1 127	1 004
5,875 per cent	1983/85	55	1 776	1 554
6,500 per cent	1983/85	56	7 377	6 651
6,500 per cent	1989/91	58	3 318	2 366
6,750 per cent	1991	60	761	627
6,875 per cent	1992	61	4 641	3 371
6,875 per cent	1992	65	6 635	4 520
6,500 per cent	1993	70	662	439
6,875 per cent	1993	71	6 215	5 013
6,500 per cent	1993	75	243	158
6,875 per cent	1993	76	1 182	808
6,500 per cent	1994	78	2 365	1 564
6,875 per cent	1994	79	1 915	1 357
6,875 per cent	1994	82	195	159
7,500 per cent	1995	83	988	748
8,750 per cent	1995	85	1 351	1 207
8,500 per cent	1995	86	197	172
9,250 per cent	1996	87	2 473	1 945
8,750 per cent	1996	88	100	88
9,250 per cent	1996	89	341	313
9,250 per cent	1996	90	7 599	5 865
8,750 per cent	1996	91	928	821
9,250 per cent	1997	92	1 504	1 280
9,125 per cent	1997	93	1 628	1 497
8,750 per cent	1997	94	159	150
8,500 per cent	1997	95	214	180
8,250 per cent	1997	96	1 430	1 185
8,000 per cent	1997	97	2	2
8,250 per cent	1997	98	1 584	1 483
8,375 per cent	1998	100	765	674
8,000 per cent	1998	101	30	24
8,000 per cent	1998	103	190	158
8,000 per cent	1998	106	332	280
9,000 per cent	1999	107	759	631
Carried forward			77 631	63 322

Description		Loan	R000 Nominal value	R000 Book value
Brought forward			77 631	63 322
8,500 per cent	1999	108	525	437
9,500 per cent	1999	110	633	568
10,750 per cent	2000	111	1 605	1 555
10,750 per cent	2000	112	3 230	2 705
10,750 per cent	2000	113	1 137	1 089
10,750 per cent	2000	114	2 168	1 847
10,250 per cent	2000	115	18	17
10,750 per cent	2000	116	520	518
10,875 per cent	1985	117	337	361
11,000 per cent	2000	118	609	605
10,750 per cent	1995	119	2 850	2 696
11,000 per cent	1986	120	100	100
11,400 per cent	2001	121	928	908
11,100 per cent	1996	122	60	60
12,750 per cent	1996	123	8	8
12,650 per cent	1986	124	10	11
12,500 per cent	2001	126	1 270	1 246
12,600 per cent	1999	127	1 506	1 490
12,450 per cent	1987	128	63	69
12,150 per cent	1982	129	1 941	1 973
11,500 per cent	1989	130	3	2
11,150 per cent	2002	131	120 012	115 415
11,750 per cent	2002	132	55 731	55 997
10,900 per cent	1988	133	17 103	18 418
10,750 per cent	2003	134	517	456
11,300 per cent	2003	135	186 328	186 111
9,700 per cent	2003	137	23 308	23 840
9,700 per cent	2003	138	6 933	6 434
10,250 per cent	2003	139	141 148	139 042
8,000 per cent	1986	140	21 968	20 697
8,650 per cent	2004	141	4 109	3 915
9,150 per cent	2004	142	50 077	48 695
7,550 per cent	1985	143	3 375	3 212
9,050 per cent	2005	144	23 800	22 602
9,550 per cent	2005	145	8 632	8 632
8,100 per cent	1987	146	15 160	15 149
9,050 per cent	1992	147	77 181	76 864
9,050 per cent	2005	148	10 112	9 643
9,550 per cent	2005	149	133 994	133 968
10,250 per cent	1990	150	45 159	44 702
10,950 per cent	2004	151	203 293	202 335
12,950 per cent	2006	153	282 318	282 318
10,000 per cent	2007	154	89 935	69 069
13,200 per cent	2007	155	674 143	674 143
Total (Note 8)			2 291 488	2 243 244
Interest accrued				46 804
				2 290 048
Market value			2 022 139	

Investments of the Reserve Fund

at 31 December 1981 — Schedule 4

Description		Loan	Nominal value R000	Book value R000
Escom internal registered stock				
5,125 per cent	1977/82	36	6 721	6 659
5,125 per cent	1976/82	37	8 301	8 104
5,125 per cent	1977/83	38	8 080	7 815
5,375 per cent	1978/83	39	14 116	13 378
5,625 per cent	1979/84	40	11 070	10 445
5,375 per cent	1979/84	42	8 696	8 098
5,375 per cent	1979/85	43	6 070	5 495
5,375 per cent	1980/85	44	4 529	3 961
5,500 per cent	1980/86	45	5 335	4 594
5,875 per cent	1981/86	46	7 546	6 513
6,250 per cent	1981/86	47	7 158	5 922
6,125 per cent	1982/87	49	4 829	3 869
5,250 per cent	1982/87	50	1 621	1 257
5,000 per cent	1983/88	51	2 195	1 562
5,000 per cent	1980/83	52	17 614	16 823
5,000 per cent	1982/84	53	6 550	5 911
5,500 per cent	1982/84	54	5 379	4 867
5,875 per cent	1983/85	55	5 725	5 137
6,500 per cent	1983/85	56	8 475	7 602
6,500 per cent	1989/91	58	6 659	5 722
6,750 per cent	1991	60	342	282
6,875 per cent	1992	61	5 716	4 270
6,500 per cent	1992	64	42	30
6,875 per cent	1992	65	577	552
6,500 per cent	1993	70	25	17
6,875 per cent	1993	71	784	734
6,500 per cent	1993	75	46	29
6,875 per cent	1993	76	131	109
6,875 per cent	1994	79	31	22
6,500 per cent	1994	81	43	31
6,875 per cent	1994	82	37	26
7,500 per cent	1995	83	515	510
7,000 per cent	1995	84	28	22
8,750 per cent	1995	85	1 082	1 056
8,500 per cent	1995	86	51	49
8,750 per cent	1996	88	4	3
8,750 per cent	1996	91	9	6
9,250 per cent	1997	92	2	1
9,125 per cent	1997	93	79	61
8,750 per cent	1997	94	57	55
8,500 per cent	1997	95	49	37
8,250 per cent	1997	96	41	29
8,250 per cent	1997	98	18	13
8,000 per cent	1998	103	19	14
9,500 per cent	1999	110	16	12
10,250 per cent	2000	115	13	11
Carried forward			156 426	141 715

