



A view of the switchyard at the Atlas distribution station with the incoming 400 kv lines from Camden.

MEMBERS OF THE

Electricity Supply Commission

DR. R. L. STRASZACKER (Chairman)

W. H. ANDRAG

T. P. STRATTEN

A. J. DU TOIT

Dr. C. V. VON ABO

Dr. the Hon. E. H. LOUW

G. R. D. HARDING

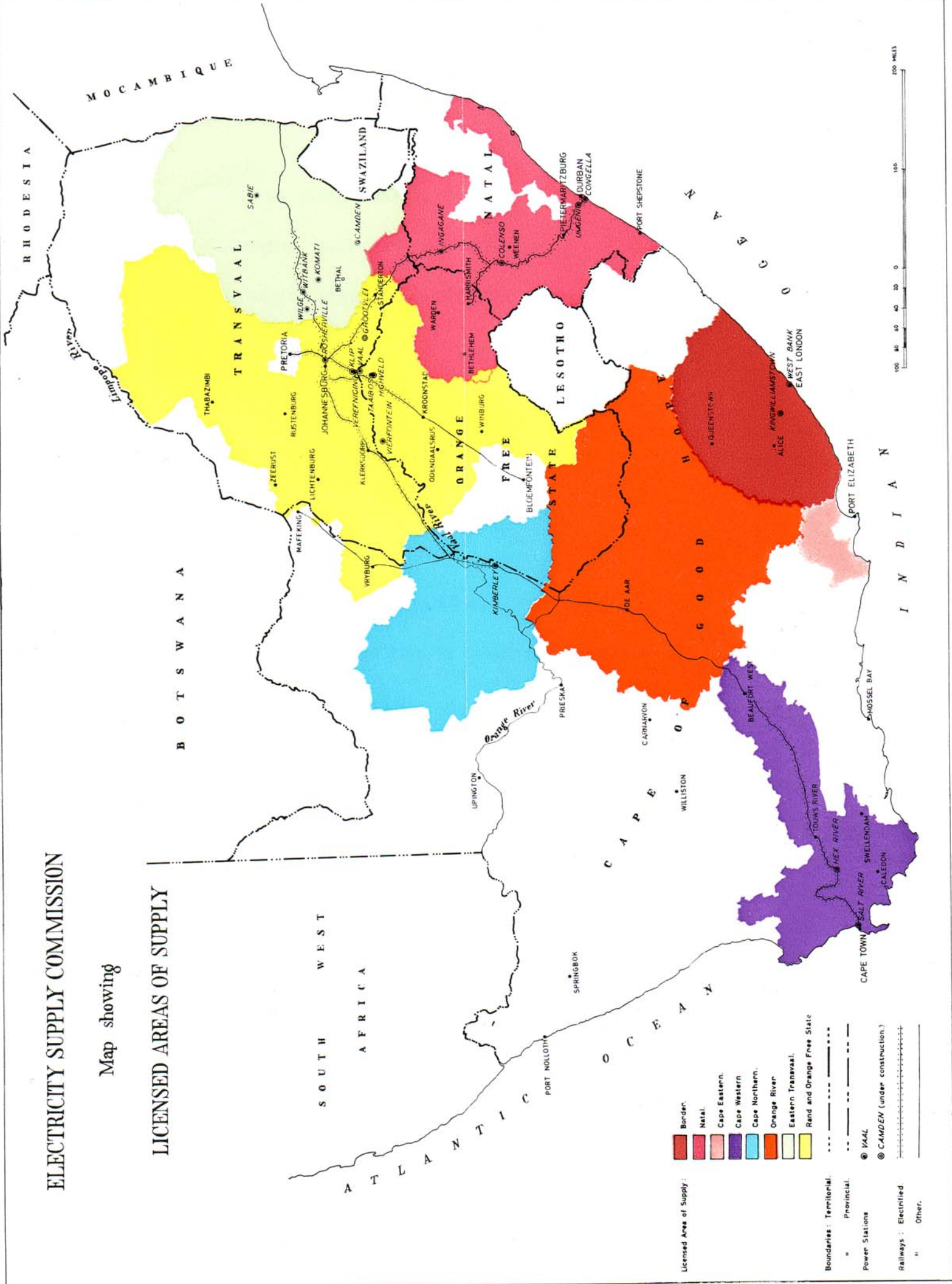
CONTENTS

	Page
SALES OF ELECTRICITY	7
EXPANSION OF MINING INDUSTRY	8
GROWTH OF INDUSTRIAL ACTIVITY	8
OUTPUT AND SALES	8
WATER SUPPLIES	9
ESCOM'S UNDERTAKINGS	10
NEW DEVELOPMENTS	11
400 kV TRANSMISSION LINE	11
ELECTRIFICATION OF RAILWAYS	12
EXTENSIONS OF ESCOM'S TRANSMISSION SYSTEMS	12
CAPITAL EXPENDITURE	12
COSTS AND TARIFFS	15
FINANCIAL	15
Loan Capital	15
Redemption Funds	16
Reserve Fund	16
Investments	16
Assets and Liabilities	16
STATISTICAL SUMMARY	18
COMMISSION'S UNDERTAKINGS	19-51
ANNEXURES	
Auditor's Report and Accounts	53-83
Statistical and other Statements	84-98

ELECTRICITY SUPPLY COMMISSION

Map showing

LICENSED AREAS OF SUPPLY



- Licensed Area of Supply:**
- Border.
 - Natal.
 - Cape Eastern.
 - Cape Western.
 - Cape Northern.
 - Orange River.
 - Eastern Transvaal.
 - Rand and Orange Free State.
- Boundaries:**
- Territorial.
 - - - Provincial.
- Power Stations**
- MAAL
 - ⊙ CAMDEW (under construction.)
- Railways:**
- Electrified.
 - - - Other.

Electricity Supply Commission

To the Honourable,
The Minister of Economic Affairs,
Union Buildings,
Pretoria.

Escom Centre,
204 Smit Street,
Johannesburg.
10th August 1967.

Sir,

As required by Section 19 of the Electricity Act, 1958, the Commission has the honour to present its forty-fourth Annual Report and the Accounts covering its work for the financial year ended 31st December, 1966.

Brief comments upon subsequent developments in connection with the more important matters are included in the Report.

INCREASE IN SALES OF ELECTRICITY

Total sales in 1966 amounted to 24,554 million units, and reflected a growth rate of 6·1 per cent for the year. This is lower than the rate of growth in recent years, and analysis of the figures draws attention to the fact that the gold mining industry has now

entered upon a period when the changes in annual demands will be small. Whereas for some years the gold mines have increased their purchases of electricity at a modest rate of about 3·3 per cent, the increase in 1966 dropped to 1·6 per cent.

Sales for 1966 also reflect a lower rate of increase of industrial supplies than might have been expected in the present conditions of expansion in so many industrial fields. Part of the explanation may be found in the severe restrictions upon the use of water from the Vaal River, which were in force during the greater part of the year, so that the amount of electricity used for pumping water was substantially lower than in the previous year. It would appear also that the heavy demands upon manpower were responsible for delay in the construction of many new projects: but the increase in sales in the four months up to April, 1967, which has been at the rate

Units sold
(Millions)

Coal burnt
tons
(2000 lbs)

25,000

2500000

20,000

2000000

15,000

1500000

10,000

1000000

5,000

500000

Price per Unit sold (Cent)

.6

.5

.4

.3

.2

.1

0

56

57

58

59

60

61

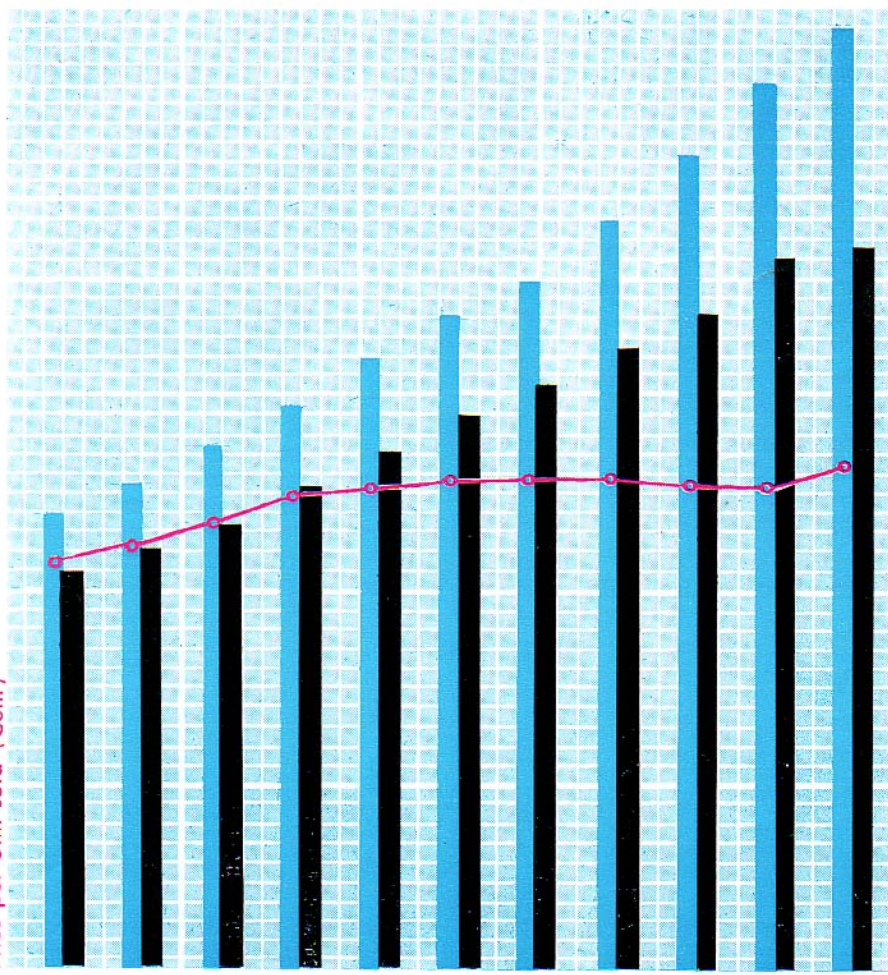
62

63

64

65

66



of 8·7 per cent, points to continued expansion at higher rates than are shown in the sales analysis for 1966.

The growth of Escom's sales over the ten years 1957-1966 is depicted by the blue columns in the diagram below.

The red line superimposed upon the diagram shows the average price per unit sold. The figure of ·5254 cent per unit sold in 1966 reflects an increase of 3·5 per cent over the price per unit sold in 1965. The greater part of this increase is due to the rise in the cost of coal burnt in Escom's power stations.

The overall figures represented in the diagram are the averages for all Undertakings. The prices for each Undertaking and for the different classes of consumer in each Undertaking are given on pages 24 to 49.

Coal burnt in Escom's power stations totalled 18,720,084 tons for the year 1966. The figures for each year are depicted by the black columns in the diagram on page 7 and the lower rate of increase in coal burnt by comparison with units sold reflects the improvement in thermal efficiency of the newer power stations. This improvement in thermal efficiency can be summed up in the following figures:—

In 1957, on an average for all stations, 1,299 units of electricity were generated for each ton of coal burnt.

In 1966, the average figure was 1,463 units per ton of coal burnt.

EXPANSION OF MINING ACTIVITY

Although sales of electricity and compressed air to the gold mines showed an increase of only 1·6 per cent, sales to coal, diamond and other mines, and particularly to platinum mines, showed substantial increases; so that the overall increase in mining sales was maintained at 4·5 per cent for the year.

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

	Units sold (millions)		
	1964	1965	1966
Gold Mining (including uranium).....	9,047	9,345	9,490
Coal Mines.....	341	365	412
Diamond, Platinum and other Mines.....	539	634	910
	<u>9,927</u>	<u>10,344</u>	<u>10,812</u>

GROWTH OF INDUSTRIAL ACTIVITY

Although Escom's figures for industrial supplies do not present a complete picture, since they do not distinguish supplies of electricity furnished to industrial consumers by municipalities and they do not include supplies generated by industrial undertakings themselves, a broad picture of the industrial development in the Republic during the past five years can be seen in the following sales (millions of units) to the main categories of industry:—

Units Sold (millions)**1962 1963 1964 1965 1966**

Building and Cement (including quarrying)	296	327	447	508	530
Chemical (including pharmaceutical)	774	849	868	1,023	1,098
Engineering (including the motor industry)	170	201	357	393	415
Foodstuffs, Consumer Goods and Commercial	510	560	624	751	935
Iron, Steel and Base Metals	1,420	1,659	1,991	2,326	2,435
Paper and Paper Products	193	212	212	267	416

UNITS GENERATED AND SOLD

The total units generated in all Escom's Undertakings in the year 1966 amounted to 27,395 million units, which was an increase of only 3·6 per cent over the corresponding figure for 1965.

Purchases from other undertakings (including units repurchased) amounted to 629 million units.

This large increase arose from the request of the Minister of Water Affairs to conserve water in the Vaal catchment area and the arrangements made for the purchase of units generated in the power stations of the Johannesburg and Pretoria municipalities, which use sewage effluent for cooling purposes.

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

OUTPUT AND SALES

	1966	1965	% Increase 1966	Average Annual Increase over 10 years %
Units generated	27,395,479,555	26,440,445,395	3.61	7.3
Units purchased	629,876,210	126,642,689	—	—
Units sold	24,554,347,088	23,143,311,124	6.10	7.4

The total sales (electricity and compressed air) for the year 1966 in the main categories of supply with the corresponding figures for 1965 and the rate of

increase in the year under review are shown in the following table. The final column reflects the average rate of growth over the ten years 1957-1966.

