



Komati, Escom's largest power station to date, with an installed capacity of 1,000,000 kW, is now fully commissioned.

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# Electricity Supply Commission

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To the Honourable,  
The Minister of Economic Affairs,  
House of Parliament,  
Cape Town.

Escom Centre,  
204 Smit Street,  
Johannesburg.  
8th September, 1966.

Sir,

As required by Section 19 of the Electricity Act, 1958, the Commission has the honour to present its forty-third Annual Report and the Accounts covering the work for the financial year ended 31st December, 1965.

Brief comments on later developments in connection with the more important matters are included in the Report.

## **INCREASE IN SALES OF ELECTRICITY**

Total sales in 1965 amounted to 23,143 million units, and reflected continued expansion at the high rate attained in the previous year, the annual growth rates being 8·92 per cent in 1965 and 8·96 per cent in 1964.

The growth of Escom's sales over the ten years 1956–1965 is depicted by the blue columns in the diagram below.

Units sold  
(millions)

Coal burnt:  
tons  
(2,000 lbs)

25,000

25,000,000

20,000

20,000,000

15,000

15,000,000

10,005

10,000,000

5,000

5,000,000

Price per Unit sold  
(cent)

5

4

3

2

1

56

57

58

59

60

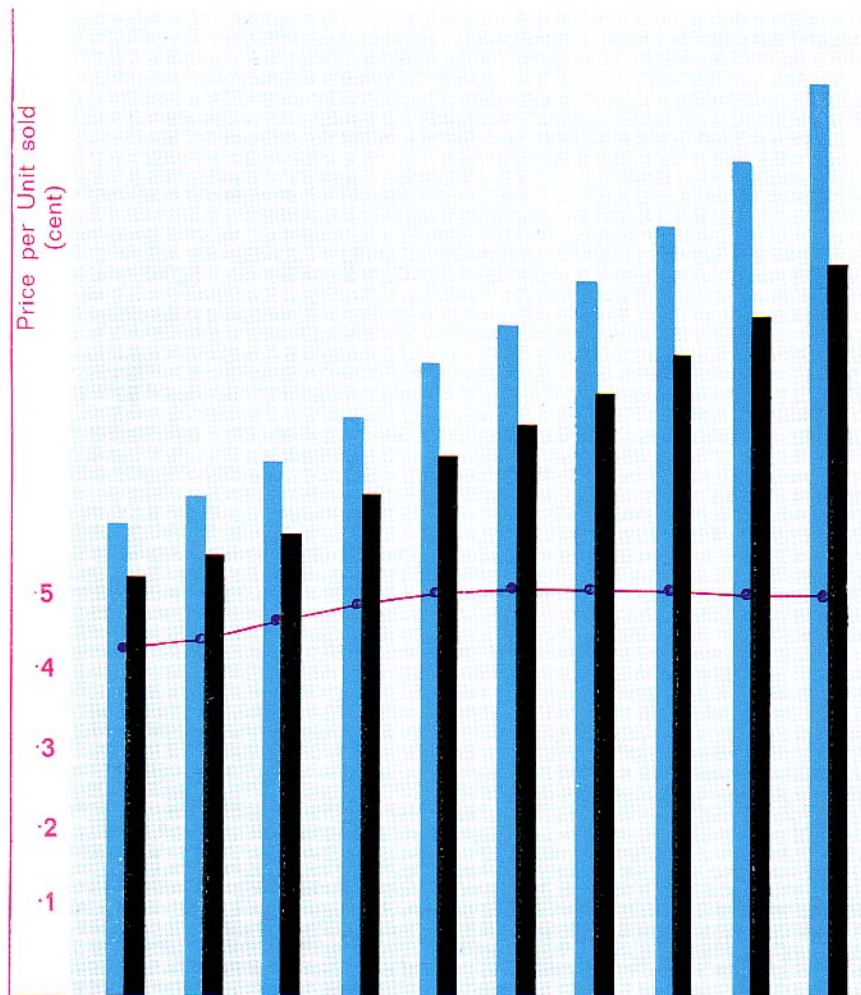
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65



The average annual increase in sales over the period is 7·8 per cent; and if growth continues at this rate, Escom's output will have to be doubled in each period of nine years. Attention is being given to the long-term implications of this rate of growth and, *inter alia*, to the part which may be assigned in the future to nuclear power stations.

The red line superimposed upon the diagram shows the average price per unit sold. Generally, the price of electricity has been kept steady in this decade in spite of the increases which Escom has had to meet in all components of cost: but this has only been possible by a persistent striving towards lower costs of production, by the use of larger units of plant in power stations and in Escom's transmission and distribution systems.

Comment has been made in past reports on the reduction in capital cost, expressed per kW installed, that is secured by using large units of plant in power stations, and to the improvement in thermal efficiency that can be gained with such plant. The following table can therefore be read both as an explanation of how Escom has been able to maintain steady tariffs in conditions of rising costs, and as an assurance that the economies of large-scale production in Escom's new stations will continue to damp down rising costs:—

## CAPITAL COST OF ESCOM POWER STATIONS

Power Station	Size of Set and Size of Station	Capital Cost per kW installed
West Bank No. 2 .....	3 × 15 MW = 45,000 kW	R156
Salt River No. 2 .....	4 × 30 MW = 120,000 kW	155
Hex River .....	3 × 20 MW } = 120,000 kW	115
	2 × 30 MW }	
Vierfontein .....	12 × 30 MW = 360,000 kW	120
Taaibos .....	8 × 60 MW = 480,000 kW	97
Highveld .....	8 × 60 MW = 480,000 kW	95
Komati .....	5 × 100 MW } = 1,000,000 kW	81*
	4 × 125 MW }	
Camden .....	8 × 200 MW = 1,600,000 kW	79*
Hendrina .....	10 × 200 MW = 2,000,000 kW	79*
Arnot .....	6 × 350 MW = 2,100,000 kW	75*

\* Estimated at current prices



It should be noted, however, that if interest rates remain near the current high rates, a net increase in financial charges will result, in spite of the reductions in capital cost per kW.

The over-all figures presented in the diagram are the averages for all Undertakings: the prices for each Undertaking and for different classes of consumers in each Undertaking are given on pages 23 to 45.

Coal burnt in Escom power stations totalled 18,438,075 tons for the year 1965. The figures for each year are depicted by the black columns in the

diagram on page 7. The average annual increase over the 10-year period was 6·4 per cent; so that the improvement in thermal efficiency of Escom's power stations, all together, is represented by the difference of about 1·4 per cent per annum, or 14 per cent between 1955 and 1965.

## EXPANSION OF MINING ACTIVITY

Sales of electricity and compressed air to mining consumers showed an increase of 4·2 per cent on the sales figures for 1964. Although this figure is below the 10-year average of 5·3 per cent, forecasts indicate that the peak in mining production has not yet been reached.

The increase in units sold to mining consumers during the last three years is shown in the following figures:—

	Units sold (millions)		
	1963	1964	1965
Gold mining (including uranium).....	8,759	9,047	9,345
Coal mines.....	315	341	365
Diamond, Platinum and other mines.....	444	539	634
	<u>9,518</u>	<u>9,927</u>	<u>10,344</u>

## **GROWTH OF INDUSTRIAL ACTIVITY**

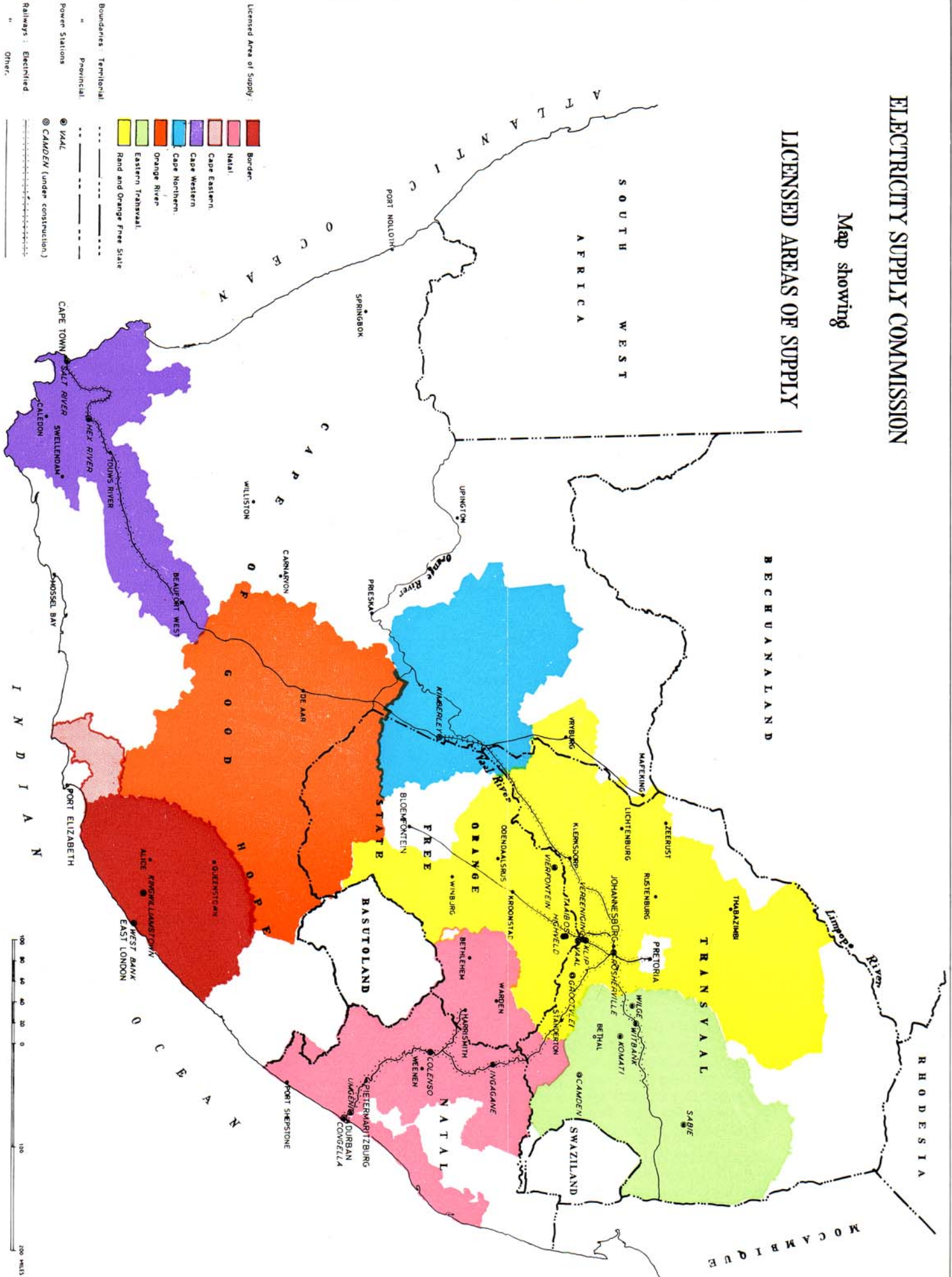
Once again the increase in sales to industrial consumers reflects a growth in industrial activity which is well above the 10-year average. Sales in this category increased to 5,672 million units in 1965, which is double Escom's sales to this group of consumers only six years ago. The annual increase in 1965 was 16·2 per cent, which is well above the ten-year average of 11·6 per cent.

Although Escom's figures for industrial supplies do not present a complete picture for the Republic, since they do not reflect supplies of electricity furnished to industrial consumers by municipalities or supplies generated by industrial undertakings them-

# ELECTRICITY SUPPLY COMMISSION

Map showing

## LICENSED AREAS OF SUPPLY



selves, none-the-less some appreciation of the phenomenal expansion that has taken place in the principal branches of industry during the past four years may

be drawn from the following figures of sales to industrial consumers who are supplied by Escom direct:—

	Units sold (millions)			
	1962	1963	1964	1965
Building and Cement (including quarrying).....	296	327	447	508
Chemical (including pharmaceutical).....	774	849	868	1,023
Engineering (including the Motor Industry).....	170	201	357	393
Foodstuffs, Consumer Goods and Commercial.....	510	560	624	751
Iron, Steel and Base Metals.....	1,420	1,659	1,991	2,326
Paper and Paper Products.....	193	212	212	267

### UNITS GENERATED AND SOLD

The total units generated in all Escom's Undertakings in the year 1965 amounted to 26,440 million units, which was an increase of 8·56 per cent over the corresponding figure for 1964.

Purchases from other undertakings (including units re-purchased) amounted to 126 million units.

The figures of units generated and purchased, and of units sold for all Undertakings were as follows:—

	1965	1964	Increase
Units generated.....	26,440,445,395	24,355,271,933	8·56%
Units purchased.....	126,642,689	40,950,587	—
Units sold.....	23,143,311,124	21,247,542,296	8·92%

Total sales (electricity and compressed air) for the year 1965 in the main categories of supply, with the corresponding figures for 1964 and the rate of increase in the year under review, are shown in the following

table. The final column enables a comparison to be made between the growth rates for 1965 and the average rate of increase over the ten years 1956–1965.

	1965	1964	% Increase 1964	Average Annual Increase in 10 years
<i>Bulk Supplies</i>				
Municipalities.....	4,924,904,748	4,498,572,591	9·5	9·1
<i>Direct Supplies by Escom</i>				
Traction.....	1,762,715,956	1,558,594,640	13·1	9·8
Mining.....	10,344,495,654	9,927,327,853	4·2	5·3
Industrial.....	5,672,163,455	4,882,354,674	16·2	11·6
Domestic.....	430,073,897	372,236,197	15·5	10·9
Street Lighting.....	8,957,414	8,456,341	5·9	10·5
	<u>23,143,311,124</u>	<u>21,247,542,296</u>	<u>8·9</u>	<u>7·8</u>

Total sales of electricity and compressed air by individual undertakings in 1965, with the correspond-

ing figures for 1964, and the percentage increase for the year were as follows:—

	1965	1964	Increase %
Cape Western.....	1,267,390,655	1,163,909,687	8·9%
Cape Northern.....	393,234,446	311,403,362	26·3%
Cape Eastern.....	1,602,202	440,069	—
Border.....	250,523,011	228,767,756	9·5%
Natal.....	3,182,492,510	2,922,098,771	8·9%
Eastern Transvaal.....	1,936,778,403	1,553,586,819	24·7%
Rand and O.F.S.....	16,111,289,897	15,067,335,832	6·9%
	<u>23,143,311,124</u>	<u>21,247,542,296</u>	<u>8·9%</u>

## ESCOM'S UNDERTAKINGS

The licensed areas of supply of Escom's Undertakings are shown in colour on the map which appears opposite this page.

The following new areas were added in 1965:—

**Cape Western Undertaking.** The inclusion of two areas, one in the Koue Bokkeveld and the other in the vicinity of Barrydale, was approved by the Electricity Control Board in September, 1965.



**Natal Undertaking.** Application was made on the 12th August, 1965, to extend the area of supply of the Natal Southern Licence to include certain areas on the north bank of the Umtamvuna River and the remainder of the districts of Polela and Underberg, and to extend the area of supply of the Natal Central Licence so as to include the remainder of the Impendhle area. These extensions were approved by the Board in November, 1965.

**Rand and O.F.S. Undertaking.** Application was made on 11th November, 1965, for extension of the Greater Rand Extension and Orange Free State Licence to include a large area in the Northern Transvaal in the districts of Warmbad, Waterberg, Potgietersrus and Pietersburg and to effect certain adjustments in the common boundaries of Escom's licensed area and the area of supply of the Pretoria Municipality. This application was before the Board at the end of the year.

## PROPOSED ORANGE RIVER UNDERTAKING

During the year further investigation was made into the hydrological data to determine the size of the hydro-electric station, the size of units in the station and the best method of control of the water in the Hendrik Verwoerd dam in order to secure the maximum use of the hydro-electric potential of the dam without detriment to the main purpose of water conservation. As a result of these further studies it has been found possible, under the condition that the hydro-electric power station will be operated in conjunction with Escom's thermal stations to increase the size of the power station at the Hendrik Verwoerd Dam from  $2 \times 60$  MW sets to  $2 \times 80$  MW sets. It follows, of course, that this increase will result in a greater contribution being made by hydro-electric generation towards the cost of the Hendrik Verwoerd Dam. The preparation of detailed plans and specifications on that basis is well advanced, and Escom expects to be in a position to issue enquiries for the power station plant and ancillary equipment during 1966.

Similar studies will be made to determine the size of station to be built at the Vanderkloof Dam.

Negotiations have been concluded with a number of municipalities which will be within the area of supply of the proposed Orange River Undertaking; and provisional contracts have been concluded with the Municipalities of Aliwal North, Burgersdorp, Colesberg, Rouxville, Smithfield, Venterstad and Zastron.

## **NEW DEVELOPMENT IN ESCOM'S UNDERTAKINGS**

### **New Power Stations in the Eastern Transvaal**

The most important development in Escom's Undertakings is the planning and construction of the large thermal stations on the Eastern Transvaal coal fields and the high voltage transmission systems (275 kV and 400 kV) which will make it possible for Escom to transmit electricity from these stations to all its Undertakings in the Republic.

Plans were made in 1965 to add another new station, which has been named Arnot Power Station, to the three large stations being erected in the Eastern Transvaal, i.e. Komati, Camden and Hendrina Stations referred to in the last Annual Report. When they are completed these four stations will have a total installed capacity of 6,700 MW and they will therefore be the main source of generation to meet new power requirements in the next decade.

Arnot Power Station, like Hendrina, will draw its water supply from the Komati and Usutu rivers so that power from these stations will be made available to the areas served by the Rand and O.F.S. Undertaking without any call upon the water in the Vaal River. The shortage of water in the Vaal River during the past season emphasizes the wisdom of placing these stations so that water can be drawn from new sources of supply.

With the completion of the seventh set at **Komati Power Station** in February, 1965, the capacity of this station was raised to 750 MW installed. Construction of the remaining two sets of 125 MW each was well advanced, and the station will be completed to the designed capacity of 1,000 MW in 1966.

**Camden Power Station** has been laid out to comprise eight 200 MW sets, with equivalent boilers, and is being built as rapidly as possible. The first 200 MW set and boiler is expected to be in service towards the end of 1966, and the final set is scheduled for completion in September, 1969.

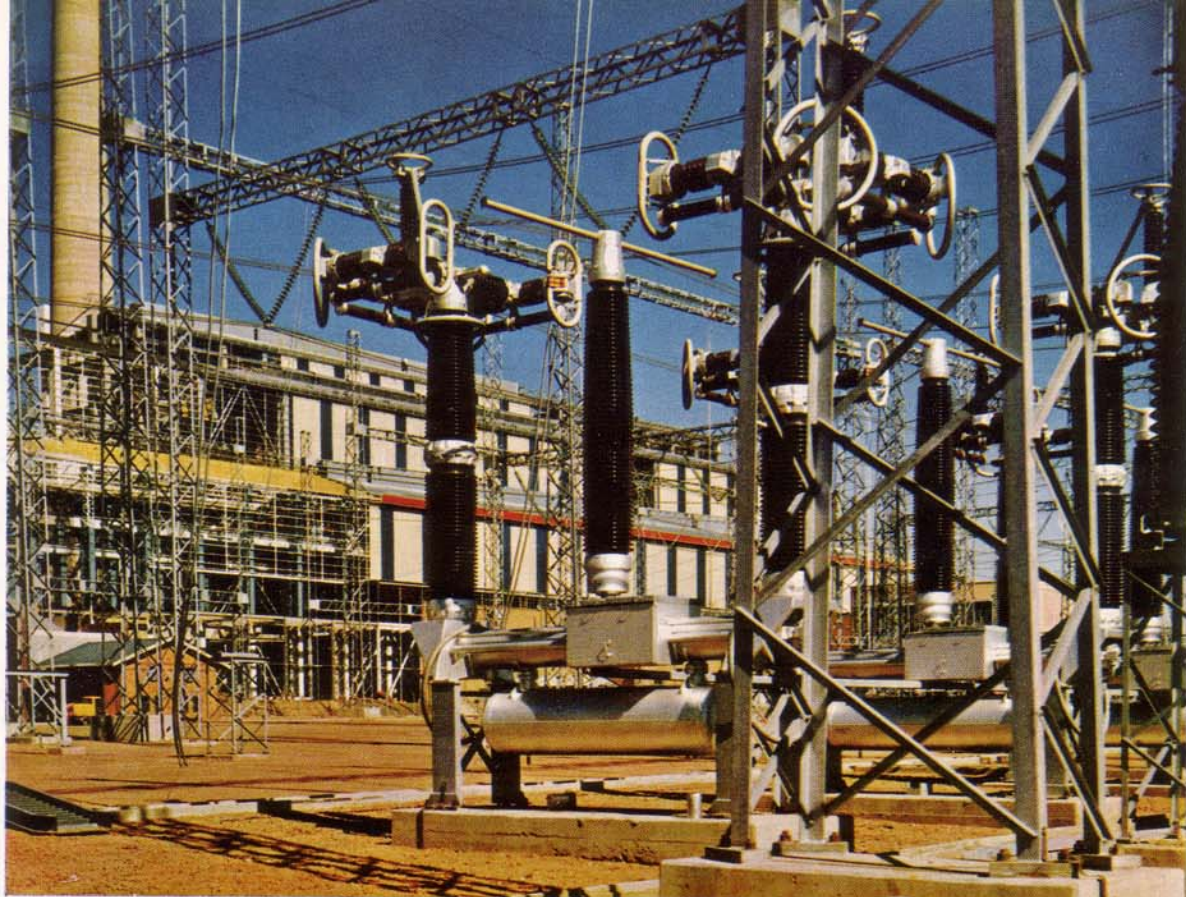
As reported in last year's Annual Report, **Hendrina Power Station** has been designed for  $10 \times 200$  MW sets with pulverized fuel boilers having steam conditions similar to the Camden boilers, i.e. 1,500 p.s.i. and  $1,000^{\circ}\text{F}$ , without re-heat. Four sets and boilers have been ordered for Hendrina, the first to be ready for starting up in May, 1970.

Although the enquiries for a coal supply for the fourth of these stations was directed especially to coal interests which had coal rights in Natal, no coal field could be found in Natal with reserves adequate to supply a station of 2,000 MW capacity. After careful weighing of the tenders received, the tender of Anglo American Corporation of South Africa, Limited, offering its Arnot coal field, was accepted. The precise location of the station has not yet been determined.

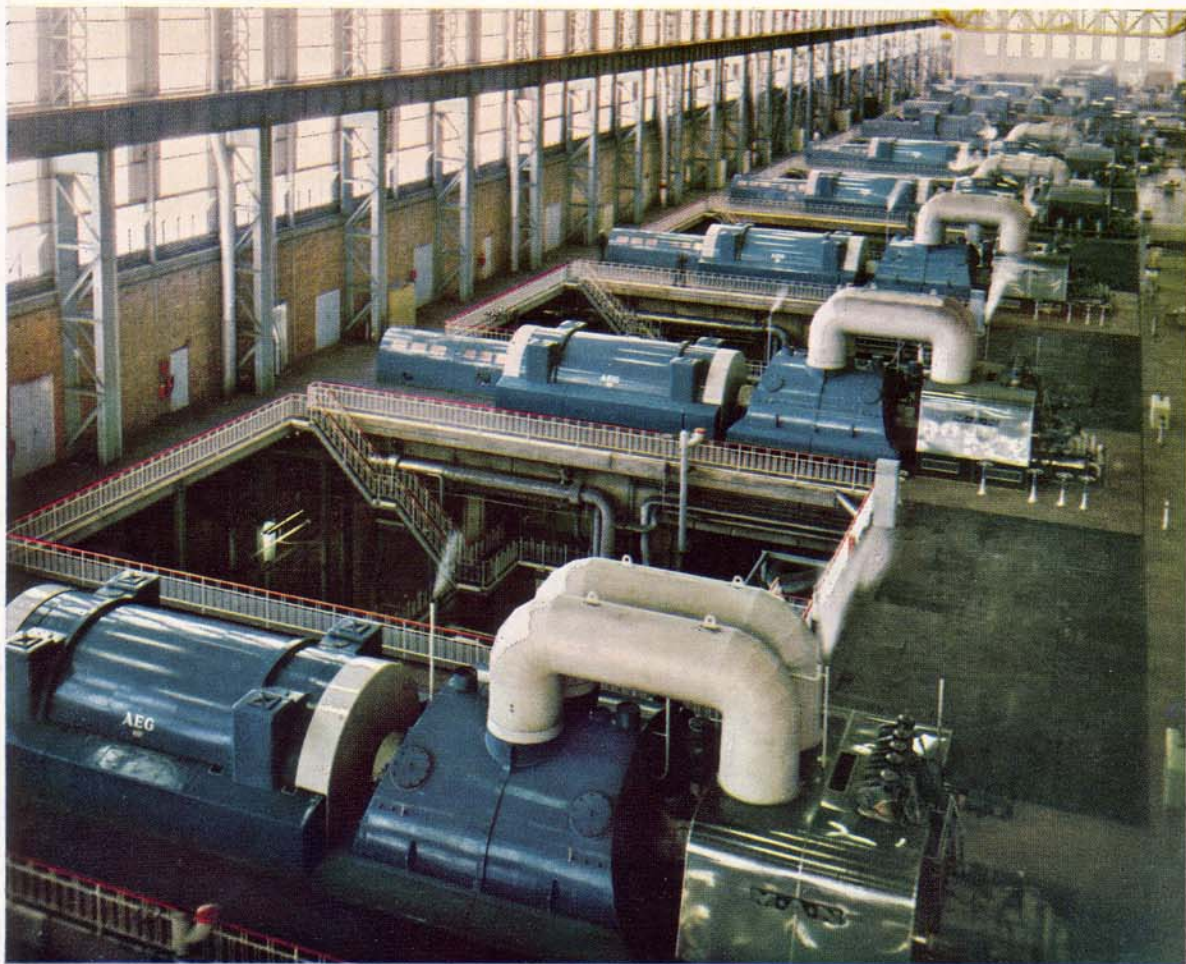
In addition, Escom has secured an option which can be exercised at any time in the next five years, on a further coal field which could provide a supply of coal for another 2,000 MW station.

Once again, a technical and economic study was made to determine the optimum size of set and the steam conditions for this station: and after careful weighing of many factors, enquiries for **Arnot Power Station** were issued for sets of 350 MW capacity with pulverized fuel boilers employing a re-heat cycle and designed for steam conditions of 2,300 p.s.i.g. and  $950/950^{\circ}\text{F}$ . Tenders for the first two sets and boilers will be adjudicated towards the end of 1966.

Good progress is being made in the construction of the high voltage transmission systems: Camden Power Station will be interconnected with Komati by a 275 kV line: but the bulk of the Camden output will be transmitted to the Rand over  $3 \times 400$  kV transmission lines to Atlas Distribution Station, near Vereeniging. At Atlas Distribution Station there will be interconnection with the 275 kV system; and two 400 kV transmission lines, one from Atlas and the other from Grootvlei are being constructed *via* the proposed Orange River Undertaking to the Western Cape.



With the generating room and the boiler house of the Camden power station in the background, the photograph shows a 400 kV circuit breaker under erection in the foreground. It is in the first of the 400 kV switchyards forming part of the network which will link the northern power stations with the Western Cape network.



A view of the turbine room at the Komati power station, showing the nine generating sets.

Hendrina and Arnot Power Stations will be connected to the 275 kV system and will also feed westwards by means of 400 kV lines to Witbank and the Far West Rand.