Description		Loan	Nominal value R000	Book value R000
Brought forward			156 426	141 715
10,750 per cent	2000	116	26	22
10,875 per cent	1985	117	320	339
11,000 per cent	2000	118	17	14
10,750 per cent	1995	119	2	2
11,000 per cent	1986	120	733	700
11,100 per cent	1996	122	175	173
12,650 per cent	1986	124	50	50
12,450 per cent	1987	128	406	400
12,150 per cent	1982	129	15 620	15 800
11,500 per cent	1989	130	2 228	2 118
10,900 per cent	1988	133	2 694	2 528
9,700 per cent	1986	137	7 264	7 001
8,000 per cent	1986	140	6 273	5 443
7,550 per cent	1985	143	32 996	32 939
8,100 per cent	1987	146	23 351	16 540
Total (Note 8)			248 581	225 784
Municipal stock				
Cape Town				
5,375 per cent	1980/85	203	600	565
5,500 per cent	1981/86	208	850	788
5,500 per cent	1983/88	219	610	548
Durban				
5,000 per cent	1984	84	500	471
5,500 per cent	1982	87	450	446
Germiston				
5,375 per cent	1985	16	150	139
Pretoria				
6,250 per cent	1977/82	49	200	199
5,500 per cent	1980/83	56	200	194
6,500 per cent	1981/84	59	200	196
External investments			3 760	3 546
			252 341	229 330
Interest accrued				4 114
				233 444
Market value			213 141	

Investments of the Redemption Fund

at 31 December 1981 — Schedule 5

Description		Loan	R000 Nominal value	R000 Book value
Escom internal registered stock				
5,125 per cent	1977/82	36	378	377
5,125 per cent	1976/82	37	421	418
5,125 per cent	1977/83	38	2 546	2 448
5,375 per cent	1978/83	39	131	127
5,625 per cent	1979/84	40	1 673	1 614
5,375 per cent	1979/84	42	3 795	3 550
5,375 per cent	1979/85	43	5 986	5 535
5,375 per cent	1980/85	44	3 771	3 323
5,500 per cent	1980/86	45	3 583	3 304
5,875 per cent	1981/86	46	1 799	1 525
6,250 per cent	1981/86	47	1 100	1 006
6,125 per cent	1982/87	49	1 091	913
5,250 per cent	1982/87	50	4 147	3 078
5,000 per cent	1983/88	51	2 102	1 623
5,000 per cent	1980/83	52	1 239	1 191
5,000 per cent	1982/84	53	3 811	3 428
5,500 per cent	1982/84	54	381	360
5,875 per cent	1983/85	55	3 736	3 420
6,500 per cent	1983/85	56	1 950	1 859
6,500 per cent	1989/91	58	957	687
6,750 per cent	1991	60	8 146	5 534
6,875 per cent	1992	61	687	462
6,500 per cent	1992	64	916	743
6,875 per cent	1992	65	4 473	3 042
6,500 per cent	1993	70	1 955	1 735
6,875 per cent	1993	71	24 670	18 031
6,500 per cent	1993	75	2 407	1 711
6,875 per cent	1993	76	5 115	3 480
6,500 per cent	1994	78	2 393	2 077
6,875 per cent	1994	79	367	307
6,500 per cent	1994	81	1 135	980
6,875 per cent	1994	82	816	202
7,500 per cent	1995	83	1 781	1 311
7,000 per cent	1995	84	922	668
8,750 per cent	1995	85	13 591	12 766
8,500 per cent	1995	86	3 469	3 118
9,250 per cent	1996	87	835	642
8,750 per cent	1996	88	1 396	1 273
9,250 per cent	1996	89	1 849	1 739
9,250 per cent	1996	90	1 675	1 474
8,750 per cent	1996	91	4 858	4 192
9,250 per cent	1997	92	1 343	1 054
9,125 per cent	1997	93	6 725	5 389
8,750 per cent	1997	94	883	823
8,500 per cent	1997	95	3 391	3 005
8,250 per cent	1997	96	2 851	2 235
8,000 per cent	1997	97	18	13
8,250 per cent	1997	98	4 544	3 369
8,250 per cent	1998	99	3 927	2 812
8,375 per cent	1998	100	1 890	1 624
8,000 per cent	1998	101	868	656
8,000 per cent	1998	103	246	206
7,625 per cent	1998	104	861	740
8,000 per cent	1998	106	7 090	4 694
9,000 per cent	1999	107	2 442	1 983
8,500 per cent	1999	108	1 048	884
9,500 per cent	1999	110	5 724	4 460
10,750 per cent	2000	111	3 907	4 309
10,750 per cent	2000	112	1 173	1 067
10,750 per cent	2000	113	3 094	2 696
Carried forward			180 078	147 292

Description		Loan	R000 Nominal value	R000 Book value
Brought forward			180 078	147 292
10,750 per cent	2000	114	843	703
10,250 per cent	2000	115	1 062	916
10,750 per cent	2000	116	3 970	3 461
10,875 per cent	1985	117	337	346
11,000 per cent	2000	118	3 523	3 492
10,750 per cent	1995	119	1 920	1 826
11,000 per cent	1986	120	191	186
11,400 per cent	2001	121	2 972	2 975
11,100 per cent	1996	122	3 147	3 124
12,750 per cent	1996	123	1 111	1 077
12,650 per cent	1986	124	46	45
12,500 per cent	2001	126	1 471	1 396
12,600 per cent	1999	127	7 838	7 582
12,450 per cent	1987	128	648	652
12,150 per cent	1982	129	12 359	12 585
11,500 per cent	1989	130	14 834	13 937
11,150 per cent	2002	131	26 700	27 696
11,750 per cent	2002	132	8 609	8 674
10,900 per cent	1988	133	4 068	3 739
10,750 per cent	2003	134	14 587	13 162
11,300 per cent	2003	135	10 650	10 866
9,700 per cent	2003	137	3 075	2 797
9,700 per cent	2003	138	7 092	6 783
10,250 per cent	2003	139	29 783	30 006
8,000 per cent	1986	140	50 687	48 036
8,650 per cent	2004	141	1 957	1 864
9,150 per cent	2004	142	60	43
7,550 per cent	1985	143	10 131	10 119
9,050 per cent	2005	144	26 888	25 652
9,550 per cent	2005	145	135	99
8,100 per cent	1987	146	22 233	21 907
9,050 per cent	1992	147	1 768	1 627
9,050 per cent	2005	148	11 307	10 780
9,550 per cent	2005	149	26	19
10,250 per cent	1990	150	71 206	69 318
10,950 per cent	2004	151	28 000	28 000
12,800 per cent	1993	152	65 434	65 150
12,950 per cent	2006	153	26 474	26 473
10,000 per cent	2007	154	6 951	5 338
Total (Note 8)			664 171	619 743
Municipal stock				
Cape Town				
5,375 per cent	1980/85	203	300	283
Germiston				
5,375 per cent	1985	16	20	18
External investments			320	301
			664 491	620 044
Interest accrued				14 141
				634 185
Market value			545 648	