	SALES			Average Annual Increase over 10 years %
	1966	1965	% Increase 1966	
<i>Bulk Supplies</i>				
Municipalities	5,344,193,439	4,924,904,748	8·5	10·1
<i>Direct Supplies</i>				
Traction	1,835,801,102	1,762,715,956	4·1	10·3
Mining	10,812,569,202	10,344,495,654	4·5	6·0
Industrial	6,070,034,563	5,672,163,455	7·0	12·4
Domestic	482,351,164	430,073,897	12·2)	
Street Lighting	9,397,618	8,957,414	4·9)	10·9
	<u>24,554,347,088</u>	<u>23,143,311,124</u>	<u>6·1</u>	<u>7·4</u>

The total sales of electricity and compressed air by individual Undertakings in 1966, with the corres-

ponding figures for 1965, and the percentage increase for the year were as follows:—

	SALES			Average Annual Increase over 10 years %
	1966	1965	% Increase 1966	
Cape Western	1,366,976,337	1,267,390,655	7·9	8·8
Cape Northern	442,387,226	393,234,446	12·5	18·9
Cape Eastern	2,481,001	1,602,202	54·8	—
Border	272,390,860	250,523,011	8·7	6·9
Natal	3,498,485,101	3,182,492,510	9·9	8·5
Eastern Transvaal	2,408,232,860	1,936,778,403	24·3	16·8
Rand and O.F.S.	16,563,393,703	16,111,289,897	2·8	6·1
	<u>24,554,347,088</u>	<u>23,143,311,124</u>	<u>6·1</u>	<u>7·4</u>

WATER SUPPLIES

The quantities of water (omitting sea water) used by the Commission's Undertakings are published in the usual form in Statement No. 7 on page 96 of the Report.

In times of severe drought public attention is inevitably drawn to the use of water for power production: and a broad picture of the sources from

which this water is obtained is given in the following table:—

	Water drawn from Rivers	Other Sources	Sea Water (circulated)
	(millions of gallons)		
	per annum		
<i>Cape Western Undertaking</i>			
Cape Town Municipality	60	—	—
Worcester Municipality	402	—	—
Sea water (estimated)	—	—	42,000
	<u>462</u>	<u>—</u>	<u>42,000</u>
<i>Border Undertaking</i>			
East London Municipality	27	—	—
Sea water (estimated)	—	—	12,000
	<u>27</u>	<u>—</u>	<u>12,000</u>
<i>Natal Undertaking</i>			
Durban Municipality	883	—	—
Sea water (estimated)	—	—	51,000
Tugela River	524	—	—
Ngagane River	793	—	—
	<u>2,200</u>	<u>—</u>	<u>51,000</u>

Rand and O.F.S. Undertaking and Eastern Transvaal Undertaking

Vaal River	13,253	—	—
Olifants River	802	—	—
Bronkhorstspuit	1,676	—	—
Komati River	4,979	—	—
Usutu complex	62	—	—
Other	—	154	—
	<hr/>	<hr/>	<hr/>
	20,772	154	—
	<hr/>	<hr/>	<hr/>
TOTAL — ALL UNDERTAKINGS	23,461	154	105,000

It will be noted that at present the Vaal River carries the heaviest burden for power generation, an average for the year 1966 of 36·3 million gallons per day: but even this large quantity represents less than 5 per cent of the quantity of water released from the Vaaldam. The value of the power produced by use of this water exceeded R40 million in 1966.

For generation of electricity in the large new stations of the inland pooled stations, water supplies will be provided from the Komati River and the rivers of the Usutu complex near Jericho dam. The ultimate installed capacities and water requirements for these new stations are shown below:—

Power Station	Installed Capacity	Water Requirements
Camden	1,600,000 kW	24 m.g.d.
Hendrina	2,000,000	30
Arnot	2,100,000	30
	<u>5,700,000 kW</u>	<u>84 m.g.d.</u>

These power stations will be connected to the 400 kV transmission system which will supply not only the three northern Undertakings (i.e. Rand and Orange Free State, Eastern Transvaal, Cape Northern) but also the new Orange River Undertaking, the Western Cape and Natal. Thus the water which previously flowed to the sea and is now being tapped to supply these stations will be utilized for the whole Republic, not only parts of it.

In the past two years Escom has conducted intensive research into re-treatment of water with a view to reducing the quantities of water used, and in the course of this research has been successful in introducing an acid treatment at Komati Power Station which has reduced the quantity of water drawn from the river by approximately 25 per cent. Treatment plants have been designed for installation at Taaibos and Highveld stations and at Vierfontein Power Station, which draw their water supplies from the Vaal River. This research is being applied wherever it is practicable; and in the new stations (Camden, Hendrina and Arnot) it has been possible by this means to reduce the water requirements from 110 m.g.d. to the total of 84 m.g.d.

Escom is also watching with great interest the development of the so-called "dry" cooling systems which are being built overseas. In these systems cooling of the condensate is effected in a closed circuit by convection heat transfer or by air-cooling; so that the quantity of water used for power generation is reduced to some 10–15% of the quantity used in the conventional "wet" cooling systems. Success in the use of this method of cooling will be an

important contribution to the conservation of water resources, particularly in the areas where the coal deposits are found.

During the year enquiries were issued for the supply and installation of a 200 MW boiler and turbo-generator set at Grootvlei Power Station, the turbo-generator set to be designed for dry cooling either by the direct or indirect system. Tenders were received in March, 1967, and were being adjudicated at the time of closing the Report.

ESCOM'S UNDERTAKINGS

The licensed areas of supply of Escom's Undertakings, including areas which have been applied for, are shown in colour on the map which appears opposite this page.

Rand and O.F.S. Undertaking

The application made on the 11th November, 1965, for extension of the Greater Rand Extension Licence to include a large area in the Northern Transvaal drew objections from the Municipalities of Warmbad and Pietersburg. Escom's licence clearly provides that Escom may not supply any person whom an urban local authority is authorized to supply in terms of a permission granted by the Electricity Control Board, unless the urban local authority consents thereto; so that the grant of Escom's application will not affect the rights granted to local authorities by the Board before the incorporation of the area within Escom's licensed area. Assurances on this point secured the withdrawal on the 13th April, 1967, of the objections by the Municipality of Pietersburg. The objection by the Municipality of Warmbad has not yet been disposed of; but, in response to an urgent call for assistance, a supply was given to Warmbad on the 1st July, 1966.

An urgent application from the Municipality of Louis Trichardt was received during the year: and negotiations were concluded for extension of the Commission's transmission system to provide a bulk supply to Louis Trichardt in 1968.

Proposed Orange River Undertaking

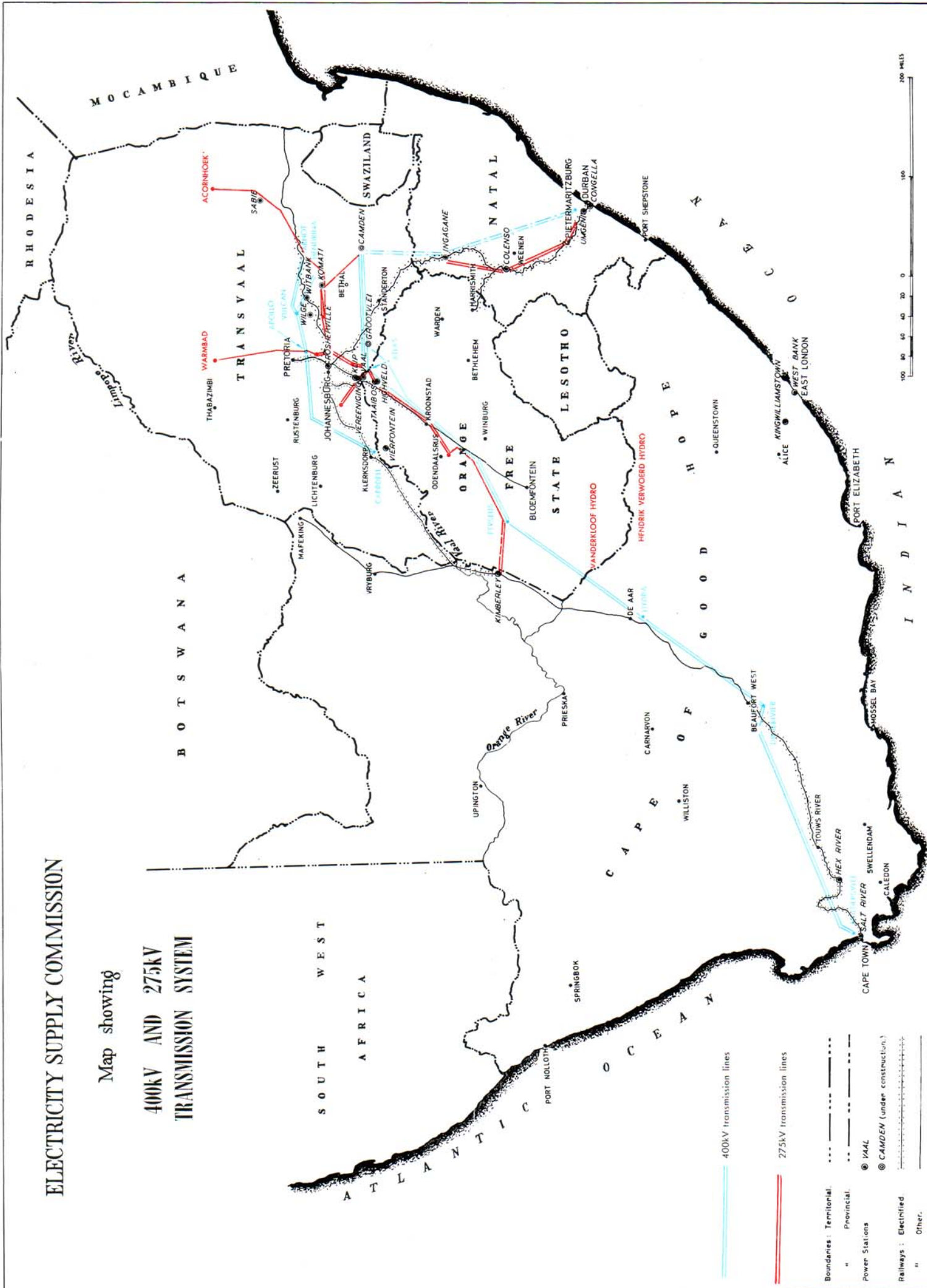
On the 15th December, 1966, application was made to the Electricity Control Board for a licence for the proposed Orange River Undertaking, and for certain consequential amendments to the Rand Licence, the Rand Extension Licence and the Cape Northern Licence, 1949.

Objections were lodged to the proposed area of supply of the Orange River Undertaking by the Municipalities of Trompsburg, Bethulie, Philippolis, Edenburg and Springfontein and Die Suid-Vrystaatse

ELECTRICITY SUPPLY COMMISSION

Map showing

400kV AND 275kV TRANSMISSION SYSTEM



- 400kV transmission lines
- 275kV transmission lines
- Boundaries : Territorial
- " Provincial
- Power Stations
- VAAL
- ◎ CAMDEN (under construction)
- Railways : Electrified
- " Other



Elektrisiteit-Voorsiening-Utiliteitsmaatskappy and also by the Municipality of Somerset East.

These applications and the objections thereto were outstanding at the date of closing this Report.

NEW DEVELOPMENTS IN ESCOM'S UNDERTAKINGS

Komati Power Station

Komati Power Station was completed during the year to its designed capacity of 1,000 MW, when Sets Nos. 8 and 9 were taken into commercial service in March and May, 1966.

Capital costs are not yet final: but the total capital expenditure up to 31st December, 1966, indicates that the final costs will be slightly below the estimated cost of R81 per kilowatt installed at this station.

The output from the station in 1966 exceeded 5,817 million units at an average cost of 231 cent per unit sent out.

Camden Power Station

Progress of construction at Camden Power Station has been retarded at times due to difficulty in accommodating contractors' employees and in some instances by delay in the delivery of materials and equipment: nevertheless work has been pushed forward as quickly as possible.

The first set in the station (200 MW) was run up on the 21st December, 1966; but a number of "teething" troubles were encountered, and it was not taken into commercial operation until the 13th April, 1967. The second and third sets are expected to be commissioned during the months of May and August, 1967, respectively.

Grootvlei Power Station

Progress of construction at Grootvlei Power Station continued satisfactorily until the early months of 1967 when some delay in the completion of the civil works was caused by the heavy rains. Steps are being taken to make up the time lost, and it is hoped that the first set in the new station will be commissioned on due date, viz. June, 1969.

As reported, 3 × 200 MW sets have been ordered for Grootvlei Power Station. These sets will use the conventional "wet" cooling system, and the layout of the station makes provision for four such sets. The decision to install a "dry" cooling set at the station in order to gain experience with this method of cooling is reported on page 10. The design of the station is such that a second "dry" cooling unit could be added, so that the total capacity of this power station could be raised to 1,200 MW. As the two "dry" cooling sets will use only one-third of the water required for a single "wet" cooling set, the increase in capacity of the station will not call for any increase in the water supply that will be required.

Hendrina Power Station

Portions of the farms Boschmanskop and Roodepoort, district Middelburg, have been acquired as the site for this power station; and work on site started on the 22nd June, 1966. As reported last year four turbo-generator sets with pulverized fuel boilers, each of 200 MW capacity, have been ordered for this station; and the target date for starting up the first set is May, 1970.

Arnot Power Station

Several portions of the farm Rietkuil 491 J.S., district Middelburg, have been purchased for use as the site of Arnot Power Station, and work started on the site on the 1st March, 1967. The station has been designed for an ultimate 6×350 MW turbo-generators with pulverized fuel boilers employing a re-heat cycle. Orders have been placed for the first two sets, the first to be in service in March, 1971, and the second in September, 1971. Options have been secured from the successful tenderers for the supply and installation of a third boiler and turbine of similar make. Extended credits have been secured for the bulk of the payments to be made to overseas manufacturers under these contracts.

400 kV TRANSMISSION SYSTEM

Undoubtedly one of the most far-reaching developments in the power supply industry in South Africa at the present time is the construction now taking place of a 400 kV transmission system which will link Escom's Undertakings throughout the country. The lines presently under construction or planned, together with the existing 275kV lines, are depicted on the map which is published on the opposite page.

The need for this transmission system rests upon the geographical feature that the bulk of the coal deposits in the Republic are found in a comparatively small area in the south-eastern Transvaal and adjacent districts of Natal, with some smaller deposits in the area around Vereeniging: so that unless and until generation of electricity by atomic energy is an economic alternative, these coal deposits are and will remain the prime source of power for most of the country's electricity undertakings. When dealing with small quantities, transport of coal by rail was the economic choice in the past: but for the increasing quantities of power that will be called for in future years, transmission of the power becomes cheaper than transport of the coal.

At the present time the cost of transporting coal to the Cape Western Undertaking represents a cost of approximately .236 cent per unit sent out from Escom's power stations at the Cape, while the prospect for the future is that of continuing increases in railage charges. The finding of the Committee on Railway Rating Policy (para. 685) was that the cost of transporting goods had increased by 115 per cent over the 24 years 1938-39 to 1962-63: so that, on the assumption that railage costs may continue to rise at that rate, the prospect that would be inherent in the building of a further coal-fired power station at the Cape is that the cost of railage alone will rise to about 6/10ths of a cent per unit during the lifetime of the station.