When the capacity of Ingagane Power Station has been taken up by the Natal Undertaking, the additional requirements for Natal will be drawn from Camden (the nearest power station) by means of 400 kV lines from Camden to a point in the vicinity of Durban.

The establishment of this high voltage transmission system will make it possible for Escom to co-ordinate the supply of electricity in all its major Undertakings; and it will provide a long-term solution to the problem which arises from the present pattern of local generation, that is, the transport of ever-increasing quantities of coal by rail from the interior coal fields to the coastal regions.

### **Dry Cooling Towers**

Great interest has been taken in recent years in the development of so-called "dry" cooling systems.

The dry-cooling system which appears to offer the best promise consists of a draft-inducing shell at the base of which a number of pure aluminium heat exchangers are mounted, and cooling of the water takes place in a closed circuit by convective heat transfer (on the same principle as a motor car radiator). It will be a more costly installation than the conventional "wet" cooling towers; but it uses only some 10 per cent of the make-up water required by the "wet" cooling system. If the technical and operating difficulties are overcome, the use of "dry" cooling towers may have an important bearing upon the generation of power where coal is available but the water supply is minimal.

Grootvlei Power Station was described in the last Report as a replacement station: and as it is located within the Vaal River basin it has been selected as the station at which a generating set using "dry" cooling towers will be installed, in order to gain experience in the use of this system of cooling under South African conditions.

## Electrification of Railways

Supplies purchased by the South African Railways for traction purposes increased by 13·1 per cent to 1,762 million units in 1965.

This increase reflects in part the full year's working of the new sections Union Junction-Volksrust and Klerksdorp-Kimberley; but in addition a number of new supplies were made available during 1965. In the Eastern Transvaal Undertaking a new supply was made available at Brakfontein substation in January, 1965, while seven new traction substations for the Witbank-Komatipoort electrification were completed and energised over the period May-December, 1965. On the Natal Undertaking a new traction substation was established at Ashburton, replacing the traction substations at Thornybush and Mkondini which were closed down due to the railway line being deviated. On the Rand and O.F.S. Undertaking, four traction substations were completed and energised to serve the new rail link between Houtkop and Potchefstroom.

Further construction is proceeding on the Witbank-Komatipoort electrification, and work was commenced for the electrification of the railway between Kimberley, Postmasburg and Hotazel.



## PLANT CAPACITY

The capacity of new generating plant installed and taken into service in Escom's power stations in 1965, and the capacity of boilers and turbo-generators under construction or on order are given in the table below.

Of the plant listed in the table as being under construction at the end of the year, one 125,000 kW set and boiler at Komati was commissioned in March, 1966, and the last set and boiler in April, 1966.

	Plant taken into service in 1966		Plant under construction or on order at 31-12-1966	
	Boilers lb/hr	Generators kW	Boilers lb/hr	Generators kW
<b>Cape Western Undertaking</b>				
Salt River Power Station .....			1,040,000	120,000
<b>Border Undertaking</b>				
West Bank Power Station .....			380,000	20,000
<b>Natal Undertaking</b>				
Ingagane Power Station .....			2,700,000	300,000
<b>Eastern Transvaal Undertaking</b>				
Komati Power Station .....	1,125,000	125,000	2,250,000	250,000
<b>Rand and O.F.S. Undertaking</b>				
Camden Power Station .....			14,400,000	1,600,000
Grootvlei Power Station .....			5,100,000	600,000
Hendrina Power Station .....			6,800,000	800,000
	1,125,000	125,000	32,670,000	3,690,000

# **EXTENSION OF ESCOM'S TRANSMISSION SYSTEMS**

A reference is made on page 10 to the 400 kV transmission lines now under construction.

Expansion of Escom's business calls for continuous construction of new and larger transmission and distribution lines, and additions to transformers and other substation equipment: and in 1965 a total of some 2,772 route miles of transmission and distribution lines and cables were added to Escom's networks. A classification of these lines and cables, with similar figures for the years 1961-64, is shown in the table below, in the three groups:—

- (i) high voltage lines of 275 kV and 132 kV;
- (ii) transmission lines of intermediate voltages, 88 kV to 33 kV;
- (iii) distribution lines and cables of lower voltages, ranging from 22 kV to 380 volts.

## Route Miles of Transmission Lines and Cables taken into service: Years 1961-65

<b>Year</b>	<b>275 kV</b>	<b>132 kV</b>	<b>88/33 kV</b>	<b>22 kV and lower</b>	<b>Total (miles)</b>
1961	—	627	65	1,132	1,824
1962	208	44	349	1,072	1,673
1963	141	129	460	1,281	2,011
1964	385	202	376	1,348	2,311
1965	349	329	641	1,453	2,772

## CAPITAL EXPENDITURE

### **Borrowing Powers for New Projects**

In 1965 two applications were made for approval in terms of Section 10 of the Act of further borrowing powers to cover planned extensions of Camden, Ingagane and West Bank power stations and of existing networks, and the new projects referred to in the preceding paragraphs, viz. Grootvlei Power Station, Hendrina Power Station, the proposed Orange River Undertaking and the 400 kV transmission system to the Western Cape. The applications which were dated 27th January, 1965, and 6th August, 1965, covered a total capital requirement of R346,200,000 including an estimated expenditure of

some R14,000,000 which Escom expects to spend on rural networks over the period 1965-1970.

The extensions and new projects and borrowing powers therefor were approved on 16th March, 1965, and 2nd September, 1965.

### **Annual Capital Expenditure**

Expenditure on Capital Account during 1965 amounted to R61,916,000.

The yearly expenditure on Capital Account for the years 1923-1965 is given in the table at the foot of page.

## ANNUAL CAPITAL EXPENDITURE

Year	Expenditure	Totals to Date	Year	Expenditure	Totals to Date
	<i>Rand</i>	<i>Rand</i>		<i>Rand</i>	<i>Rand</i>
1923	34,000	34,000	1944	1,462,000	48,036,000
1924	75,000	109,000	1945	1,877,000	49,913,000
1925	1,770,000	1,879,000	1946	2,940,000	52,853,000
1926	2,394,000	4,273,000	1947	4,797,000	57,650,000
1927	8,937,000	13,210,000	1948	30,362,000	88,012,000
1928	1,637,000	14,847,000	1949	9,408,000	97,420,000
1929	764,000	15,611,000	1950	14,821,000	112,241,000
1930	556,000	16,167,000	1951	21,592,000	133,833,000
1931	424,000	16,591,000	1952	36,612,000	170,445,000
1932	232,000	16,823,000	1953	42,701,000	213,146,000
1933	453,000	17,276,000	1954	50,683,000	263,829,000
1934	1,510,000	18,786,000	1955	40,513,000	304,342,000
1935	4,195,000	22,981,000	1956	37,726,000	342,068,000
1936	4,122,000	27,103,000	1957	35,197,000	377,265,000
1937	3,460,000	30,563,000	1958	40,436,000	417,701,000
1938	3,734,000	34,297,000	1959	35,429,000	453,130,000
1939	2,348,000	36,645,000	1960	38,341,000	491,471,000
1940	2,017,000	38,662,000	1961	38,094,000	529,565,000
1941	2,146,000	40,808,000	1962	52,014,000	581,579,000
1942	2,955,000	43,763,000	1963	55,497,000	637,076,000
1943	2,811,000	46,574,000	1964	42,117,000	679,193,000
			1965	61,916,000	741,109,000
		(Assets sold excluded)			



## **COSTS AND TARIFFS**

The more important components of Escom's cost structure are shown in the diagram on page 14 of Production Costs for the year 1965.

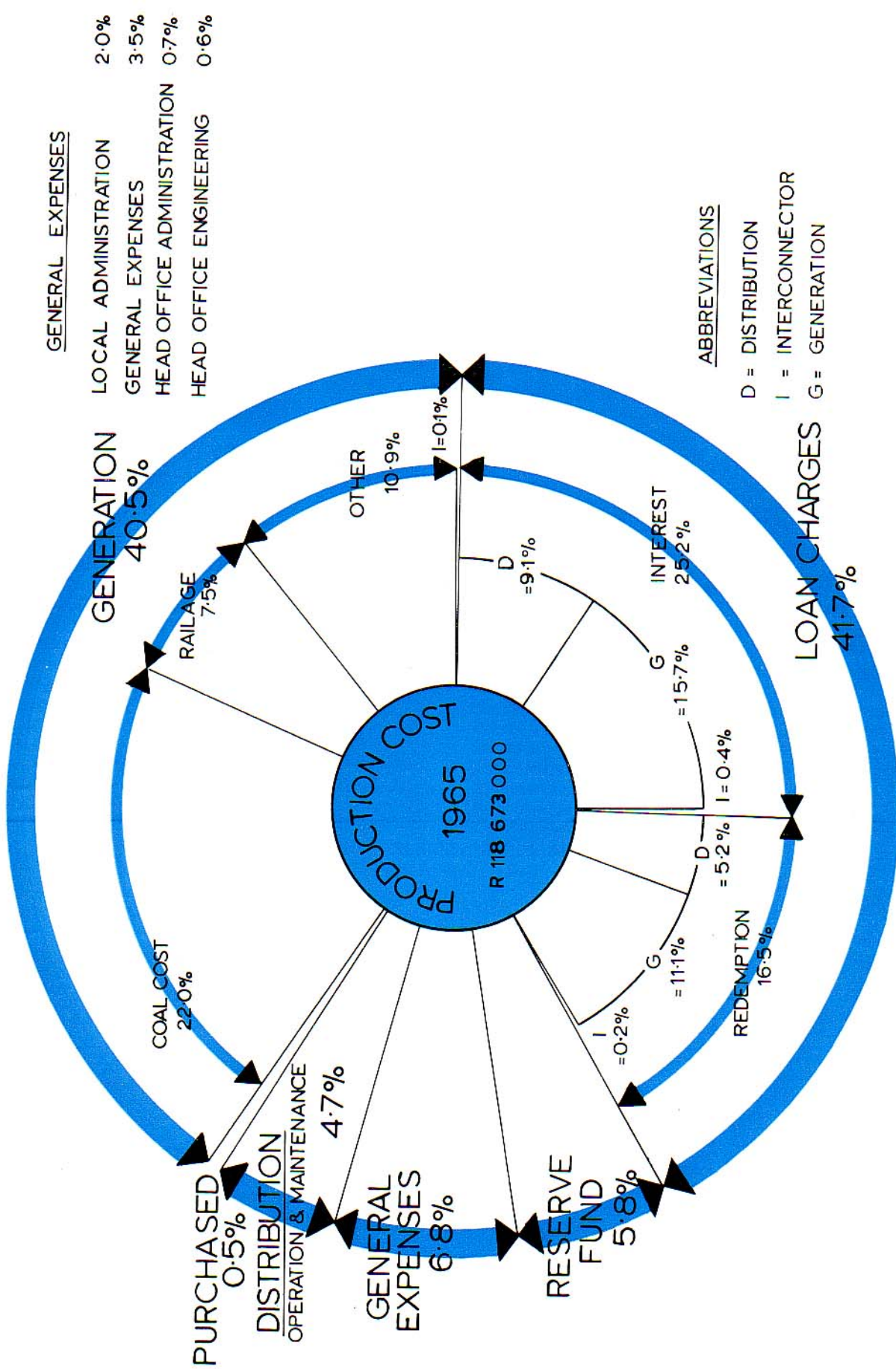
The changes in tariffs made during the financial year 1965 were as follows:—

### **Cape Western Undertaking**

A rebate of 5 per cent on the standard tariffs was introduced for all consumers with effect from January, 1965.

### **Rand and Orange Free State Undertaking**

A further small reduction in tariffs on the Rand and Orange Free State Undertaking was made by



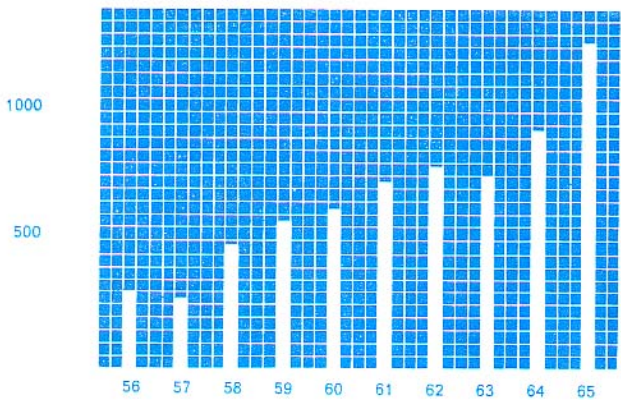
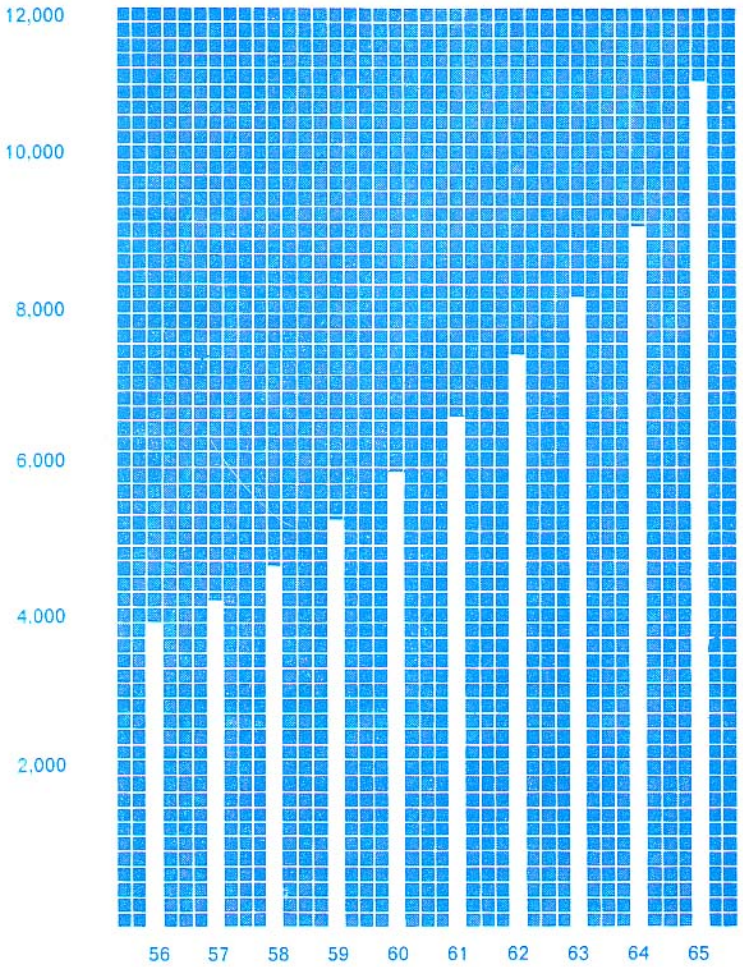
increasing the general discount under the Rand Licences from 6 per cent to 8 per cent. The corresponding adjustment in the tariffs in the Extension Areas was effected by reducing the surcharge in those areas from 8 per cent to 6 per cent.

## RURAL ELECTRIFICATION

During the year Eskom continued to have difficulty in securing an adequate quantity of treated wood

poles for its rural construction programme. This, coupled with the shortage of staff trained in this construction work, slowed down the completion of rural schemes: nonetheless, 1965 was the first year in which the total of new farms connected up exceeded the 1,000 mark. The actual total of 1,274 represents a five-fold increase on the number of new connections made only 10 years ago, and brings the total number of farms supplied to 11,064.

## No. of Farms connected



As stated, borrowing powers have been granted for an amount of R14,000,000 which Escom expects to spend on farm schemes over the period 1965-70: and special attention will be directed towards securing the men and materials which will be necessary for the construction and maintenance of these networks.

The steady expansion of Escom's rural networks year by year is shown on the diagrams on page 15 which depict (i) the total number of farms supplied at the end of the year, and (ii) the number of new connections made in the year.

### **STATISTICAL SUMMARY**

The figures of revenue, production costs, output and sales which are customarily set out in a Statistical Summary are shown in the table which appears on page 17.

This table has been extended to show the figures for the last five years, as well as showing the increase or decrease in the 1965 figures compared with the 1964 figures.

## FINANCIAL

### Loan Capital

During 1965 the two local loans totalling R70,000,000 were raised as follows:—



<b>Date Issued</b>	<b>Amount</b>	<b>Interest</b>	<b>Issued Price</b>	<b>Redeemable</b>
27th April	R32,000,000	5-7/8%	R99-00	31.5.83/85
31st August	R38,000,000	6-1/2%	R98-50	31.8.83/85
	<hr/> <b>R70,000,000</b> <hr/>			

These loans were fully subscribed and at the year end the loans raised locally as Local Registered Stock totalled R706,000,000. Loans Nos. 23 and 10 for R10,000,000 and R3,000,000 were redeemed on 31st August and 30th November, 1965, respectively and the total local loans repaid now amount to R41,500,000.

In addition, a loan for German Marks 50,000,000 (R8,921,000) was raised by public subscription in Germany. During the year R4,507,000 was repaid against overseas loans.

These amounts increased the Commission's loans outstanding at the date of the Balance Sheet to R702,790,000.

### **Redemption Fund**

The amount in the Redemption Fund at the 31st December, 1965, totalled R187,534,000.

This figure includes the proceeds from the sales of assets and profits on realisation of investments.

### **Reserve Fund**

The amount in the Reserve Fund at the 31st December, 1965, was R58,457,000.

## **Capital Expenditure**

Expenditure on Capital Account during the year amounted to R61,916,000 which increased the total capital expenditure at the 31st December, 1965, to R741,109,000.

Expenditure on Capital Account will amount to approximately R1,388,000,000 on completion of all the works to which the Commission is committed and on projected works.

## **Investments**

The book value of securities, representing investment in stocks of Electricity Supply Commission, Republic of South Africa and municipalities held by the Commission on behalf of the redemption and reserve funds at 31st December, 1965, was R244,241,000 the nominal value being R246,254,000. The market value of these investments at that date was R216,525,000.

## **Assets and Liabilities**

The Commission's total assets at the 31st December, 1965, amounted to R1,044,043,000 and its total liabilities

ties to R 736,630,000, the difference being R307,413,000 which is represented by the amounts in the redemption and reserve funds, loans repaid and the balance on revenue accounts.

## STAFF

### Home Ownership Scheme

The balance at 31st December, 1965, on loans granted to employees to enable them to acquire homes under the Commission's Home Ownership Scheme in terms of the Electricity Act, was R3,332,000.

### Personnel

The staff employed by the Commission at the 31st December, 1965, numbered 17,851 employees made up as follows:—

	1964	1965	Increase
Whites.....	6,032	6,254	222 3·7%
Coloured and Bantu	11,140	11,597	457 4·1%
	17,172	17,851	679 4·0%

The Commission desires to record its appreciation of the loyal and conscientious service of its employees.

# STATISTICAL SUMMARY

Revenue, costs, output and sales, and other figures relating to the operation of the Commission's Undertakings during the years 1961 to 1965 are as follows:—

	1961	1962	1963	1964	1965	Increase 1965 over 1964
TOTAL REVENUE.....	R88,059,000	R93,966,000	R101,401,000	R108,861,000	R117,959,000	8.357%
TOTAL COSTS.....	86,102,000	93,385,000	100,010,000	108,751,000	118,673,000	9.124%
Difference between Total Revenue and Total Costs.....	1,957,000	581,000	1,391,000	110,000	-714,000	-R824,000
Sales of Electricity, Air and Steam.....	87,710,000	93,579,000	100,953,000	108,382,000	117,481,000	8.395%
Net Costs (less Sundry Revenue).....	85,753,000	92,998,000	99,562,000	108,272,000	118,195,000	9.165%
Average Price per Unit Sold.....	.5155c	.5164c	.5177c	.5101c	.5076c	-0.490%
Average Cost per Unit Sold.....	.5061c	.5153c	.5129c	.5118c	.5128c	0.195%
Average Net Cost per Unit Sold.....	.5040c	.5132c	.5106c	.5096c	.5107c	0.216%
Cost of Coal Consumed (including railage)...	27,713,000	29,230,000	31,009,000	32,367,000	34,986,000	8.092%
Railage on Coal Consumed.....	8,849,000	8,627,000	8,428,000	8,504,000	8,856,000	4.139%
Coal Consumed (in tons of 2,000 lbs.).....	14,544,837	15,383,313	16,226,535	17,256,296	18,438,075	6.848%
Units Generated.....	19,575,396,581	20,805,518,186	22,312,389,427	24,355,271,933	26,440,445,395	8.651%
Units Sent Out.....	18,284,050,367	19,403,958,379	20,793,543,262	22,591,625,157	24,541,436,352	8.631%
Units Purchased.....	8,399,659	12,559,278	18,582,815	40,950,587	126,642,689	209.257%
Units Sold.....	17,013,161,822	18,121,036,829	19,500,013,697	21,247,542,296	23,143,311,124	8.922%

## ESCOM'S UNDERTAKINGS

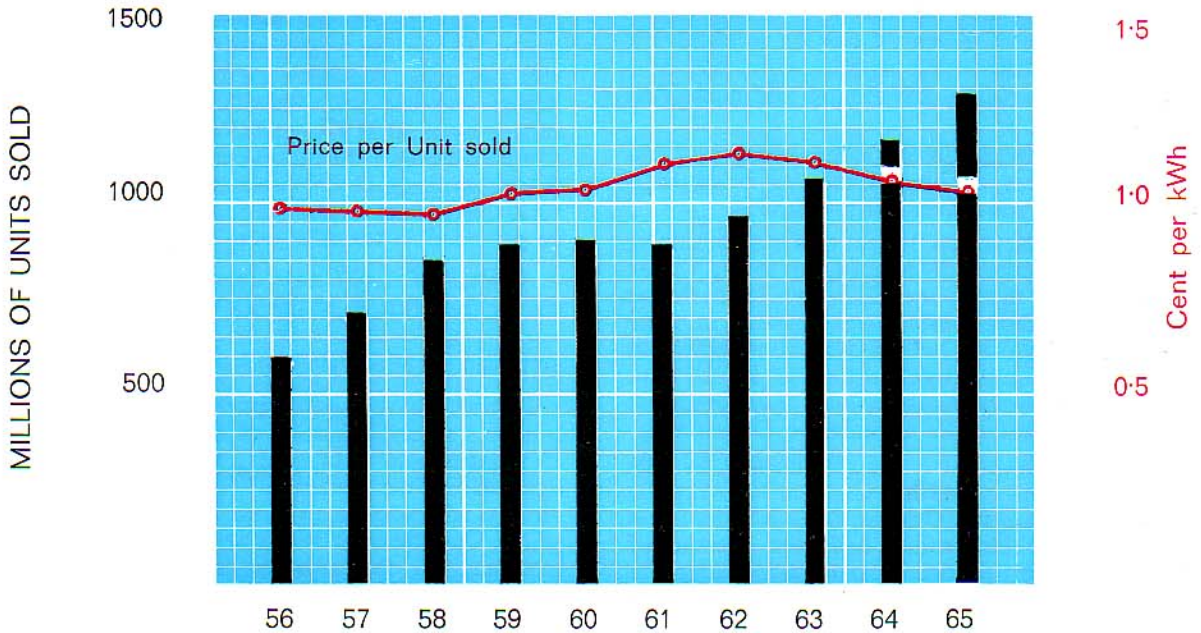
The development and operation of Escom's separate Undertakings are reviewed in detail in the following pages.

*General Note:*—"Working Costs" include interest charges and Redemption Fund contributions on loan capital and amounts set aside to Reserve Fund.





## CAPE WESTERN UNDERTAKING



### Expansion of the Cape Western Undertaking

The graph above depicts the expansion of the Cape Western Undertaking, which serves the area shown on page 20, in terms of units sold over the years 1956–65. Sales increased from 585 million units to 1,267 million units (an increase of 116%) over this period.

The average price per unit of electricity sold is shown by the red line. The downward trend in recent years is due in large measure to the growth of industrial supplies on this Undertaking.

Details of sales to the main consumer classes, revenue received and the more important features of the power station operating statistics for the year 1965, are shown in the table on page 23.

### Output and Sales

Units generated in the stations in the Undertaking increased to 1,447 million units in 1965; and total sales amounted to 1,267 million units, which was 8.9% more than the sales for the previous year.

The maximum half-hour demand for the year was 258.6 MW, an increase of 19.9 MW.

The output of all power stations again exceeded that of 1964, with Hex River Power Station showing the biggest increase.

During the year, stocks of coal at Escom's power stations were reduced to the lowest levels ever recorded in the Undertaking; but supplies improved at the end of the year, and in January, 1966, stocks were built up to a safe level.

The breakdown of two turbo-generators at Salt River Power Station towards the end of 1965 gave rise to some concern over the capacity of generating

plant that would be available to the Undertaking prior to the commissioning of the new plant in the Salt River Power Station in 1967; and an approach was made to the Cape Town City Council who agreed to provide assistance, if required, up to 30 MW or more during the critical months ahead.

As reported last year, the Cape Town City Council has agreed to purchase its additional requirements for the four years 1970–1973 from Escom and to defer consideration of its proposal to build a second station on the Athlone site. Indications are that a supply may be needed a year earlier, in 1969.

### Extensions to Salt River Power Station No. 2

At the end of the year the foundations for the extension to the power station were practically complete and a large proportion of the steel frame for the building had been erected. A start was made with the brickwork in January, 1966, and contractors arrived on site to commence erection of plant.

### Power Stations Operation and Maintenance

Units generated at the two Salt River Power Stations showed an increase of approximately 7½% over the previous year, with a corresponding improvement in load factor. Generation at the Hex River Power Station increased by approximately 10% or 48 million units more than in 1964. This increased generation which made it possible to run Nos. 4 and 5 machines at a higher load factor resulted in an increase in the overall thermal efficiency from 25.1% to 25.6%.

### Major Transmission Lines

During the year construction of the Windmill–Hex 132 kV line and the erection of terminal equipment was completed, and the line was commissioned at

66 kV during July. A considerable improvement in the transmission capacity of the Worcester-Cape Town network was thus effected.

The conversion of Eerste Rivier to a 66/33 kV substation was completed, together with the construction of a new 33/66 kV section and associated line work.

The new Langebaan substation was completed and commissioned. This enabled Amcor to bring their new concentrator plant into full production.

The largest construction project undertaken during the year was the provision of a supply to the Caltex Refinery. For this supply one of the Salt River Power Station-Oakdale 66 kV cables was deviated into the new Acacia substation, which was constructed to make provision for a large future 132 kV section. The complete network extension was completed and the supply to Caltex made available in December.

Survey work has commenced on the 400 kV line routes and distribution station sites for receiving the supply of power *via* the Orange River Scheme: and by the end of the year routes had been determined for both lines from Hydra Distribution Station (at De Aar) to Droërivier Distribution Station (near Beaufort West.)

During the year field survey on the urgently required Muldersvlei/Moorreesburg 132 kV line route commenced; and by the year end 90% of the route had been set out and 80% of the wayleaves obtained.

From enquiries and projects in progress it is expected that in 1966 there will be an even greater overall increase in the demand for electricity.

### **Development of Urban Distribution Network**

The demand for electricity in the urban areas of Goodwood, Parow and Bellville increased by 21.3% during the year, to a total of 61.6 MVA. This demand was met from the three stepdown centres of Elsie's River, Oakdale and Bellville South with installed capacities of 30 MVA, 25 MVA and 40 MVA respectively. Although this would appear to be adequate, the interlinking 11 kV cable transmission capacity is such that a new central stepdown centre will have to be provided in the new year.

A total of 1,407 new consumers was connected during the year, of whom 25 were large users.