Investments in Escom foreign loan bonds

at 31 December 1981 — Schedule 6

Description			Loan	Foreign currency		R000 Nominal value	R000 Book value
German	6,5 per cent	1968/83	FF004	DM	1 088 000	196	175
German	8,5 per cent	1970/85	FF005	DM	838 000	164	152
German	8 per cent	1971/86	FF007	DM	3 119 000	610	537
Unit of account	8,25per cent	1971/86	FF009	UA	225 000	488	459
Euro-dollar	8,5 per cent	1971/86	FF013	$	80 000	57	50
German	6,25per cent	1972/87	FF017	DM	4 194 000	1 054	869
Swiss	6,5 per cent	1973/88	FF020	SF	3 110 000	516	504
German	7 per cent	1973/88	FF023	DM	4 559 000	1 139	950
Euro-dollar	9,25per cent	1974/89	FF027	$	1 228 000	825	726
Euro-dollar	10,25per cent	1975/83	FF037	$	60 000	52	51
German	8 per cent	1978/84	FF092	DM	135 000	68	65
German	8,75per cent	1979/84	FF108	DM	145 000	74	72
German	9,25per cent	1980/87	FF129	DM	8 530 000	3 281	3 888
Total (Note 8)						8 524	8 498
Interest accrued							279
							8 777
Market value					11 881		

Capital Development Fund Account

for the year ended 31 December 1981 — Schedule 7

	R000			
	1981		1980	
Amounts set aside		435 478		426 400
Cape Western Undertaking	30 986		30 046	
Cape Northern Undertaking	12 667		12 550	
Border Undertaking	4 507		4 389	
Orange River Undertaking	6 346		6 458	
Natal Undertaking	69 073		68 140	
Eastern Transvaal Undertaking	67 678		62 773	
Rand & Orange Free State Undertaking	244 221		242 044	
Central Generating Undertaking	—		—	
Investment income		235 049		159 527
Interest earned	233 720		159 171	
Adjustments of investment values	1 329		356	
Balance at beginning of year		1 886 333		1 300 406
Balance at end of year (Note 7.3)		2 556 860		1 886 333

Reserve Fund Account

for the year ended 31 December 1981 — Schedule 8

	R000			
	1981		1980	
Amounts set aside		900		900
Cape Western Undertaking	—		1	
Cape Northern Undertaking	—		—	
Border Undertaking	—		1	
Orange River Undertaking	—		2	
Natal Undertaking	—		1	
Eastern Transvaal Undertaking	—		—	
Rand & Orange Free State Undertaking	—		—	
Central Generating Undertaking	900		895	
Investment income		19 966		18 423
Interest accrued	15 424		16 460	
Adjustments of investment values	4 542		1 963	
		20 866		19 323
Expenditure		31 216		19 393
Cape Western Undertaking	916		130	
Cape Northern Undertaking	346		369	
Border Undertaking	24		15	
Orange River Undertaking	236		53	
Natal Undertaking	(108)		998	
Eastern Transvaal Undertaking	255		345	
Rand & Orange Free State Undertaking	648		534	
Central Generating Undertaking	28 899		16 949	
		(10 350)		(70)
Balance at beginning of year		224 081		224 151
Balance at end of year (Note 7.3)		213 731		224 081

Redemption Fund Account

for the year ended 31 December 1981 — Schedule 9

	R000			
	1981		1980	
Amounts contributed		69 624		55 328
Cape Western Undertaking	2 917		2 632	
Cape Northern Undertaking	1 924		1 778	
Border Undertaking	483		489	
Orange River Undertaking	546		487	
Natal Undertaking	2 638		2 451	
Eastern Transvaal Undertaking	3 577		3 348	
Rand & Orange Free State Undertaking	9 017		8 148	
Central Generating Undertaking	48 522		35 995	
Other contributions		869		835
Proceeds of sales of fixed property		2 758		721
Investment income		62 510		48 589
Interest earned	60 415		48 393	
Adjustments of investment values	2 095		196	
		135 761		105 473
Repayment of internal registered stock				
4,625 per cent 1980 (Loan 33)	—		16 000	
4,875 per cent 1980 (Loan 34)	—		16 000	
5,125 per cent 1981 (Loan 35)	16 500		—	
12,450 per cent 1981 (Loan 125)	20 000	36 500	—	32 000
		99 261		73 473
Balance at beginning of year		583 791		510 318
Balance at end of year (Note 7.3)		683 052		583 791

Statistics

1. *Power stations: principal equipment installed*

at 31 December 1981

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
Coal-fired stations									
Arnot	1 998,6	2 100	1 980	6	333,1	6	350	15,9/3,98	510/510
Camden	1 814,4	1 600	1 520	8	226,8	8	200	10,3	538
Colenso	90,8 50,4	50 30		4 2	22,7 25,2	2 1	25 30	2,0 2,0	385 385
	141,2	80	70	6		3			
Duvha	1 521,0	1 800	1 725	3	507,0	3	600	16,1/3,55	535/535
Grootvlei	1 071,0 230,6	1 200		5 1	214,2 230,6	6	200	10,3 10,3	538 538
	1 301,6	1 200	1 140	6		6			
Hendrina	2 142,0	2 000	1 900	10	214,2	10	200	10,3	538
Hex River	100,8 69,2	60 60		4 2	25,2 34,6	3 2	20 30	4,2 4,2	427 482
	170,0	120	111	6		5			
Highveld	554,4	480	440	8	69,3	8	60	6,3	482
Ingagane	567,0	500	465	5	113,4	5	100	8,4	510
Klip	567,5	396 *28		25	22,7	12	33	2,5	390
	567,5	424	372	25		12			
Komati	[illegible]0 566,8	500 500		5 4	113,4 141,7	5 4	100 125	8,4 8,4	510 510
	1 133,8	1 000	925	9		9			
Kriel	2 640,0	3 000	2 850	6	440,0	6	500	16,0/3,17	510/510
Matla	2 032,8	2 400	2 300	4	508,2	4	600	16,1/3,68	535/535
Salt River	328,0	120 120		10	32,8	4 2	30 60	4,2 4,2	482 482
	328,0	240	228	10		6			
Taaibos	584,0	480	440	8	73,1	8	60	4,2	441
Umgeni	181,6 164,0	120 120		8 5	22,7 32,8	4 2	30 60	4,2 4,2	454 454
	345,6	240	222	13		6			
Vaal	430,2	297 §21		18	23,9	9	33	2,5	427
	430,2	318	282	18		9			
Vierfontein	503,5	360	336	19	26,5	12	30	4,2	441
West Bank	85,6 53,0	45 40		4 2	21,4 26,5	3 2	15 20	2,9 2,9	427 427
	138,6	85	80	6		5			
Wilge	62,8 201,6 73,1	 60 180		4 4 1	15,7 50,4 73,1	 2 3	 30 60	 4,2 4,2	 454 454
	337,5	240	221	9		5			

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
Total, coal-fired stations	19 251,7	18 667	17 607	185		136			
Gas-turbine stations									
Acacia		171	171			3	57		
Port Rex		171	171			3	57		
Total, gas-turbine stations		342	342			6			
Hydro-electric stations									
Hendrik Verwoerd		320	320			4	80		
Vanderkloof		220	220			2	110		
Total hydro stations		540	540			6			
Pumped-storage station									
Drakensberg		500	500			2	250		
Total, pumped-storage station		500	500			2			
Total, all Escom	19 251,7	20 049	18 989	185		150			

Other power sources

	Firm contractual capacity MW
Cahora Bassa	1 373

*Four 7 MW house sets installed at Klip.
§Three 7 MW house sets installed at Vaal.