Escom estimates that the cost of transmitting power to the Cape by means of the 400 kV transmission system will be about 2/10ths of a cent per unit, when the loads have been built up to the point where the lines are carrying something like the designed "safe" capacity. Since the capital cost of the transmission system is fixed for the whole period of the loans, the saving in cost will increase over the years, and in addition it can be expected that after the loans are repaid these lines will continue to give many years of useful service.

The first section of 400 kV line between Camden Power Station and Atlas Distribution Station was completed and energized for carrying current on the 21st March, 1967. Construction of the first 400 kV line from Atlas to the Western Cape is proceeding.

It is not to be inferred that existing power stations in the Western Cape and in other parts of the country will be shut down, or that the existing coal traffic will cease: nonetheless, as Escom's 400 kV transmission system is developed and brought into use, transmission of electricity will increasingly take the place of the transport of coal which previously was performed by the South African Railways.

ELECTRIFICATION OF RAILWAYS

Supplies purchased by the South African Railways for traction purposes increased by 4·1 per cent to 1,835 million units in 1966.

The remaining nine traction sub-stations for the

Witbank/Komatipoort electrification were commissioned during the year; and work was commenced on the electrification of the sections between Harrismith and Kroonstad and between Postmasburg and Hotazel.

PLANT CAPACITY

The capacity of new generating plant installed and taken into service in Escom's power stations in 1966 and the capacity of boilers and turbo-generators under construction or on order at the end of the year are given in the table below.

Of the plant listed in the table as being under construction at the end of the year 1 × 200 MW set and boiler at Camden Power Station was commissioned in April, 1967 and 1 × 100 MW set and boiler at Ingagane Power Station was commissioned at the end of March, 1967.

Cape Western Undertaking

Salt River Power Station

Border Undertaking

West Bank Power Station

Natal Undertaking

Ingagane Power Station

Eastern Transvaal Undertaking

Komati Power Station

Rand and O.F.S. Undertaking

Camden Power Station

Grootvlei Power Station

Hendrina Power Station

Arnot Power Station

Plant taken into service in
1966Boilers
lb/hrGenerators
kWPlant under construction or
on order at 31-12-66Boilers
lb/hrGenerators
kW

—

—

1,040,000

120,000

—

—

380,000

40,000

—

—

2,700,000

300,000

2,250,000

250,000

—

—

—

—

14,400,000

1,600,000

—

—

5,100,000

600,000

—

—

6,800,000

800,000

—

—

7,860,000

700,000

2,250,000

250,000

38,280,000

4,160,000

EXTENSIONS OF ESCOM'S TRANSMISSION SYSTEMS

During the year 1966 a total of 2,053 route miles of transmission and distribution lines and cables were added to Escom's networks. A summary of the route miles of lines and cables constructed and laid in 1966,

with similar figures for the years 1962-1965, 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 1962-66

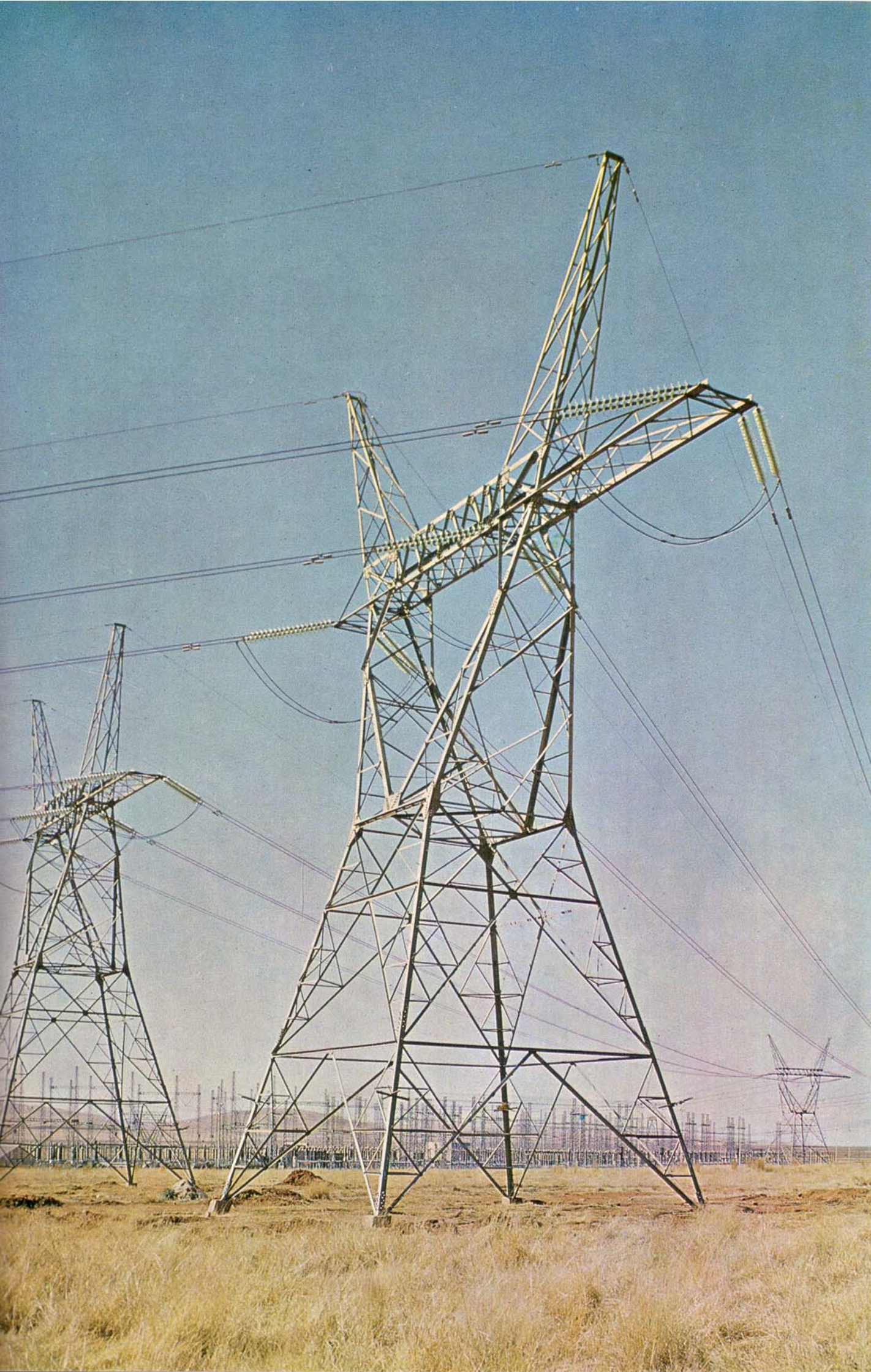
Year	275 kV	132 kV	88/33 kV	22 kV and lower	Total (miles)
1962	208	44	349	1,072	1,673
1963	141	129	460	1,281	2,011
1964	385	202	376	1,348	2,311
1965	349	329	641	1,453	2,772
1966	83	290	204	1,476	2,053

CAPITAL EXPENDITURE

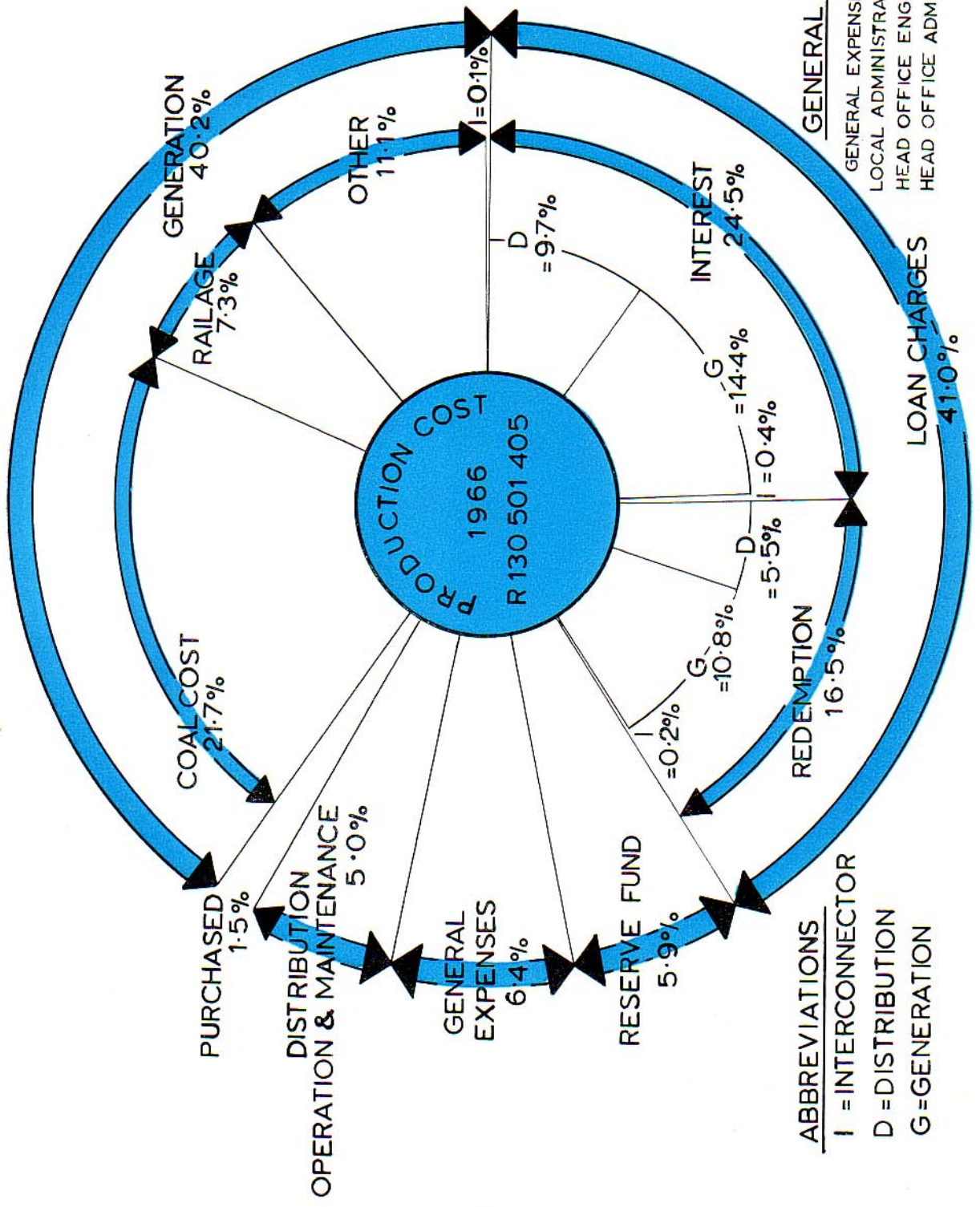
Borrowing Powers for New Projects

On the 4th March, 1966, application was made for approval in terms of Section 10 of the Act, for further

borrowing powers for sums totalling R113,600,000. The projects covered by this application were extensions to West Bank No. 2 Power Station, extensions at Ingagane Power Station, the cost of the first two sets at Arnot Power Station, the cost of the 400 kV



The incoming 400 kv lines from Camden at the Atlas distribution station.



transmission lines to the Western Cape and to Natal, and for extensions to distribution networks in all Undertakings. The extensions and new projects and borrowing powers therefore were approved on the 5th April, 1966.

Annual Capital Expenditure

Expenditure on Capital Account during 1966 amounted to R99,673,000.

The yearly expenditure on Capital Account for the years 1923-1966 is given in the table hereunder:—

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	1945	1,877,000	49,913,000
1924	75,000	109,000	1946	2,940,000	52,853,000
1925	1,770,000	1,879,000	1947	4,797,000	57,650,000
1926	2,394,000	4,273,000	1948	30,362,000	88,012,000
1927	8,937,000	13,210,000	1949	9,408,000	97,420,000
1928	1,637,000	14,847,000	1950	14,821,000	112,241,000
1929	764,000	15,611,000	1951	21,592,000	133,833,000
1930	556,000	16,167,000	1952	36,612,000	170,445,000
1931	424,000	16,591,000	1953	42,701,000	213,146,000
1932	232,000	16,823,000	1954	50,683,000	263,829,000
1933	453,000	17,276,000	1955	40,513,000	304,342,000
1934	1,510,000	18,786,000	1956	37,726,000	342,068,000
1935	4,195,000	22,981,000	1957	35,197,000	377,265,000
1936	4,122,000	27,103,000	1958	40,436,000	417,701,000
1937	3,460,000	30,563,000	1959	35,429,000	453,130,000
1938	3,734,000	34,297,000	1960	38,341,000	491,471,000
1939	2,348,000	36,645,000	1961	38,094,000	529,565,000
1940	2,017,000	38,662,000	1962	52,014,000	581,579,000
1941	2,146,000	40,808,000	1963	55,497,000	637,076,000
1942	2,955,000	43,763,000	1964	42,117,000	679,193,000
1943	2,811,000	46,574,000	1965	61,916,000	741,109,000
1944	1,462,000	48,036,000	1966	99,673,000	840,782,000

(Assets Sold Excluded)

COSTS AND TARIFFS

The more important components of Escom's cost structure are shown in the diagram on page 14 of the Production Costs for the year 1966. The only change in tariff made during the financial year 1966 was as follows:—

Cape Northern Undertaking

With effect from April, 1966, the rebate of 10 per cent on the standard tariffs was increased to 20 per cent.

SUPPLIES TO FARMERS

The steady expansion of Escom's rural networks year by year is shown in the diagrams on page 16, 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 18.

This table has been extended to show the figures for the last five years, as well as showing the increase or decrease in the 1966 figures compared with the 1965 figures.