### **Development of Rural Supplies**

During the year extensions to the rural networks totalling nearly 290 miles of high voltage lines, over 15 miles of low voltage lines and four miles of street light mains were erected. These figures reflect the greatest increases in any year since the establishment of the Undertaking. 510 new connections were made including 197 on farms and 44 large users, of which nineteen were farmers.

### **Financial**

Revenue for the year totalled R13,198,669 as against working costs of R13,377,514 resulting in a deficit of R178,845, so that the accumulated surplus was reduced to R268,998. No change has been made in the 5% reduction in tariffs which was introduced from January, 1965.

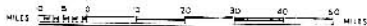
CAPE WESTERN UNDERTAKING

CONSUMER		SALES			REVENUE FROM SALES		AVERAGE PRICE PER UNIT SOLD																																																																																																									
		Units		% Change																																																																																																												
Class	Number		1964	1965	1964	1965	1964	1965																																																																																																								
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Traction.....	7	3	356,489,436	- 2.232	64/63	3,555,000	R	1.0201																																																																																																								
Bulk.....	33	32	258,023,440	+ 9.373		2,412,000	R	0.8547																																																																																																								
Mining.....																																																																																																																
Industrial.....	4,113	3,705	375,626,698	+18.486		4,438,000	R	0.9972																																																																																																								
Domestic and Street Lighting.....	36,809	34,487	173,770,113	+10.251		2,755,000	R	1.4378																																																																																																								
Total.....	40,962	38,227	1,267,390,655	+ 8.891	+ 10.701	13,160,000	R	1.0384																																																																																																								
Total Revenue.....								12,428,000																																																																																																								
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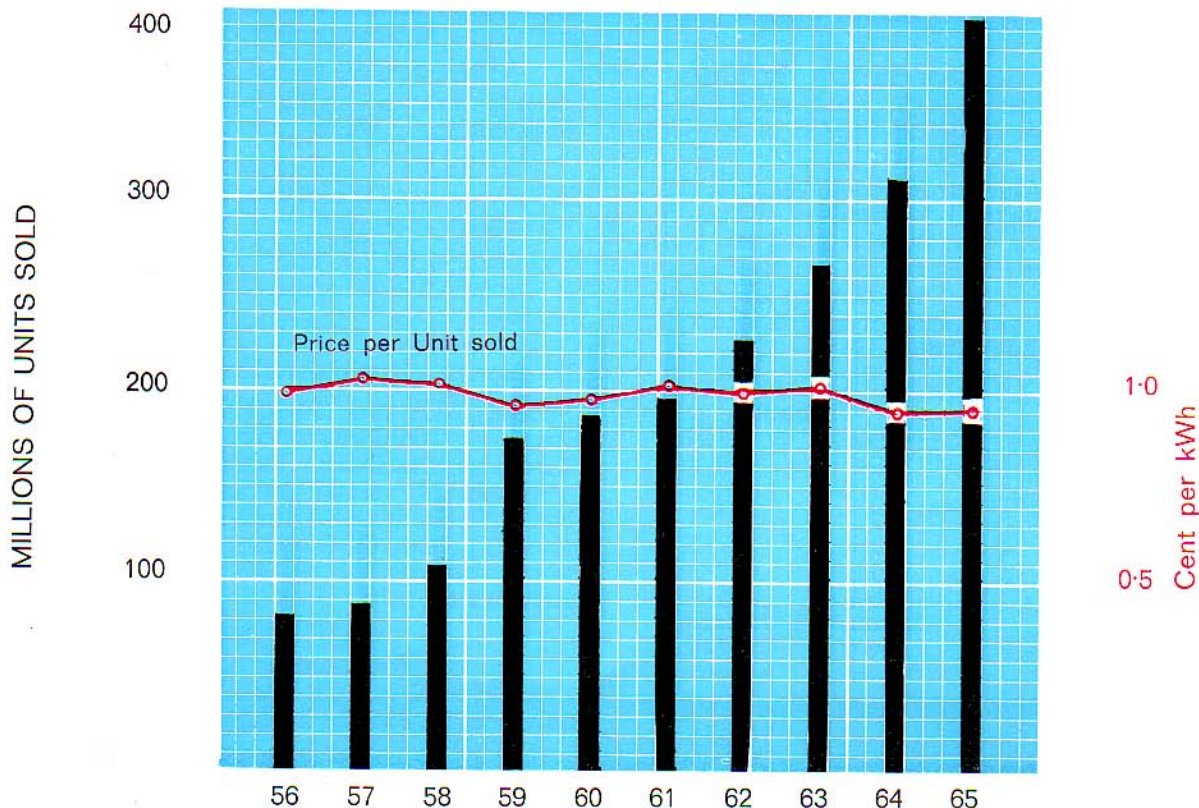


**CAPE NORTHERN UNDERTAKING  
REFERENCE**

- Area of Supply..... (23,700 Square Miles)
- ESC Power Station..... @ **KIMBERLEY**
- Transmission lines.....
- Transmission lines under construction.....



## CAPE NORTHERN UNDERTAKING



### Expansion of the Cape Northern Undertaking

The graphical representation draws attention to the rapid expansion of the Cape Northern Undertaking during the past decade. Escom's networks have been established over extensive areas of the Undertaking, as shown on the map on page 24, and the units sold in 1965 increased to five times the quantity sold in 1956.

### Sales

Total sales amounted to 393.2 million units in 1965. This represents an increase of 26.3 per cent over the previous year, a large part of this increase being in units sold to the South African Railways for traction purposes. Sales have more than doubled in the last four years.

A maximum demand of 76.8 megawatts was recorded in July, which was an increase of 11.6 MW over the 1964 figure.

Sales to the Kimberley City Council increased by 7.9% to 90.4 million units. During the year this Municipality introduced riplay control for domestic water heaters, street lighting, etc., which reduced their monthly demands to some extent.

The De Beers Company's four diamond mines at Kimberley increased their consumption by 13.1% to 78.9 million units.

De Beer's new Finsch diamond mine, near Silverstreams, was given a permanent supply from the new 132 kV line towards the end of 1965. Consumption was 2.4 million units for the year, and it is expected that this load will grow to 15 million units per annum at the mine with an additional 5 million units for pumping water for diamond washing purposes.

A fifty-mile 18" pipeline is being constructed from the confluence of the Vaal and Harts Rivers, now known as the Vaal-Gamagara scheme, and is due for completion in mid-1966. The water will be pumped by three separate pumping stations to a height of 2,000 feet on the Asbestos Mountains near Silverstreams, after which the water will flow by gravity to Postmasburg, Sishen and Hotazel.

Underground reticulation and street lighting for the Finsch mine housing scheme were installed during the year, and 80 out of the first 103 houses were connected. These all-electric houses consumed 415,000 units, and will use over one million units in a full year.

The Anglo Alpha Cement Company at Ulco took 53.7 million units, with the plant running to about maximum capacity.

The traction supply taken by the South African Railways for the section of the main line extending from Beaconsfield to the Undertaking boundary about ninety miles northwards towards Klerksdorp amounted to 39.4 million units during the first complete year of operation. Additional consumption on this section of the electrified line is expected.

Electricity sold to the Northern Lime Company for the production of lime at the Silverstreams and Taung works increased by 9.1% to 19.8 million units.

Iscor's iron ore quarry at Sishen consumed 19.5 million units, an increase of 36.4%, and further development is expected.

Amcor's Lylyveld iron ore quarry, near Sishen, took 3.6 million units in the first complete year of operation.

The combined consumption of S.A. Manganese and Associated Manganese showed a slight gain at 11.6 million units.

A bulk supply of electricity will be given to Associated Manganese's Black Rock mine towards the middle of 1966. An initial demand of 500 kVA will rise to over 1,000 kVA.

The demand for blue asbestos continues to increase. Asbestos mines consumed 29.3 million units, a rise of 47.3% during the year. Three new asbestos mines south of Bretby are expected to be connected during the second half of 1966. The following table shows the breakdown of units sold for mining, quarrying and for cement manufacture in 1965:—

	Units sold (millions)	
	1964	1965
Diamonds.....	76.6	88.4
Lime and Cement.....	69.5	73.5
Iron Ore.....	20.9	27.6
Blue Asbestos.....	19.9	29.2
Manganese.....	6.5	7.2
Gypsum Quarrying.....	2.1	2.4
	<u>195.5</u>	<u>228.3</u>

Sales to the small municipalities increased as follows:—

Barkly West, Boshof and Warrenton showed increases of 1.4, 7.3 and 1.8 per cent respectively.

Hartswater Municipal area increased by 7.5% and Christiana Municipality by 15.3%. Kuruman Municipality, consuming 4.6 million units per annum, increased by 11%.

Postmasburg Municipality increased by 25.6% to 3.75 million units per annum. This municipality is supplying Treasure Trove's West End mine and the large increase is mainly due to the continued development of that mine.

The small township of Danielskuil was reticulated during the year and about 100 consumers were connected and consumed 151,000 units.

In September a bulk supply was given to the Olifantshoek Village Management Board, who have erected a new reticulation network. This development is injecting new life into this small town.

With the addition of 104 plottolders the electrical network of the Vaalharts Irrigation Scheme is now virtually complete. There are now 971 domestic consumers connected. These consumers increased their consumption by 26.3% to 3.6 million units during the year.

The Taung Bantu area continued to expand at the high rate of 21% and is now consuming almost one million units.

Riparian farmers on the Vaal and Harts Rivers increased their pumping due to the prolonged drought and consumed over 4.3 million units for this purpose.

#### Interconnection with the Pooled Power Stations

During the year 442.7 million units were supplied from Rand and Orange Free State network and 422.8 million units were received at Kimberley.

97% of the units sent out from the Kimberley Distribution Station were supplied from the Rand and O.F.S. network compared with 90.7% in 1964.

The Central Power Station contributed 13.5 megawatts towards meeting the system peak of 76.8 megawatts during the winter period.

After the 275 kV interconnector was commissioned in July, no standby sets were run at night or during weekends.

Only 12.6 million units were sent out from the local power station compared with 31.6 million units in 1964.

#### Development of the Undertaking

During June two 150 MVA 275/132/11 kV interconnecting transformers were commissioned at the Kimberley Distribution Station. This brought into service the 151 mile 275 kV line from Everest Distribution Station (O.F.S.) which is able to carry a load much larger than the Grootkop 165 kV interconnector, which was installed in 1958 and had reached its economic capacity.

The second 50 mile 132 kV line from Kimberley to Ulco was completed by the Undertaking's construction staff, and the second 132 kV line, Ulco to Silverstreams, 32 miles in length, was 60% completed.

60% of the survey work for the Kimberley-Postmasburg-Sishen traction line was completed by the year-end and erection of the line by contractors started early in 1966. This 220 mile line was commissioned in sections and will be completed by mid-1967.

The Lylyveld and Eldoret substations, temporarily run at 11 kV, were uprated to 66 kV.

Six miles of 132 kV line on steel towers were erected between Silverstreams substation and Finsch mine to replace the temporary 11 kV line to the mine. This permanent line will form a part of the traction line in that area.

Petrusburg Municipality has accepted the terms offered and will be given a bulk supply towards the end of 1966. A 38 mile 22 kV line extension will be necessary, which will pass near Paardeburg on the Modder River. From Paardeburg rural development, up and down the river, will now become a feasible proposition and it is expected that a new area will be opened up embracing Ritchie, the Riet River Settlement and Jacobsdal.

At the end of the year negotiations with Douglas, Griquatown and Prieska Municipalities were not yet finalised.

#### Financial

There was no change in the tariffs in force on the Undertaking during the year under review; but from April, 1966, the rebate on standard tariffs was increased from 10 to 20 per cent.

Revenue for 1965 amounted to R3,734,385, being an increase of 26.8 per cent for the increase of 26.3 per cent of units sold. The surplus for the year was R35,544.

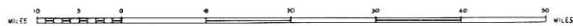
CAPE NORTHERN UNDERTAKING

CONSUMER		SALES				REVENUE FROM SALES		AVERAGE PRICE PER UNIT SOLD			
		Number		Units						% Change	
		1965	1964	1965	1964					65/64	64/63
Traction.....	2	2	1,759,296		+2137.302		R		c		
Bulk.....	9	8	105,801,140		+ 8.405	+12.813	409,000	24,000	1.0398	1.3604	
Mining.....	57	49	97,597,630		+ 21.137	+19.588	824,000	775,000	0.7785	0.7944	
Industrial.....	240	200	144,174,112		+ 6.761	+17.357	1,767,000	1,496,000	1.0116	1.0377	
Domestic and Street Lighting.....	1,903	1,638	64,391,291		+ 19.506	+16.946	548,000	491,000	0.8512	0.8133	
Total.....	2,211	1,897	393,234,446	311,403,362	+ 26.278	+17.542	183,000	156,000	2.0247	2.0636	
Total Revenue.....							3,735,000	2,942,000		0.9487	
Working Costs.....							3,375,000				
Surplus.....							360,000				
Deficit.....											
Capital Expenditure.....							1,334,000				
Central Power Station (Kimberley)											
Electricity Units Sent Out.....											
Maximum Demand kW S.O. } Half-hour.....							R	R			
Demand kW S.O. } 2 Minute.....							3,735,000	2,945,000			
Load Factor %.....							3,375,000	2,808,000			
Thermal Efficiency % S.O.....							360,000	137,000			
FUEL:											
Coal Consumed—tons.....											
Average per unit sent out—lb.....											
Calorific Value B. Th. U./lb.....											
Total Cost—Rand.....											
Cost per ton—Rand.....											
Central Power Station (Kimberley)											
			1965	1964							
Maximum Demand kW S.O. } Half-hour.....			12,683,200	31,612,818							
Demand kW S.O. } 2 Minute.....			14,476	23,680							
Load Factor %.....			17,500	25,700							
Thermal Efficiency % S.O.....			10.0	22.8							
			8.1	9.9							
Coal Consumed—tons.....			23,975	48,384							
Average per unit sent out—lb.....			3.781	3.223							
Calorific Value B. Th. U./lb.....			11,090	11,230							
Total Cost—Rand.....			98,000	198,000							
Cost per ton—Rand.....			4.07	4.10							



CAPE EASTERN UNDERTAKING  
REFERENCE

- Area of Supply (3,100 Square Miles) .....
- Border Undertaking .....
- Transmission Lines .....
- Transmission Lines Under Construction .....
- Substation Site .....





## CAPE EASTERN UNDERTAKING

### Area of Supply

The area of supply of the Cape Eastern Undertaking is shown on the map on page 28.

### Supply of Electricity in the Gamtoos Valley

Progress is being made in the construction of the hydro-electric power station which is being built by the Department of Water Affairs at the Kouga dam primarily for the purpose of supply to the Department's pumping plants in the Gamtoos Valley: and agreement has been reached in principle between the Department and Escom on the following basis:—

- (i) The hydro-electric power station will remain the property of and will be operated by the Department of Water Affairs; but there will be full co-operation between the Department and Escom in the generation of electricity for Escom's consumers, including the sale of surplus units to the Municipality of Port Elizabeth.
- (ii) The electrical distribution system in the Gamtoos Valley, including such distribution lines as may be needed to transmit the supplies required for the Department's pumping plants, will be provided and operated by Escom. The Department will make a capital contribution and a payment towards operating and maintenance costs for the service given to it.
- (iii) The price to be paid by Escom for electricity supplied to it by the Department will be a unit charge equal to the average cost of coal per unit generated in the power stations of the Municipality of Port Elizabeth, or the price prevailing in the area of supply for a supply from some other source, whichever is the lower.

A scheme to reticulate the Gamtoos Valley with electricity generated at the hydro-electric station at the Kouga dam was approved and at the close of the year the routing of the 22 kV line down the Valley was in hand. Line construction was scheduled to commence in 1966.

### Supply of Electricity in the Sundays River Valley

During the year development of the reticulation system in the Sundays River Valley proceeded steadily, a total of 33·8 miles of three phase lines and 32·6 miles of single phase 11 kV lines being erected.

160 consumers, all in the Domestic or Small Power User categories, were connected, bringing the total number of consumers in the valley at the end of the year to 212.

A suitable building and a fenced stores area were erected at Kirkwood to provide for workshop, office and stores accommodation.

### Output and Sales

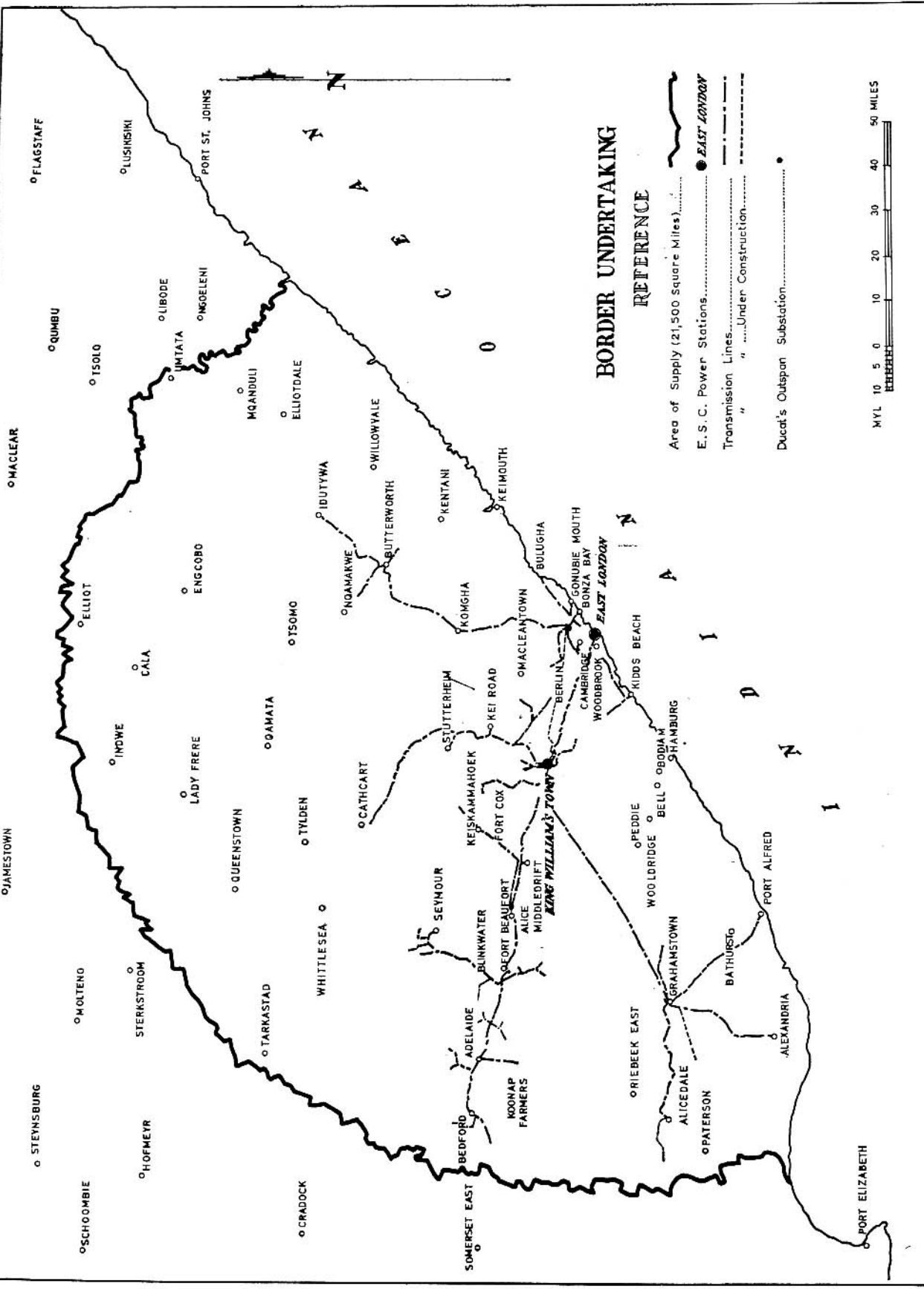
The total sales by the Undertaking amounted to 1,602,202 units. The supply purchased from Port Elizabeth Municipality at Aloes amounted to 1,872,478 units with a maximum demand of 827 kVA paid for. Kirkwood Municipality purchased a total of 795,040 units during the year with a maximum demand of 368 kVA.

### Financial

Total revenue for the year amounted to R55,363 resulting in a surplus on the year's working of R433.

## CAPE EASTERN UNDERTAKING

CONSUMER			SALES				REVENUE FROM SALES		AVERAGE PRICE UNIT SOLD PER	
Class	Number		Units		% Change		1965 R	1964 R	1965 c	1964 c
	1965	1964	1965	1964	65/64	64/63				
Traction.....	—	—	—	—	—	—	—	—	—	—
Bulk.....	1	1	795,040	300,520	+164.555	—	19,000	10,000	2.3933	3.2188
Mining.....	—	—	—	—	—	—	—	—	—	—
Industrial.....	35	13	498,699	124,605	+300.224	—	20,000	6,000	4.0838	4.9950
Domestic and Street Lighting.....	182	38	308,463	14,944	+1964.126	—	16,000	1,000	5.0557	5.9623
<b>Total.....</b>	<b>218</b>	<b>52</b>	<b>1,602,202</b>	<b>440,069</b>	<b>+264.080</b>	<b>—</b>	<b>55,000</b>	<b>17,000</b>	<b>3.4321</b>	<b>3.8149</b>
							1965	1964	Accumulated to 31.12.65	
							R	R	R	
Total Revenue.....							55,000	17,000		
Working Costs.....							55,000	18,000		
Surplus.....							—	—		
Deficit.....							—	1,000	1,000	
Capital Expenditure.....							166,000	201,000	449,000	



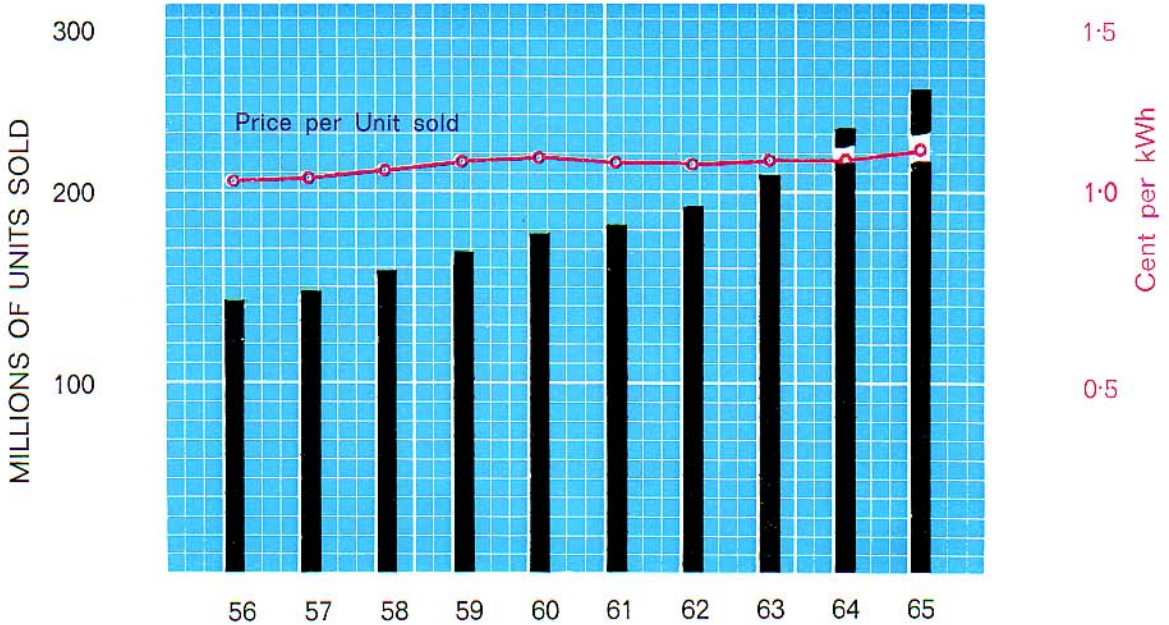
### BORDER UNDERTAKING

#### REFERENCE

- Area of Supply (21,500 square Miles).....
- E. S. C. Power Stations..... ● EAST LONDON
- Transmission Lines.....
- " " Under Construction.....
- Ducat's Outspan Substation..... ●



## BORDER UNDERTAKING



### Expansion of the Border Undertaking

The area of the Border Undertaking is shown on the map on page 30; and the expansion of this Undertaking during the past ten years is shown on the graph above of units sold for the years 1956-1965. Sales increased from 139 million units in 1956 to 250.5 million units in 1965, an average annual increase of 6.8 per cent over this period.

The price of electricity is indicated by the red line imposed upon the diagram, which shows the average price per unit sold.

Details for the year 1965 of the sales to the main classes of consumers, the revenue and working costs for the year and the statistics relating to the generation of electricity in the West Bank power stations are given on page 32.

### Output and Sales

The total sales by the Undertaking amounted to 250,523,011 units, an increase of 9.5 per cent over the figure for the previous year, while the system maximum demand increased from 47,110 kW in 1964 to 51,520 kW in 1965.

East London Municipality purchased 194,809,500 units, the increase for the year being 7.3%. The maximum demand for this consumer increased from 36,900 kVA in 1964 to 41,970 kVA in 1965, an increase of 13.7%.

180 new consumers, including nine large users, were connected during the year, the total number of consumers on the Undertaking at the end of the year being 3,662.

### West Bank Power Stations

No new items of major plant were commissioned during the year.

The erection of the fourth 170,000 lb/hr. boiler was proceeding satisfactorily, and it is hoped that the commissioning date of August, 1966, will be maintained.

The civil work in connection with the "D" Extensions programme to extend the Station to accommodate a 20 MW Generator and a 210,000 lb/hr. boiler was proceeding.

These units are due for commissioning in March and August, 1967, respectively.

Coal supplies came forward fairly regularly; but in July the stock fell to the equivalent of just under two days steaming. During the latter part of the year stocks were increased to a satisfactory level.

The efficiency of the combined stations decreased

from 21.5 per cent in 1964 to 21.3 per cent in 1965 as a result, due to increased loads, of the greater use of the relatively inefficient plant in West Bank No. 1 Station.

### King William's Town Power Station

The steam plant was not required to run during the year and operation of the 1,000 kW diesel set was confined to routine test runs.

### Development of the Undertaking

A scheme to supply a cheese factory and a group of farmers in the Kroomie area was completed in May, 1965. Supply was also given to a sawmill established on the mountain above Kroomie.

A line was built from Alicedale to Olifantskop and supply made available to a General Post Office Microwave Station in November. Supply was also given to General Post Office Microwave Stations at Governor's Kop and Mount Kempt adjacent to existing F.M. Stations.

A new South African Broadcasting Corporation F.M. Station near Bedford was given supply in November.

Authority was given for the erection of a 66 kV line from Ducats Substation to King William's Town to provide a duplicate supply to the inland areas. Routing of this line was well advanced at the close of the year.

With increasing loads at Port Alfred and Alexandria it was decided to uprate the present 11 kV systems from Grahamstown to 22 kV and investigation into suitable stepdown substation sites was proceeding.

Several farmers in the Seven Fountains area near Grahamstown accepted our terms for supply and work on the scheme was scheduled to commence early in 1966.

A scheme to supply the town of Peddie and an adjacent Hospital and also a group of farmers in the Breakfastlei area was accepted by the consumers. These supplies will be made available in the latter part of 1966.

### Financial

There was no change in the tariffs in force on the Undertaking during the year under review.