2. *Immovable property and rights acquired*

during the year ending 31 December 1981

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	R474 637	R392 315
Cape Northern Undertaking	R33 917	R215 226
Orange River Undertaking	R363 881	R100 865
Border Undertaking	R186 745	R16 698
Natal Undertaking	R601 600	R133 058
Eastern Transvaal Undertaking	R356 863	R169 891
Rand and O.F.S. Undertaking	R3 320 287	R564 153
Head Office	R24 839 367	R1 580 233

3. *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 1981

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	905	2 840	4 074	1 707
Cape Northern		196	580	305	2 442	1 089	4 913	9 525	4 144
Cape Western		24			1 346	2 370	11 778	15 518	8 898
Eastern Transvaal			1 263		2 762	1 850	14 757	20 632	12 336
Natal			1 380		1 336	3 507	12 826	19 049	12 116
Orange River				392	196	759	2 571	3 918	3 921
Rand and O.F.S.		433	2 930		4 516	10 752	21 611	40 242	51 503
Central Generating	1 030	7 227		108	49			8 414	32 013
Total	1 030	7 880	6 153	965	12 816	21 232	71 296	121 372	126 638

	Underground cables							Total
Border							132	132
Cape Northern							40	40
Cape Western					22	127	3 960	4 109
Eastern Transvaal							131	131
Natal						3	825	828
Orange River							5	5
Rand and O.F.S.					34	303	1 609	1 946
Total					56	433	6 702	7 191

	Total lines and cables						Total	Total capacity of transformers MVA
1981	1 030	7 880	7 118	12 872	21 665	77 998	128 563	126 638
1980	1 030	7 571	6 986	12 533	21 147	73 847	123 114	122 825
Additions	—	309	132	339	518	4 151	5 449	3 813

4. *Power station operating statistics*

during the year ending 31 December 1981

Power station	Sent-out rating on 31 December 1981 MW	Energy sent out million kW.h	Maximum demands 1 hour sent out MW	Station load factors % *A	Station load factors % **B	Overall thermal efficiency % Sent out	°Availability %	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
Coal-fired stations											
Arnot	1 980	12 226	2 056	70,5	96,0	33,3	73,3	5 973 774	0,489	21,99	10,80
Camden	1 520	8 467	1 359	63,6	90,8	29,4	70,0	4 471 293	0,528	23,18	12,26
Colenso	70	244	76	39,8	43,4	19,1	91,7	180 477	0,740	25,51	18,88
Duvha	§1 725	6 762	1 175	54,7	98,0	34,4	55,8	3 018 514	0,446	23,21	10,47
Grootvlei	1 140	7 440	1 195	74,5	90,3	29,7	82,5	4 127 163	0,555	21,80	12,12
Hendrina	1 900	13 097	1 910	78,7	92,2	31,2	85,3	6 666 461	0,509	22,65	11,54
Hex River	111	373	112	38,4	46,5	22,6	82,6	226 586	0,607	26,19	15,90
Highveld	440	2 368	459	61,4	77,3	27,0	79,5	1 762 073	0,744	17,89	13,35
Ingagane	465	2 955	459	72,5	90,1	26,7	80,5	1 739 544	0,589	22,77	13,49
Klip	372	1 322	307	40,6	51,4	17,3	79,0	1 495 177	1,131	18,42	20,84
Komati	925	5 551	829	68,5	96,7	26,8	70,8	3 379 618	0,609	22,02	13,44
Kriel	2 850	14 624	2 774	58,6	94,7	34,3	61,8	7 752 308	0,530	19,71	10,50
Matla	§2 300	10 454	2 412	63,8	91,0	34,7	70,1	5 227 441	0,500	20,58	10,37
Salt River	228	933	256	46,7	52,3	25,2	89,3	521 746	0,559	25,52	14,26
Taaibos	440	2 546	483	66,0	75,0	25,6	88,1	2 035 349	0,800	17,59	14,09
Umgeni	222	952	220	49,0	58,5	22,2	83,7	617 715	0,649	24,98	16,21
Vaal	282	1 655	271	67,0	84,2	18,6	79,6	1 769 558	1,069	18,09	19,34
Vierfontein	336	1 802	349	61,2	64,8	21,0	94,4	1 662 425	0,923	18,56	17,13
West Bank	80	320	89	45,7	50,8	22,7	90,1	190 563	0,595	26,69	15,87
Wilge	221	1 584	229	81,8	94,9	24,7	86,2	1 085 933	0,686	21,26	14,59
Sub-total for all coal-fired stations	17 607	95 675	—	64,8	88,4	30,0	73,3	53 903 718	0,563	21,25	12,01
Gas-turbine stations											
Acacia	171	44	184	2,9	3,6	25,7	81,0	13 312	—	—	—
Port Rex	171	37	183	2,5	3,1	25,5	82,1	11 686	—	—	—
Sub-total for gas-turbine stations	342	81	—	2,7	3,4	25,6	81,6	24 998	—	—	—
Hydro-electric stations											
Hendrik Verwoerd	320	748	404	26,7	30,0	—	89,0	—	—	—	—
Vanderkloof	220	905	283	47,0	53,4	—	87,9	—	—	—	—
Sub-total for hydro stations	540	1 653	—	34,9	39,4	—	88,6	—	—	—	—
Pumped-storage station											
Drakensberg	§500	415	759	21,4	26,3	—	81,3	—	—	—	—
Sub-total for pumped-storage station	500	415	—	21,4	26,3	—	81,3	—	—	—	—
Total/weighted average all Escom	18 989	97 824	—	62,2	83,8	—	74,2	—	—	—	—
Other power sources											
Cahora Bassa	1 373	2 601	1 723	21,6	102,4	—	21,1	—	—	—	—
Sub-total other power sources	1 373	2 601	—	21,6	102,4	—	21,1	—	—	—	—
Total/weighted average	20 362	100 425	—	59,3	84,2	—	70,4	—	—	—	—