Loan Capital

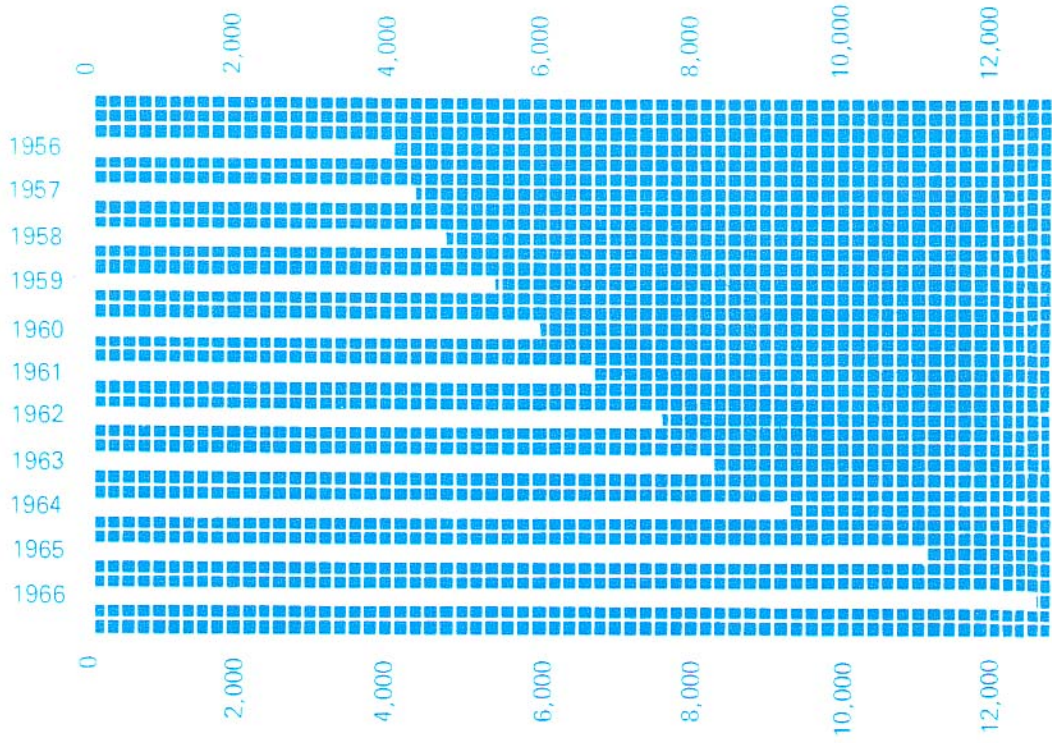
FINANCIAL

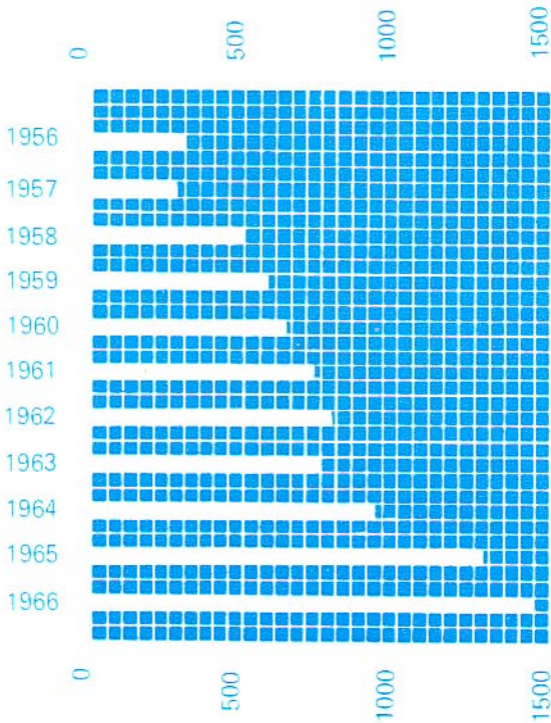
During 1966 two local loans totalling R65,000,000 were raised as follows:—

Date Issued	Amount	Interest	Issue Price	Redeemable
31st March	R30,000,000	6½%	R98.50	31.3.89/91
14th September	R35,000,000	6¾%	R97.00	30.9.1991
	<u>R65,000,000</u>			

These loans were fully subscribed but at the year end the amount received on account of the loan issued on the 14th September was R33,966,000. The balance of R1,034,000 payable not later than the 31st January, 1967, in terms of the prospectus has since been received. At the year end the loans raised locally as Local Registered Stock totalled R771,000,000. Loans Nos. 7 and 11 for R4,000,000 each were redeemed on the 31st March and Loan No. 22 for R9,000,000 was redeemed on the 31st August, 1966, and the total local loans repaid now amount to R58,500,000.

On the 8th September, 1966, an agreement was signed for a further loan of \$20,000,000 (R14,400,000) by the International Bank for Reconstruction and Development, this loan to be taken up not later than the 31st March, 1968. At the 31st December, 1966, an amount of \$6,301,000 (R4,525,000) of this loan had been received. During 1966, R4,663,000 was repaid against overseas loans, and the total amount of loans outstanding at the end of the year was R749,619,000.





Redemption Fund

The amount in the Redemption Fund at the 31st December, 1966, totalled R198,114,000 which exceeded the amounts required for the redemption of the loans in accordance with the provisions of the Act.

The amount in the Redemption Fund includes the

proceeds from sales of assets and profits on realization of investments.

Reserve Fund

The amount in the Reserve Fund at the 31st December, 1966, was R68,270,000.

Capital Expenditure

Expenditure on Capital Account during the year amounted to R99,673,000 which increased the total capital expenditure at the 31st December, 1966, to R840,782,000.

Expenditure on Capital Account will amount to approximately R1,384,000,000 on completion of all the works, for which borrowing powers have been approved.

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, 1966, was R262,607,000, the nominal value being R264,943,000. The market value of these investments at that date was R234,578,000.

Assets and Liabilities

The Commission's total assets at the 31st December, 1966, amounted to R1,158,168,000 and its total liabilities to R813,958,000, the difference being R344,210,000 which is represented by the amounts in the Redemption and Reserve Funds, loans repaid and balances on revenue accounts.

STAFF

Home Ownership Scheme

The balance at the 31st December, 1966, 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 R3,803,000.

Personnel

The staff employed by the Commission at the 31st December, 1966, numbered 18,579 employees made up as follows:—

	1965	1966	Increase	
Whites.....	6,254	6,455	201	3·2%
Coloured and Bantu.....	11,597	12,124	527	4·5%
	17,851	18,579	728	4·1%

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

STATISTICAL SUMMARY

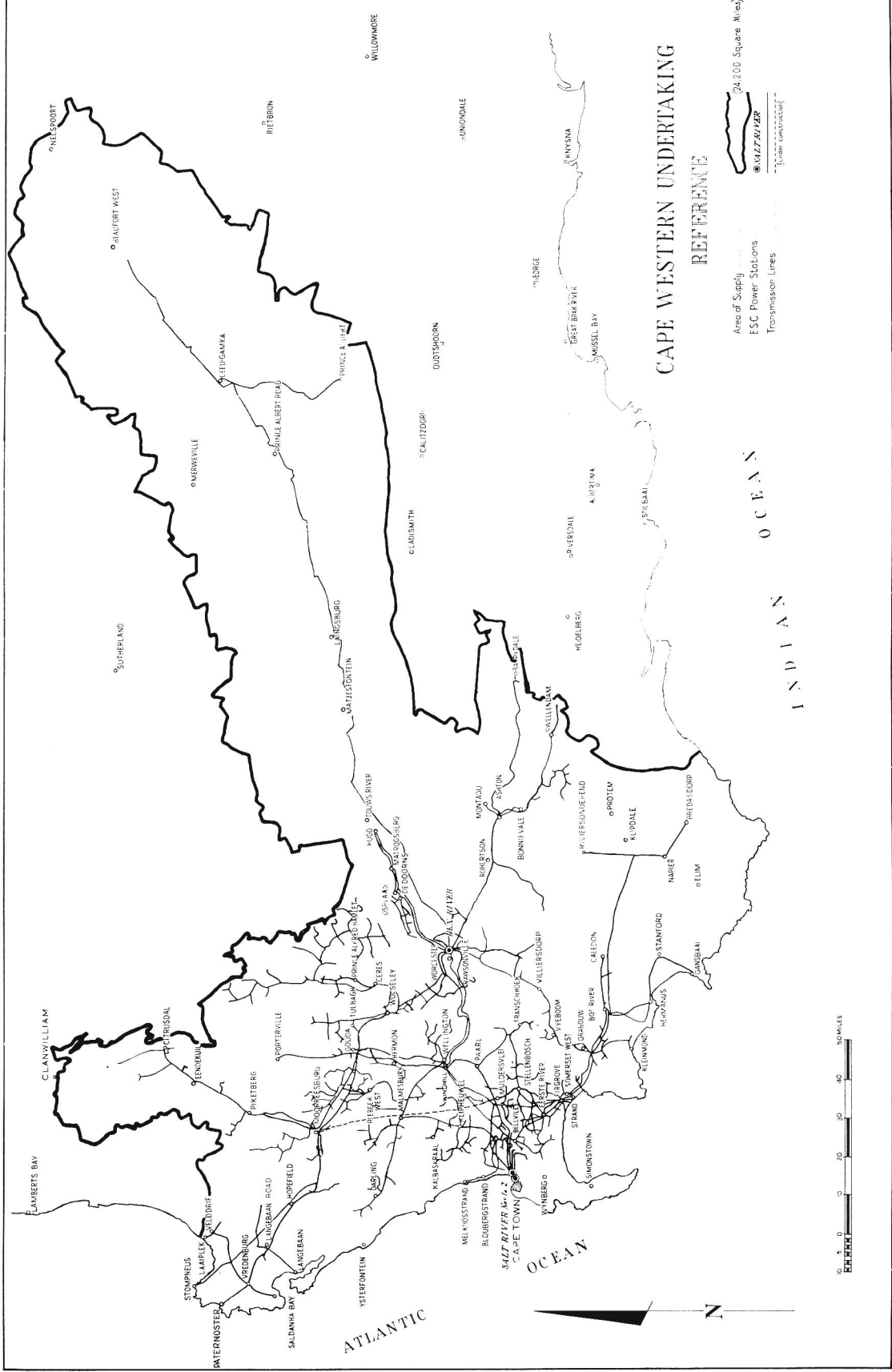
Revenue, costs, output and sales, and other figures relating to the operation of the Commission's Undertakings during the years 1962 to 1966 are as follows:—

	1962	1963	1964	1965	1966	Increase 1966 over 1965
TOTAL REVENUE.....	R 93,966,000	R 101,401,000	R 108,861,000	R 117,959,000	R 129,517,000	9.798%
TOTAL COSTS.....	93,385,000	100,010,000	108,751,000	118,673,000	130,500,000	9.966%
Difference between Total Revenue and Total Costs.....	581,000	1,391,000	110,000	—714,000	—983,000	—R269,000
Sales of Electricity, Air and Steam.....	93,579,000	100,953,000	108,382,000	117,481,000	129,009,000	9.813%
Net Costs (less Sundry Revenue).....	92,998,000	99,562,000	108,272,000	118,195,000	129,992,000	9.981%
Average Price per Unit Sold.....	.5164c	.5177c	.5101c	.5076c	.5254c	3.503%
Average cost per Unit Sold.....	.5132c	.5129c	.5118c	.5128c	.5315c	3.647%
Average Net Cost per Unit Sold.....	.5132c	.5106c	.5096c	.5107c	.5294c	3.662%
Cost of Coal Consumed (including Railage).....	29,230,000	31,009,000	32,367,000	34,986,000	37,901,000	8.332%
Railage on Coal Consumed.....	8,627,000	8,428,000	8,504,000	8,856,000	9,524,000	7.543%
Coal Consumed (in tons of 2,000 lbs).....	15,383,313	16,226,535	17,256,296	18,438,075	18,720,084	1.529%
Units Generated.....	20,805,518,186	22,312,389,427	24,355,271,933	26,440,445,395	27,395,479,555	3.612%
Units sent out.....	19,403,958,379	20,793,543,262	22,695,417,029	24,634,982,969	25,528,081,820	3.625%
Units Purchased.....	12,559,278	18,582,815	40,950,587	126,642,689	629,876,210	397,365%
Units Sold.....	18,121,036,829	19,500,013,697	21,247,542,296	23,143,311,124	24,554,347,088	6.097%

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.



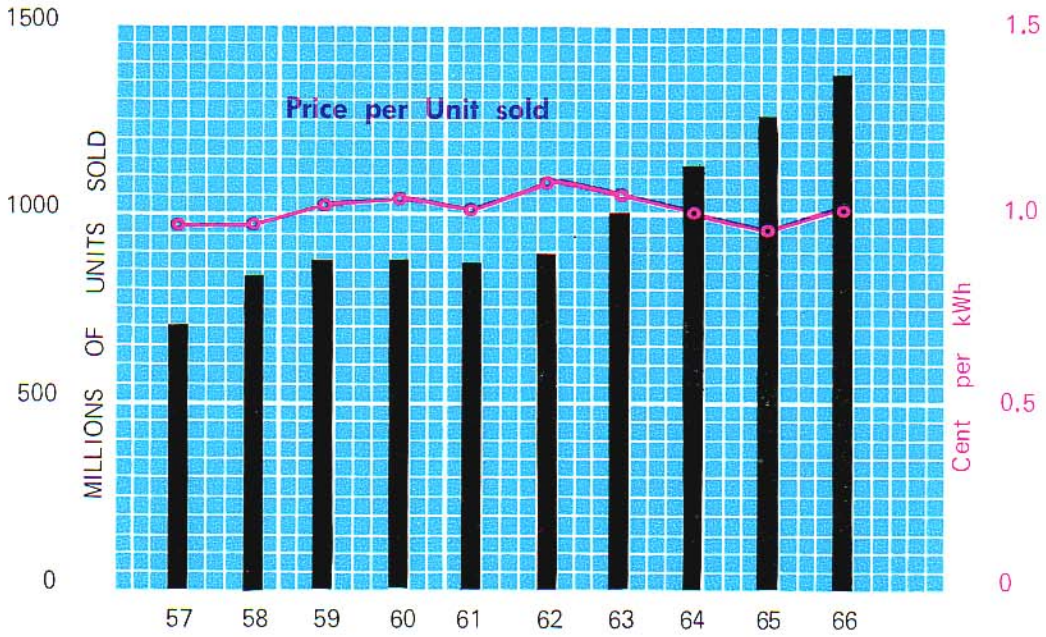
CAPE WESTERN UNDERTAKING

REFERENCE

- Area of Supply (24,200 Square Miles)
- ESC Power Stations
- Transmission Lines
- SALT RIVER** (Under construction)



CAPE WESTERN UNDERTAKING



Expansion of the Cape Western Undertaking

The above graph depicts the expansion of the Cape Western Undertaking which serves the area as shown on page 20, in terms of the units sold over the years 1957 to 1966.