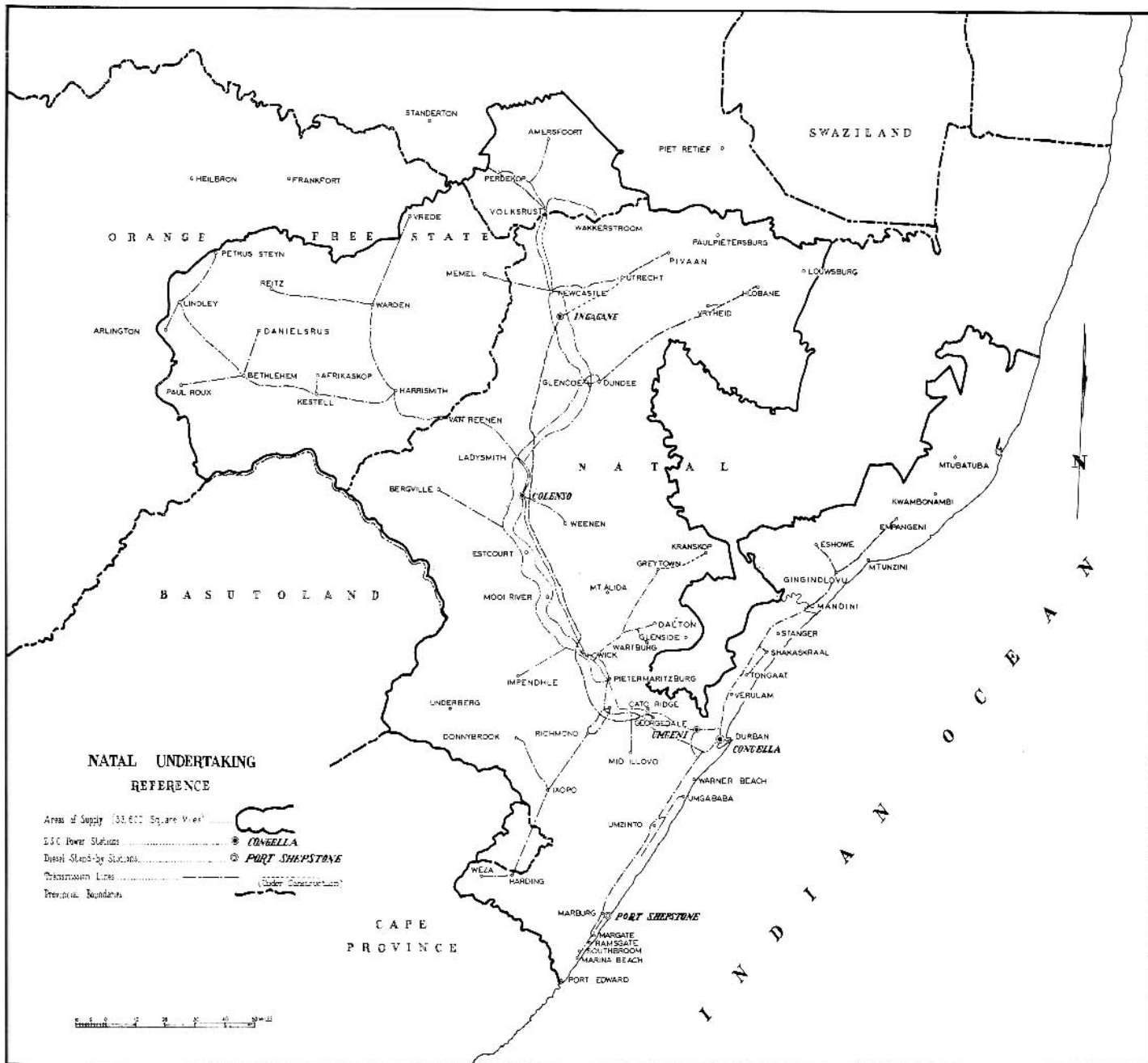
Total revenue for the year amounted to R2,767,005, an increase of 11.4 per cent over the revenue for 1964.

A surplus of R90,075 was realised on the year's working and the accumulated deficit was thus reduced to R13,787.

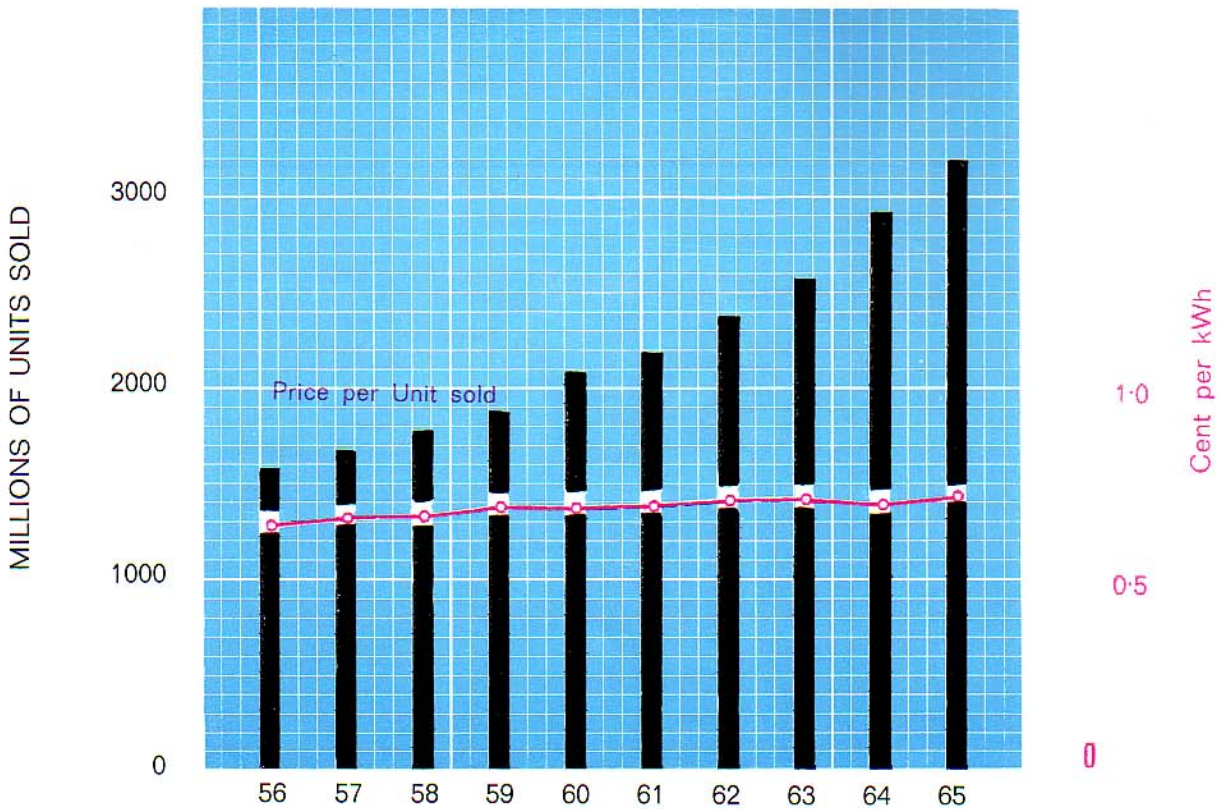
BORDER UNDERTAKING

CONSUMER Class	SALES			REVENUE FROM SALES		AVERAGE PRICE PER UNIT SOLD	
	Number		Units	% Change		1964	
	1965	1964		1965	1964	1965	1964
Traction.....	14	14	201,721,800	+ 8.909	+10.884	1,963,000	0.9840
Bulk.....	374	331	11,654,419	+20.597	+23.592	300,000	2.1384
Mining.....	3,274	3,118	15,391,537	+ 8.992	+13.390	302,000	1.7985
Industrial.....	3,662	3,463	228,767,756	+ 9.510	+11.635	2,764,000	1.1033
Domestic and Street Lighting.....							
Total.....						2,479,000	1.0837
Total Revenue.....						1965	1964
Working Costs.....						R	R
Surplus.....						2,767,000	2,483,000
Deficit.....						2,677,000	2,445,000
Capital Expenditure.....						90,000	38,000
						665,000	250,000
							Accumulated to 31.12.65
							R
							14,000
							12,854,000

	East London-West Bank No. 1 & 2 Power Station		King William's Town Power Station		King William's Town Power Station	
	Power Station		(steam)		(oil)	
	1965	1964	1965	1964	1965	1964
Electricity Units Sent Out.....						
Maximum.....	252,369,430	232,883,480			4,750	3,000
Demand KW S.O. } Half-hour.....	51,520	47,110			1,000	1,000
Load Factor %.....	55.9	56.3			1,000	1,000
Thermal Efficiency % S.O.....	21.3	21.5				
FUEL:						
Coal Consumed—tons.....	174,889	160,415				
Average per unit sent out—lb.....	1.386	1.378				
Calorific Value B. Th. U./lb.....	11,570	11,540				
Total Cost—Rand.....	892,000	804,000				
Cost per ton—Rand.....	5.10	5.01				
Fuel oil consumed—lb.....					3,145	2,075
Fuel oil per unit sent out—lb.....					0.664	0.691



## NATAL UNDERTAKING



### Expansion of the Natal Undertaking

The area of the Natal Undertaking, which combines the areas of supply of the Natal Central Licence and the Natal Southern Licence, is shown on page 33.

Expansion of this Undertaking over the period 1956-1965 is depicted in the diagram above, which shows the total units sold over those years. Total sales have increased from 1,553 million units in 1956 to 3,182 million units in 1965, an increase of 105% in the last nine years.

The price of electricity in the Undertaking is shown by the red line imposed upon the graph, which shows the average price per unit sold.

Details of the units sold to the major classes of consumers, the revenue received and operating expenses during 1964, and the principal features of the generation of electricity in the Natal power stations appear in the tables on pages 36 and 37.

### Output and Sales

Sales of electricity from the pooled power stations totalled 3,182,496,990 units and exceeded sales for 1964 by 8.9 per cent. The maximum demand rose from 515,660 kW to 564,540 kW, an increase of 9.5% over the previous year.

A bulk supply was made available to Eshowe Municipality towards the end of the year, this being Escom's first bulk supply in Zululand. It was followed by a bulk supply to Empangeni early in 1966. A partial supply was made available to S.A. Pulp and Paper Industries at Mandini in October, and the full supply from December, 1965.

Thirty-five new large consumers were connected to the supply during the year. In addition, sixteen existing large power users took increased supplies.

During the year negotiations were concluded for the purchase of assets and taking over the consumers from the Zululand Electrical Utility Co. (Pty) Ltd., and some 200 consumers in the Gingindlovu, Utuzini, Uyoni and Amatikulu areas were transferred to Escom's supply.

The village of Wartburg, with approximately 100 consumers, and a few consumers in the surrounding rural areas were taken over late in the year from the Albert Falls Power Company, Limited.

### Construction at Power Stations

The construction of foundations and steelwork for the third 100 MW turbo-generator set at Ingagane was started.

At Colenso the construction of the workshops was completed; and at Umgeni construction of the two 132 kV feeders to Mandini and an additional 33 kV feeder to Pineside were completed.

### Distribution System

During January the Newcastle/Volksrust section of the Ingagane/Volksrust No. 1 88 kV line was completed, thus providing a duplicate supply to Volksrust.

Work also commenced on the construction of the Newcastle/Volksrust section of the No. 2 88 kV line, and by the end of the year line two had been completed but not commissioned.

Construction of the tee-lines to the South African Railways traction substations between Newcastle and Volksrust started in September and was approximately 70% complete at the end of the year.

The 88 kV switching substation at Craigside and the 88/6.6 kV substation at Hlobane were energised during the year for supply to Hlobane Colliery.

The supplies to Zululand progressed well and one 132 kV line from Umgeni to the S.A. Pulp and Paper Industries substation at Mandini was completed together with part of the S.A. Pulp and Paper Industries 132/6.6 kV substation. Work was well advanced on the 88/11 kV substation at Empangeni and the 132/33 kV substation at Shakaskraal.

During the year a total length of 415.34 miles of transmission and distribution lines were constructed and taken into service at 6.6 kV and above.

#### **Rural Development**

During the year 1,043 rural and large power users were quoted terms compared to 740 in 1964. The total number of applications outstanding at the end of the year was 865, compared to 713 in 1964.

#### **Financial**

Total revenue increased from R20,485,000 in 1964 to R22,955,000 in 1965, which was an increase of 12% for the year. A surplus of R351,000 was shown on the year's working.

**NATAL UNDERTAKING**

CONSUMER Class	SALES				REVENUE FROM SALES	AVERAGE PRICE PER UNIT SOLD		
	Number		Units				% Change	
	1965	1964	1965	1964				
Traction.....	9	1	546,649,038	521,314,806	R	c		
Bulk.....	23	21	2,055,240,031	1,904,045,462	4,109,000	3,825,000	0.7517	
Mining.....	25	19	83,235,162	72,519,243	+ 4.860	12,256,000	0.6627	
Industrial.....	1,955	1,641	440,687,893	372,780,818	+ 7.941	558,000	0.7964	
Domestic and Street Light- ing.....	12,645	12,171	56,680,386	51,438,442	+ 14.777	2,855,000	0.7837	
Total.....	14,657	13,853	3,182,492,510	2,922,098,771	+ 18.216	904,000	1.7609	
					22,845,000	20,398,000	0.7178	
Total Revenue.....					1965	1964	Accumulated to	
Working Costs.....					R	R	31.12.65	
Surplus.....					22,955,000	20,486,000	R	
Deficit.....					22,604,000	19,944,000	R	
Capital Expenditure.....					351,000	542,000	1,053,000	
					7,768,000	4,469,000	123,120,000	
Congella Power Station No. 1 and 2							1964	
Colenso Power Station No. 1 and 2							1965	
Electricity Units Sent Out.....							1964	
Maximum } Half-Hour.....			587,432,930	595,313,590	689,511,860	689,271,700		
Demand kW S.O. } 2 Minute.....			113,870	119,020	140,250	152,405		
Load Factor %.....			142,000	143,000	156,000	168,000		
Thermal Efficiency % S.O.....			58.9	56.9	56.1	51.5		
			17.0	18.3	20.0	20.9		
FUEL:								
Coal Consumed—tons.....			520,519	487,808	521,660	491,110		
Average per unit sent out—lb.....			1.772	1.639	1.513	1.425		
Calorific Value B. Th. U./lb.....			11,330	11,400	11,240	11,460		
Total Cost—Rand.....			1,963,000	1,643,000	1,783,000	1,595,000		
Cost per ton—Rand.....			3.77	3.37	3.42	3.25		



NATAL UNDERTAKING

	Umgeni Power Station		Ingagane Power Station	
	1965	1964	1965	1964
Electricity Units Sent Out.....				
Maximum } Half-hour.....	993,295,636	1,142,049,716	1,004,691,700	584,448,800
Demand kW S.O. } 2 Minute.....	219,200	223,200	165,600	152,000
Load Factor %.....	232,000	237,000	188,000	160,000
Thermal Efficiency % S.O.....	51.7	58.3	69.3	43.8
	23.3	24.0	28.9	28.6
<b>FUEL:</b>				
Coal Consumed—tons.....	627,192	692,693	542,081	319,162
Average per unit sent out—lb.....	1.263	1.213	1.079	1.092
Calorific Value B. Th. U./lb.....	11,600	11,720	10,950	10,910
Total Cost—Rand.....	2,848,000	2,996,000	1,331,000	722,000
Cost per ton—Rand.....	4.54	4.32	2.46	2.26

	Port Shepstone Power Station (oil)	
	1965	1964
Electricity Units Sent Out.....		
Maximum } Half-hour.....	55,567	23,262
Demand kW S.O. } 2 Minute.....	3,326	2,950
Load Factor %.....	3,400	3,100
Thermal Efficiency % S.O.....		
<b>FUEL:</b>		
Coal Consumed—tons.....		
Average per unit sent out—lb.....		
Calorific Value B. Th. U./lb.....		
Total Cost—Rand.....		
Cost per ton—Rand.....		
Fuel oil consumed—lb.....	32,824	14,830
Fuel oil per unit sent out—lb.....	0.591	0.638



## EASTERN TRANSVAAL UNDERTAKING

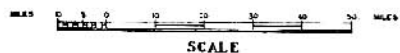
### REFERENCE

Area of Supply (35,700 Square Miles)

E.S.C. Power Stations ● WILGE

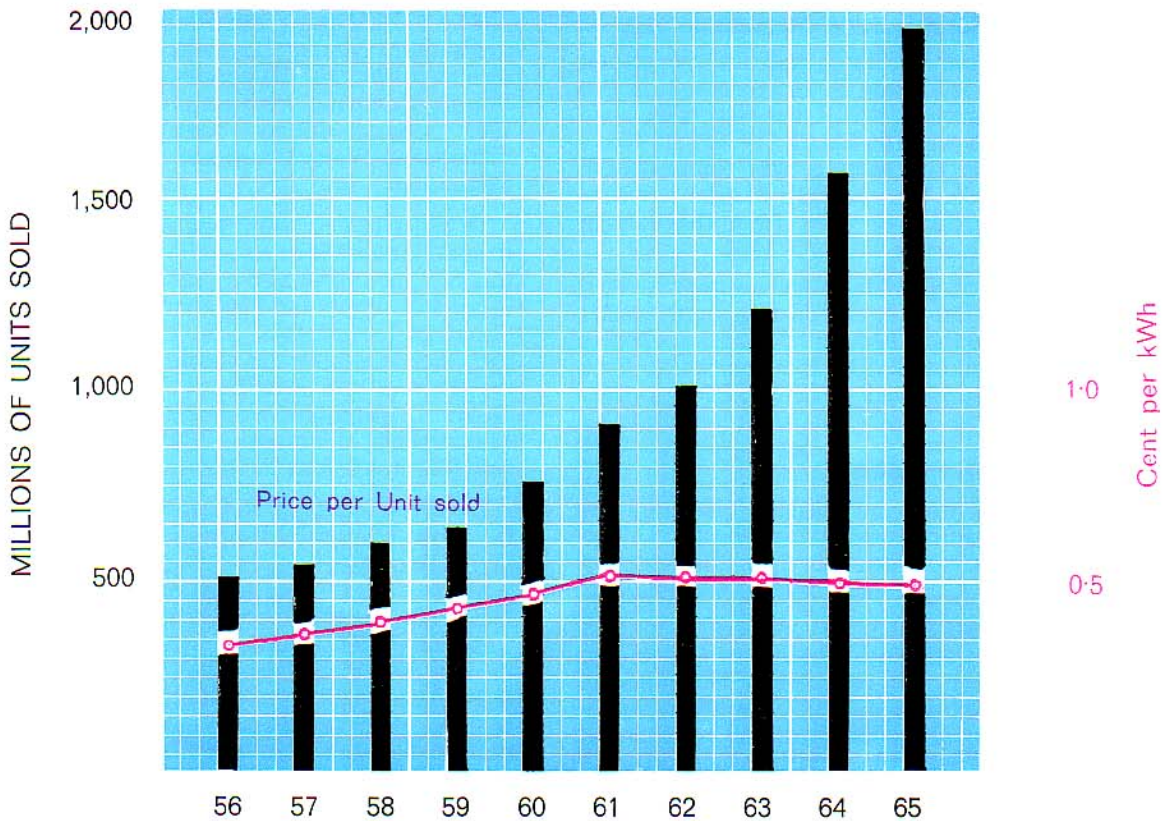
Transmission lines

Transmission lines under construction



SCALE

## EASTERN TRANSVAAL UNDERTAKING



### Expansion of the Eastern Transvaal Undertaking

The expansion of the Eastern Transvaal Undertaking which serves the area shown on page 38 has continued at a phenomenal rate. Total sales of electricity, depicted in the above graph, have increased from 506 million units in 1956 to 1,937 million units in 1965, an increase nearly four-fold in the past nine years. The increase in 1965 over the previous year was 24.7 per cent.

The price per unit of electricity sold is shown by the red line superimposed on the graph. In this Undertaking the upward trend of prices reflects the cost of extending the transmission and distribution systems into the new areas which have been added in recent years — the slightly downward trend in the last few years showing that, with growth of load, somewhat better use is being made of these new systems.

### Sales of Electricity

Statistics for the year 1965 of the units sold to the main classes of consumers and the revenue received are given in the table on page 41.

The large increase in traction supplies is due to the commissioning of the new traction substation at Brakfontein, and the first sections of the Witbank/Komatipoort electrification. At the year end seven of the sixteen substations were completed and energised, and good progress had been made towards the completion of the remainder.

Under Bulk supplies, two new consumers — the Municipality of Witrivier and Phalaborwa Health Committee — were added during the year, and substantial increases were recorded in the supply to all local authorities in the Eastern Transvaal, and particularly Ermelo, Middelburg and Witbank.

Supplies to the gold mines on the Evander gold fields increased by 9.6 per cent to a total of 374 million units for the year. Coal mining within the area of this Undertaking, including the new collieries being opened up for the supply of coal to Komati and Camden power stations, continues to expand, and Escom's sales for the year reflect an increase of 4.9 per cent. The supply to Palabora Mining Company, Limited, increased from 5.5 million units in 1964 to 12.6 million units in 1965.

In the industrial category, the supply taken by R.M.B. Alloys Limited at Middelburg increased from 98 million units in 1964 to 220 million units in the year under review. The new supply to Transalloys, Limited, rose to 154 million units, and a construction supply was made available to Highveld Steel and Vanadium Company Limited, from Transalloys substation, in November, 1965.

In the Phalaborwa area, the supply taken by Phosphate Development Corporation (Pty) Limited ("Foskor") increased by 12 million units to a total of 68 million; and Chemical Industries of South Africa Limited, purchased 11 million units for its new fertilizer factory at Phalaborwa.

## **Komati Power Station**

The essential features of the generation of electricity in Komati Power Station are given on page 10.

At the 31st December, 1965, and for the greater part of the year 1965 seven of the nine sets in this station were in service. No. 8 set was taken into commercial service on 11th March, 1966, and No. 9 set, the final set at this Station, was commissioned on 22nd April, 1966. Thus Komati Station has been completed in less than 4½ years from the date of starting up the first set in January, 1962.

The load factor at Komati reflects an improvement to 73·5 per cent; but it is expected to show further improvement when the "teething" difficulties with this new plant are eliminated. The total output of 4,468 million units was produced from 2,657,741 tons of coal.

## **Transmission and Distribution System**

The amount of work involved in extending the transmission and distribution systems in this Undertaking has made severe demands upon the resources both of Head Office departments and the Undertaking.

During 1965 approximately 34 miles of 88 kV line to supply the two traction substations at Middelburg and Olifants Rivier was completed; 115 miles of 132 kV line between Rockdale and Marathon Distribution Stations was also completed, and work on the remaining section between Marathon and Komati-poort was well advanced. As reported above, seven of the traction substations were completed and energised by the end of the year.

No. 3 275 kV line between Komati Power Station and Kruispunt Distribution station which is required to reinforce the network in the Witbank area, was completed in March, 1965; and two of the three 250 MVA 275 / 132 kV transformers for Kruispunt were on site. This distribution station which will be a coupling point between the 275 kV and the 132 kV networks in this area is expected to be commissioned in May, 1966.

Construction of the 56 mile 275 kV line to interconnect Camden Power Station with Komati Station was approximately 50% complete at the year end.

In order to meet the rising loads and new developments in the Phalaborwa area, it was necessary to establish the 275 kV link from Komati to Leeuwkloof, some 47 miles. This was completed at the end of October, 1965, and the whole line Komati-Marathon was converted to 275 kV operation at the end of November, 1965, after completion of the extensions at Marathon, comprising 2×75 MVA 275/132 kV transformers. Similar extensions were made to Acornhoek Distribution Station, and the section Marathon/Acornhoek was converted to 275 kV in January, 1966. At the end of 1965 preliminary work in preparation for the construction of a duplicate 132 kV line from Acornhoek to Foskor substation had been completed.

The target date for completion of this line is May, 1966.

Two 132 kV lines from Foskor Distribution Station to Palabora Mining Company Limited, and the substation to provide the permanent supply to Palabora Mining Company were commissioned in December, 1965. Separate supplies were also provided to the Phalaborwa Water Board and the Phalaborwa Health Committee.

In order to deal with load development, Selati Distribution station is being established in this area, and it was 80% complete at the year end. When completed, Selati will supply the Phalaborwa Health Committee, Chemical Industries of S.A. Ltd., and the industrial sites. Selati is also the starting point for the 66 kV line to supply Consolidated Murchison (Transvaal) Goldfields and Development Co. Ltd., and the Municipality of Tzaneen. Work on this 66 kV extension was in hand at the end of the year.

In the lowveld area, Nelspruit Municipality accepted the terms offered by Escom for a partial supply and preliminary work is in hand for the supply over 9 miles of 66 kV line to be built from Marathon to Nelspruit. The supply to Witrivier Municipality, which was previously furnished by Nelspruit, was taken over by Escom in July, 1965. The permanent supply to Barberton was completed in April, 1965. The supply to S.A. Pulp and Paper Industries, Limited, paper mill at Ngodwana in the Elands River valley was made available in March, 1966. Two small temporary supplies were made available to the Transvaal Suiker Korporasie Beperk at Malelane early in 1966.

In the Camden area work is proceeding on the construction of Uitkomst Switching Station at Camden for the supply to the Department of Water Affairs at Jericho Dam and the supplies to Usutu West Colliery and Usutu South Colliery.

## **Rural Electrification**

During 1965 some 242 miles of distribution lines of voltages ranging from 22 kV to 2·2 kV were added to the Undertaking's rural networks, together with some 10 miles of low voltage lines. A total of 174 farms and 114 other consumers in rural areas were given supply; and an additional 166 consumers in urban areas were also connected up.