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

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

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

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

5. *Summary of operating statistics*

Calendar year	Coal-fired power stations: Coal used: Thousands of tons	Average heat content (as received) MJ/kg	kg/kW.h sent out	Average heat rate MJ/kW.h sent out	Overall thermal efficiency sent-out basis %	Coal cost: Total R000	Average rand/ton	Cents/ kW.h sent out	Total power stations output million kW.h sent out: Coal-fired stations	Hydro-electric stations	Pump-storage stations	Diesel and gas turbine stations	Total power station output	Total power station capacity assigned sent-out rating MW as at 31 December	Average power station plant load factor sent-out basis %
1950	6 323.4	22.72	0,869	19.74	18.2	5 302	0,84	0.072 9	7 276	7	—	4	7 287	1 290	64,7
1951	6 662.9	22.72	0,855	19.43	18.5	6 553	0,98	0,084 0	7 797	6	—	3	7 806	1 361	66,1
1952	7 113.4	22.75	0,865	19.68	18.3	8 520	1,20	0,103 7	8 220	6	—	1	8 227	1 454	66,9
1953	7 393.9	23.08	0,837	19.32	18.6	9 862	1,33	0,111 6	8 838	7	—	—	8 845	1 635	65,5
1954	8 024.9	23,06	0,805	18,56	19,4	11 329	1,41	0,113 6	9 971	6	—	—	9 977	1 846	66,4
1955	8 999,7	22,89	0,788	18.04	20,0	13 709	1,52	0,120 1	11 419	6	—	—	11 425	2 145	65,9
1956	9 688,5	22,96	0,765	17,56	20,5	13 653	1,62	0,123 6	12 663	7	—	—	12 670	2 498	61,2
1957	10 220,6	22,79	0,750	17,09	21,1	17 256	1,69	0,126 6	13 634	6	—	—	13 640	2 555	61,1
1958	10 784,1	22,73	0,743	16,89	21,3	19 039	1,77	0,131 2	14 511	5	—	—	14 516	2 748	62.0
1959	11 548,7	22,44	0,732	16,43	21,9	20 970	1,82	0,132 9	15 774	3	—	—	15 777	2 983	62,6
1960	12 512,6	22,52	0,723	16,28	22,1	25 373	2,03	0,146 6	17 306	2	—	—	17 308	3 091	65,2
1961	13 194,9	22,39	0,722	16,17	22,3	27 713	2,10	0,151 6	18 282	2	—	—	18 284	3 226	66,2
1962	13 955,5	22,22	0,719	15,98	22,5	29 230	2,09	0,150 7	19 401	3	—	—	19 404	3 406	65,8
1963	14 721,1	22,15	0,708	15,68	23,0	31 009	2,11	0,149 2	20 789	4	—	—	20 793	3 788	65,7
1964	15 654,7	22,15	0,692	15,33	23,5	32 367	2,07	0,143 0	22 634	5	—	—	22 639	4 077	65,2
1965	16 726,7	22,39	0,680	15,23	23,6	34 986	2,09	0,142 3	24 583	—	—	—	24 583	4 181	67,4
1966	16 982,3	22,20	0,666	14,79	24,4	37 901	2,23	0,148 6	25 504	—	—	—	25 504	4 377	67,1
1967	18 307,7	22,44	0,645	14,47	24,9	42 053	2,30	0,148 2	28 371	—	—	—	28 371	5 328	66,8
1968	19 133,9	22,63	0,620	14,03	25,6	44 604	2,33	0,144 6	30 843	—	—	—	30 843	5 800	62,9
1969	19 982,9	22,73	0,595	13,52	26,6	47 453	2,37	0,141 2	33 598	—	—	—	33 598	6 441	62,1
1970	21 630.6	22,97	0,580	13,32	27,0	48 807	2,26	0,130 8	37 321	—	—	—	37 321	7 060	62,9
1971	23 416,2	23,30	0,576	13,42	26,8	52 705	2,25	0,129 7	40 645	94	—	—	40 739	8 373	61,3
1972	24 952,8	22,89	0,571	13,07	27,5	56 113	2,25	0,128 5	43 662	813	—	—	44 475	8 849	59,6
1973	27 907,9	22,47	0,563	12,65	28,5	66 837	2,39	0,134 8	49 570	189	—	—	49 759	9 482	62,5
1974	30 891,4	22,42	0,560	12,56	28,7	90 269	2,92	0,163 7	55 141	1 110	—	—	56 251	10 002	66,3
1975	34 231,7	22,21	0,567	12,59	28,6	138 592	4,05	0,229 5	60 400	1 098	—	—	61 498	10 522	68,6
1976	37 257,4	21,87	0,579	12,66	28,4	200.781	5,39	0,312 2	64 309	1 853	—	26	66 188	11 688	66,8
1977	37 505,6	21,78	0,576	12,55	28,7	233 229	6,22	0,358 2	65 114	1 924	—	12	67 050	12 756	61,9
1978	39 589,5	21,61	0,574	12,44	28,9	263 880	6,67	0,382 4	69 004	1 887	—	11	70 902	13 595	60,7
1979	43 264,9	21,22	0,580	12,33	29,2	301 273	6,96	0,404 5	74 485	1 144	—	14	75 643	15 056	60,9
1980	46 755.0	21,34	0,568	12.16	29,6	379 942	8,12	0,461 4	82 342	992	—	28	83 362	17 339	57,8
1981	53 903.7	21,25	0,563	12.01	30,0	523 663	9,71	0,547 3	95 675	1 653	415	81	97 824	18 989	62,2

6. *Integrated Escom system: electricity sent out and sold*

Calendar year	Escom's share in national electricity supply		Electricity sent out					
	Republic of S.A. total mill. kW.h sent out	*Escom electricity sent out as % of Republic	mill. kW.h sent out from Escom power stations	mill. kW.h purchased from other sources	mill. kW.h own consumption	mill. kW.h sent out Escom system	Peak demand on integrated Escom system MW	Integrated Escom system load factor %
1950	§10 437	71,1	7 287	131	—	7 418	§1 182	71,6
1951	§11 098	72,1	7 806	195	—	8 001	§1 212	75,4
1952	§11 678	74,1	8 227	424	—	8 651	§1 265	77,9
1953	§12 823	73,3	8 845	550	—	9 395	§1 394	76,9
1954	§14 167	73,5	9 977	437	—	10 414	§1 570	75,7
1955	§16 021	73,4	11 425	339	—	11 764	§1 806	74,4
1956	§17 293	74,8	12 670	257	—	12 927	§2 001	73,5
1957	18 720	73,7	13 640	163	—	13 803	§2 151	73,3
1958	19 765	74,3	14 516	164	—	14 680	§2 249	74,5
1959	21 051	75,4	15 777	94	—	15 871	§2 429	74,6
1960	22 717	76,3	17 308	15	—	17 323	§2 605	75,7
1961	23 760	77,0	18 284	8	—	18 292	§2 733	76,4
1962	25 599	75,8	19 404	13	—	19 417	§2 925	75,3
1963	27 335	76,1	20 793	19	—	20 812	§3 183	74,6
1964	§29 547	76,8	22 639	41	—	22 680	§3 460	74,6
1965	31 939	77,4	24 583	126	—	24 709	3 669	76,9
1966	§33 929	77,0	25 504	°630	—	26 134	3 906	76,4
1967	36 897	77,1	28 371	70	—	28 441	4 227	76,8
1968	39 761	77,6	30 843	8	—	30 851	4 658	75,4
1969	42 847	78,4	33 598	8	—	33 606	5 055	75,9
1970	47 456	77,7	37 321	7	—	37 328	5 622	75,8
1971	51 081	79,8	40 739	8	—	40 747	6 115	76,1
1972	55 298	80,4	44 475	10	—	44 485	6 630	76,4
1973	60 080	82,8	49 759	11	—	49 770	7 350	77,3
1974	§65 498	85,9	56 251	8	—	56 259	8 552	75,1
1975	69 883	88,1	61 498	35	—	61 533	9 185	76,5
1976	75 381	89,4	66 188	1 226	—	67 414	10 085	76,1
1977	79 491	89,7	67 050	4 241	27	71 264	10 735	75,8
1978	84 954	91,5	70 902	6 924	52	77 774	11 490	77,3
1979	92 613	92,8	75 643	10 394	58	85 979	12 855	76,4
1980	99 967	93,0	83 362	9 659	71	92 950	13 668	77,5
1981	106 837	93,3	97 824	2 601	712	99 713	14 674	77,6