Sales have increased from 699 million units in 1957 to 1,370 units in 1966, an average annual increase of 8.8 per cent over this period and an increase of 7.9 per cent over sales for 1965.

The average price per unit of electricity sold is shown on the graph by the red line, the average revenue per unit being 1.0264 cents (an increase of 2.31 per cent over the previous year's figure).

The downward trend in the average cost per unit sold, evident since 1962 and attributed to industrial growth in the Undertaking was therefore reversed in 1966, being partially due to the increase in tariff caused by the rise in the average price of coal which increased from R5.42 per ton in 1965 to R5.65 per ton in 1966.

The development of the Undertaking during 1966 followed the pattern of previous years with an increase in the number of, and sales to all categories of consumers except traction where the position remained static. No new bulk supply consumers were connected. Rural development, however, attained a new record, both in mileages of line built and number of consumers connected. Main line and substation construction proceeded according to programme and in step with the extensions to Salt River No. 2 Power Station.

Details of sales to the main consumer classes, revenue received and the more important features of the power station operating statistics for the year 1966, are shown in the table on page 24.

Output and Sales

Units generated in the stations in the Undertaking increased to 1,525 million units in 1966. A further 40 million units have been purchased from the Cape

Town City Council. Total sales amounted to 1,366 million units, being 7.8 per cent higher than the sales for 1965. The maximum half hour demand for the year was 274.3 MW being an increase of 15.7 MW or 6.5 per cent over the 1965 figure.

In contrast with previous years the supply of coal to the power stations was maintained at a high level and at no time during the year were stocks critically low. Some difficulty in fact was experienced in controlling spontaneous combustion arising at both Salt River and Hex River Power Stations in coal which was stockpiled early in the year.

With generator 1 at Salt River No. 2 Power Station out of commission during the year, output from Salt River No. 2 dropped by 12 per cent as compared with the output for 1965, and it was necessary to utilise the less efficient plant at Salt River No. 1 as well as to draw heavily at peak periods on the supply made available by the Cape Town City Council, a total of 40,479,800 units being purchased at a cost of R202,112. This agreement with the Cape Town City Council will remain in force until the extensions to Salt River 2 are complete.

Additional output was drawn from both Salt River 1 and Hex River Power Stations, and the total output from these stations exceeded the output attained in 1965 by about 80 million units.

Discussion of the technical arrangements for the bulk supply to be given to the Cape Town City Council are approaching finality, and it has been decided that the supply will be taken from the Commission's substation at Ysterplaats which is being sold to the Council. The two incoming 132 kV switches to be owned by the Commission have been purchased.

The target date for the supply is May, 1968.

Extensions to Salt River Power Station No. 2

The "C" extensions are progressing satisfactorily and there is every indication that the completion dates will be met.

While the building is not complete it is sufficiently advanced to enable the plant contractors to fulfill their obligations being the steaming of two 260,000 lb/hr. boilers in January, 1967, and the running of one (No. 5) turbo-generator scheduled for the end of February. Turbo-generator No. 5 was actually commissioned on the 4th March, 1967, followed by turbo-generator No. 6 on the 26th May, 1967.

Power Station Operation and Maintenance

Total units generated for the year showed an increase of approximately 5½ per cent over the 1965 figure. The balance of the units required to meet the load growth was purchased from the Cape Town City Council.

Salt River Power Station

The units generated by the combined Salt River Power Stations showed a decrease of approximately 2 per cent below the 1965 output, due to the fact that No. 1 turbogenerator at Salt River 2 was out of service throughout the year.

The turbine spindle of this set which had been sent overseas for repairs was lost in the wreck of the Seafarer. A new spindle has been ordered for delivery in August, 1967.

As a result of this loss the output from Salt River decreased by 12 per cent below the 1965 figure, while Salt River 1 generated a greater percentage of the total, its output increasing by 96.1 per cent on the 1965 output.

Coal stocks were affected by spontaneous combustion when the stocks of coal were built up in the early part of the year, and supplies were suspended for 16 days. During this period the wagon tippler was overhauled. It has been decided to install a second wagon tippler.

Due to a shortage in plant the old low pressure boilers in Salt River 1 were overhauled and recommissioned after eight years of dry outage.

Hex River Power Station

Generation at the Hex River Power Station increased by approximately 16 per cent over the figure for 1965 with corresponding increase in load factor. There was, however, a drop of 0.1 per cent in the overall thermal efficiency.

Major Transmission Lines

During the year construction of the Acacia-Muldersvlei No. 2 132 kV transmission line, as well as the erection of the 66 kV and extension of the 132 kV section of the Muldersvlei substation, was completed. Installation of the two 120 MVA 132/66 kV transformers, oil circuit breakers and terminal equipment at Muldersvlei was virtually completed by the year end.

Erection of the Acacia substation extensions was well advanced at the end of the year and installation of equipment is due to start early in 1967.

Laying and jointing of the 132 kV cable from Generator 5 at Salt River to Acacia has been completed and all transmission work associated with the commissioning of this generator will be completed by the middle of February, 1967.

The additions and alterations in the new year will materially add to the Undertaking's generation and transmission capacity.

Work on the 400 kV line routes and distribution station sites for receiving the supply of power via the Orange River Scheme is proceeding, and on the route from Hydra to Muldersvlei negotiation of servitudes, setting out and profiling is virtually complete for the distance of some 325 route miles from Hydra to Karoopoort. On the Karoopoort-Muldersvlei section negotiation of options and survey work is continuing. An aerial survey of the extremely mountainous sections of the Witzenberg and Elands-kloofberg ranges was undertaken.

Survey of the 132 kV line from Muldersvlei to Moorreesburg was completed during the year and a substation site has been purchased at Moorreesburg. Construction of the line is being carried out departmentally and commenced in November. The grillages and bases for 15 per cent of the towers were placed at the end of the year, the target date for the line being November, 1967.

Four substations were erected in the Worcester area, three of which have been commissioned.

Considerable extensions were made to the Ascot Substation during the year to enable a duplicate supply of 15 MW to be given to Fisons who started construction of a large fertiliser factory earlier in the year adjacent to the Caltex oil refinery. For this project arrangements were made to deviate the second Oakdale-Salt River Power Station 66 kV underground cable into Acacia Substation to augment the substation capacity.

The 66 kV system has been extended by the erection of a line from Ashton through the Cogmans Kloof to Montagu where a 66/22 kV substation has been erected to feed into some 120 miles of 22 kV farmers schemes lines supplying initially 140 consumers with an aggregate connection load of about 1,600 horsepower.

Survey work on a much needed 66 kV line from Bonnicvale to Swellendam is 50 per cent complete with 80 per cent of the wayleaves negotiated.

Development of the Urban Distribution Network

The demand for electricity in the Urban areas of Goodwood, Parow and Bellville increased by 8.8 per cent during the year to a total of 67 MVA. This demand was adequately met from the three stepdown centres of Elsies River, Oakdale and Bellville South with installed capacities of 30 MVA, 30 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 1967. Ground has already been purchased for this purpose, and the main items of equipment have been ordered.

A total of 979 new consumers were connected during the year, of which 22 were large users.

The total connected transformer capacity feeding the urban areas 11 kV network is now 109,890 kVA (excluding large users transformers taking supply at 11 kV). This represents an increase of 9.9 per cent.

Development of Rural Supplies

During 1966 the "C" extension to the Koue Bokkeveld 22 kV scheme was constructed, some 75

miles of line supplying 46 farmers being involved. The total 22 kV network mileage supplied from Gydo Substation in this area is now 192.

A large 22 kV scheme was commenced in the Koo-Montagu-Barrydale area and by the end of the year 80 per cent of the Montagu-Barrydale section was erected.

Extensions to the rural network totalled over 300 miles of high voltage lines (22 kV, 11 kV and 6.6 kV), some 12 miles of low voltage lines and 2 miles of street lighting mains.

These figures surpass the record figures established last year. A total of 958 new connections were made, including 222 for farms and 40 for large users, 15 of which were farmers.

Financial

Although revenue from sales was in excess of that estimated, expenditure was considerably higher than anticipated due to the increase in coal railage tariffs, the necessity for greater use of old plant, and salary and wage increases.

In addition it was necessary to purchase a total of 40,479,800 units from the Cape Town City Council at a cost of R202,112.75 or 0.488 cents per unit.

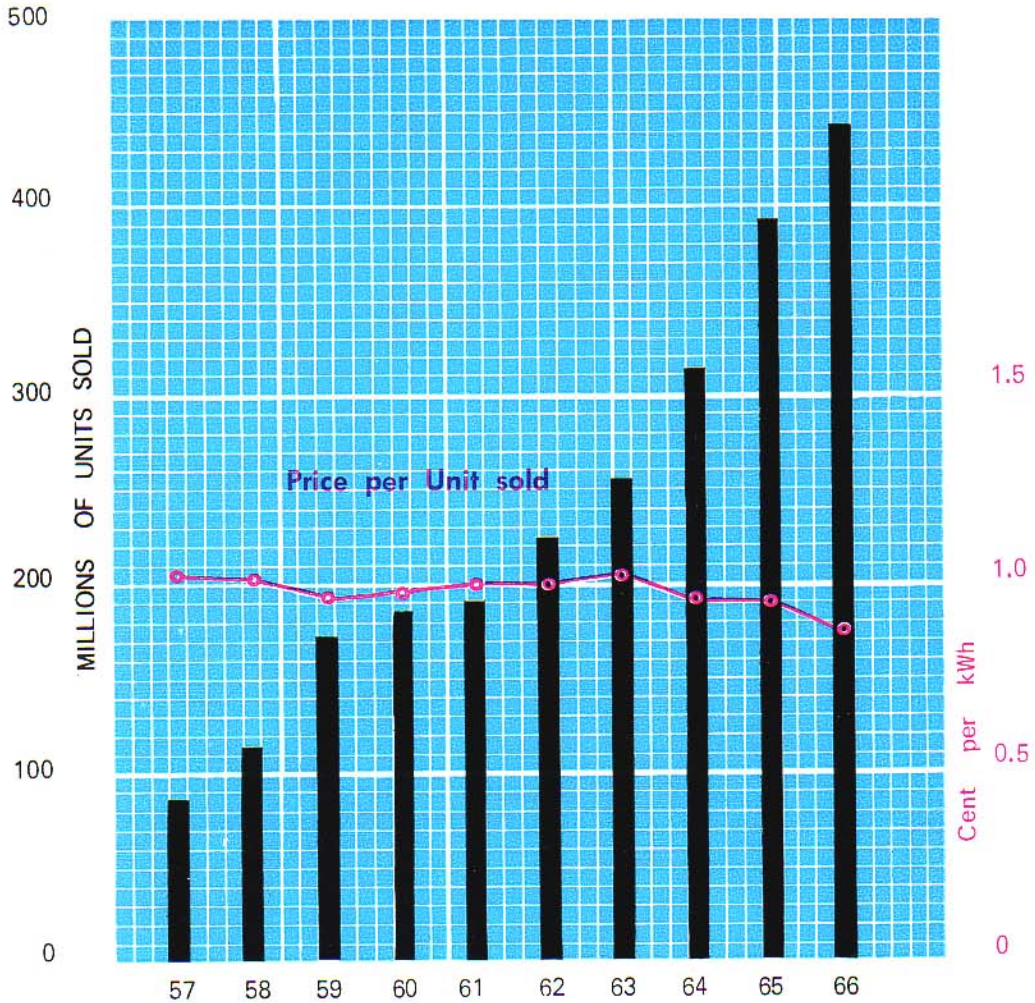
Total revenue for the year amounted to R14,566,477 as against working costs of R14,841,165 resulting in a deficit of R274,688 so that the accumulated surplus of R268,998 remaining at the end of 1965 was converted to a deficit of R5,690 at the end of 1966.

CAPE WESTERN UNDERTAKING

CONSUMER		SALES			REVENUE FROM SALES		AVERAGE PRICE/U.S.	
		Number	Units	% Change	R	R	c	c
Class	1966	1965	1966	1965	1966	1965	1966	1965
Traction.....	7	348,533,330	351,671,494	+ 0.900	3,676,000	3,555,000	1.0453	1.0201
Bulk.....	33	282,208,581	307,498,630	+ 8.961	2,672,000	2,412,000	.8688	0.8547
Mining.....	4,567	445,065,432	499,101,858	+12.141	5,183,000	4,438,000	1.0385	0.9972
Industrial.....	39,113	191,583,312	208,704,355	+ 8.937	2,992,000	2,755,000	1.4338	1.4378
Domestic and Street Lighting.....	43,720	1,267,390,655	1,366,976,337	+ 7.858	14,523,000	13,160,000	1.0624	1.0384
Total.....								
Total Revenue.....					14,566,000	13,199,000	1965	Accumulated to 31/12/66
Working costs.....					14,841,000	13,378,000		
Surplus.....								
Deficit.....					275,000	179,000		6,000
Capital Expenditure.....					13,642,000	3,846,000		88,558,000

	Salt River No. 1 Power Station		Salt River No. 2 Power Station		Hex River Power Station	
	1966	1965	1966	1965	1966	1965
Electricity units sent out.....	165,234,860	83,273,890	677,720,800	770,658,400	606,482,920	522,047,950
Maximum Demand k.W.S.O. } Half hour.....	83,461	53,596	94,054	118,926	119,000	113,900
Load Factor %.....	89,000	61,000	100,000	130,000	124,000	124,000
Thermal Efficiency % S.O.....	22.6	17.7	82.3	74.0	58.1	52.3
	18.2	16.7	26.9	26.9	25.5	25.5
FUEL:						
Coal Consumed — Tons.....	69,311	39,010	428,013	442,908	347,925	300,216
Average per unit sent out — lb.....	11,770	11,690	11,770	11,690	11,670	11,610
Calorific Value B. Th. U./lb.....	2,811,000	2,614,000	Included Under Sali River No. 1 Station	1,937,000	1,937,000	1,600,000
Total Cost Rand.....	5.65	5.42			5.57	5.33
Cost Per Ton — Rand.....						

CAPE NORTHERN UNDERTAKING



Expansion of the Cape Northern Undertaking

The graph above depicts the rapid expansion of the Cape Northern Undertaking during the past ten years, which serves the area shown on the map on page 26.

The price of electrical energy is indicated by the red line imposed upon the diagram. This shows that the average price per unit sold remained at about one cent for most of the period. However, during the last three years the average cost per unit sold has been reduced for all supplies by over 15 per cent in spite of the very considerable increases in the cost of fuel, transport and labour, the figure for 1966 being 0.8751c/unit.