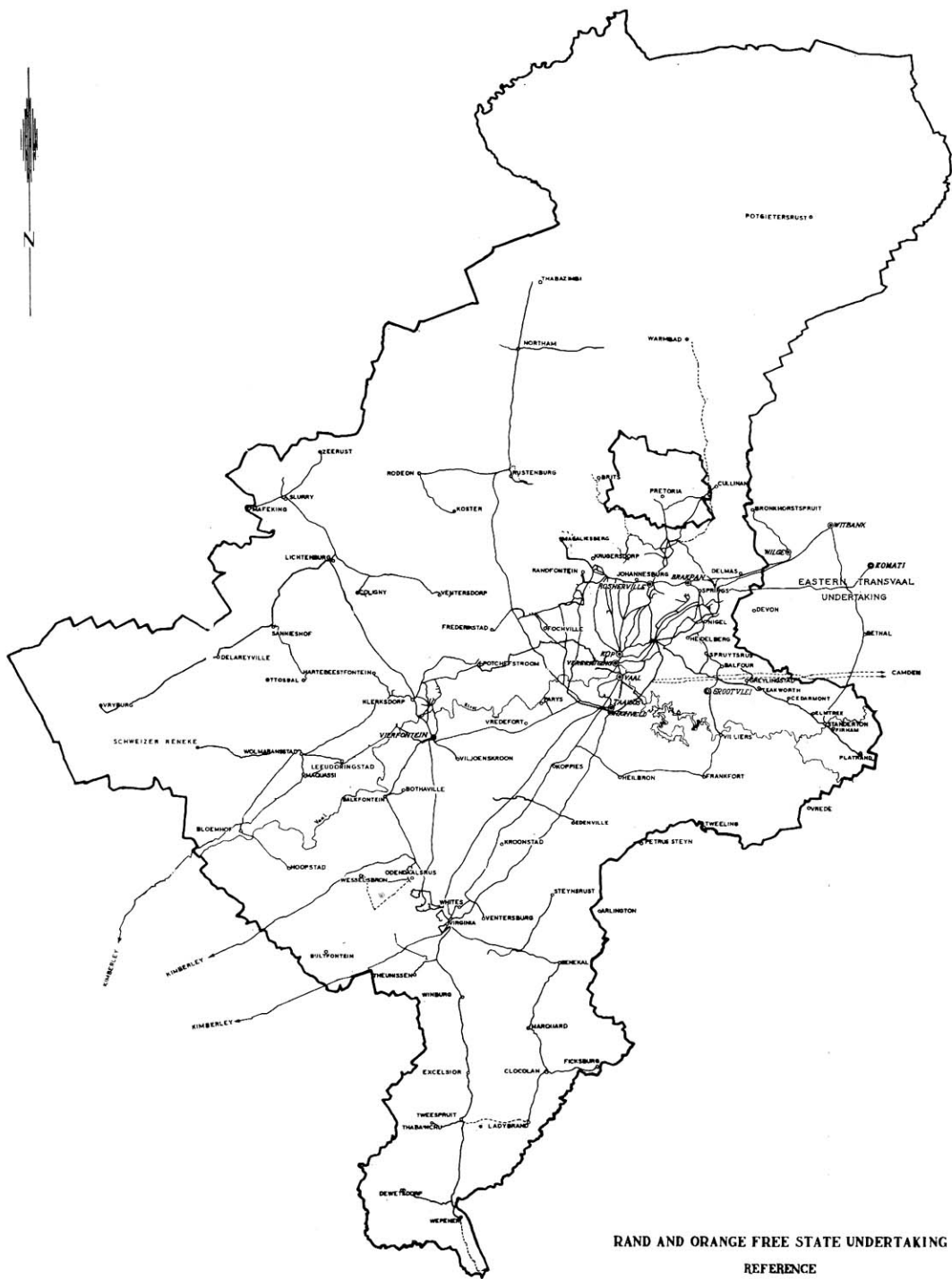
New rural schemes were started in the following areas: (i) between Malelane and Hectorspruit, (ii) in the Mlumati River valley, near Kaalrug, south of Malelane, (iii) in the area between Acornhoek, Bedford and Hectorspruit, and (iv) in the area between Groblersdal and Roosenekal.

## **Financial**

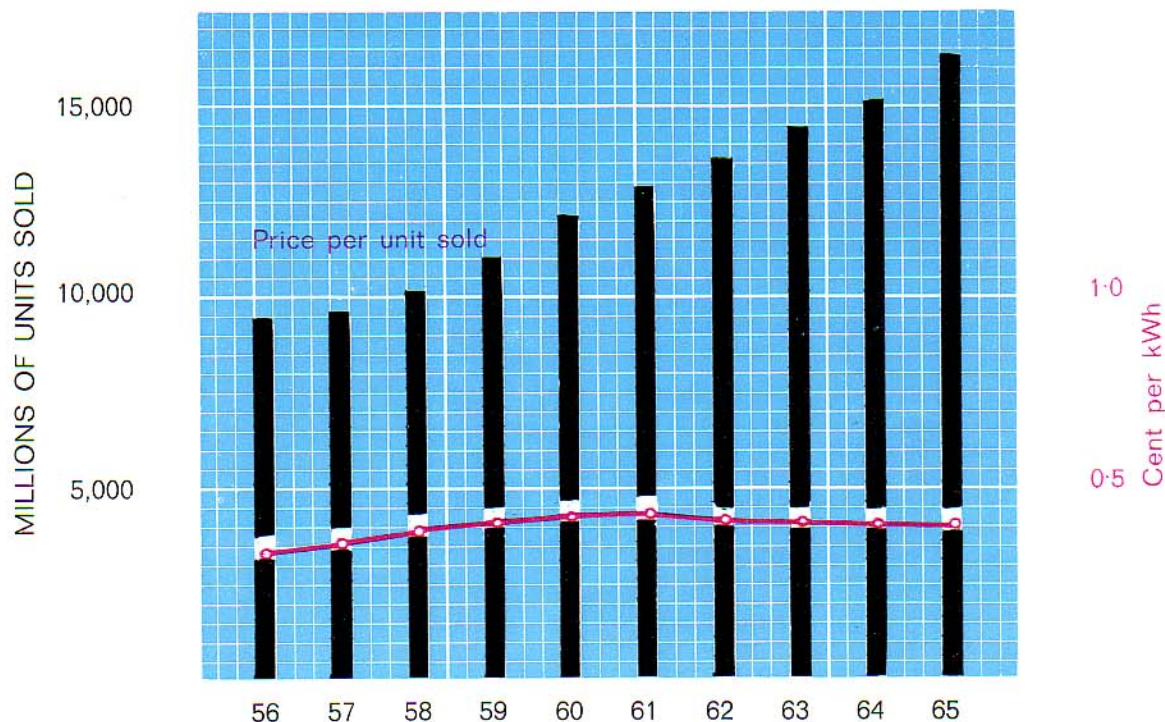
Revenue for the year amounted to R9,573,000, giving an average price of 4897 cent per unit sold. The Revenue Account for the year showed a surplus of R237,000.

EASTERN TRANSVAAL UNDERTAKING

CONSUMER		SALES				REVENUE FROM SALES		AVERAGE PRICE PER UNIT SOLD			
		Number		Units						% Change	
		1965	1964	1965	1964					65/64	64/63
Class											
Traction.....	5	1	113,125,279	89,048,650	+27.038	+16.017	R 684,000	R 488,000	0.6045	0.5486	
Bulk.....	14	12	92,531,642	78,350,075	+18.100	+21.210	501,000	426,000	0.5418	0.5433	
Mining.....	62	62	639,448,623	575,349,954	+11.141	+15.942	3,296,000	2,960,000	0.5154	0.5145	
Industrial.....	1,121	818	1,068,572,256	790,038,530	+35.256	+41.878	4,606,000	3,509,000	0.4310	0.4442	
Domestic and Street Lighting.....	3,905	3,735	23,100,603	20,799,610	+11.063	+17.818	398,000	369,000	1.7253	1.7755	
Total.....	5,107	4,628	1,936,778,403	1,553,586,819	+24.665	+28.170	9,485,000	7,752,000	0.4897	0.4990	
Total Revenue.....							17,859,000	17,859,000	17,366,000	124,040,000	
Working Costs.....										Accumulated to 31.12.65	
Surplus.....										R 7,847,000	
Deficit.....										R 7,782,000	
Capital Expenditure.....										65,000	
										733,000	
										124,040,000	
		Witbank Power Station		Komati Power Station		Sabie Gorge Hydro Power Station					
Electricity Units Sent Out.....											
One Hour.....											
Half-hour.....											
2 Minute.....											
Maximum Demand kw S.O.....											
Load Factor %.....			55.6	66.7	73.5	69.7	28.7	28,000	28,000	4,517,210	
Thermal Efficiency % S.O.....			15.0	15.5	28.1	28.1	28.7	900	1,025	1,000	
FUEL:											
Coal Consumed—tons.....			630,900	571,094	2,657,741	1,781,328	1.188				
Average per unit sent out—lb.....			2.109	2.030	1.190	1.188					
Calorific Value B. Th. U./lb.....			10,780	10,830	10,220	10,020					
Total Cost—Rand.....			800,000	663,000	3,117,000	2,387,000					
Cost per ton—Rand.....			1.27	1.16	1.17	1.34					
										Station on Caretaker basis used in emergencies only.	



## RAND AND ORANGE FREE STATE UNDERTAKING



### Expansion of the Rand and Orange Free State Undertaking

A steady rate of growth has been maintained in the Rand and O.F.S. Undertaking which serves the area shown on the map on page 42, including the industrialized area of the Witwatersrand.

Over the 10 years represented in the above graph the total electric units sold has increased from 8,960 million units to 16,024 million units, which reflects an average annual increase of 6.7 per cent.

Total sales to the main classes of consumers are shown in the table on page 45. Once again the growth of industrial supplies (11.3 per cent for the year) was substantially greater than the increase in mining supplies (3.5 per cent).

The price per unit sold is depicted by the red line superimposed upon the graph. The figure of .4020 cent in 1965 reflects the slightly downward trend, which has continued during the past four years, due to reduction in the cost of generating electricity in the pooled power stations.

### Operation of the Pooled Power Stations

In terms of the Licences granted by the Electricity Control Board, the power stations of the Rand and Orange Free State Undertaking, together with Witbank and Komati Power Stations of the Eastern Transvaal Undertaking, are operated as a single system of pooled stations.

During 1965 No. 7 set and boiler (125,000 kW) at Komati Power Station was brought into service. This, together with No. 6 set, which was commissioned at the end of September, 1964, was barely sufficient to meet the increase in the peak demands upon the system.

At the year end a total of 3,250,000 kW of additional plant was under construction or on order for the pooled stations, as follows:—

Komati Power Station.....	250,000 kW
Camden Power Station.....	1,600,000 kW
Grootvlei Power Station.....	600,000 kW
Hendrina Power Station.....	800,000 kW
	3,250,000 kW

Part of this new plant is required as a replacement of plant in old power stations which are approaching the end of their useful lives.

The output from the pooled power stations in 1965 was 19,625 million units sent out, which was an increase of 8.7 per cent over the output for 1964. (The increase in 1964 was 7.9 per cent.) The maximum simultaneous demand on these stations was 2,907,052 kW which is an increase of 216,415 kW (or 8.04%) over 1964. The supplies taken by the four Undertakings which drew their power either wholly or in part from this pooled system were as follows:—

	Maximum demand in the year	Total Units (millions)
Rand and Orange Free State Undertaking.....	2,573,716 kW	17,237.3 kWh
Eastern Transvaal Undertaking.....	290,479	1,964.7
Cape Northern Undertaking.....	69,410	422.3
Natal Undertaking.....	4,320	1.1

The average cost per unit sent out from the pooled stations, including financial charges, amounted to 2973 cent per kWh.

### Sales of Electricity and Compressed Air

The sales of electricity to the consumers of the Rand and Orange Free State Undertaking increased to a total of 16,024 million units in 1965, which represents an increase of 7 per cent over 1964. The percentage increase in the previous year was 6.1 per cent. With the gradual closing down of the old mines on the Central Witwatersrand, the compressed air system is being abandoned, and sales of compressed air dropped further from 94 million units to 87 million units. It is expected that the supply of compressed air by the Undertaking will cease finally during 1966.

The increase in units sold to the mining industry (3.5 per cent over-all) is practically the same as in 1964. As in recent years, there was a drop in consumption in the old mining area between Springs and Randfontein; but all other areas showed increases which are the concomitant of normal development. This trend is shown in the following table of units sold in the main mining areas:—

	Units sold (millions)			
	1962	1963	1964	1965
Witwatersrand.....	2,934	2,815	2,716	2,663
Klerksdorp.....	1,350	1,412	1,488	1,560
Far West Rand.....	1,812	1,949	2,040	2,193
Orange Free State.....	2,225	2,282	2,449	2,534

Supplies to the industrial section showed a marked increase in consumption, the increase for 1965 being 11.3 per cent, compared with an average of 9.9 per cent over the past ten years. The units sold to the main groups of industrial consumers were as follows:

	Units sold (millions)		
	1963	1964	1965
Building and Cement (including quarrying).....	267	305	335
Chemical (including pharmaceutical).....	528	491	594
Engineering (including Motor Industry).....	192	343	375
Foodstuffs, consumer goods and commercial.....	464	501	570
Iron, steel and base metals.....	1,276	1,356	1,452
Paper Production.....	212	212	255

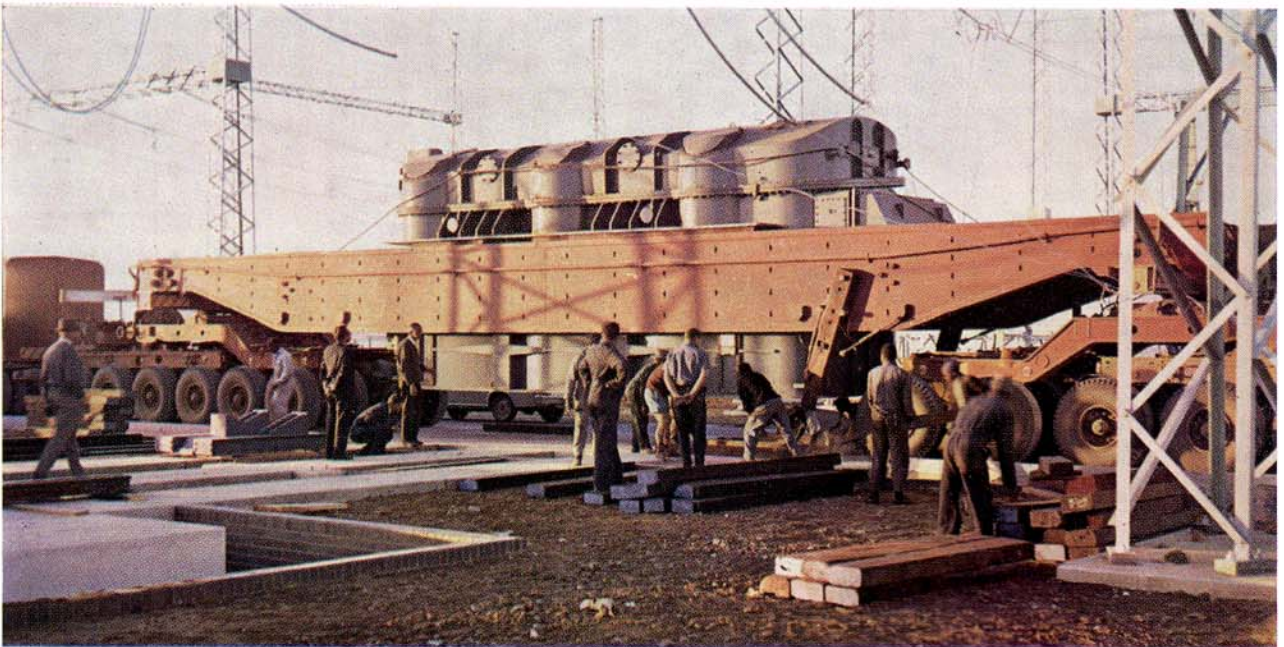
### Rural Electrification

The Undertaking was active over a wide area and further farm schemes were started in many districts. All available resources of men and materials were fully used, and more than 600 miles of new power lines of 11 kV and lower voltages were built in rural areas. During 1965, 392 new farm supplies were given and a further 1,398 consumers (not classified as farmers) on small holdings and in peri-urban areas were connected.

### Financial

As reported on page 13, a reduction of two per cent in the standard tariff was made from January, 1965, by increasing the general discount from 6 per cent to 8 per cent; and in terms of the proviso to the Extension Licences a corresponding adjustment was made by reducing the surcharge in the outlying areas from 8 per cent to 6 per cent.

The total revenue for the year was R65,732,000; but the year's accounts showed a loss of R1,573,000. The accumulated surplus was thus reduced to R1,147,000.



The first 750 MVA, 400/300 kV coupling transformer arriving on site at the Atlas distribution station from where power will be transmitted to the Western Cape.



**RAND AND ORANGE FREE STATE UNDERTAKING**

CONSUMER	Number		SALES		% Change		REVENUE FROM SALES		AVERAGE PRICE PER UNIT SOLD																																																									
	1965		1964		65/64		1965		1964																																																									
	Class	1965	1964	Units	1964	65/64	64/63	1965	1964	1965	1964																																																							
<b>ELECTRICITY:</b>																																																																		
Traction.....	2	2	715,047,541	589,982,452	+21.198	+16.653	3,517,000	2,927,000	0.4918	0.4961																																																								
Bulk.....	109	99	2,164,241,678	1,953,998,566	+10.760	+12.184	9,550,000	8,821,000	0.4413	0.4514																																																								
Mining.....	107	110	9,373,418,255	9,055,202,321	+3.514	+3.668	35,940,000	35,570,000	0.3834	0.3928																																																								
Industrial.....	1,213	1,074	3,629,863,541	3,262,519,200	+11.260	+7.356	13,923,000	12,813,000	0.3836	0.3927																																																								
Domestic and Street Lighting.....	12,799	11,210	141,549,810	111,719,084	+26.702	+29.138	1,487,000	1,157,000	1.0503	1.0357																																																								
Total Electricity.....	14,230	12,495	16,024,120,825	14,973,421,623	+7.017	+6.135	64,417,000	61,288,000	0.4020	0.4093																																																								
<b>AIR and STEAM:</b>																																																																		
Bulk.....	1	1	4,394,046	4,535,098	-3.110	+12.315																																																												
Mining.....	8	8	73,745,571	80,082,223	-7.913	-27.010																																																												
Industrial.....	20	21	9,029,455	9,296,888	-2.877	-1.685																																																												
Total Air.....	29	30	87,169,072	93,914,209	-7.182	-18.480	1,024,000	1,078,000	1.1745	1.1476																																																								
Total Electricity and Air...	14,259	12,525	16,111,289,897	15,067,335,832	+6.929	+5.936	65,441,000	62,366,000	0.4062	0.4139																																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">1965</th> <th colspan="2">1964</th> <th colspan="2">Accumulated to 31.12.65</th> </tr> <tr> <th colspan="2"></th> <th colspan="2">R</th> <th colspan="2">R</th> <th colspan="2">R</th> </tr> </thead> <tbody> <tr> <td>Total Revenue.....</td> <td></td> <td>65,732,000</td> <td>67,305,000</td> <td>62,666,000</td> <td>63,382,000</td> <td></td> <td></td> </tr> <tr> <td>Working Costs.....</td> <td></td> <td>1,573,000</td> <td>29,010,000</td> <td>716,000</td> <td>13,113,000</td> <td></td> <td></td> </tr> <tr> <td>Surplus.....</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1,147,000</td> <td></td> </tr> <tr> <td>Deficit.....</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>383,428,000</td> </tr> <tr> <td>Capital Expenditure.....</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>													1965		1964		Accumulated to 31.12.65				R		R		R		Total Revenue.....		65,732,000	67,305,000	62,666,000	63,382,000			Working Costs.....		1,573,000	29,010,000	716,000	13,113,000			Surplus.....						1,147,000		Deficit.....							383,428,000	Capital Expenditure.....							
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Capital Expenditure.....																																																																		

**RAND AND ORANGE FREE STATE UNDERTAKING**

	Highveld Power Station		Klip Power Station	
	1965	1964	1965	1964
Electricity Units Sent Out.....				
Maximum	3,174,966,097	3,205,814,621	2,199,218,564	2,165,822,826
Demand kW S.O. } One Hour.....	451,279	465,709	380,505	363,380
Load Factor %.....	80.3	78.4	65.8	67.8
Thermal Efficiency % S.O.....	28.4	28.7	20.3	20.4
FUEL:				
Coal Consumed—tons.....	2,162,532	2,189,899	1,989,722	1,935,109
Average per unit sent out—lb.....	1.362	1.369	1.809	1.787
Calorific Value B. Th. U./lb.....	8,820	8,700	9,290	9,410
Total Cost—Rand.....	3,506,000	3,625,000	4,323,000	3,913,000
Cost per ton—Rand.....	1.62	1.66	2.17	2.02

	Rosherville Power Station		Taaibos Power Station	
	1965	1964	1965	1964
Electricity Units Sent Out.....				
Maximum	3,989,873	10,234,553	3,202,129,355	3,116,614,682
Demand kW S.O. } One Hour.....	19,789	20,906	448,675	449,716
Load Factor %.....	2.3	4.9	81.5	78.9
Thermal Efficiency % S.O.....	7.6	7.8	26.3	26.3
FUEL:				
Coal Consumed—tons.....			2,269,873	2,283,675
Average per unit sent out—lb.....			1.418	1.465
Calorific Value B. Th. U./lb.....			9,180	8,850
Total Cost—Rand.....			3,552,000	3,602,000
Cost per ton—Rand.....			1.56	1.58

RAND AND ORANGE FREE STATE UNDERTAKING

	Vaal Power Station		Vereeniging Power Station	
	1965	1964	1965	1964
Electricity Units Sent Out.....	2,065,833,437	2,029,735,725	605,861,730	616,777,905
Maximum Demand kW S.O. } One Hour.....	290,948	292,052	135,145	138,900
Load Factor %.....	81.0	79.1	51.2	50.6
Thermal Efficiency % S.O.....	20.9	20.8	14.4	14.5
FUEL:				
Coal Consumed—tons.....	1,983,907	1,960,470	863,030	894,284
Average per unit sent out—lb.....	1.921	1.932	2.849	2.900
Calorific Value B. Th. U./lb.....	8,500	8,500	8,310	8,230
Total Cost—Rand.....	2,065,000	2,045,000	914,000	940,000
Cost per ton—Rand.....	1.04	1.04	1.06	1.05
	Vierfontein Power Station		Wilge Power Station	
	1965	1964	1965	1964
Electricity Units Sent Out.....	1,721,897,217	1,807,195,056	1,585,198,163	1,533,277,399
Maximum Demand kW S.O. } One Hour.....	341,703	330,590	220,572	224,834
Load Factor %.....	57.5	67.6	82.0	77.6
Thermal Efficiency % S.O.....	22.4	22.4	25.1	24.8
FUEL:				
Coal Consumed—tons.....	1,476,529	1,519,988	1,129,314	1,100,488
Average per unit sent out—lb.....	1.715	1.682	1.425	1.436
Calorific Value B. Th. U./lb.....	8,890	9,040	9,550	9,640
Total Cost—Rand.....	2,282,000	2,159,000	1,118,000	1,057,000
Cost per ton—Rand.....	1.55	1.42	0.99	0.96

## MUNICIPAL ELECTRICITY SUPPLY SCHEMES

Reports submitted during the year by the Commission to the Administrators of the various Provinces on the proposal of local authorities to establish or to enlarge existing Undertakings were as follows:—

### New Schemes

### Extensions

#### TRANSVAAL:

Amsterdam

Bedfordview  
Johannesburg  
Piet Retief  
Pongola

#### CAPE:

Aliwal North  
Calvinia  
Carnarvon

Douglas  
Encobo  
Oudtshoorn  
Richmond  
Tarkastad

#### ORANGE FREE STATE:

Bethlehem  
Bloemfontein  
Koffiefontein  
Kroonstad  
Parys  
Wesselsbron

Up to 31st December, 1965, a total of 1,862 reports on municipal supply schemes had been submitted by the Commission. Of these 299 were in respect of new schemes, 935 were in respect of extension schemes and 628 were reports on tenders.

## ANNEXURES

The Commission submits for the 1965 with this Report:—

### ANNEXURE A: AUDITORS' REPORT AND ACCOUNTS

The Report of the Auditors.  
Balance Sheet.

Schedule No. 1—Expenditure on Capital Account.

Schedule No. 2—Investments of the Redemption Fund.

Schedule No. 3—Loan Capital.

Account No. 1—Redemption Fund Account.

Account No. 2—Reserve Fund Account.

Revenue Accounts in respect of:

Account No. 3—Cape Western Undertaking.

Account No. 4—Cape Northern Undertaking.

Account No. 5—Cape Eastern Undertaking.

Account No. 6—Border Undertaking.

Account No. 7—Natal Undertaking.

Account No. 8—Natal Southern Undertaking.

Account No. 9—Natal Central Undertaking.

Statement of Pooled Costs and Allocation for Natal Southern and Natal Central Undertakings.

Account No. 10—Eastern Transvaal Undertaking.

Account No. 11—Rand and Orange Free State Undertaking.

Statement of Pooled Costs and Allocation for Rand and Orange Free State and Eastern Transvaal Undertakings.

## ANNEXURE B: STATISTICAL AND OTHER STATEMENTS

Statement No. 1—Summary of principal plant and equipment installed at the Commission's undertakings as at 31st December, 1965.

Statement No. 2—Summary of principal plant and equipment in course of installation or on order as at 31st December, 1965.

Statement No. 3—Units sold to all consumers during the past forty-one years.

Statement No. 4—Units sold and number of consumers, 1965.

Statement No. 5—Power Station Statistics, 1965.

Statement No. 6—Power purchased, 1965.

Statement No. 7—Water consumed by power stations, 1965.

Statement No. 8—Showing the price or rent of land or rights or interests in or over land or other property acquired or hired by the Commission during the year 1965.

Statement No. 9—Coal used at the Commission's steamdriven power stations.

### ANNEXURE C: NATIONAL STATISTICS

Tables, illustrating the production and distribution of electricity, incorporating information supplied by courtesy of the Bureau of Census and Statistics (Pretoria).

Yours faithfully,



*Chairman.*

# THE REPORT OF THE AUDITORS

*The Chairman and Members,  
Electricity Supply Commission,  
Johannesburg.*

Johannesburg,  
21st July, 1966.

Gentlemen,

We have completed the audit of the books and accounts of the Commission for the year ended 31st December, 1965.

## Redemption Fund

In the course of our audit we have examined the position of the Redemption Fund established by the Commission in terms of the Schedule to the Electricity Act 1958 to provide for the redemption of the loans issued by the Commission.

In the records of the Commission the Fund is divided into sections corresponding to its Undertakings. The Commission has invested the moneys accruing to each section of the Fund in the investments prescribed in the Schedule to the Act, and in valuing the Fund at 31st December, 1965, we have taken into account the market value of the investments at that date. The value of the Fund at 31st December, 1965, was in excess of the sum required, in terms of the Schedule to the Act, for the redemption of the respective loans.

The redemption periods fixed by the Commission do not exceed 25 years from the dates of issue of the respective loans.

The Minister has fixed the dates from which provision for redemption of Loans Nos. 52 and 53 commenced at 1st July, 1965, and 1st May, 1966, respectively. In accordance with the usual practice provision has also been made for the redemption of moneys expended out of subsequent loans on works which had come into commercial operation before 31st December, 1965.

## Overseas Loans

Repayments of capital, in respect of Loans Nos. 20, 24 and 30, as laid down in the Loan Agreements, take the place of contributions to Redemption Fund

normally required to be made for loans issued by the Commission.

Loan No. 41, raised in Switzerland, is repayable by ten annual instalments, the first of which was paid during 1965. Provision is being made for repayment by setting aside amounts over the period of the loan, i.e. 15 years from February, 1959.

Loan No. 48 from the International Bank for Reconstruction and Development is repayable by half yearly instalments over a period of 8½ years from 1st December, 1963, but contributions are charged to Revenue Accounts of Undertakings on a 25 year sinking fund basis, the shortfall being met from local loans raised partly for this purpose.

Loan No. 57 was raised during the year in the Federal Republic of Germany and is repayable by ten annual instalments from 1971 to 1980, but provision is being made for repayment by setting aside amounts over the period of the loan, i.e. 15 years.

## Verification of Landed Properties, Rights and Investments

We have verified the existence of the titles of the landed properties and of the rights and investments as shown in the records of the Commission.

## Head Office Administration, Engineering and General Expenses

The net expenditure under this heading, after crediting Fees for reporting on Power Schemes of Local Authorities, and amounts chargeable to Revenue Accounts under other headings, has been allocated to—

- (a) Capital and Reserve Fund Expenditure.
- (b) Revenue Accounts of all Undertakings in commercial operation.

The amount allocated to Revenue Accounts of Undertakings has been apportioned by the Commission. We have no reason to disagree with the apportionment so made.