*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 %	Average selling price cents/ kW.h	Total number at 31 December	Number/ mill. kW.h sold	R000	R000/ mill. kW.h sold
0,932	6 910,6	11,1	0,274 1	9 352	1,353	[1]—	—
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
0,936	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
0,942	87 539,3	8,6	2,024 2	47 490	0,542	5 604 038	64,02
0,941	93 844,0	7,2	2,281 1	52 080	0,555	6 323 048	67,38

[1]Figures not available.

7. *Summary of consolidated revenue and expenditure account*

Year	Total Escom mill. kW.h sold		Total Escom costs: Interest	Redemption and other provision for loan repayment	Reserve Fund	Capital Development Fund	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
1967	26 657,1	R(000)	37 312	24 536	9 912	—	71 760	313	42 488	14 618	7 146	10 603	146 928	146 783
		c/kW.h sold	0,140 0	0,092 0	0,037 2	—	0,269 2	0,001 2	0,159 4	0,054 8	0,026 8	0,039 8	0,551 2	0,550 6
		% of total cost	25,39	16,70	6,75	—	48,84	0,21	28,92	9,95	4,86	7,22	100,00	99,90
1968	28 885,0	R(000)	43 282	23 884	12 300	—	79 466	121	45 117	17 016	8 097	12 176	161 993	161 475
		c/kW.h sold	0,149 8	0,082 7	0,042 6	—	0,275 1	0,000 4	0,156 2	0,058 9	0,028 0	0,042 2	0,560 8	0,559 0
		% of total cost	26,72	14,74	7,59	—	49,06	0,07	27,85	10,50	5,00	7,52	100,00	99,68
1969	31 505,6	R(000)	50 943	20 809	13 605	—	85 357	102	48 035	19 038	9 264	13 578	175 374	176 106
		c/kW.h sold	0,161 7	0,066 0	0,043 2	—	0,270 9	0,000 3	0,152 5	0,060 4	0,029 4	0,043 1	0,556 6	0,559 0
		% of total cost	29,05	11,87	7,76	—	48,67	0,06	27,39	10,86	5,28	7,74	100,00	100,42
1970	34 890,6	R(000)	59 484	23 654	15 202	—	98 340	89	49 440	21 955	10 594	15 448	195 866	193 475
		c/kW.h sold	0,170 5	0,067 8	0,043 6	—	0,281 9	0,000 3	0,141 7	0,062 9	0,030 4	0,044 3	0,561 4	0,554 5
		% of total cost	30,37	12,08	7,76	—	50,21	0,05	25,24	11,21	5,41	7,89	100,00	98,78
1971	38 040,0	R(000)	70 266	30 928	8 568	—	109 762	82	53 587	26 276	11 492	18 440	219 639	219 584
		c/kW.h sold	0,184 7	0,081 3	0,022 5	—	0,288 5	0,000 2	0,140 9	0,069 1	0,030 2	0,048 5	0,577 4	0,577 2
		% of total cost	31,99	14,08	3,90	—	49,97	0,04	24,40	11,96	5,23	8,40	100,00	99,97
1972	41 648,9	R(000)	86 631	30 575	3 056	13 596	133 858	95	57 259	31 586	13 486	21 737	258 021	254 394
		c/kW.h sold	0,208 0	0,073 4	0,007 3	0,032 6	0,321 4	0,000 2	0,137 5	0,075 8	0,032 4	0,052 2	0,619 5	0,610 8
		% of total cost	33,58	11,85	1,18	5,27	51,88	0,04	22,19	12,24	5,23	8,42	100,00	98,59
1973	46 578,4	R(000)	101 858	34 200	3 760	15 366	155 184	117	68 634	38 685	17 082	26 460	306 162	302 034
		c/kW.h sold	0,218 7	0,073 4	0,008 1	0,033 0	0,333 2	0,000 3	0,147 4	0,083 1	0,036 7	0,056 8	0,657 3	0,648 4
		% of total cost	33,27	11,17	1,23	5,02	50,69	0,04	22,42	12,64	5,58	8,64	100,00	98,65
1974	52 585,1	R(000)	114 308	27 151	66	28 114	169 639	86	92 530	48 572	20 617	32 611	364 055	358 768
		c/kW.h sold	0,217 4	0,051 6	0,000 1	0,053 5	0,322 6	0,000 2	0,176 0	0,092 4	0,039 2	0,062 0	0,692 3	0,682 2
		% of total cost	31,40	7,46	0,02	7,72	46,60	0,02	25,42	13,34	5,66	8,96	100,00	98,55
1975	57 869,2	R(000)	136 963	30 814	1 400	40 730	209 907	114	141 913	*44 980	*18 477	*71 758	487 149	460 073
		c/kW.h sold	0,236 7	0,053 2	0,002 4	0,070 4	0,362 7	0,000 2	0,245 2	0,077 7	0,031 9	0,124 0	0,841 8	0,795 0
		% of total cost	28,12	6,33	0,29	8,36	43,09	0,02	29,13	9,23	3,79	14,73	100,00	94,44
1976	63 355,7	R(000)	173 829	41 470	1 700	53 584	270 583	2 399	208 316	62 477	19 712	92 835	656 322	656 381
		c/kW.h sold	0,274 4	0,065 5	0,002 7	0,084 6	0,427 1	0,003 8	0,328 8	0,098 6	0,031 1	0,146 5	1,036 0	1,036 0
		% of total cost	26,49	6,32	0,26	8,16	41,23	0,37	31,74	9,52	3,00	14,14	100,00	100,01
1977	67 125,4	R(000)	224 418	63 403	900	224 000	512 721	15 501	239 228	76 294	19 859	133 494	997 097	1 030 552
		c/kW.h sold	0,334 3	0,094 5	0,001 3	0,333 7	0,763 8	0,023 1	0,356 4	0,113 7	0,029 6	0,198 9	1,485 4	1,535 3
		% of total cost	22,51	6,36	0,09	22,47	51,42	1,55	23,99	7,65	1,99	13,39	100,00	103,36
1978	72 780,4	R(000)	308 970	76 036	900	300 000	685 906	26 364	271 222	89 193	23 677	138 106	1 234 468	1 301 829
		c/kW.h sold	0,424 5	0,104 4	0,001 2	0,412 1	0,942 4	0,036 2	0,372 6	0,122 5	0,032 5	0,189 7	1,696 1	1,788 7
		% of total cost	25,03	6,16	0,07	24,30	55,56	2,14	21,97	7,22	1,92	11,19	100,00	105,46
1979	80 582,8	R(000)	373 718	88 800	900	380 000	843 418	36 061	319 428	95 887	28 689	188 203	1 511 686	1 529 474
		c/kW.h sold	0,463 7	0,110 1	0,001 1	0,471 5	1,046 6	0,044 7	0,396 3	0,118 9	0,035 6	0,233 5	1,875 9	1,898 0
		% of total cost	24,72	5,87	0,06	25,14	55,79	2,39	21,13	6,34	1,90	12,45	100,00	101,18
1980	87 539,3	R(000)	504 732	101 629	900	426 400	1 033 661	35 806	405 630	117 968	36 824	240 078	1 869 967	1 772 000
		c/kW.h sold	0,576 6	0,116 1	0,001 0	0,487 1	1,180 8	0,040 9	0,463 3	0,134 8	0,042 1	0,274 2	2,136 1	2,024 2
		% of total cost	26,99	5,44	0,05	22,80	55,28	1,91	21,69	6,31	1,97	12,84	100,00	94,76
1981	93 844,0	R(000)	603 546	117 088	900	435 478	1 157 012	4 106	569 949	170 206	43 034	273 756	2 218 063	2 140 689
		c/kW.h sold	0,643 1	0,124 8	0,001 0	0,464 0	1,232 9	0,004 4	0,607 3	0,181 4	0,045 9	0,291 7	2,363 6	2,281 1
		% of total cost	27,21	5,28	0,04	19,63	52,16	0,19	25,70	7,67	1,94	12,34	100,00	96,51