Sales

Total sales amounted to 442.4 million units in 1966 — a 12.5 per cent increase over the previous year. Sales have almost doubled in the last four years.

A maximum demand of 86.0 megawatts was recorded in the winter of 1966.

Sales to the Kimberley City Council increased by 5.0 per cent to 95 million units. The relatively small increase was due to the mild winter and to the reduction in municipal water pumping from the Vaal River owing to the garden watering restrictions imposed during the drought.

The De Beers Company's four working diamond mines in Kimberley increased consumption by 7.1 per cent to 84.5 million units.

The De Beers new Finsch diamond mine near Silverstreams was brought to full production at the end of 1966 when additional water was made available from the Water Affairs Department's new pipe line.

The first 103 staff houses were completed and an additional 40 houses are now being built in Finsch township together with a shopping centre. A coloured township in this vicinity is also envisaged.

The total sales for Finsch mining, housing and water pumping were 11.65 million units during the year and it is anticipated that this will increase to at least 20 million units per annum in the near future.

Anglo Alpha Cement's consumption at Ulco remained almost constant at 55 million units but this may be reduced for a time when their new works at Dudfield reach full production.

The Northern Lime Company's consumption at the Silverstreams and Taung works remained static at 19.6 million units during the year. This will increase when a new crusher and an additional larger kiln, now on order, are brought into production at Silverstreams in 1968.

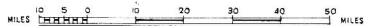
Consumption at Iscor's iron ore quarry at Sishen increased by 15.6 per cent to 22.5 million units



CAPE NORTHERN UNDERTAKING

REFERENCE

- Area of Supply..... (23,200 Square Miles)
- ESC Power Station..... @KIMBERLEY
- Transmission lines.....
- Transmission lines under construction.....



during the year and will continue to rise to provide for the growing output of steel at Vanderbijlpark.

The blue asbestos mining industry consumed 38.9 million units with an increase of 32.8 per cent during the year. Consumption has almost doubled during the last two years and further development is expected when the three large new mines, Strelley, Corheim and Bosrand, are brought into full production within the next two to three years. A total additional demand of 3.5 megawatts is anticipated for these mines.

Sales to manganese mines increased by 18.0 per cent in 1966 and now totals 8.5 million units per annum.

A ten mile 66 kV line has now been commissioned to the northwest of Hotazel to develop the manganese fields around the Black Rock area in the Kalahari.

Sales to small diamond mines have increased by 18.5 per cent to 8.4 million units in 1966. Further steady development is expected in the Bellsbank, Smith mine and Boshof areas.

	Units 1965	Sold 1966	% Increase of units during year 1966	% of total units sold 1966
	Millions			
Diamonds	88.4	102.3	11.6	23.1
Lime & Cement	73.5	74.3	1.0	16.8
Iron Ore	27.6	31.5	11.3	7.1
Blue Asbestos	29.2	38.9	32.8	8.8
Manganese	7.2	8.5	18.0	1.9
Gypsum	2.4	2.3	-5.0	.5
Total	228.3	257.8	12.9	58.2

Sales to the small municipalities increased as follows:—

Barkly West Municipality increased its consumption during the year by 13.0 per cent, part of which was due to the new meat factory which has commenced production on a limited scale. The S.A.R. Administration is now building fourteen new houses in the town.

Boshof, Warrenton and Hartswater Municipalities have increased by 14.6, 9.0 and 13 per cent respectively, while Christiana has increased by 24.2 per cent. Indications are that the recent rapid development here is likely to continue for several years to come with the introduction of a grain elevator, brickworks and a water scheme. Postmasburg and Kuruman Municipalities both purchased over 5 million units per annum with increases of 35.6 per cent and 14.1 per cent respectively. Postmasburg's large increase is partly due to the development of Treasure Troves West End diamond mine. This mine is expected to double its output in the second half of 1967.

The Village Management Boards of both Danielskuil and Olifantshoek during their first complete year consumed 402,000 and 320,000 units respectively.

The Vaalharts Plotholders scheme is now completely reticulated, catering for 1,050 domestic consumers taking 4.4 million units. This gives an average consumption for each consumer of 350 units per month.

The consumption of power in the Silverstreams-Postmasburg-Kuruman mining complex has increased by 27 million units to 115 million during the year and this development should continue at the same tempo. The Kimberley-Postmasburg-Hotazel railway line, which is now being electrified, will be able to deal with the extra traffic, involved in the transport of additional ore from this area.

The consumption of electricity on the Cape Northern Undertaking's section of the S.A. Railways' electrified line between Kimberley and Klerksdorp increased by 8.6m units to nearly 48 million for the year. Consumption from mid-1967 for the Kimberley-Postmasburg section has been estimated at 9 million units per month and from mid-1968 an additional 3 million units per month when the Postmasburg-Hotazel section is completed.

The following table shows the breakdown of energy which was employed for mining, quarrying and cement manufacture:—

Units 1965	Sold 1966	% Increase of units during year 1966	% of total units sold 1966
Millions			
88.4	102.3	11.6	23.1
73.5	74.3	1.0	16.8
27.6	31.5	11.3	7.1
29.2	38.9	32.8	8.8
7.2	8.5	18.0	1.9
2.4	2.3	-5.0	.5
228.3	257.8	12.9	58.2

The Taung area, mainly in the Bantu Reserve, improved consumption by 24.7 per cent and is taking almost 1.2 million units per annum.

Riparian farmers on the Vaal and Harts Rivers increased their pumping in the first part of the year until drought restrictions were enforced in October. Several spray irrigation plants have been installed to use the available water more economically. These plants, however, are using several times more energy than when they were pumping for flood irrigation only. A total of 4.1 million units was used by river pumping farmers during the year.

Development of the Undertaking

Starting in June, 1966, contractors erected the 132 kV lattice steel transmission line from Kimberley to Postmasburg, a distance of 128 miles, to serve nine traction substations. The line and substations were commissioned during March and April 1967.

The Undertaking's construction staff completed the second 132 kV line on wooden structures between Ulco and Silverstreams and erected a total of 7 miles of 11 kV and 16½ miles of 22 kV lines to serve three temporary pumping stations along the Vaal-Gamagara pipe line by October, 1966.

A 10 mile 66 kV transmission line was also erected from Hotazel to Klipkop in a north westerly direction to provide for the Associated Manganese Company's development in the Black Rock area.

8½ Miles of 11 kV line was erected from White Rock mine to Batlharos Mission Hospital which is situated

some thirteen miles north of Kuruman in the Bantu Reserve to provide a supply of 25 kVA initially.

At Vaalbos a 132/22 kV substation and at Hillside a 22/11 kV substation were erected to cater for additional loads at Postmasburg and the surrounding area.

Extensions at Warrenton, Midplots and Ganspan substations were effected to provide for the increasing load.

The 36 mile 22 kV line from Olifantskop to Petrusburg Municipality was completed in February, 1967. This line passes Perdeberg and will provide for future rural electrification along the Modder River which will receive a much more constant supply of water when the 4 million rand Krugersdrift dam is completed in 1969/70.

Towards the end of 1966 negotiations for bulk supply were concluded with Douglas, Griquatown, Prieska and Upington Municipalities. The scheme will include a large mining supply at Koegasburg on the Orange River and will entail some 270 miles of 132 kV transmission line with at least four stepdown substations.

Interconnection with the Pooled Power Stations

During the year 461·4 million units were supplied from the Rand and O.F.S. network and 440·3 million units were received in Kimberley.

98½ per cent of the units sent out from Kimberley Distribution Station were supplied from the Rand and O.F.S. compared with 97 per cent in 1965 and 90·7 per cent in 1964.

The Central Power Station, which was used at times of peak load, contributed 11·5 M.W. or 13½ per cent of the winter peak of 86 M.W. This power station sent out only 6·9 million units, and was finally closed down in December 1966.

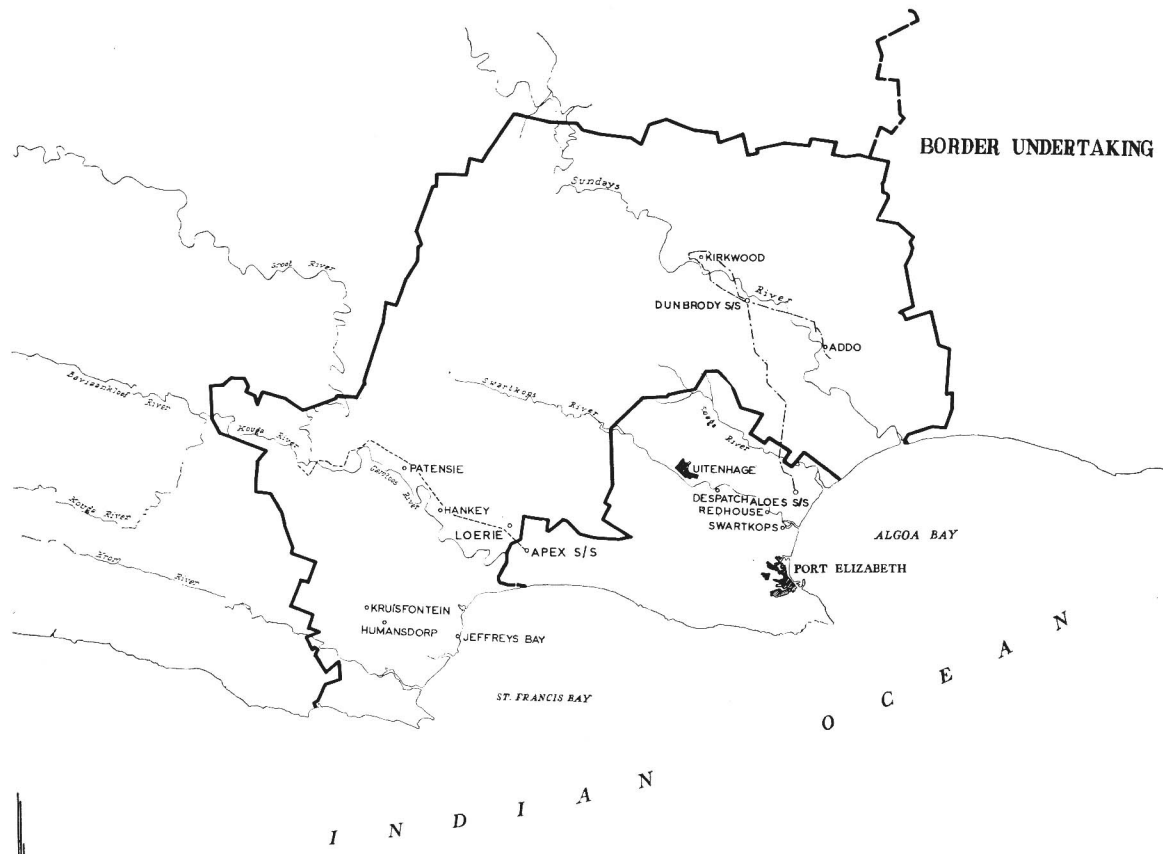
Financial

From April 1966 the rebate on standard tariffs was increased from 10 to 20 per cent.

The revenue due to the tariff adjustment rose by 3·75 per cent to R3,880,000 for an increase of 12·5 per cent in unit sales. A revenue surplus of R57,565 is shown in this year's accounts compared with a surplus of R359,544 in 1965.

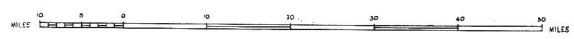
CAPE NORTHERN UNDERTAKING

CONSUMER Class	Number		SALES				REVENUE FROM SALES		AVERAGE PRICE/U.S.	
	1966	1965	Units		% Change	R	R	c	c	
			1966	1965	66/65	1966	1965	1966	1965	
Traction.....	2	2	47,981,433	39,360,768	+21.902	428,000	409,000	0.8924	1.0398	
Bulk.....	9	9	113,480,990	105,801,140	+7.259	811,000	824,000	0.7148	0.7785	
Mining.....	59	57	203,013,768	174,648,043	+16.242	1,893,000	1,767,000	0.9325	1.0116	
Industrial.....	275	240	66,763,760	64,391,291	+3.684	538,000	548,000	0.8062	0.8512	
Domestic and Street Lighting.....	2,053	1,903	11,147,275	9,033,204	+23.403	201,000	183,000	1.7994	2.0247	
Total.....	2,398	2,211	442,387,226	393,234,446	+12.500	3,871,000	3,731,000	0.8751	0.9487	
Total Revenue.....							1966	1965	Accumulated to 31/12/1966	
Working costs.....							R	R	R	
Surplus.....							3,880,000	3,735,000	1,136,000	
Deficit.....							3,822,000	3,600,000		
Capital Expenditure.....							58,000			
							2,841,000	1,334,000	19,175,000	
Central Power Station (Kimberley)										
							1966	1965		
Electricity Units Sent Out.....							6,878,890	12,683,200		
Maximum Demand kW.SO. } Half Hour.....							13,608	14,476		
Load Factor %.....							15,400	17,500		
Thermal Efficiency % S.O.....							5.8	10.0		
							5.7	8.1		
FUEL:										
Coal Consumed — Tons.....							12,309	23,975		
Average per unit sent out—lb.....							3,579	3,781		
Calorific Value B. Th. U./lb.....							11,200	11,090		
Total Cost—Rand.....							52,000	98,000		
Cost per ton—Rand.....							4.24	4.07		



CAPE EASTERN UNDERTAKING
REFERENCE

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



Area of Supply

The area of supply of the Cape Eastern Undertaking is shown on the map on page 30.

Supply of Electricity in the Sundays River Valley

Further steady progress was made with the connection of consumers to the reticulation system in the Sundays River Valley, but at a lower rate than in 1965 when the major portion of the scheme was completed.

The net increase in the number of consumers was 48, bringing the total at the end of the year to 266. The additional consumers were all in the Domestic or small power user classes.

Supply of Electricity in the Gamtoos River Valley

The detailed planning of the scheme to provide supplies to consumers in the Gamtoos River Valley, using electricity generated at the hydro-electric station at the Kouga Dam, was proceeded with and orders were placed for the major portion of the necessary equipment.