## Revenue Accounts

The following is a summary of the operations of the Commission's Undertakings for 1964 and 1965—

	<i>Surplus + Deficit -</i>		<i>Amounts set aside to Reserve Fund</i>	
	(In R1,000)		(In R1,000)	
	1964	1965	1964	1965
Cape Western.....	+ 44,000	- 179,000	582,000	600,000
Cape Northern.....	+ 137,000	+ 360,000	210,000	210,000
Cape Eastern.....	- 1,000	—	—	1,000
Border.....	+ 38,000	+ 90,000	90,000	90,000
Natal.....	+ 543,000	+ 351,000	970,000	1,000,000
Eastern Transvaal.....	+ 65,000	+ 237,000	822,000	1,072,000
Rand & O.F.S.....	- 716,000	- 1,573,000	3,836,000	3,945,000
	<u>+ R110,000</u>	<u>- R714,000</u>	<u>R6,510,000</u>	<u>R6,918,000</u>
Brought Forward from previous year.....		4,979,000		
Net Accumulated Surplus at end of year as detailed in Balance Sheet.....		<u>R4,265,000</u>		

Operations for the year resulted in a surplus at each of the Undertakings except at Cape Western and Rand and O.F.S. Undertakings, each of which had an accumulated surplus on revenue account exceeding the deficit for the year. The accumulated deficit carried forward at the Border Undertaking has now been reduced to R14,000. The accumulated surplus at Cape Northern Undertaking was increased to the relatively high figure of R1,078,000. A reduction in charges at this undertaking became effective in April, 1966.

#### **Reserve Fund**

In addition to the ordinary contributions to Reserve Fund mentioned in the previous paragraph, special contributions amounting to R636,000 were added to the fund in 1965 as provisions against certain contingencies such as machinery breakdown, storm damage etcetera. This amount is shown separately in the Reserve Fund Account.

#### **General**

As a result of our audit of the books and accounts of the Commission for the year 1965 and, subject

to the foregoing remarks, in terms of Section 18 (8) of the Electricity Act, 1958, we certify as follows:—

- (a) We have found the Accounts of the Commission to be in order.
- (b) The Accounts issued present a true and correct view of the financial position of the Commission and its transactions and of the results of trading.
- (c) Due provision has been made for the redemption and repayment of moneys borrowed by or advanced to the Commission.
- (d) As formerly, the Land and Rights, Buildings and Civil Works and Machinery and Plant are set out in the Balance Sheet on a cost basis.
- (e) Sums fixed by the Commission have been set aside to the Reserve Fund under Section 13 as prescribed.
- (f) All our requirements as Auditors have been complied with and carried out.

Yours faithfully,

**HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,**

*Chartered Accountants (S.A.)  
Auditors.*

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# **ACCOUNTS**

STATISTICAL AND OTHER STATEMENTS  
NATIONAL STATISTICS

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# Electricity Supply Commission

Established under the

Electricity Act, 1922

Balance sheet at

31st, December, 1965

1964					
R640,201,000	<b>Loans Outstanding</b> .....	R702,790,000			
40,109,000	(Schedule No. 3)				
54,892,000	<b>Loans Repaid Less Assets Sold</b> .....	56,521,000			
14,783,000					
	Loans repaid (Schedule No. 3).....	R71,586,000			
	Less: Cost of Assets sold proceeds credited to Redemption Fund.....	15,065,000			
175,658,000	<b>Redemption Fund</b> .....	187,534,000			
	(Account No. 1)				
50,575,000	<b>Reserve Fund</b> .....	59,093,000			
	(Account No. 2)				
4,979,000	<b>Balance on Revenue Accounts</b> .....	4,265,000			
	(Accounts Nos. 3 to 9)				
448,000	Cape Western Undertaking.....	269,000			
718,000	Cape Northern Undertaking.....	1,078,000			
Dr. 1 000	Cape Eastern Undertaking.....	Dr. 1,000			
Dr. 104,000	Border Undertaking.....	Dr. 14,000			
702,000	Natal Undertaking.....	1,053,000			
496,000	Eastern Transvaal Undertaking.....	733,000			
2,720,000	Rand & Orange Free State Undertaking.....	1,147,000			
26,571,000	<b>Creditors and Provisions</b> .....	33,840,000			
	Creditors.....	21,535,000			
14,996,000	Interest accrued on loans.....	7,123,000			
6,407,000	Provisions including provisions for repayment of overseas loans.....	5,182,000			
5,168,000					
3,246,000	<b>Temporary Borrowings</b>				
	Amount due to Bankers less Cash on Current Accounts and on hand.				
	NOTE:				
	In addition to the liabilities shown above the Commission is committed to the extent of approximately R354,400,000 expenditure on Capital Account, and R4,330,000 chargeable against Reserve Fund.				
	In addition to the annual contributions the Commission is committed to pay R130,000 annually to the Electricity Supply Commission Pension and Provident Fund for the period ending 31st December, 1969, and R22,000 during 1970.				
	The Commission has indemnified the Electricity Supply Commission Pension and Provident Fund against any loss resulting from the negligence, dishonesty or fraud on any of the Fund's officers or of the Trustees.				
<u>R941,339,000</u>		<u>R1,044,043,000</u>			

	<b>Capital Expenditure at Cost</b> .....	R741,109,000			1964
	(Schedule No. 1)				R679,193,000
	Land and Rights.....	R9,344,000			7,524,000
	Buildings and Civil Works.....	155,343,000			142,589,000
	Machinery and Plant.....	576,422,000			529,080,000
	<b>Stores and Movable Plant</b> .....	33,075,000			27,491,000
	Stores and Materials at cost.....	28,609,000			23,721,000
	Movable plant and equipment at cost less depreciation.....	4,466,000			3,770,000
	<b>Investment of Redemption Fund</b> .....	187,095,000			171,854,000
	(Schedule No. 2)				
	Nominal Value Market Value				
	1965 R188,700,000 R165,908,000				
	1964 R173,323,000 R165,607,000				
	<b>Investment of Reserve Fund</b> .....	57,146,000			49,306,000
	Stocks of Electricity Supply Commission, Republic of South Africa and Municipalities including Interest Accrued.				
	Nominal Value Market Value				
	1965 R57,554,000 R50,617,000				
	1964 R49,555,000 R48,059,000				
	<b>Sundry Investments</b> .....	4,155,000			4,168,000
	Electricity Supply Commission Swiss Loan Bonds including Interest Accrued.....	822,000			1,247,000
	Nominal Value Market Value				
	1965 R842,000 R848,000				
	1964 R1,328,000 R1,375,000				
	Entire Share capital of the Rand Mines Power Supply Company Limited.....	1,000			1,000
	Housing Loans to Employees secured by First Mortgages.....	3,332,000			2,920,000
	<b>Debtors and Payments in Advance</b> .....	10,070,000			9,327,000
	Debtors.....	9,742,000			9,144,000
	Payments in advance.....	328,000			183,000
	<b>Cash at Bankers and on Hand</b> .....	11,393,000			
		<u>R1,044,043,000</u>			<u>R941,339,000</u>

Johannesburg,  
31st March, 1966.

R. L. STRASZACKER, *Chairman*.  
J. A. BOTHMA, *Chief Accountant*.

Referred to in our report of 21st July, 1966

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN & CARTER  
Chartered Accountants (S.A.)  
Auditors.

# Electricity Supply Commission

## Schedule of Capital Expenditure at 31st December, 1965

Expenditure in connection with Electricity Undertakings	Total at 31st December, 1964	Year Ended 31st December, 1965	Total at 31st December, 1965
<b>Cape Western Undertaking</b>			
Land and Rights.....	R 827,000	R 72,000	R 899,000
Buildings and Civil Works.....	14,190,000	415,000	14,605,000
Machinery and Plant.....	56,053,000	3,359,000	59,412,000
	<b>R 71,070,000</b>	<b>R 3,846,000</b>	<b>R 74,916,000</b>
<b>Cape Northern Undertaking</b>			
Land and Rights.....	R 151,000	R 56,000	R 207,000
Buildings and Civil Works.....	543,000	59,000	602,000
Machinery and Plant.....	14,306,000	1,219,000	15,525,000
	<b>R 15,000,000</b>	<b>R 1,334,000</b>	<b>R 16,334,000</b>
<b>Cape Eastern Undertaking</b>			
Land and Rights.....	R 13,000	Cr. R 3,000	R 10,000
Buildings and Civil Works.....	17,000	16,000	33,000
Machinery and Plant.....	253,000	153,000	406,000
	<b>R 283,000</b>	<b>R 166,000</b>	<b>R 449,000</b>
<b>Border Undertaking</b>			
Land and Rights.....	R 44,000	R 17,000	R 61,000
Buildings and Civil Works.....	2,029,000	78,000	2,107,000
Machinery and Plant.....	10,116,000	570,000	10,686,000
	<b>R 12,189,000</b>	<b>R 665,000</b>	<b>R 12,854,000</b>
<b>Natal Undertaking</b>			
Land and Rights.....	R 1,125,000	R 97,000	R 1,222,000
Buildings and Civil Works.....	25,383,000	1,947,000	27,330,000
Machinery and Plant.....	88,844,000	5,724,000	94,568,000
	<b>R 115,352,000</b>	<b>R 7,768,000</b>	<b>R 123,120,000</b>
<b>Eastern Transvaal Undertaking</b>			
Land and Rights.....	R 1,228,000	R 103,000	R 1,331,000
Buildings and Civil Works.....	26,346,000	1,987,000	28,333,000
Machinery and Plant.....	78,607,000	15,769,000	94,376,000
	<b>R 106,181,000</b>	<b>R 17,859,000</b>	<b>R 124,040,000</b>

Expenditure in connection with Electricity Undertakings	Total at 31st December, 1964	Year Ended 31st December, 1965	Total at 31st December, 1965
<b>Rand and Orange Free State Undertaking</b>			
Land and Rights.....	R 3,613,000	R 778,000	R 4,391,000
Buildings and Civil Works.....	69,904,000	7,684,000	77,588,000
Machinery and Plant.....	280,901,000	20,548,000	301,449,000
	<b>R 354,418,000</b>	<b>R 29,010,000</b>	<b>R 383,428,000</b>
<b>Head Office</b>			
Land.....	R 523,000	R 700,000	R 1,223,000
Buildings and Equipment.....	4,177,000	568,000	4,745,000
	<b>R 4,700,000</b>	<b>R 1,268,000</b>	<b>R 5,968,000</b>
<b>Summary</b>			
Land and Rights.....	R 7,524,000	R 1,820,000	R 9,344,000
Buildings and Civil Works.....	142,589,000	12,754,000	155,343,000
Machinery and Plant.....	529,080,000	47,342,000	576,422,000
	<b>R 679,193,000</b>	<b>R 61,916,000</b>	<b>R 741,109,000</b>

# Electricity Supply Commission

SCHEDULE No. 2

Schedule of Investments of the Redemption fund at

31st December, 1965

INVESTMENTS		Nominal Value	Book Value
LOCAL REGISTERED STOCKS			
<b>Electricity Supply Commission</b>			
3¼ per cent	1956/66	R 1,122,000	R 1,048,000
3½ per cent	1957/67	923,000	868,000
3½ per cent	1961/66	1,454,000	1,373,000
3½ per cent	1965/70	1,271,000	1,213,000
3 per cent	1967/73	1,372,000	1,291,000
3 per cent	1968/74	2,386,000	2,307,000
3½ per cent	1968/73	13,624,000	13,476,000
3½ per cent	1969/74	690,000	648,000
3½ per cent	1969/74	208,000	189,000
3½ per cent	1965/67	720,000	684,000
3½ per cent	1964/67	2,540,000	2,418,000
3½ per cent	1964/68	705,000	661,000
4¼ per cent	1964/67	1,960,000	1,911,000
5 per cent	1966/68	1,320,000	1,303,000
5 per cent	1967/69	1,384,000	1,363,000
5 per cent	1968/70	1,501,000	1,474,000
5 per cent	1967/70	5,770,000	5,650,000
5 per cent	1971/74	1,952,000	1,918,000
5 per cent	1971/75	3,535,000	3,476,000
4½ per cent	1975/80	9,789,000	9,738,000
4½ per cent	1975/80	8,163,000	8,105,000
5½ per cent	1976/81	4,888,000	4,800,000
5½ per cent	1977/82	1,004,000	986,000
5½ per cent	1976/82	3,934,000	3,877,000
5½ per cent	1977/83	10,072,000	9,978,000
5½ per cent	1978/83	3,841,000	3,792,000
5½ per cent	1979/84	5,069,000	5,037,000
5½ per cent	1979/84	7,010,000	6,855,000
5½ per cent	1979/85	5,996,000	5,889,000
5½ per cent	1980/85	7,106,000	6,983,000
5½ per cent	1980/86	5,035,000	4,904,000
5½ per cent	1981/86	7,343,000	7,292,000
6¼ per cent	1981/86	6,178,000	6,115,000
6¼ per cent	1982/87	6,291,000	6,236,000
5½ per cent	1982/87	6,389,000	6,310,000
5 per cent	1983/88	10,297,000	10,206,000
5 per cent	1980/83	6,295,000	6,119,000
5 per cent	1982/84	3,655,000	3,552,000
5½ per cent	1982/84	3,119,000	3,049,000
5½ per cent	1983/85	10,101,000	9,918,000
6½ per cent	1983/85	6,539,000	6,360,000
<b>Republic of South Africa</b>			
3 per cent	1957/66	1,070,000	1,042,000
3 per cent	1958/68	30,000	30,000
3 per cent	1959/69	200,000	188,000
3 per cent	1960/70	687,000	659,000
5½ per cent	1979	300,000	300,000
6 per cent	1985	500,000	499,000
<i>Carried forward</i>		<u>R 185,338,000</u>	<u>R 182,090,000</u>

Johannesburg,  
31st March, 1966.

	Nominal Value	Book Value
<i>Brought forward</i>	R 185,338,000	R 182,090,000
<b>Municipal — Johannesburg</b>		
3¼ per cent 1956/66	3,000	3,000
3½ per cent 1962/67	258,000	234,000
3½ per cent 1965/70	588,000	567,000
3 per cent 1967/77	60,000	60,000
5½ per cent 1974/79	194,000	193,000
<b>Municipal — Cape Town</b>		
3½ per cent 1962/67	450,000	445,000
3 per cent 1976	200,000	190,000
5½ per cent 1980/85	300,000	296,000
<b>Municipal — Durban</b>		
3½ per cent 1962/72	231,000	180,000
3½ per cent 1965/75	90,000	82,000
3½ per cent 1966/76	100,000	100,000
3 per cent 1967/77	668,000	635,000
5½ per cent 1974/79	120,000	118,000
<b>Municipal — Bloemfontein</b>		
5½ per cent 1975/80	80,000	79,000
<b>Municipal — Germiston</b>		
5½ per cent 1985	20,000	20,000
	<u>R 188,700,000</u>	<u>R 185,292,000</u>
<b>Interest Accrued</b>		1,803,000
		<u>R 187,095,000</u>
<b>Market Value</b>	<u>R 165,908,000</u>	
<b>ALLOCATION OF INVESTMENTS TO UNDERTAKINGS</b>		
	Nominal Value	Book Value including Interest accrued
Cape Western Undertaking	R 20,635,000	R 20,492,000
Cape Northern Undertaking	2,795,000	2,773,000
Cape Eastern Undertaking	6,000	6,000
Border Undertaking	3,423,000	3,392,000
Natal Undertaking	28,924,000	28,648,000
Eastern Transvaal Undertaking	10,729,000	10,639,000
Rand and Orange Free State Undertaking	112,859,000	111,804,000
Undertaking which has been sold	6,500,000	6,526,000
Head Office	2,829,000	2,815,000
	<u>R 188,700,000</u>	<u>R 187,095,000</u>

J. A. BOTHMA, Chief Accountant.

# Electricity Supply Commission

Loans at 31st December, 1965

Loans Nos. 1 and 2 R16,000,000 repaid out of subsequent loans		Outstanding	Repaid
Loan No.	Local Registered Stocks		
3	R1,000,000 4½ per cent 1953/63		R 1,000,000
4	R5,000,000 4½ per cent 1953		5,000,000
5	R13,500,000 3½ per cent 1954/64		13,500,000
6	R5,000,000 3½ per cent 1959/64		5,000,000
7	R4,000,000 3½ per cent 1956/66	R 4,000,000	
8	R4,000,000 3½ per cent 1957/67	4,000,000	
9	R4,000,000 3½ per cent 1959/64		4,000,000
10	R3,000,000 3½ per cent 1960/65		3,000,000
11	R4,000,000 3½ per cent 1961/66	4,000,000	
12	R5,000,000 3½ per cent 1965/70	5,000,000	
13	R6,000,000 3 per cent 1967/73	6,000,000	
14	R6,000,000 3 per cent 1968/74	6,000,000	
15	R30,000,000 3½ per cent 1968/73	30,000,000	
16	R6,000,000 3½ per cent 1969/74	6,000,000	
17	R6,000,000 3½ per cent 1969/74	6,000,000	
18	R10,500,000 3½ per cent 1965/67	10,500,000	
19	R6,000,000 3½ per cent 1964/67	6,000,000	
21	R10,000,000 3½ per cent 1964/68	10,000,000	
22	R9,000,000 4½ per cent 1964/67	9,000,000	
23	R10,000,000 5 per cent 1964/67		10,000,000
25	R7,000,000 5 per cent 1966/68	7,000,000	
26	R8,000,000 5 per cent 1967/69	8,000,000	
27	R8,500,000 5 per cent 1968/70	8,500,000	
29	R16,000,000 5 per cent 1967/70	16,000,000	
31	R16,000,000 5 per cent 1971/74	16,000,000	
32	R20,000,000 5 per cent 1971/75	20,000,000	
33	R16,000,000 4½ per cent 1975/80	16,000,000	
34	R16,000,000 4½ per cent 1975/80	16,000,000	
35	R16,500,000 5½ per cent 1976/81	16,500,000	
36	R20,000,000 5½ per cent 1977/82	20,000,000	
37	R22,000,000 5½ per cent 1976/82	22,000,000	
38	R24,000,000 5½ per cent 1977/83	24,000,000	
39	R24,000,000 5½ per cent 1978/83	24,000,000	
40	R22,000,000 5½ per cent 1979/84	22,000,000	
42	R20,000,000 5½ per cent 1979/84	20,000,000	
43	R16,000,000 5½ per cent 1979/85	16,000,000	
44	R16,000,000 5½ per cent 1980/85	16,000,000	
45	R17,000,000 5½ per cent 1980/86	17,000,000	
46	R16,000,000 5½ per cent 1981/86	16,000,000	
47	R18,000,000 6¼ per cent 1981/86	18,000,000	
49	R18,000,000 6½ per cent 1982/87	18,000,000	
50	R22,000,000 5½ per cent 1982/87	22,000,000	
51	R29,000,000 5 per cent 1983/88	29,000,000	
52	R40,000,000 5 per cent 1980/83	40,000,000	
53	R20,000,000 5 per cent 1982/84	20,000,000	
54	R20,000,000 5½ per cent 1982/84	20,000,000	
55	R32,000,000 5½ per cent 1983/85	32,000,000	
56	R38,000,000 6½ per cent 1983/85	38,000,000	
	<b>R706,000,000 Total Local Registered Stocks</b>	<b>R 664,500,000</b>	<b>R 41,500,000</b>

Loan No.	Description	Outstanding	Repaid
	R706,000,000 Brought forward	R 664,500,000	R 41,500,000
<b>INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT</b>			
20	R21,465,000 \$30,000,000 4 per cent. Repayable by half-yearly instalments 1954/70	7,870,000	13,595,000
28	R2,822,000 \$30,000,000 4½ per cent. Repayable by half-yearly instalments 1955/63. Less repaid out of local loans.	R 21,454,000 18,632,000	R 2,822,000
48	R8,140,000 \$14,000,000 5½ per cent. Repayable by half-yearly instalments 1963/71. Less repaid out of local loans.	R 10,012,000 1,872,000	R 8,140,000
		7,550,000	590,000
<b>EXPORT-IMPORT BANK OF WASHINGTON</b>			
24	R14,016,000 \$19,600,000 4 per cent. Repayable by half-yearly instalments 1956/70	5,622,000	8,394,000
<b>COMMONWEALTH DEVELOPMENT FINANCE COMPANY LIMITED</b>			
30	R4,000,000 5 per cent. Repayable by half-yearly instalments 1954/68	880,000	3,120,000
<b>SWISS LOAN</b>			
41	R8,275,000 Swiss Francs 50,000,000 5 per cent. Repayable by annual instalments 1965/74	7,447,000	828,000
<b>GERMAN LOAN</b>			
57	R8,921,000 German Marks 50,000,000 6½ per cent. Repayable by annual instalments 1971/80	8,921,000	
	<b>R773,639,000</b>	<b>R 702,790,000</b>	<b>R 70,849,000</b>
	Sundry Loans		737,000
			<b>R71,586,000</b>

# Electricity Supply Commission

Redemption Fund Account for the

Year ended 31st December, 1965

1964				
R9,000,000	<b>Repayment of Local Registered Stock</b> .....		R13,000,000	
5,000,000	3½ per cent 1959/64 (Loan No. 6)			
4,000,000	3½ per cent 1959/64 (Loan No. 9)			
	3½ per cent 1960/65 (Loan No. 10) .....	R3,000,000		
	5 per cent 1964/67 (Loan No. 23) .....	10,000,000		
175,658,000	<b>Balance as per Balance Sheet</b> .....		187,534,000	
18,945,000	Cape Western Undertaking .....	20,556,000		
2,348,000	Cape Northern Undertaking .....	2,797,000		
1,000	Cape Eastern Undertaking .....	8,000		
2,995,000	Border Undertaking .....	3,417,000		
25,878,000	Natal Undertaking .....	28,783,000		
8,308,000	Eastern Transvaal Undertaking .....	10,627,000		
107,994,000	Rand and Orange Free State Undertaking .....	112,018,000		
2,689,000	Head Office .....	2,828,000		
6,500,000	Original Cost of an Undertaking which has been sold .....	6,500,000		
<u>R184,658,000</u>			<u>R200,534,000</u>	

As from the 1st April, 1964, the Natal Southern and Natal Central Undertakings were combined to form the Natal Undertaking.

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

				1964
	<b>Balance Brought Forward</b> .....		R175,658,000	R161,671,000
	Cape Western Undertaking .....	R18,945,000		16,969,000
	Cape Northern Undertaking .....	2,348,000		1,965,000
	Cape Eastern Undertaking .....	1,000		—
	Border Undertaking .....	2,995,000		2,538,000
	Natal Undertaking .....	25,878,000		—
	Natal Southern Undertaking .....	—		14,985,000
	Natal Central Undertaking .....	—		7,588,000
	Eastern Transvaal Undertaking .....	8,308,000		6,212,000
	Rand and Orange Free State Undertaking .....	107,994,000		102,341,000
	Head Office .....	2,689,000		2,573,000
	Assets Sold .....	6,500,000		6,500,000
	<b>Amounts Contributed During the Year as per Revenue Accounts</b> .....		15,847,000	14,936,000
	Cape Western Undertaking .....	1,752,000		1,688,000
	Cape Northern Undertaking .....	391,000		276,000
	Cape Eastern Undertaking .....	6,000		1,000
	Border Undertaking .....	321,000		315,000
	Natal Undertaking .....	2,725,000		1,874,000
	Natal Southern Undertaking .....	—		324,000
	Natal Central Undertaking .....	—		213,000
	Eastern Transvaal Undertaking .....	2,120,000		1,827,000
	Rand and Orange Free State Undertaking .....	8,532,000		8,418,000
	<b>Other Contributions</b> .....		98,000	70,000
	<b>Proceeds of Sales of Fixed Property</b> .....		143,000	64,000
	<b>Profit on Redemption of Investments</b> .....		112,000	105,000
	<b>Interest Earned on Investments</b> .....		8,676,000	7,812,000
			<u>R200,534,000</u>	<u>R184,658,000</u>

We hereby certify that we are satisfied as to the correctness of the Accounts and Books of the Redemption Fund and as to the maintenance of the Fund at the amount required by the Schedule to the Electricity Act 1958, subject to the remarks contained in our report dated 21st July, 1966.

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN & CARTER  
*Chartered Accountants (S.A.)*  
Auditors.

# Electricity Supply Commission

Reserve Fund Account for the

Year ended 31st December, 1965

1964		
R973,000	<b>Expenditure During the Year on Replacements and Betterment.....</b>	R1,885,000
158,000	Cape Western Undertaking.....	R238,000
29,000	Cape Northern Undertaking.....	2,000
57,000	Border Undertaking.....	24,000
174,000	Natal Undertaking.....	668,000
14,000	Natal Southern Undertaking.....	
21,000	Natal Central Undertaking.....	
138,000	Eastern Transvaal Undertaking.....	170,000
382,000	Rand and Orange Free State Undertaking.....	783,000
50,575,000	<b>Balance as per Balance Sheet.....</b>	59,093,000
4,815,000	Cape Western Undertaking.....	5,500,000
1,175,000	Cape Northern Undertaking.....	1,459,000
—	Cape Eastern Undertaking.....	1,000
682,000	Border Undertaking.....	801,000
6,901,000	Natal Undertaking.....	7,713,000
3,070,000	Eastern Transvaal Undertaking.....	4,184,000
33,932,000	Rand and Orange Free State Undertaking.....	39,435,000
<u>R51,548,000</u>		<u>R60,978,000</u>

As from the 1st April, 1964, the Natal Southern and Natal Central Undertakings were combined to form the Natal Undertaking.

Johannesburg,  
31st March, 1966.

		1964
	<b>Balance Brought Forward.....</b>	R42,643,000
	Cape Western Undertaking.....	4,160,000
	Cape Northern Undertaking.....	940,000
	Border Undertaking.....	615,000
	Natal Undertaking.....	—
	Natal Southern Undertaking.....	2,915,000
	Natal Central Undertaking.....	2,896,000
	Eastern Transvaal Undertaking.....	2,252,000
	Rand and Orange Free State Undertaking.....	28,865,000
	<b>Amounts set aside during the Year as per Revenue Accounts.....</b>	6,510,000
	Cape Western Undertaking.....	582,000
	Cape Northern Undertaking.....	210,000
	Cape Eastern Undertaking.....	—
	Border Undertaking.....	90,000
	Natal Undertaking.....	602,000
	Natal Southern Undertaking.....	360,000
	Natal Central Undertaking.....	8,000
	Eastern Transvaal Undertaking.....	822,000
	Rand and Orange Free State Undertaking.....	3,836,000
	<b>Special Contributions set aside during the year.....</b>	—
	Cape Western Undertaking.....	55,000
	Cape Northern Undertaking.....	8,000
	Border Undertaking.....	15,000
	Natal Undertaking.....	100,000
	Eastern Transvaal Undertaking.....	24,000
	Rand and Orange Free State Undertaking.....	434,000
	<b>Interest Earned on Investments.....</b>	2,395,000
	<b>Profit on Redemption of Investments.....</b>	—
	<u>R60,978,000</u>	<u>R51,548,000</u>

J. A. BOTHMA, Chief Accountant.

# Electricity Supply Commission

Cape Western Undertaking

Revenue Account for the Year ended 31st December, 1965

1964					1964
R4,892,000	<b>Generation</b> .....		R5,392,000	<b>Sales of Electricity</b> .....	R13,160,000
3,811,000	Operation—			Traction Supplies.....	R3,555,000
87,000	Fuel.....	R4,214,000		Bulk Supplies.....	2,412,000
357,000	Water and Stores.....	98,000		Industrial Supplies.....	4,438,000
55,000	Salaries and Wages.....	423,000 *		Domestic and Lighting Supplies.....	2,755,000
	Other Expenses.....	60,000 *			
71,000	Maintenance—			<b>Other Revenue</b> .....	39,000
415,000	Stores.....	72,000 *			
96,000	Salaries and Wages.....	466,000 *		Balance carried down.....	13,199,000
	Other Expenses.....	59,000 *			179,000
779,000	<b>Distribution</b> .....		892,000		
67,000	Operation and Maintenance—				
564,000	Stores.....	75,000			
148,000	Salaries and Wages.....	664,000			
	Other Expenses.....	153,000			
1,227,000	<b>General Expenses</b> .....		1,379,000		
443,000	Local Administration and Technical Management.....	467,000			
571,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, Special Contributions to Reserve Fund etc.).....	680,000			
115,000	Head Office Administration Expenses.....	129,000			
98,000	Head Office Engineering Expenses.....	103,000			
5,524,000	<b>Capital Charges</b> .....		5,715,000		
3,095,000	Interest.....	3,198,000			
1,688,000	Redemption Fund.....	1,752,000			
159,000	Instalments and Provision for Repayment of Overseas and Sundry Loans	165,000			
582,000	Reserve Fund.....	600,000			
12,422,000					
44,000	Balance carried down				
<u>R12,466,000</u>			<u>R13,378,000</u>		<u>R13,378,000</u>
	Balance brought down.....		R179,000		R448,000
R448,000	Balance as per Balance Sheet.....		269,000		44,000
<u>R448,000</u>			<u>R448,000</u>		<u>R448,000</u>

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our report of 21st July, 1966.