*Basis of allocation changed in 1975.

8. *Distribution undertakings*

consumer details, electricity sales

Border Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h sold: 1980	Average price in c/kW.h sold: 1981
*Bulk supplies	23	88,0	854,7	7,6	7,4	28 729	2,989	3,361
Direct supplies: Domestic and street lighting	4 311	3,1	30,5	12,5	**	1 794	5,364	5,883
Industrial	2 008	8,9	86,1	7,5	13,0	4 754	5,020	5,525
Mining	—	—	—	—	—	—	—	—
Traction	—	—	—	—	—	—	—	—
Total	6 342	100,0	971,3	7,8	7,6	35 277	3,241	3,632

Cape Northern Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h. sold: 1980	Average price in c/kW.h. sold: 1981
*Bulk supplies	38	18,0	492,4	10,5	7,9	14 149	2,624	2,873
Direct supplies: Domestic and street lighting	748	0,9	23,2	**	**	1 212	4,575	5,228
Industrial	4 873	7,8	213,3	17,1	11,6	9 370	3,722	4,393
Mining	96	58,4	1 593,6	5,8	17,1	51 189	3,028	3,212
Traction	5	14,9	407,1	0,2	6,7	16 717	3,765	4,106
Total	5 760	100,0	2 729,6	5,9	12,6	92 637	3,145	3,394

Cape Western Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h sold: 1980	Average price in c/kW.h sold: 1981
*Bulk supplies	68	54,0	3 606,8	8,5	7,3	79 211	1,898	2,196
Direct supplies: Domestic and street lighting	77 004	8,1	540,8	10,7	**	28 173	4,712	5,210
Industrial	18 515	28,4	1 893,7	6,5	5,9	66 708	3,087	3,523
Mining	—	—	—	—	—	—	—	—
Traction	9	9,5	636,2	10,4	5,5	22 913	3,291	3,602
Total	95 596	100,0	6 677,5	8,3	6,3	197 005	2,594	2,950

Eastern Transvaal Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h. sold: 1980	Average price in c/kW.h. sold: 1981
*Bulk supplies	31	9,8	1 433,8	29,7	11,2	32 314	2,020	2,254
Direct supplies: Domestic and street lighting	2 825	0,2	29,6	5,3	**	1 181	3,618	3,987
Industrial	9 193	66,7	9 730,3	14,3	14,7	205 032	1,900	2,107
Mining	135	19,3	2 807,0	5,4	8,5	62 020	1,981	2,210
Traction	5	4,0	583,6	1,3	9,0	16 369	2,571	2,805
Total	12 189	100,0	14 584,3	13,2	12,7	316 916	1,961	2,173

Natal Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h sold: 1980	Average price in c/kW.h sold: 1981
*Bulk supplies	36	52,7	7 828,4	10,1	7,8	161 621	1,848	2,065
Direct supplies: Domestic and street lighting	17 440	0,9	140,7	10,7	**	6 068	3,890	4,354
Industrial	14 712	34,9	5 187,9	1,6	10,8	111 002	1,892	2,140
Mining	48	2,3	340,2	8,9	9,6	9 002	2,381	2,646
Traction	10	9,3	1 389,9	4,2	5,6	37 921	2,421	2,728
Total	32 246	100,0	14 885,0	6,4	8,4	325 614	1,949	2,188

Orange River Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h. sold: 1980	Average price in c/kW.h. sold: 1981
*Bulk supplies	50	96,2	1 319,1	3,5	5,7	35 045	2,239	2,657
Direct supplies: Domestic and street lighting	362	0,1	2,1	15,8	**	217	9,618	10,346
Industrial	1 226	3,7	46,4	—5,6	1,1	3 478	6,073	7,497
Mining	—	—	—	—	—	—	—	—
Traction	—	—	—	—	—	—	—	—
Total	1 638	100,0	1 367,6	3,2	5,4	38 740	2,391	2,833

Rand and O.F.S. Undertaking

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h sold: 1980	Average price in c/kW.h sold: 1981
*Bulk supplies	188	27,4	14 425,7	12,1	8,9	328 962	2,008	2,280
Direct supplies: Domestic and street lighting	10 862	0,5	236,0	18,2	**	8 745	3,293	3,705
Industrial	27 195	26,5	13 933,7	2,0	6,2	309 681	1,961	2,223
Mining	124	42,5	22 390,5	4,6	7,0	441 771	1,748	1,973
Traction	2	3,1	1 642,8	5,1	5,6	45 341	2,423	2,760
Total	38 371	100,0	52 628,7	5,9	7,2	1 134 500	1,901	2,156

Total Escom

Category	No. of consumers 1981	Electricity sales: % of total 1981	mill. kW.h 1981	% yearly increase: 1981/80	% yearly increase: Average 5 years 1976-81	Revenue R000 1981	Average price in c/kW.h. sold: 1980	Average price in c/kW.h. sold: 1981
*Bulk supplies	434	31,9	29 960,9	11,3	8,3	680 030	2,003	2,270
Direct supplies: Domestic and street lighting	113 552	1,1	1 001,6	10,5	**	47 390	4,275	4,734
Industrial	77 722	33,1	31 090,7	5,8	9,3	710 024	2,026	2,284
Mining	403	28,9	27 131,3	4,8	7,7	563 982	1,854	2,079
Traction	3†	5,0	4 659,5	4,6	6,0	139 262	2,676	2,989
Total	192 142	100,0	93 844,0	7,2	8,2	2 140 688	2,024	2,281

*Supplies to municipal and other supply authorities.
**Change in definition of domestic use.