The construction of the 22 kV line down the valley from the Kouga Dam was commenced and was well advanced at the end of the year. Completion of the main line is scheduled for September, 1967. Negotiations are in hand for the purchase of a site about five miles from Loerie, for a substation to be named Apex, at which interconnection will be made with the Port Elizabeth Municipality's system. This substation is due for completion in December, 1967. It is expected that the hydro-electric station at Kouga Dam will come into operation in 1968.

Terms are in course of preparation for quoting to consumers at Hankey and Patensie and it is planned to commence work on the reticulation systems towards the middle of 1967. A temporary supply will be taken from Port Elizabeth Municipality at Loerie in order to give supplies to consumers connected before power is available from the hydro station.

Preliminary investigations are in hand in regard to the supplies to farmers and to the pumping plants belonging to the Department of Water Affairs.

Output and Sales

The total sales by the Undertaking for 1966 amounted to 2,481,001 units, an increase of 54.9 per cent over the figure for 1965. The system maximum demand increased from 827 kVA in 1965 to 1107 kVA.

Kirkwood Municipality purchased a total of 977,320 units during the year, this being an increase of 23.0 per cent. The maximum demand for this consumer increased by 2.2 per cent, from 368 kVA in 1965 to 376 kVA in 1966.

The supply purchased from Port Elizabeth Municipality at Aloes amounted to 2,918,132 units. The average cost per unit sold was 3.1813 cents being 7.8 per cent less than the average for 1965.

Financial

The total revenue for the year amounted to R79,364, which is an increase of 43.4 per cent on the figure for the previous year.

There was a deficit of R6,041 on the year's working, and this resulted in an accumulated deficit at the end of the year of R7,184.

CAPE EASTERN UNDERTAKING

CONSUMER Class	Number		Units		SALES		% Change		REVENUE FROM SALES		AVERAGE PRICE/U.S.				
	1966	1965	1966	1965	1966	1965	66/65	65/64	R	R	c	c			
Traction.....	—	1	—	—	—	—	—	—	—	—	—	—			
Bulk.....	1	—	977,320	795,040	+22.927	+164.555	—	—	20,000	19,000	2.0898	2.3933			
Mining.....	—	—	—	—	—	—	—	—	—	—	—	—			
Industrial.....	47	35	788,607	498,699	+58.133	+300.224	—	—	28,000	20,000	3.5384	4.0838			
Domestic and Street Lighting.....	218	182	715,074	308,463	+131.818	+1964.126	—	—	31,000	16,000	4.2791	5.0557			
Total.....	266	218	2,481,001	1,602,202	+54.849	+264.080	—	—	79,000	55,000	3.1813	3.4321			
										1966		1965		Accumulated to 31/12/1966	
										R		R		R	
										79,000		55,000		7,000	
										85,000		55,000		588,000	
										—		—		—	
										6,000		—		—	
										139,000		166,000		—	
										Total Revenue.....		Total Revenue.....		Total Revenue.....	
										Working costs.....		Working costs.....		Working costs.....	
										Surplus.....		Surplus.....		Surplus.....	
										Deficit.....		Deficit.....		Deficit.....	
										Capital Expenditure.....		Capital Expenditure.....		Capital Expenditure.....	

BORDER UNDERTAKING



Expansion of the Border Undertaking

The area of the Border Undertaking is shown on the map on page 34; and the expansion of this undertaking is shown on the graph above of units sold for the years 1957-1966. Sales increased from 143.1 million units in 1957 to 272.4 million units in 1966, an average annual increase of 6.9 per cent over this period, and an increase of 8.7 per cent over sales for 1965.

The price of electricity is indicated by the red line on the graph. The average price per unit sold was 1.1204 cents being an increase of 1.02 per cent over the 1965 figure.

Details for the year 1966 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 36.

Output and Sales

The total sales by the Undertaking amounted to 272,390,860 units, an increase of 8.7 per cent over the figure for the previous year, while the system maximum demand increased from 51,520 kW in 1965 to 54,610 kW in 1966.

East London Municipality purchased 206,467,500 units, the increase for the year being 6.0 per cent. The maximum demand for this consumer increased from 41,970 kVA in 1965 to 42,990 kVA in 1966, an increase of only 2.4 per cent.

The net increase in the number of consumers during the year was 212, bringing the total at the end of the year to 3,874. Seven new large users were connected and three small users increased their loading to become large users, while five large users terminated their supplies. Thirty-eight farmers and ten other rural consumers were connected.

West Bank Power Stations

The initial commissioning of the fourth 170,000 lb/hr boiler in West Bank 2 Power Station took place

in August, 1966, and the boiler was placed in full operation in October.

The work on the "D" extensions proceeded satisfactorily. The 20 MW generator is now due to be commissioned in May, 1967, and the 210,000 lb/hr boiler in August, 1967. The second chimney stack is due for completion in April, 1967.

In West Bank 1 Power Station, economisers were fitted on boilers 7, 8, 9 and 10.

A diesel locomotive was placed in service in June, 1966, for shunting coal trucks on the power station sidings, and this has speeded up the coal-handling operations and permitted a reduction in the labour force engaged on this section of the work.

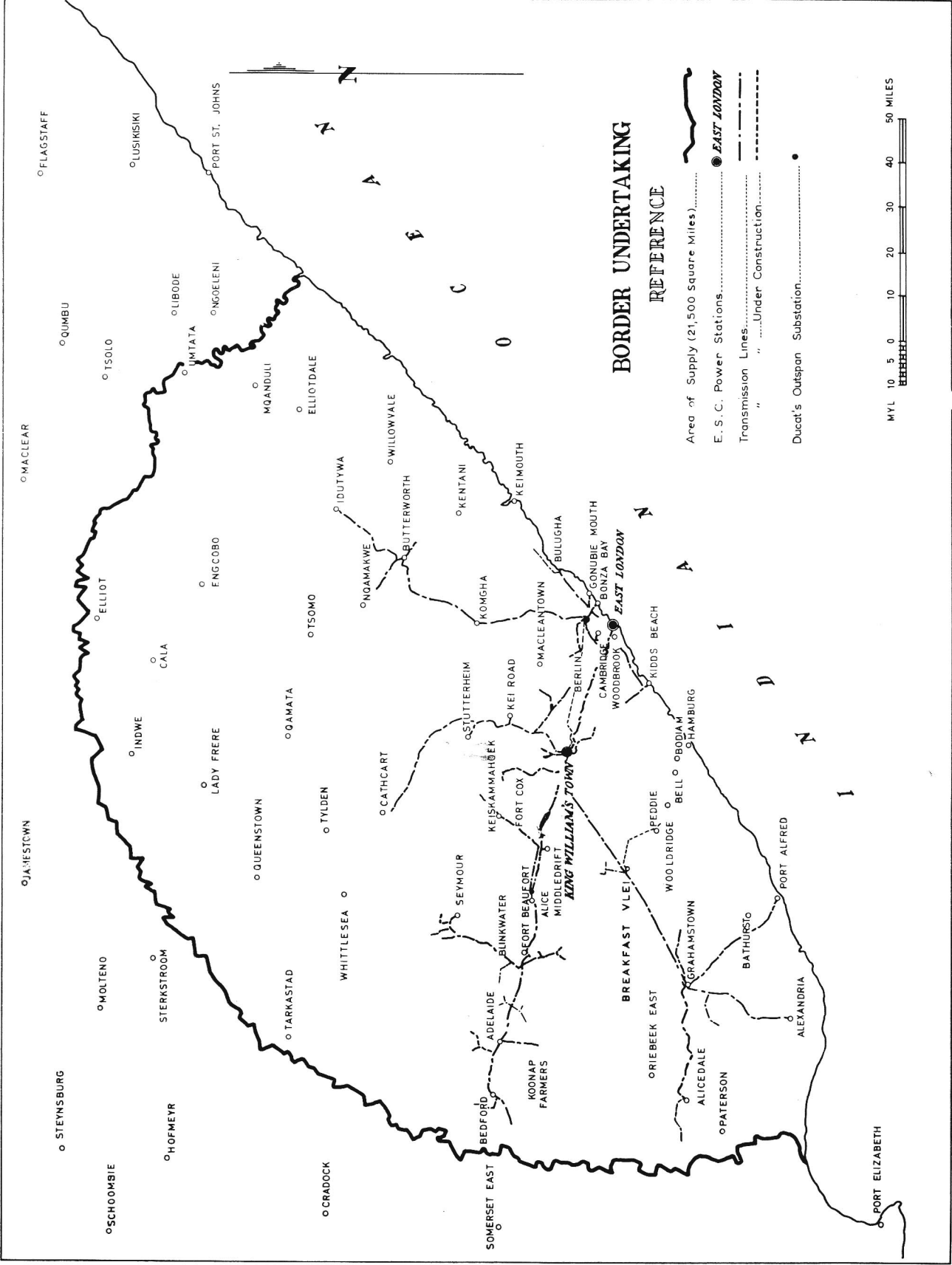
Coal supplies came forward regularly and the stock was maintained at a satisfactory level throughout the year.

The efficiency of the combined stations remained at the same figure as in 1965, i.e. 21.3 per cent, the proportion of the total output generated in the less efficient plant in West Bank 1 Power Station being about the same as in 1965.

King William's Town Power Station

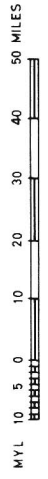
The steam plant was brought into operation for a short time in February, 1966, while maintenance work was being carried out on the East London/King William's Town 66 kV line, and again in June, 1966, when a generator at West Bank 2 Power Station was out of service.

The 1,000 kW diesel generator was run for a short time during a line outage in April, 1966. Later in April it was dismantled and sold. The installation of a second 66 kV line between East London and King William's Town, now in progress, will make it unnecessary to retain the standby plant at King William's Town.



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..... ●



Development of the Undertaking

The project to supply the town of Peddie and a group of farmers in the Breakfastvlei area was commenced and at the year end the 66/11 kV substation at Breakfastvlei was commissioned. Supply was commenced to two farmers in the Breakfastvlei area. It is expected that the supply to the various consumers in Peddie will be commenced in the second quarter of 1967.

Erection of the 66 kV transmission line from Ducats Substation near East London to King William's Town was commenced and the major portion of this project was complete at the year end. Earth filling was completed at Ducats Substation in preparation for the extensions necessary and it is planned to have the line ready for commissioning during April, 1967.

Increased system loading made it necessary to provide for installation of additional transformer capacity at Ducats and Grahamstown substations during 1967 and the 11/66 kV step-up capacity at Gately is to be increased by the installation of a 12 MVA transformer in 1968.

A temporary 66/11 kV stepdown substation was erected near Arnoldton to provide supplies to the contractors engaged on the construction of a new dam for the East London Municipality at Bridle Drift.

Reinsulation of the Port Alfred and Alexandria lines for uprating to 22 kV operation was completed, with the exception of the spur lines to individual consumers, and erection of stepdown substations at Alexandria (Kwaaihoek Substation) and Port Alfred (Station Hill) as well as extensions at Grahamstown Substation is scheduled to commence early in 1967.

An additional supply was given to Port Alfred Municipality at their new water pumping scheme on the Kowie River.

The scheme to supply several farmers in the Seven Fountains area near Grahamstown was commenced and completed.

Several farmers in the Brakfontein/Lilyfontein area beyond Gonubie Hall on the North Coast system accepted terms for supply and work on this scheme is scheduled to commence in the second quarter of 1967.

Financial

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

The total revenue for the year was R3,055,000 which represents an increase of 10.4 per cent over the revenue for 1965.

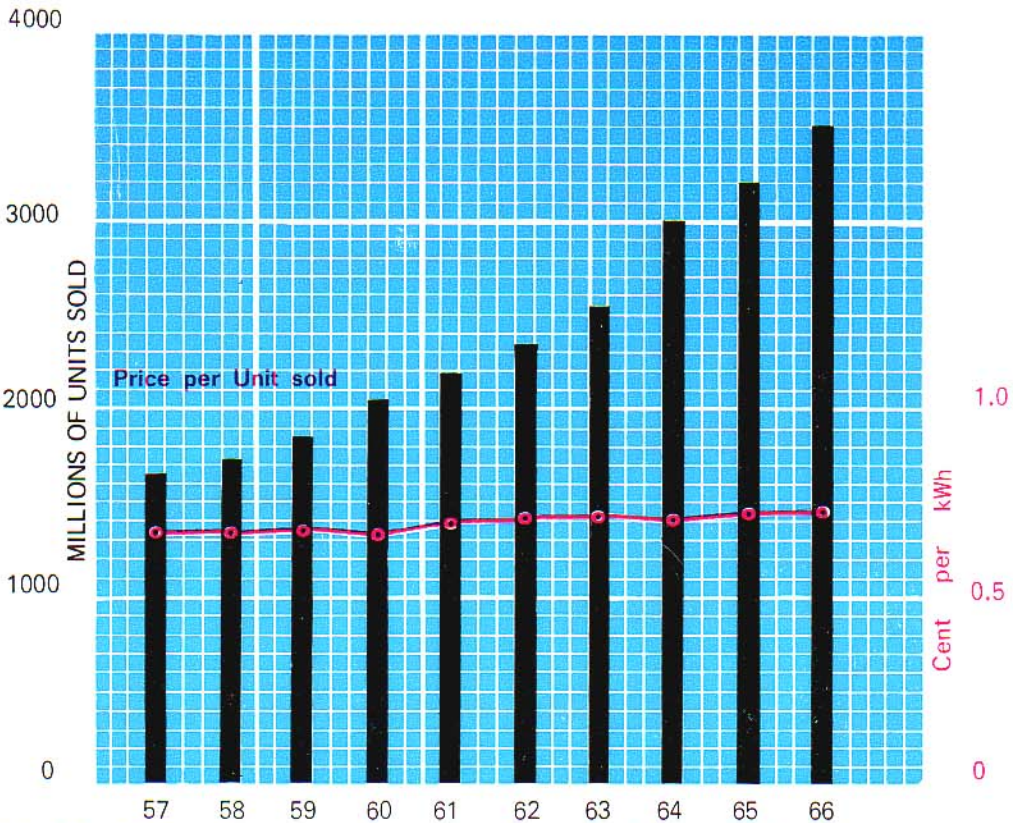
There was a surplus of R101,000 on the year's working. The accumulated deficit was thus wiped out, leaving an accumulated surplus of R100,627.