HALSEY, BUTTON & PERRY  
ALEX, AIKEN & CARTER  
*Chartered Accountants (S.A.)  
Auditors.*

# Electricity Supply Commission

Cape Northern

Undertaking

Revenue Account for the Year

ended 31st December, 1965

1964		R1,716,000
R1,481,000	<b>Generation</b> .....	R1,716,000
1,008,000	Proportion of Pooled Costs of Rand and Orange Free State and Eastern Transvaal Undertakings .....	R1,317,000
124,000	Proportion of Transmission Costs charged by Rand and Orange Free State Undertaking .....	174,000
198,000	Operation—	
27,000	Fuel .....	98,000
64,000	Water and Stores .....	15,000
13,000	Salaries and Wages .....	65,000
	Other Expenses .....	7,000
34,000	Maintenance—	
4,000	Stores .....	3,000
9,000	Salaries and Wages .....	34,000
	Other Expenses .....	3,000
111,000	<b>Distribution</b> .....	132,000
21,000	Operation and Maintenance—	
59,000	Stores .....	24,000
31,000	Salaries and Wages .....	77,000
	Other Expenses .....	31,000
178,000	<b>General Expenses</b> .....	190,000
60,000	Local Administration and Technical Management .....	63,000
63,000	General Expenses (including Stores Expenses, Rates, Insurances, Pension Fund Contributions, Special Contributions to Reserve Fund, etc.) .....	67,000
30,000	Head Office Administration Expenses .....	33,000
25,000	Head Office Engineering Expenses .....	27,000
1,038,000	<b>Capital Charges</b> .....	1,337,000
552,000	Interest .....	736,000
276,000	Redemption Fund .....	391,000
210,000	Reserve Fund .....	210,000
2,808,000	Balance carried down .....	3,375,000
137,000		360,000
<u>R2,945,000</u>		<u>R3,735,000</u>
R718,000	Balance as per Balance Sheet .....	R1,078,000
<u>R718,000</u>		<u>R1,078,000</u>

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

		R3,731,000	1964
	<b>Sales of Electricity</b> .....	R3,731,000	R2,942,000
	Traction Supplies .....	R409,000	24,000
	Bulk Supplies .....	824,000	775,000
	Mining Supplies .....	1,767,000	1,496,000
	Industrial Supplies .....	548,000	491,000
	Domestic and Lighting Supplies .....	183,000	156,000
	<b>Other Revenue</b> .....	4,000	3,000
	Balance brought forward .....	R3,735,000	R2,945,000
	Balance brought down .....	R718,000	R581,000
		360,000	137,000
		<u>R1,078,000</u>	<u>R718,000</u>

Referred to in our report of 21st July, 1966.

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN, & CARTER  
*Chartered Accountants (S.A.)  
Auditors.*



# Electricity Supply

Cape Eastern

Revenue Account for the Year

1964			
R6,000	Electricity Purchased .....		R18,000
2,000	Distribution .....		5,000
	Operation and Maintenance—		
—	Stores .....	R1,000	
1,000	Salaries and Wages .....	2,000	
1,000	Other Expenses .....	2,000	
6,000	General Expenses .....		11,000
3,000	Local Administration and Technical Management .....	5,000	
3,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, Special Contributions to Reserve Fund, etc.) .....	5,000	
	Head Office Administration Expenses .....	1,000	
4,000	Capital Charges .....		21,000
3,000	Interest .....	14,000	
1,000	Redemption Fund .....	6,000	
—	Reserve Fund .....	1,000	
<u>R18,000</u>			<u>R55,000</u>
R1,000	Balance brought down .....		R1,000
	Balance brought forward .....		
<u>R1,000</u>			<u>R1,000</u>

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

# Commission

Undertaking

ended 31st December, 1965

			1964
	Sales of Electricity .....	R55,000	R17,000
	Bulk Supplies .....	R19,000	10,000
	Industrial Supplies .....	20,000	6,000
	Domestic Supplies .....	16,000	1,000
	Balance carried down .....		1,000
		<u>R55,000</u>	<u>R18,000</u>
	Balance as per Balance Sheet .....	R1,000	R1,000
		<u>R1,000</u>	<u>R1,000</u>

Referred to in our Report of 21st July, 1966.

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN & CARTER  
*Chartered Accountants (S.A.)  
Auditors.*

# Electricity Supply Commission

ACCOUNT No. 6

Border Undertaking

Revenue Account for the Year

ended 31st December 1965

1964					1964
R1,144,000	<b>Generation</b> .....		R1,292,000	<b>Sales of Electricity</b> .....	R2,764,000
804,000	Operation—			Bulk Supplies.....	R2,162,000
12,000	Fuel.....	R892,000		Industrial Supplies.....	300,000
146,000	Water and Stores.....	13,000		Domestic and Lighting Supplies.....	302,000
9,000	Salaries and Wages.....	178,000			
37,000	Other Expenses.....	11,000		<b>Other Revenue</b> .....	3,000
106,000	Maintenance—				4,000
30,000	Stores.....	48,000			
	Salaries and Wages.....	128,000			
	Other Expenses.....	22,000			
131,000	<b>Distribution</b> .....		156,000		
19,000	Operation and Maintenance—				
86,000	Stores.....	19,000			
26,000	Salaries and Wages.....	104,000			
	Other Expenses.....	33,000			
180,000	<b>General Expenses</b> .....		221,000		
72,000	Local Administration and Technical Management.....	90,000			
87,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, Special Contributions to Reserve Fund, etc.).....	109,000			
11,000	Head Office Administration Expenses.....	12,000			
10,000	Head Office Engineering Expenses.....	10,000			
990,000	<b>Capital Charges</b> .....		1,008,000		
584,000	Interest.....	597,000			
315,000	Redemption Fund.....	321,000			
1,000	Instalments and Provision for Repayment of Overseas and Sundry Loans Reserve Fund.....	90,000			
90,000					
2,445,000			2,677,000		
38,000	Balance carried down.....		90,000		
<u>R2,483,000</u>			<u>R2,767,000</u>		
R142,000	Balance brought forward.....		R104,000		
<u>R142,000</u>			<u>R104,000</u>		
				Balance brought down.....	R90,000
				Balance as per Balance Sheet.....	14,000
					<u>R104,000</u>
					<u>R2,483,000</u>
					<u>R38,000</u>
					<u>104,000</u>
					<u>R142,000</u>

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our report of 21st July, 1966.

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN & CARTER  
*Chartered Accountants (S.A.)  
Auditors.*



# Electricity Supply Commission

Eastern Transvaal Undertaking

Revenue Account for the Year ended 31st December, 1965

1964					
R4,781,000	<b>Generation</b> .....			R5,857,000	
4,761,000	Proportion of Pooled Costs (Statement attached).....	R5,854,000			
13,000	Other Operation and Maintenance Costs—				
5,000	Operation—				
2,000	Salaries and Wages.....	1,000			
	Other Expenses.....	1,000			
	Maintenance—				
	Salaries and Wages.....	1,000			
230,000	<b>Electricity Purchased</b> .....			238,000	
2,000	Electricity Purchased.....	—			
228,000	Electricity Supplied by Rand and Orange Free State Undertaking.....	238,000			
391,000	<b>Distribution</b> .....			453,000	
57,000	Operation and Maintenance—				
234,000	Stores.....	50,000			
100,000	Salaries and Wages.....	302,000			
	Other Expenses.....	101,000			
399,000	<b>General Expenses</b> .....			453,000	
257,000	Local Administration and Technical Management.....	286,000			
384,000	General Expenses (including Maintenance of Quarters, Stores Expenses,				
137,000	Rates, Insurance, Pension Fund Contributions, Special Contributions to				
116,000	Reserve Fund, etc.) .....	480,000			
894,000	Head Office Administration Expenses.....	154,000			
495,000	Head Office Engineering Expenses.....	122,000			
	Less Charged to Pooled Costs.....	1,042,000			
		589,000			
1,981,000	<b>Capital Charges</b> .....			2,336,000	
3,849,000	Interest.....	4,832,000			
1,827,000	Redemption Fund.....	2,120,000			
161,000	Instalments and Provision for Repayment of Overseas Loans.....	444,000			
822,000	Reserve Fund.....	1,072,000			
6,659,000	Less Charged to Pooled Costs.....	8,468,000			
4,678,000		6,132,000			
7,782,000	Balance carried down.....			9,337,000	
65,000				237,000	
<u>R7,847,000</u>				<u>R9,574,000</u>	
R496,000	Balance as per Balance Sheet.....			R733,000	
<u>R496,000</u>				<u>R733,000</u>	

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

	<b>Sales of Electricity</b> .....			R9,485,000	1964 R7,752,000
	Traction Supplies.....	R684,000			488,000
	Bulk Supplies.....	501,000			426,000
	Mining Supplies.....	3,296,000			2,960,000
	Industrial Supplies.....	4,606,000			3,509,000
	Domestic and Lighting Supplies.....	398,000			369,000
	<b>Other Revenue</b> .....			89,000	95,000
	Other Revenue.....	145,000			154,000
	Less Credited to Pooled Costs.....	56,000			59,000
	Balance brought forward.....			R9,574,000	R7,847,000
	Balance brought down.....			R496,000	R431,000
				237,000	65,000
				<u>R733,000</u>	<u>R496,000</u>

Referred to in our Report of 21st July, 1966.

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN & CARTER  
*Chartered Accountants (S.A.)  
Auditors.*

# Electricity Supply Commission

Rand and Orange Free State Undertaking

Revenue Account for the Year ended 31st December, 1965

1964		R51,950,000
R49,058,000	<b>Generation</b> .....	
48,610,000	Proportion of Pooled Costs (Statement attached) .....	R51,474,000
	Other Operation and Maintenance Costs	
	Operation—	
157,000	Fuel .....	159,000
31,000	Water and Stores .....	27,000
122,000	Salaries and Wages .....	138,000
2,000	Other Expenses .....	3,000
	Maintenance—	
24,000	Stores .....	25,000
109,000	Salaries and Wages .....	122,000
3,000	Other Expenses .....	2,000
2,476,000	<b>Distribution</b> .....	2,677,000
	Operation and Maintenance—	
601,000	Stores .....	576,000
1,924,000	Salaries and Wages .....	2,231,000
152,000	Other Expenses .....	126,000
2,677,000		2,933,000
	Less charged to:—	
77,000	Pooled Costs (Interconnector) .....	82,000
124,000	Cape Northern Undertaking .....	174,000
1,099,000	<b>General Expenses</b> .....	1,246,000
	Local Administration and Technical Management .....	978,000
	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, Special Contributions to Reserve Fund, etc.) .....	2,156,000
1,753,000	Head Office Administration Expenses .....	316,000
281,000	Head Office Engineering Expenses .....	252,000
239,000		3,702,000
3,210,000	Less Charged to Pooled Costs .....	2,456,000
2,111,000		
10,749,000	<b>Capital Charges</b> .....	11,432,000
	Interest .....	15,348,000
15,253,000	Redemption Fund .....	8,532,000
8,418,000	Instalments and Provision for Repayment of Overseas Loans .....	2,823,000
2,770,000	Reserve Fund .....	3,945,000
3,836,000		30,648,000
30,277,000	Less Charged to Pooled Costs .....	19,216,000
19,528,000		
<u>R63,382,000</u>		<u>R67,305,000</u>
R716,000	Balance brought down .....	R1,573,000
2,720,000	Balance as per Balance Sheet .....	1,147,000
<u>R3,436,000</u>		<u>R2,720,000</u>

1964		R64,417,000	R61,288,000
	<b>Sales of Electricity</b> .....		
	Traction Supplies .....	R3,517,000	2,927,000
	Bulk Supplies .....	9,550,000	8,821,000
	Mining Supplies .....	35,940,000	35,570,000
	Industrial Supplies .....	13,923,000	12,813,000
	Domestic and Lighting Supplies .....	1,487,000	1,157,000
	<b>Sales of Air and Steam</b> .....	1,024,000	1,078,000
	<b>Electricity Supplied to Undertakings</b> .....	241,000	232,000
	Eastern Transvaal Undertaking .....	238,000	228,000
	Natal Undertaking .....	3,000	4,000
	<b>Other Revenue</b> .....	50,000	68,000
	Other Revenue .....	258,000	268,000
	Less Credited to Pooled Costs .....	208,000	200,000
	<b>Balance carried down</b> .....	65,732,000	62,666,000
		1,573,000	716,000
	<b>Balance brought forward</b> .....	R2,720,000	R3,436,000
		<u>R2,720,000</u>	<u>R3,436,000</u>

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our Report of 21st July, 1966.

HALSEY, BUTTON & PERRY  
ALEX. AIKEN & CARTER  
*Chartered Accountants (S.A.)  
Auditors.*

# Electricity Supply Commission

Rand and Orange Free State

and Eastern Transvaal Undertakings

Statement of Pooled Costs and

Allocation for the Year ended 31st December, 1965

1964		R30,112,000
R27,670,000	<b>Generation</b> .....	
	Operation—	
20,696,000	Fuel.....	R21,902,000
439,000	Water and Stores.....	545,000
2,551,000	Salaries and Wages.....	2,917,000
312,000	Other Expenses.....	322,000
	Maintenance—	
1,334,000	Stores.....	1,522,000
2,221,000	Salaries and Wages.....	2,694,000
117,000	Other Expenses.....	210,000
	<b>Electricity Purchased</b> .....	322,000
79,000	<b>Interconnector</b> .....	82,000
	Operation and Maintenance—	
17,000	Stores.....	15,000
55,000	Salaries and Wages.....	63,000
5,000	Other Expenses.....	4,000
	<b>General Expenses</b> .....	3,045,000
2,606,000		
788,000	Local Administration and Technical Management.....	826,000
1,330,000	General Expenses (including Stores Expenses, Rates, Insurance, Pension	
488,000	Fund Contributions, Special Contributions to Reserve Fund, etc.).....	1,688,000
	Head Office Administration and Engineering Expenses.....	531,000
	<b>Capital Charges</b> .....	25,348,000
24,206,000		
12,309,000	Interest.....	12,838,000
6,374,000	Redemption Fund.....	6,497,000
2,674,000	Instalments and Provision for Repayment of Overseas Loans.....	3,006,000
2,849,000	Reserve Fund.....	3,007,000
		<u>R58,909,000</u>
<u>R54,638,000</u>		

Johannesburg,  
31st March, 1966.

J. A. BOTHMA, *Chief Accountant.*

	R264,000	1964
<b>Sundry Revenue</b> .....	R264,000	R259,000
<b>Allocation</b> .....	58,645,000	54,379,000
Rand and Orange Free State Undertaking.....	R51,474,000	48,610,000
Eastern Transvaal Undertaking.....	5,854,000	4,761,000
Cape Northern Undertaking.....	1,317,000	1,008,000
		<u>R54,638,000</u>
	<u>R58,909,000</u>	

Referred to in our Report of 21st July, 1966.

HALSEY, BUTTON & PERRY,  
ALEX, AIKEN & CARTER  
*Chartered Accountants (S.A.)*  
*Auditors.*

# Electricity Supply Commission

## ANNEXURE B

POWER STATIONS: PRINCIPAL EQUIPMENT INSTALLED AS AT 31ST DECEMBER 1965

Undertaking and Area (sq. miles)	Electric Power Station	Type	STATION CAPACITY		BOILERS		MAIN GENERATORS		HOUSE SETS	
			Boilers Thousand lb/hr.	Generators MW	No.	Continuous Maximum Rating Each Thousand lb/hr.	No.	Normal Rating Each MW	No.	Normal Rating Each MW
Border (21,500)	King William's Town	Steam	10·0 36·0	3·0	1 3	10·0 12·0	2	1·5		
	King William's Town Total.....	Oil	46·0 —	3·0 1·0	4 —		2 1	1·0		
			46·0	4·0	4		3			
	West Bank No. 1	Steam	129·0 220·0	1·5 8·0 22·5	6 4	21·5 55·0	1 2 3	1·5 4·0 7·5		
	West Bank No. 2	Steam	349·0 510·0	32·0 45·0	10 3	170·0	6 3	15·0		
	West Bank Total....		859·0	77·0	13		9			
Total Border Undertaking		905·0	81·0	17		12				
Cape Eastern (3,100)	No generating plant.									
Cape Western (24,200)	Salt River No. 1	Steam	120·0 600·0	30·0 60·0 0·3	2 6	60·0 100·0	3 3	10·0 20·0	1	0·3
	Salt River No. 2		720·0 1 560·0	90·3 120·0	8 6	260·0	6 4	30·0	1	
		Salt River Total.....	2 280·0	210·3	14		10		1	
	Hex River.....	Steam	800·0 550·0	60·0 60·0	4 2	200·0 275·0	3 2	20·0 30·0		
	Hex River Total....		1 350·0	120·0	6		5			
	Total Cape Western Undertaking.....		3 630·0	330·3	20		15		1	0·3
Natal (33,600)	Colenso No. 1 & 2	Steam	480·0 320·0 900·0 400·0	60·0 75·0 30·0	8 4 5 2	60·0 80·0 180·0 200·0	5 3 1	12·0 25·0 30·0		
	Colenso Total.....		2 100·0	165·0	19		9			
	Ingagane.....	Steam	1 800·0	200·0	2	900·0	2	100·0		
	Congella No. 1 & 2	Steam	360·0 400·0 1 600·0	36·0 20·0 30·0 120·0	6 4 8	60·0 100·0 200·0	3 1 3	12·0 20·0 30·0 40·0		
		Congella Total.....	2 360·0	206·0	18		8			

Undertaking and Area (sq. miles)	Electric Power Station	Type	STATION CAPACITY		BOILERS		MAIN GENERATORS		HOUSE SETS	
			Boilers Thousand lb/hr.	Generators MW	No.	Continuous Maximum Rating Each Thousand lb/hr.	No.	Normal Rating Each MW	No.	Normal Rating Each MW
	Umgeni.....	Steam	1 440·0	120·0	8	180·0	4	30·0		
			1 300·0	120·0	5	260·0	2	60·0		
	Umgeni Total.....		2 740·0	240·0	13		6			
	Port Shepstone.....	Oil		0·7			1	0·7		
				2·0		2	1·0			
Port Shepstone Total			2·7		3					
Total Natal Undertaking.....			9 000·0	813·7	52		28			
Eastern Transvaal (35,700)	Komati.....	Steam	4 500·0	500·0	5	900·0	5	100·0		
			3 375·0	250·0	3	1 125·0	2	125·0		
	Komati Total.....		7 875·0	750·0	8		7			
	Witbank.....	Steam	1 400·0	120·0	20	70·0	6	20·0		
			160·0	8·0	2	80·0			1	8·0
	Witbank Total.....		1 560·0	128·0	22		6		1	
Sabie Gorge.....	Hydro		1·35			3	0·45			
Total Eastern Transvaal Undertaking			9 435·0	879·35	30		16		1	
Rand & O.F.S. (73,200)	Highveld.....	Steam	4 400·0	480·0	8	550·0	8	60·0		
	Klip.....	Steam	4 500·0	396·0	25	180·0	12	33·0		
				28·0					4	7·0
	Klip Total.....		4 500·0	424·0	25		12		4	
	Rosherville.....	Steam	380·0	38·4	10	38·0	4	9·6		
			336·0		7	48·0				
	Rosherville Total....		716·0	38·4	17		4			
	Taaibos.....	Steam	4 640·0	480·0	8	580·0	8	60·0		
	Vaal.....	Steam	3 420·0	297·0	18	190·0	9	33·0		
				21·0					3	7·0
Vaal Total.....		3 420·0	318·0	18		9		3		
Vereeniging.....	Steam	900·0	60·0	20	45·0	3	20·0			
			1 080·0	90·0	6	180·0	3	30·0		
Vereeniging Total...		2 040·0	150·0	27		6				
Vierfontein.....	Steam	3 990·0	360·0	19	210·0	12	30·0			



Undertaking and Area (sq. miles)	Electric Power Station	Type	STATION CAPACITY		BOILERS		MAIN GENERATORS		HOUSE SETS		
			Boilers Thousand lb/hr.	Generators MW	No.	Continuous Maximum Rating Each Thousand lb/hr.	No.	Normal Rating Each MW	No.	Normal Rating Each MW	
	Wilge.....	Steam	500·0	60·0	4	125·0	2	30·0			
			1 600·0		4	400·0					
			580·0		1	580·0					
	Wilge Total.....		2 680·0	240·0	9		5				
Total Rand & O.F.S. Undertaking.....		26 386·0	2 490·4	131		64		7			
Cape Northern (23,200)	Central Kimberley...	Steam	3·0	15·0	8	30·0	1	3·0			
			240·0		4		75·0	3			5·0
			300·0		4			2			6·0
	Central Kimberley Total.....		540·0	30·0	12		6				
	Total E.T.U. + R. & O.F.S.U. + C.N.U.		36 361·0	3 399·75	173		86		8		
	Total All Escom.....	Oil	49 896·0	3·7	262		4				
		Hydro		1·35			3				
		Steam		4 562·4			134				
		Steam	57·3						9		
			49 896·0	4 624·75	262		141		9		

## Major Items of Plant Commissioned 1965

Eastern Transvaal	Komatipoort.....	Steam	1 125·0	125·0	1	1 125·0	1	125·0		
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## Plant Recommissioned 1965

Eastern Transvaal	Witbank.....	Steam	280·0		4	70·0				
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**TRANSMISSION LINES AND CABLES: CIRCUIT MILES (EXCLUDING SERVICE CONNECTIONS  
ON RETICULATION SYSTEMS) AT 31ST DECEMBER, 1965.**

**(a) TRANSMISSION LINES**

Undertaking	275kV	132kV	88kV	66kV	42kV	33kV	22kV 21kV	11kV	6-6kV	3-3kV	2-0kV 2-1kV 2-2kV	380/220V	Total
Border.....				139·10		35·70	94·51 26·00	602·29 77·79		4·92		89·54	966·06
Cape Eastern.....		433·03		287·15			63·46	700·03				27·95	103·79
Cape Northern.....	150·0	497·11		660·18		151·26	139·44	1,965·52	300·41			1,103·51	1,661·62
Cape Western.....	169·30	448·88		89·13			970·17	1,133·83	39·88	8·40	47·47	160·58	4,817·43
Eastern Transvaal.....	332·03	319·06	410·45 950·85			378·27	34·30	2,238·16	284·25	1·55	0·95	440·31	3,478·09
Natal.....													4,979·73
Rand & O.F.S.....	629·11	1,355·81	2,864·02		1,293·56		184·30	1,789·52	240·31		5·62	540·82	8,903·07
Totals.....	1,280·44	3,053·89	4,225·32	1,175·56	1,293·56	565·23	1,512·18	8,507·14	864·85	14·87	54·04	2,362·71	24,909·79

**(a) UNDERGROUND CABLES**

Border.....							0·82	24·56		2·34		6·50	34·22
Cape Eastern.....													—
Cape Northern.....								132·10	6·40	2·40	0·11	141·27	377·72
Cape Western.....	4·08			23·68		67·79	25·34	17·11	1·57	1·04	0·03	75·77	120·94
Eastern Transvaal.....						4·73		61·78	6·10	0·02	0·06	47·95	120·61
Natal.....					12·31		81·67	69·05	209·59			80·95	453·63
Rand & O.F.S.....													
Totals.....		4·08		23·68	12·31	72·52	107·83	304·60	223·66	5·80	0·20	352·44	1,107·12

Statement No. 1—(Continued)

**CAPACITY OF TRANSFORMERS IN SERVICE AT 31ST DECEMBER, 1965.**

Undertaking	Number	MVA
Border.....	481	1,409·250
Cape Eastern.....	54	37·750
Cape Northern.....	1,223	818·955
Cape Western.....	4,573	1,304·780
Eastern Transvaal.....	2,598	1,570·300
Natal.....	3,737	2,581·778
Rand & O.F.S.....	7,436	18,592·001
At Compressor Stations, Rand.....	42	336·321
<b>TOTALS.....</b>	<b>20,144</b>	<b>26,651·135</b>

Statement No. 1—(Continued)

**COMPRESSED AIR POWER STATIONS: RAND UNDERTAKING—1965**

Name of Station	Number of Sets	Type	Compressor Output, h.p.		Drive
			Each	Total	
<i>Electric driven</i>					
Canada Dam Compressor Station.....	1	Turbo	3,000	17,400	Electric Motor
	3	Turbo	4,800		"
Robinson Compressor Station.....	2	Turbo	2,000	9,150	"
	1	Turbo	2,150		"
	1	Turbo	3,000		"
<i>Steam driven</i>					
Rosherville Power Station.....	1	Turbo	4,400	34,300	Steam Turbine
	1	Turbo	6,000		"
	2	Turbo	7,100		"
	1	Turbo	9,700		"
Total Compressed Air Sets.....	13			60,850	

STATEMENT No. 2

**POWER STATIONS: PRINCIPAL EQUIPMENT ON ORDER AS AT 31ST DECEMBER, 1965.**

Undertaking	Electric Power Station	Type	INCREASE IN STATION CAPACITY		BOILERS		MAIN GENERATORS		HOUSE SETS	
			Boilers Thousand lb/hr.	Generators MW	No.	Contin- uous Maximum Rating Each Thous- and lb/hr.	No.	Normal Rating Each MW	No.	Normal Rating Each MW
Border	West Bank No. 2	Steam	380	20	1	170 210	1	20	—	—
Cape Eastern	—	—	—	—	—	—	—	—	—	—
Cape Northern	—	—	—	—	—	—	—	—	—	—
Cape Western	Salt River No. 2	Steam	1,040	120	4	260	2	60	—	—
Eastern Transvaal	Komati.....	Steam	2,250	250	2	1,125	2	125	—	—
Natal	Ingagane.....	Steam	2,700	300	3	900	3	100	—	—
Rand & O.F.S.	Camden.....	Steam	14,400	1,600	8	1,800	8	200	—	—
	Grootvlei.....	Steam	5,100	600	3	1,700	3	200	—	—
	Hendrina.....	Steam	6,800	800	4	1,700	4	200	—	—
Total All Escom.....		Steam	32,670	3,690	26		23		—	—

**UNITS SOLD BY UNDERTAKINGS TO ALL CONSUMERS DURING THE PAST FORTY-ONE YEARS.**  
(MILLION UNITS)

Year	Border	Cape Eastern	Cape Northern	Cape Western	Eastern Transvaal	Klip	Natal Central	Natal Southern	Natal U.	Rand & O.F.S.	Sabie	Vaal	Total
1926				0.3	160.0		0.7				0.7		161.7
1927				5.8	439.1		104.2				1.9		551.0
1928				31.0	464.3		114.2	15.6			2.8		627.9
1929				47.9	543.1		123.9	78.9			3.2		797.0
1930				49.8	619.0		117.1	99.2			4.6		889.6
1931				52.1	603.4		101.1	103.9			6.6		867.1
1932				64.3	610.3		100.3	109.8			6.1		890.7
1933				100.7	639.4		109.2	118.5			6.3		974.1
1934				73.6	648.2		124.9	131.1			7.3		985.2
1935				80.0	727.9		154.3	149.9			7.2		1,119.2
1936				85.8	696.4		171.5	170.5			6.9		1,668.0
1937				94.0	684.5	557.0	210.6	189.4			7.2		2,535.6
1938				98.8	768.1	1,349.9	234.9	209.5			7.2		2,985.5
1939				106.5	767.7	1,656.9	266.2	233.7			6.4		3,573.7
1940				119.8	853.3	2,193.2	281.1	242.7			6.7		4,070.2
1941				136.2	862.6	2,566.5	302.4	270.3			6.6		4,254.0
1942				151.8	873.4	2,675.9	307.7	273.7			6.3		4,320.8
1943				145.7	849.1	2,707.8	312.4	293.4			5.9		4,275.6
1944				158.7	889.2	2,669.1	336.0	321.6			6.7		4,415.8
1945				165.9	830.7	2,703.6	333.2	348.8			6.6	377.9	4,706.1
1946				184.6	896.9	2,643.0	347.0	369.7			7.4	582.5	5,002.4
1947	56.2			198.6	887.7	2,614.3	346.0	402.6			7.6	668.6	5,114.5
1948	69.2			222.4	633.2	2,547.2	367.9	448.7		2,185.7	7.3	435.1	5,576.9
1949	68.7			249.5	388.2	1,207.4	371.8	513.0		4,653.9	7.0		6,222.2
1950	79.9			271.9	378.5		406.5	561.8		5,151.8	6.3		6,910.6
1951	88.1			303.5	386.8		433.4	617.0		5,563.2	6.1		7,456.5
1952	97.7			341.2	425.0		454.0	655.6		6,039.6	6.1		8,080.6
1953	107.8			375.5	409.9		492.3	713.2		6,559.9	6.4		8,732.2
1954	118.2			436.2	270.5		532.5	777.7		7,465.2	5.6		9,676.6
1955	130.8			527.1	394.6		546.4	870.0		8,416.3	5.7		10,964.0
1956	139.1			585.1	505.9		595.4	957.7		9,151.6	6.0		12,019.5
1957	143.1			698.6	536.6		621.7	1,018.7		9,652.5	5.9		12,763.1
1958	152.9			826.0	584.1		616.1	1,104.1		10,200.6	3.0		13,602.2
1959	165.0			861.8	633.3		629.4	1,228.6		11,034.8			14,724.5
1960	172.3			871.6	762.0		649.3	1,409.0		12,044.8			16,094.1
1961	178.8			860.0	901.5		684.0	1,497.5		12,700.0			17,013.2
1962	188.6			945.0	1,012.2		731.0	1,589.5		13,429.8			18,121.0
1963	204.9			264.9	1,051.4		779.0	1,764.6		14,223.1			19,500.0
1964	228.8	0.4		311.4	1,212.1		—	—	2,922.1	15,067.3			21,247.5
1965	250.5	1.6		393.2	1,553.6		—	—	3,182.5	16,024.1			23,056.1
				1,267.4	1,936.8								

Notes:—(1) Klip and Vaal are now included in Rand and O.F.S. Undertaking.