9. *Sales of electricity to industry, million kW.h*

Sector of industry	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
Building cement and quarrying	1 068	1 087	1 198	1 121	1 194	1 353	13,3	4,8
Chemical	2 655	3 103	4 117	4 657	5 751	7 215	25,5	22,1
Engineering, iron, steel and base metals	11 173	11 927	13 338	15 600	15 900	15 316	—3,7	6,5
Foodstuffs, consumer goods commercial, and other	4 350	4 819	4 916	5 378	5 688	6 341	11,5	7,8
Paper and paper products	661	650	613	719	840	866	3,1	5,6
Total	19 907	21 586	24 182	27 475	29 373	31 091	5,8	9,3

10. Sales of electricity to mining, million kW.h

Mining category	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
Gold and uranium	13 918	14 708	16 241	17 201	18 477	19 406	5,0	6,9
Platinum	2 184	2 287	2 388	2 772	2 973	3 014	1,4	6,7
Coal	812	941	1 078	1 248	1 426	1 522	6,7	13,4
Copper	728	874	1 023	1 042	1 117	1 131	1,3	9,2
Diamonds	343	342	497	596	678	714	5,3	1,8
Asbestos	266	275	223	233	242	240	— 0,8	—2,0
Iron	180	271	272	334	361	335	— 7,2	13,2
Chrome	61	84	106	126	127	117	— 7,9	13,9
Antimony	61	76	73	67	67	58	—13,4	—1,0
Manganese	49	62	72	83	94	104	10,6	16,2
Other	144	219	246	298	320	490	53,1	27,8
Total	18 746	20 139	22 219	24 000	25 882	27 131	4,8	7,7

11. Total electricity sales in Escom's undertakings, million kW.h

Undertaking	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
Border	675	727	779	826	901	971	7,8	7,5
Cape Northern	1 507	1 668	1 937	2 368	2 577	2 730	5,9	12,6
Cape Western	4 930	5 028	5 216	5 593	6 168	6 677	8,3	6,3
Eastern Transvaal	8 028	9 062	10 061	11 698	12 887	14 584	13,2	12,7
Natal	9 931	10 747	11 736	12 988	13 989	14 885	6,4	8,4
Orange River	1 049	1 059	1 077	1 203	1 326	1 368	3,2	5,5
Rand and O.F.S.	37 236	38 834	41 974	45 907	49 691	52 629	5,9	7,2
Total	63 356	67 125	72 780	80 583	87 539	93 844	7,2	8,2

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

Undertaking	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
Border	734	790	845	895	968	1 052	8,7	7,5
Cape Northern	1 675	1 832	2 171	2 647	2 883	3 032	5,2	12,6
Cape Western	5 403	5 556	5 818	6 139	6 807	7 387	8,5	6,5
Eastern Transvaal	8 122	9 400	10 358	12 190	13 346	14 765	10,6	12,7
Natal	10 471	11 320	12 458	13 900	14 812	15 901	7,4	8,7
Orange River	1 107	1 121	1 130	1 272	1 406	1 454	3,4	5,6
Rand and O.F.S.	39 902	41 245	44 994	48 936	52 728	56 122	6,4	7,1
Net electricity sent out	67 414	71 264	77 774	85 979	92 950	99 713	7,3	8,1
Central Generating Undertaking own consumption	*—	**27	52	58	71	712	902,8	
Gross electricity sent out	67 414	71 291	77 826	86 037	93 021	100 425	8,0	8,3

*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, Port Rex and Drakensberg power stations when operated in the synchronous condenser mode and at Drakensberg in the pumping mode from 1981 onwards.

13. *Maximum one-hour demand on the respective systems of Escom's undertakings, MW*

Undertaking	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
Border	145	152	168	175	177	213	20,3	8,0
Cape Northern	273	299	363	433	465	507	9,0	13,2
Cape Western	882	890	943	922	1 005	1 122	11,6	4,9
Eastern Transvaal	1 197	1 316	1 465	1 716	2 048	2 201	7,5	13,0
Natal	1 618	1 761	1 962	2 167	2 211	2 429	9,9	8,5
Orange River	186	167	164	191	208	209	0,5	2,4
Rand and O.F.S.	6 075	6 363	6 720	7 468	7 965	8 517	6,9	7,0
Aggregate of non-simultaneous maximum demands	10 376	10 948	11 785	13 072	14 079	15 197	7,9	7,9
Maximum simultaneous one-hour demand on total Escom system MW	09h00 23/6/76 10 085	09h00 12/8/77 10 735	09h00 23/6/78 11 490	09h00 26/7/79 12 855	09h00 18/7/80 13 668	09h00 12/6/81 14 674	7,4	7,8

14. *Total number of farm supplies*

at 31 December 1981

Undertaking	1976	1977	1978	1979	1980	1981	% increase 1981/80	Average yearly increase over 5 years %
Border	864	940	1 000	1 054	1 135	1 302	14,7	8,5
Cape Northern	2 497	2 614	2 831	3 149	3 801	4 322	13,7	11,6
Cape Western	7 959	9 158	9 246	9 473	10 017	10 603	5,9	5,9
Eastern Transvaal	4 864	5 284	5 608	5 906	6 495	7 003	7,8	7,6
Natal	6 752	7 280	7 700	8 034	8 571	9 362	9,2	6,8
Orange River	722	719	746	769	889	1 040	17,0	7,6
Rand and O.F.S.	11 003	12 015	12 656	13 220	14 248	15 709	10,3	7,4
Total	34 661	38 010	39 787	41 605	45 156	49 341	9,3	7,3

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

15. *Plant taken into service and on order*

Name of power station	Plant taken into service in 1981		Plant under construction or on order at 31 December 1981		Year of completion	
	Boilers kg/s	Generators MW	Boilers kg/s	Generators MW	First set	Last set
Coal-fired steam plant:						
Matla	508	600	1 016	1 200	1979	1983
Duvha	507	600	1 521	1 800	1980	1984
Tutuka	—	—	3 042	3 654	1985	1988
Lethabo	—	—	3 042	3 708	1985	1989
Matimba	—	—	2 308	2 660	1986	1989
Khutala	—	—	3 462	—	1987	1992
Pumped-storage hydro plant:						
Drakensberg	—	500	—	500	1981	1982
Nuclear plant:						
Koeberg	—	—	—	1 844	1983	1983