(2) Sabie Undertaking incorporated in Eastern Transvaal Undertaking since 1st July, 1958, in terms of the Amended Licence. De-commissioned November, 1964.

(3) Natal Central and Southern one Undertaking as from 1st April, 1964.

# UNITS SOLD AND NUMBER OF CONSUMERS, 1965, (Electricity, Air)

STATEMENT No. 4

Energy Used:—  
ELECTRICITY = 99·623 % of Total

Undertakings	TRACTION			BULK			MINING		
	Units	Per cent Traction	No. Cons.	Units	Per cent Bulk	No. Cons.	Units	Per cent Mining	No. Cons.
Border.....	—	—	—	219,692,590	4·465	14	—	—	—
Cape Eastern.....	—	—	—	795,040	0·016	1	—	—	—
Cape Northern.....	39,360,768	2·233	2	105,801,140	2·150	9	174,648,043	1·700	57
Cape Western.....	348,533,330	19·772	7	282,208,581	5·735	33	—	—	—
Eastern Transvaal.....	113,125,279	6·418	5	92,531,642	1·881	14	639,448,623	6·226	62
Natal.....	546,649,038	31·012	9	2,055,240,031	41·769	23	83,235,162	0·811	25
Rand & O.F.S.....	715,047,541	40·565	2	2,164,241,678	43·984	109	9,373,418,255	91·263	107
Total Electricity.....	1,762,715,956	100·000	25	4,920,510,702	100·000	203	10,270,750,083	100·000	251
Per cent of Total.....	7·646			21·341			44·546		

AIR = 0·377 % of Total

Rand & O.F.S.— Air.....				4,394,046		1	73,745,571		8
Total Air.....				4,394,046		1	73,745,571		8
Per cent of Total.....				5·040			84·601		

ELECTRICITY AND AIR = 100%

Grand Total all Sales...	1,762,715,956		25	4,924,904,748		204	10,344,495,654		259
Per cent of Grand Total	7·616			21·280			44·698		

Energy used by Provinces:—  
ELECTRICITY AND AIR

Cape.....	370,394,098	21·013	8	629,490,618	12·782	57	174,066,419	1·683	55
Natal.....	507,124,369	28·769	9	2,011,714,426	40·848	17	83,235,162	0·805	25
O.F.S.....	58,839,390	3·338	1	297,275,340	6·036	43	2,614,904,300	25·278	17
Transvaal.....	826,358,099	46·880	7	1,986,424,364	40·334	87	7,472,289,773	72·234	162
Total.....	1,762,715,956	100·000	25	4,924,904,748	100·000	204	10,344,495,654	100·000	259

INDUSTRIAL			DOMESTIC AND STREET LIGHTING			TOTAL UNITS SOLD		Total Number of Consumers
Units	Per cent Ind.	No. Cons.	Units	Per cent Dom. & S.L.	No. Cons.	Units	Per cent Total Units sold	
14,054,888	0·248	374	16,775,533	3·821	3,274	250,523,011	1·087	3,662
498,699	0·009	35	308,463	0·070	182	1,602,202	0·007	218
64,391,291	1·137	240	9,033,204	2·057	1,903	393,234,446	1·705	2,211
445,065,432	7·859	4,113	191,583,312	43·638	36,809	1,267,390,655	5·497	40,962
1,068,572,256	18·869	1,121	23,100,603	5·262	3,905	1,936,778,403	8·401	5,107
440,687,893	7·781	1,955	56,680,386	12·910	12,645	3,182,492,510	13·803	14,657
3,629,863,541	64·097	1,213	141,549,810	32·242	12,799	16,024,120,825	69·500	14,230
5,663,134,000	100·000	9,051	439,031,311	100·000	71,517	23,056,142,052	100·000	81,047
24·562			1·905			100·000		

9,029,455		20				87,169,072		29
9,029,455		20				87,169,072		29
10·359						100·000		

5,672,163,455		9,071	439,031,311		71,517	23,143,311,124		81,076
24·508			1·898			100·000		

523,640,887	9·232	4,749	217,286,316	49·492	42,074	1,914,878,338	8·274	46,943
436,057,784	7·688	1,676	48,471,030	11·040	9,985	3,086,602,771	13·337	11,712
176,104,991	3·104	203	7,730,405	1·761	1,491	3,154,854,426	13·632	1,755
4,536,359,793	79·976	2,443	165,543,560	37·707	17,967	4,986,975,589	64·757	20,666
5,672,163,455	100·000	9,071	439,031,311	100·000	71,517	23,143,311,124	100·000	81,076

POWER STATION OPERATING STATISTICS; YEAR 1965

ELECTRICITY GENERATION

1-1 STEAM ELECTRIC Stations at 31/12/65—The number of Stations, those with separate Turbine Houses (i.e. not under same roof) are counted as two.

Power Station	Units Generated	Units sent out	MAXIMUM DEMANDS		
			½ Hour (or Hour) sent out kW	2 Min. Peak kW	Stn. L.F. % sent out
<b>Border Undertaking:</b>					
King William's Town.....	—	—	—	—	—
West Bank Nos. 1 and 2.....	266,824,100	252,369,430	51,520	55,400	55.9
Total.....	266,824,100	252,369,430	—	—	—
<b>Cape Western Undertaking:</b>					
Hex River.....	550,900,200	522,047,950	113,900	—	52.3
Salt River No. 1.....	89,391,045	83,263,890	53,596	61,000	17.7
Salt River No. 2.....	807,201,600	770,658,400	118,926	130,000	74.0
Total.....	1,447,492,845	1,375,970,240	—	—	—
<b>Natal Undertaking:</b>					
Colenso Nos. 1 and 2.....	630,269,660	587,432,930	113,870	142,000	58.9
Congella Nos. 1 and 2.....	746,255,300	689,511,860	140,250	156,000	56.1
Ingagane.....	1,077,249,800	1,004,691,700	165,600	188,000	69.3
Umgeni.....	1,057,374,636	993,295,636	219,200	232,000	51.7
Total.....	3,511,149,396	3,274,932,126	—	—	—
<b>Eastern Transvaal Undertaking:</b>					
Komati.....	4,820,631,289	4,468,198,858	693,733	—	73.5
Witbank.....	647,474,933	598,188,062	122,919	—	55.6
Total.....	5,468,106,222	5,066,386,920	—	—	—
<b>Rand and O.F.S. Undertaking:</b>					
Highveld.....	3,386,366,360	3,174,966,097	451,279	—	80.3
Klip.....	2,364,103,667	2,199,218,564	380,505	—	65.8
Rosherville.....	4,568,493	3,989,873	19,789	—	2.3
Taaibos.....	3,455,922,306	3,202,129,355	448,675	—	81.5
Vaal.....	2,197,558,818	2,065,833,437	290,948	—	81.0
Vereeniging.....	657,748,682	605,861,730	135,145	—	51.2
Vierfontein.....	1,854,654,192	1,721,897,217	341,703	—	57.5
Wilge.....	1,715,037,900	1,585,198,163	220,572	—	82.0
Total.....	15,635,960,418	14,559,094,436	—	—	—
<b>Cape Northern Undertaking:</b>					
Central Kimberley.....	17,227,300	12,683,200	14,476	17,500	10.0
Total E.T.U.+R. & O.F.S.U.+ C.N.U.	21,121,293,940	19,638,164,556	—	—	—
Total B.U.+C.W.U.+N.U.....	5,225,466,341	4,903,271,796	—	—	—
GRAND TOTAL.....	26,346,760,281	24,541,436,352	—	—	—

Coal Burnt Tons (2,000 lb.)	LB OF COAL		Calorific Value of Coal B.Th.U. as Received (Wt. Ave.)	B.Th.U. PER UNIT		OVERALL THERMAL EFFICIENCY %	
	Per Unit Generated	Per Unit Sent Out		Generated	Sent Out	Gen.	Sent Out
—	—	—	—	—	—	—	—
174,889	1.311	1.386	11,570	15,170	16,040	22.5	21.3
174,889	—	—	—	—	—	—	—
300,216	1.090	1.150	11,610	12,660	13,350	27.0	25.5
39,010	1.625	1.744	11,690	19,010	20,410	17.9	16.7
442,908	1.034	1.083	11,690	12,100	12,670	28.6	26.9
782,134	—	—	—	—	—	—	—
520,519	1.652	1.772	11,330	18,720	20,080	18.2	17.0
521,660	1.398	1.513	11,240	15,710	17,010	21.7	20.0
542,081	1.006	1.079	10,950	11,020	11,820	31.0	28.9
627,192	1.186	1.263	11,600	13,760	14,650	24.8	23.3
2,211,452	—	—	—	—	—	—	—
2,657,741	1.103	1.190	10,220	11,310	12,160	30.3	28.1
630,900	1.949	2.109	10,780	21,010	22,740	16.2	15.0
3,288,641	—	—	—	—	—	—	—
2,162,532	1.277	1.362	8,820	11,263	12,010	30.3	28.5
1,989,722	1.683	1.809	9,290	15,630	16,810	21.8	20.3
9,430	4.128	4.727	9,530	39,410	45,130	8.7	7.6
2,269,873	1.314	1.418	9,180	12,060	13,020	28.4	26.3
1,983,907	1.806	1.921	8,500	15,350	16,330	22.2	20.9
863,030	2.624	2.849	8,310	21,800	23,680	15.6	14.4
1,476,529	1.592	1.715	8,890	14,150	15,250	24.1	22.4
1,129,314	1.317	1.425	9,550	12,580	13,610	27.1	25.1
11,884,337	—	—	—	—	—	—	—
23,975	2.783	3.781	11,090	30,870	41,930	11.1	8.1
15,196,953	—	—	—	—	—	—	—
3,168,475	—	—	—	—	—	—	—
18,365,428	—	—	—	—	—	—	—

1-2 HYDRO ELECTRIC

Power Station	Units Generated	Units Sent Out	Maximum Demand—kW		Stn. Load Factor Sent Out	Rain	
			½ Hour S.O.	2 Min. Gen.		Inches	M.M.
Sabie Gorge.....	28,400	28,000	900	1,025	35.51		
Sabie Falls.....	—	—	—	—	—		
<b>Total.....</b>	<b>28,400</b>	<b>28,000</b>	<b>—</b>	<b>—</b>	<b>—</b>		

1-3 DIESEL ELECTRIC

Power Stations	Units Generated	Units Sent Out	Maximum Demand—kW		Fuel Consumed		Lub. Oil gal.
			½ Hour	2 Mins.	Total lb.	Per kW/h Sent Out	
King William's Town.....	4,750	4,750	—	—	3,154	0.664	—
Port Shepstone.....	56,364	55,567	3,326	3,400	32,824	0.591	135
<b>Total.....</b>	<b>61,114</b>	<b>60,317</b>	<b>—</b>	<b>—</b>	<b>35,978</b>	<b>—</b>	<b>—</b>

(2) COMPRESSED AIR GENERATION

Station	Type <sup>a</sup>	Units Generated	Air Units Sent Out		Coal Burnt lb Coal/Units Sent Out	Electric Input		Max. Sust. Ld. over 1 Hour	L.F. %
			Units	%		Total kW/h excl. Loss	U.S.O. kW/h %		
Central Rand Compressed Air System:									
Rosherville.....	Steam	41,300,800	41,163,500	44.1	3,530	—	—	—	—
Robinson.....	Electric	34,892,700	34,892,700	37.3	—	45,529,159	—	31,190 June	34.2
Canada Dam.....	Electric	17,402,100	17,402,100	18.6	—	21,653,091	—	—	—
<b>Air Pipeline Totals.....</b>		<b>93,595,600</b>	<b>93,458,300</b>	<b>100.0</b>	<b>—</b>	<b>67,182,250</b>	<b>—</b>	<b>—</b>	<b>—</b>

<sup>a</sup>Electrically driven compressors are fed from the electric distribution system of the Rand Undertaking.

	Units Generated	Units Sent Out	Coal Burnt
Electricity Total Units.....	26,346,760,281	24,541,436,352	18,365,428
{ Steam	28,400	28,000	—
{ Hydro	61,114	60,317	—
{ Diesel			
	26,346,849,795	24,541,524,669	18,365,428
Air Pipeline Totals .....	93,595,600	93,458,300	72,647
GRAND TOTAL 1965 .....	26,440,445,395	24,634,982,969	18,438,075
Total for 1964 .....	24,355,271,933	22,695,417,029	17,256,296
Change on 1964 (Units or Tons) .....	2,085,173,462	1,939,565,940	1,181,779
Per cent. ....	+ 8.561	+ 8.546	+ 6.848



## POWER PURCHASED FROM OUTSIDE SOURCES IN 1965.

Undertaking	Purchased from	Maximum Demands	Units
Border.....	East London Municipality.....	—	10,560
Cape Eastern.....	Port Elizabeth Municipality.....	—	1,872,748
Natal.....	Durban Navigation Collieries Ltd.....	252	618,924
	Durban — Canefields.....	5,850	22,482,000
	S.A. Pulp and Paper Industries Ltd.....	26	70,636
	Empangeni Municipality.....	49	49,060
	Eshowe Municipality.....	348	868,300
Rand & O.F.S.....	Johannesburg Municipality.....	59,329	48,814,601
	Pretoria Municipality.....	38,000	51,855,860
Total Units purchased.....			126,642,689
Total Units sold—1965.....			23,143,311,124
Purchased as % of Sales.....			0.547

## STATEMENT NO. 7

## WATER (OTHER THAN SEA WATER) CONSUMED BY POWER STATIONS FOR THE YEAR 1965.

(Millions of Gallons)

Undertakings	Potable Water		Crude River Water		Water from Other Sources including Bore-holes, Dams and Sewage	
	1964	1965	1964	1965	1964	1965
Border.....	28	28	—	—	—	—
Cape Eastern.....	—	—	—	—	—	—
Cape Northern.....	80	45	—	—	—	—
Cape Western.....	369	413	—	—	—	—
Natal.....	941	853	483	466	397	667
Rand (including Komati and Witbank Power Stations)	316	309	18,205	20,288	95	148

Note: These figures include water blown down from cooling tower ponds and returned to source of supply.

## STATEMENT No. 8

### STATEMENT SHOWING THE PRICE OR RENT OF LAND OR INTERESTS IN OR OVER LAND OR OTHER PROPERTY ACQUIRED OR HIRED BY THE COMMISSION DURING THE YEAR 1965.

(See previous Annual Reports for Rights or Interests in or over land acquired prior to 1965)

#### Cape Western Undertaking

Immovable property acquired for considerations amounting to.....	R23,470.00
Servitudes acquired — capitalised payments amounting to.....	R6,799.47

#### Cape Northern Undertaking

Immovable property acquired for considerations amounting to.....	R6,890.00
Servitudes acquired — capitalised payments amounting to.....	R1,314.72

#### Cape Eastern Undertaking

Immovable property acquired for considerations amounting to.....	R1,500.00
--	-----------

#### Natal Undertaking

Immovable property acquired for considerations amounting to.....	R147,350.00
Servitudes acquired — capitalised payments amounting to.....	R23,549.17
Leases acquired for annual rentals amounting to.....	R800.00

#### Eastern Transvaal Undertaking

Immovable property acquired for considerations amounting to.....	R56,849.21
Servitudes acquired — capitalised payments amounting to.....	R4,121.00

#### Border Undertaking

Immovable property acquired for considerations amounting to.....	R5,202.00
Servitudes acquired — capitalised payments amounting to.....	NIL
Leases acquired for annual rentals amounting to.....	NIL

#### Rand and O.F.S. Undertaking

Immovable property acquired for considerations amounting to.....	R205,564.98
Servitudes acquired — capitalised payments amounting to.....	R125,079.62
Servitudes acquired — options moneys paid amounting to.....	R34,618.45
Leases acquired for annual rentals amounting to.....	R666.00

COAL USED AT COMMISSION'S POWER STATIONS  
AVERAGE COST PER TON [2,000 lb.]

Power Station	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Brakpan.....	R 1.42	R 1.50	R 1.65	R 1.73	R 1.93	R 1.70	R 1.77	R 1.82	R 1.83	R 3.37	R —
Colenso.....	2.52	2.71	2.87	2.97	3.17	3.12	3.11	3.36	3.48	3.42	3.77
Congella.....	3.13	3.25	3.43	3.58	3.82	3.79	3.75	3.91	3.59	3.25	3.42
Hex River.....	3.89	4.06	4.17	4.54	4.70	4.68	4.76	4.93	5.21	5.17	5.33
Highveld.....	—	—	—	—	1.33	1.45	1.60	1.53	1.55	1.66	1.62
Ingagane.....	—	—	—	—	—	—	—	—	2.27	2.26	2.46
Kimberley Central.....	3.08	3.28	3.40	3.59	3.83	3.78	3.75	3.90	4.12	4.10	4.07
Klip.....	1.45	1.61	1.73	1.79	1.82	2.09	2.14	2.13	2.04	2.02	2.17
King William's Town.....	4.57	4.68	4.84	4.81	4.54	—	4.58	—	4.58	—	—
Komati.....	—	—	—	—	—	—	1.19	1.29	1.53	1.34	1.17
Rosherville.....	1.65	1.72	1.87	1.92	2.04	1.86	1.90	2.08	2.13	2.15	2.19
Salt River.....	4.07	4.22	4.38	4.57	4.86	4.83	4.85	5.03	5.36	5.32	5.42
Taabos.....	.87	.73	.76	.84	.93	1.83	1.98	1.75	1.70	1.58	1.56
Umgeni.....	3.28	3.31	3.49	3.72	4.05	4.04	4.01	4.28	4.37	4.32	4.54
Vaal.....	.71	.71	.73	.73	.74	.79	.93	.95	1.03	1.04	1.04
Vereeniging.....	.82	.85	.92	.98	.91	.87	.96	1.02	1.07	1.05	1.06
Vierfontein.....	.83	.96	1.10	1.23	1.23	1.50	1.56	1.46	1.43	1.42	1.55
West Bank.....	4.18	4.08	4.17	4.39	4.66	4.61	4.59	4.77	5.02	5.01	5.10
Wilge.....	.78	.79	.89	.91	.97	.90	.94	.97	.95	.96	.99
Witbank.....	.76	1.03	1.03	1.05	1.11	1.06	1.05	1.14	1.15	1.16	1.27

POWER SUPPLY IN SOUTH AFRICA:  
ESCOM AND REPUBLIC

Year	Escom		Units Generated (kWh) (millions)		Escom Coal Burnt (Thousands)	Sales (kWh) (millions)		Escom Total Staff	Sales Escom + V.F.P. (kWh) (millions)	
	Capital Expenditure (Rand)	Installed Capacity (MW)	Escom + V.F.P. (X)	Republic of S.A. (Y)		(X) / (Y) %	Escom			Republic of S.A.
1925		1.35								
1926		61.35				0.1	1,376.4		1,411.4	
1927		121.35				161.7	1,516.9		1,560.5	
1928	1,399,678	175.65	1,422.2	2,109.6	1,934.9	627.9	1,807.4	633		
1929	1,575,492	194.65	1,516.7	2,300.1	2,086.1	797.0	2,007.6			
1930	16,167,114	215.65	1,766.3	2,453.7	2,166.4	889.6	2,126.8	688	1,632.4	
1931	16,591,164	215.65	1,857.4	N.A.	2,237.2	867.1	N.A.	664	1,689.5	
1932	16,823,332	227.65	2,028.7	N.A.	2,388.0	890.7	N.A.	645	1,814.2	
1933	17,275,780	247.65	2,246.4	2,946.6	2,542.0	974.1	2,462.2	678	1,929.0	
1934	18,786,190	287.65	2,525.9	3,308.6	2,831.3	985.2	2,853.9	706	2,140.3	
1935	22,980,968	307.65	2,848.4	3,772.5	3,152.3	1,119.2	3,246.2	778	2,414.9	
1936	27,103,556	486.843	3,406.7	4,602.9	3,584.3	1,688.0	3,767.9	862	2,820.6	
1937	30,563,380	519.843	3,980.6	5,336.0	3,844.2	2,535.6	4,361.3	1,024	3,238.5	
1938	34,296,968	623.346	4,452.8	5,933.0	4,176.4	2,985.4	4,898.2	1,097	3,639.7	
1939	36,645,076	737.656	4,740.7	6,574.3	4,409.2	3,573.7	5,453.4	1,100	4,095.6	
1940	38,661,664	770.631	5,098.3	7,167.8	4,626.0	4,070.2	6,121.9	1,189	4,516.9	
1941	40,808,068	771.300	5,444.9	7,592.1	4,903.7	4,254.0	6,504.7	N.A.	4,833.5	
1942	43,762,646	770.551	5,538.9	7,798.5	5,111.9	4,320.8	6,767.7	N.A.	4,920.0	
1943	46,573,506	795.456	5,404.0	7,699.8	4,977.6	4,275.6	6,638.4	1,238	4,795.8	
1944	48,036,044	796.856	5,597.8	8,042.9	5,164.2	4,415.8	6,919.7	1,328	4,970.5	
1945	49,913,496	862.856	5,748.7	8,328.5	5,309.2	4,706.1	7,142.4	1,531	5,101.1	
1946	52,852,490	975.690	5,895.6	8,556.9	5,321.9	5,002.4	7,338.3	1,836	5,218.8	
1947	57,649,694	1,033.190	6,035.9	8,787.8	6,000.3	5,144.5	7,493.6	2,169	5,341.7	
1948	90,815,886	1,385.071	6,553.5	9,480.7	6,126.0	5,576.9	8,089.2	2,692	5,787.0	
1949	100,234,082	1,411.985	7,075.3	10,013.3	6,365.6	6,222.2	8,829.0	8,764		
1950	115,128,520	1,439.985	7,773.6	11,187.0	6,970.4	6,910.6	9,749.8	9,352		
1951	137,283,154	1,520.590	8,326.6	11,895.0	7,344.8	7,456.5	10,473.9	10,336		
1952	176,559,102	1,624.590	8,778.0	12,517.0	7,841.1	8,080.6	11,233.5	10,889		
1953	218,739,074	1,806.070	9,442.0	13,744.0	8,150.3	8,732.2	11,806.3	11,518		
1954	270,621,248	2,051.010	10,651.9	15,184.0	8,846.0	9,676.6	12,811.9	12,317		
1955	304,341,966	2,377.721	12,214.5	17,172.0	9,920.5	10,964.0	14,309.9	12,490		
1956	342,068,024	2,734.871	13,578.4	18,535.0	10,679.8	12,019.5	15,782.0	12,977		
1957	377,265,178	2,826.700	14,388.1	19,954.0	11,266.2	12,763.1	17,140.0	13,421		
1958	417,700,898	3,036.550	15,582.6	20,133.0	11,887.4	13,602.2	17,321.0	14,312		
1959	453,130,370	3,289.450	16,926.5	21,165.0	12,730.3	14,724.5	18,132.0	13,947		
1960	491,471,208	3,408.950	18,543.3	22,561.0	13,792.8	16,094.1	19,334.0	14,654		
1961	529,563,151	3,558.950	19,575.4	24,365.0	14,544.8	17,013.2	20,968.0	15,441		
1962	581,579,266	3,758.950	20,805.5	26,165.0*	15,383.3	18,121.0	N.A.	16,467		
1963	637,076,261	4,175.950	22,312.4	27,828.0*	16,227.2	19,500.0		16,804		
1964	679,192,772	4,499.600	24,355.3	30,422.0*	17,256.3	21,247.5		17,172		
1965	741,109,317	4,624.750	26,440.4	32,508.0*	18,438.1	23,143.3		17,851		

1) N.A. not available.

2) V.F.P. taken over by Escom 1/7/48.

\* Provisional