BORDER UNDERTAKING

CONSUMER		SALES			REVENUE FROM SALES		AVERAGE PRICE/U.S.	
		Units		% Change	R	R	c	c
Class	1966	1965	1966	1965	66/65	65/64	1966	1965
Traction.....	14	14	237,354,531	219,692,590	+ 8.039	+ 8.909	2,364,000	2,162,000
Bulk.....	391	374	16,656,073	14,054,888	+18.507	+20.597	362,000	300,000
Industrial.....	3,469	3,274	18,380,256	16,775,533	+ 9.566	+ 8.992	326,000	302,000
Domestic and Street Lighting.....	3,874	3,662	272,390,860	250,523,011	+ 8.729	+ 9.510	3,052,000	2,764,000
Total.....								
							1966	1965
Total revenue.....							R	R
Working costs.....							3,056,000	2,767,000
Surplus.....							2,955,000	2,677,000
Deficit.....							101,000	90,000
Capital Expenditure.....							1,529,000	665,000
								Accumulated to 31/12/1966
								R
								87,000
								14,383,000

	East London — West Bank Nos. 1 & 2 Power Station		King William's Town Power Station	
	1966	1965	(Steam)	(Oil)
Electricity Units Sent Out.....				
Maximum Demand kWS.O. } Half Hour.....	275,243,230	252,369,430	159,150	2,020
Load Factor %.....	54,610	51,520	—	480
Thermal Efficiency % S.O.....	58,400	55,400	—	500
	57.5	55.9	—	—
	21.3	21.3	—	—
FUEL:				
Coal Consumed—Tons.....	191,047	174,889	262	—
Average per unit sent out—lb.....	1,388	1,386	—	—
Calorific Value B. Th. U./lb.....	11,530	11,570	—	—
Total Cost—Rand.....	997,000	892,000	1,000	—
Cost Per Ton—Rand.....	5.22	5.10	4.65	—
Fuel Oil Consumed—lb.....	—	—	—	1,195
Fuel Oil Per Unit Sent Out—lb.....	—	—	—	0.547
				3,145
				0.664

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 38.

Expansion of this undertaking over the period 1957-1966 is depicted in the diagram above, which shows the total units sold over these years. Total sales have increased from 1,640 million units in 1957 to 3,498 million units in 1966 — an average increase of 8.4 per cent per annum in the last ten years, and an increase of 9.9 per cent since 1965.

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, there being a slight increase from 0.7178 to 0.7322 during 1966, due to the delivered price of coal having increased at all power stations. Details of the units sold to the major classes of consumers, the revenue received and operating expenses during 1966, and the principal features of the generation of electricity in the Natal Power Stations appear in the tables on pages 40 and 41.

Output and Sales

Sales of electricity from the interconnected power stations of the undertaking totalled 3,498,485,101 units and exceeded the sales for 1965 by 9.9 per cent. In addition 9,600 units were exported during the year to the Rand and O.F.S. Undertaking through the 88 kV system at Platrand.

The maximum demand sent out on a half-hourly basis rose from 564.54 MW to 613.30 MW — an increase of 8.6 per cent.

An additional Railway Traction Substation at Wykom was supplied during the year and a connection

was made to a replacement traction substation at Cato Ridge necessitated by a deviation of the railway line in the vicinity of the original substation.

Negotiations were concluded for the supplies to Kokstad and Matatiele in the Cape Province, this work being planned for completion in 1969.

A bulk supply was made available to the Borough of Colenso in October when the Council took over the reticulation of electricity within its area which had been undertaken by Escom since the building of Colenso Power Station.

Thirty-two new large power users were connected during the period under review and a further twenty-six large users had increased supplies made available to them.

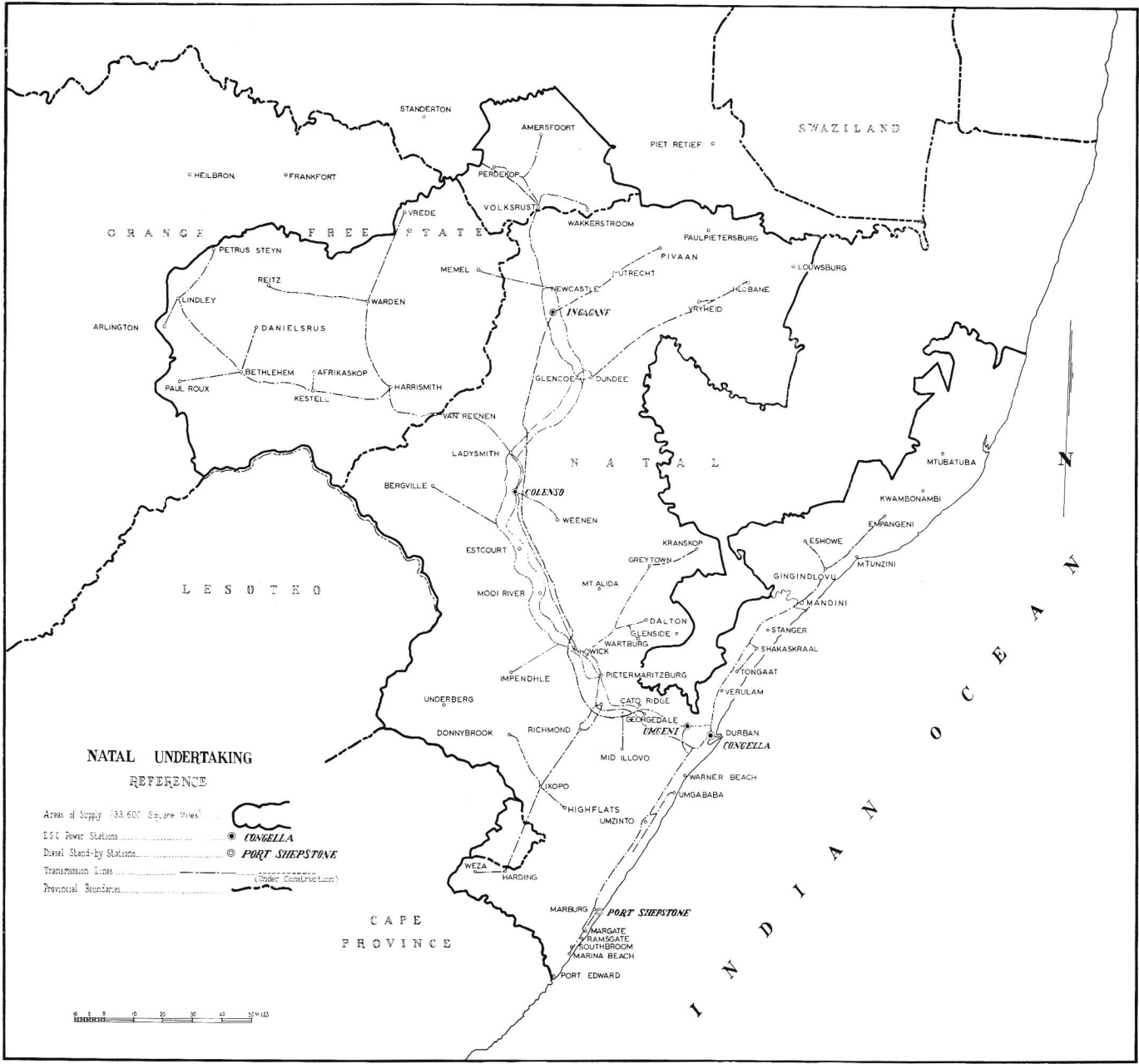
A further twenty-eight large users were converted to the ampere-demand tariff as the conditions of their usage were suitable for this change.

During the year negotiations were concluded for the purchase of assets and taking over the one hundred-odd consumers in the village of Kranskop from the private concessionaire supplying electricity there. The necessary modifications will be completed early in 1967.

Power Station Operation and Maintenance

The output from Congella Power Station decreased by 2.2 per cent during 1966 and was accompanied by a small drop in efficiency, which is attributed to the poorer qualities of coal received during the year.

Umgeni Power Station increased its output by 7.4 per cent accompanied by a rise in station load factor. As a probable result of this, the overall thermal efficiency increased from 23.3 per cent in 1965 to 23.6 per cent in 1966.



The output from Ingagane increased by 22·8 per cent over the 1965 figure, but with a decrease in thermal efficiency, due in part to a deterioration in the quality of the coal received.

The programme covering the introduction of planned maintenance at Ingagane Power Station is reaching finality whereas the scheme has been partially implemented at the other power stations.

Construction at Power Stations

The erection and installation of the third 100 MW turbo-generator and its associated boiler at Ingagane progressed satisfactorily, and the set was in fact commissioned in March, 1967.

The construction of foundations and steelwork for the fourth and fifth 100 MW sets at Ingagane was started.

At Umgeni Power Station two additional 132 kV feeders to Durban Corporation were commissioned. These feeders supply the Corporation's Old Fort Substation.

At Colenso, twenty additional houses were completed and occupied by the married staff.

Distribution System

The installation of the third 150 MVA 275/132 kV transformer at Georgedale Substation has been started and should be completed during 1967.

Duplication of the 88 kV tees was completed to the Railway Traction Substations at Mount Prospect, Ingogo, Boscobello, Wykom, Charlestown and Nottingham Road.

The Newcastle/Utrecht 33 kV wood-pole line was replaced by an 88 kV line on steel towers from Ingagane Power Station to Utrecht to provide for expansion in that area. The new 88/11/33 kV substation at Utrecht was commissioned.

At Ladysmith work was started on a new 88/11 kV substation to replace the old 88/6·6 kV substation now inadequate for the load. The new substation will be equipped initially with two 15 MVA transformers.

To provide for increased demand of the South African Rubber Works at Howick, work was started on an 88/11 kV substation there to replace the original supply derived from Cedara Substation by two 11 kV lines. The new substation will be equipped with two 7·5 MVA transformers.

During the year supplies were made available to the F.M. transmitters of the S.A.B.C. at Volksrust, Fort Mistake and Lowlands.

The high-voltage lines on the railway track structure between Colenso and Pieters and between Nottingham and Rosetta were replaced by cross-country lines to conform with the policy of removing all lines off track structures.

On the Natal North Coast a new 33/11 kV substation is being built with a firm capacity initially of 10 MVA at Maidstone near Tongaat to provide the load for an industrial township being created in this Border Industrial Area for Indians. The first factory has been built by David Whitehead Limited for textile production. A new township nearby for the housing of their white workers was supplied with electricity.

Following Escom's taking over the supply to the village of Wartburg a systematic re-construction of the network was carried out during 1966.

Early in 1966 a supply of electricity was made available to Empangeni Municipality which completed the first major programme of supplies to Zululand. In conjunction with this a supply was made available to a 132/33 kV substation at Shakaskraal for a supply to Stanger, Tongaat and Maidstone areas. This development replaces the previous arrangement for the purchase of electricity from the Durban Corporation at Compensation.

The 132/33 kV substation at Shakaskraal with two 15 MVA transformers was commissioned early in the year as was the 88/11 kV 2·5 MVA substation at Empangeni.

To accommodate the road and railway construction in the vicinity of Congella Power Station, two 88 kV cables were laid and commissioned to replace a section of the double-circuit overhead line between the Power Station and Coedmore Substation.

During the year a total length of 253·70 miles of transmission and distribution lines and cable were constructed and taken into service at 6·6 kV and above, and 108·56 miles of line and cable were taken out of service and dismantled, mostly from the South African Railway track structures.

Rural Development

During the year, 1,034 rural and large power users were quoted terms compared to 1,043 in 1965. The total number of applications outstanding at the end of the year was 1,048 compared with 865 in 1965. 290 Additional rural consumers were connected and 52 were given increased supplies.

Financial

Total revenue increased from R22,955,000 in 1965 to R25,739,000 in 1966 which was an increase of 12 per cent for the year. A surplus of R792,000 was shown on the year's working, as compared with a surplus of R531,130 for the year 1965.

In September, 1966, a new rail tariff came into operation resulting in an approximate 10 per cent increase in the delivered price of coal to power stations receiving coal by rail.

NATAL UNDERTAKING

Class	CONSUMER		SALES		REVENUE FROM SALES		AVERAGE PRICE/U.S.	
	Number		Units		R		c	
	1966	1965	1966	1965	1966	1965	1966	1965
Traction.....	9	9	496,790,749	546,649,038	3,974,000	4,109,000	0.7999	0.7517
Bulk.....	24	23	2,232,512,623	2,055,240,031	14,926,000	13,621,000	0.6686	0.6627
Mining.....	25	25	107,419,512	83,235,162	910,000	663,000	0.8475	0.7964
Industrial.....	2,161	1,955	599,438,103	440,687,893	4,763,000	3,454,000	0.7945	0.7837
Domestic and Street Lighting.....	12,991	12,645	62,324,114	56,680,386	1,044,000	998,000	1.6750	1.7609
Total.....	15,210	14,657	3,498,485,101	3,182,492,510	25,617,000	22,845,000	0.7322	0.7178

	1966		1965		Accumulated to 31/12/1966	
	R	% Change	R	% Change	R	R
Total revenue.....	25,739,000		22,955,000		22,955,000	
Working costs.....	24,947,000		22,604,000		22,604,000	
Surplus.....	792,000		351,000		351,000	1,845,000
Deficit.....						
Capital Expenditure.....	13,172,000		7,768,000		7,768,000	136,292,000

	Colenso Power Station Nos. 1 & 2		Congella Power Station Nos. 1 & 2	
	1966	1965	1966	1965
Electricity Units Sent Out.....	627,788,130	587,432,930	705,743,990	689,511,860
Maximum Demand kWS.O. } Half Hour.....	141,210	113,870	137,445	140,250
} 2 Minute.....	155,000	142,000	164,000	156,000
Load Factor %.....	50.8	58.9	58.6	56.1
Thermal Efficiency % S.O.....	17.5	17.0	19.9	20.0
FUEL:				
Coal Consumed—Tons.....	530,076	520,519	538,192	521,660
Average Per Unit Sent Out—lb.....	1,689	1,772	1,525	1,513
Calorific Value B. Th. U./lb.....	11,570	11,330	11,260	11,240
Total Cost—Rand.....	2,075,000	1,963,000	1,915,000	1,783,000
Cost Per Ton—Rand.....	3.91	3.77	3.56	3.42

NATAL UNDERTAKING

	Umgeni Power Station		Ingagane Power Station	
	1966	1965	1966	1965
Electricity Units Sent Out.....				
Maximum } Half Hour.....	1,069,651,888	993,295,636	1,233,958,740	1,004,691,700
Demand kWS.O. } 2 Minute.....	224,800	219,200	192,800	165,600
Load Factor %.....	240,000	232,000	206,000	188,000
Thermal Efficiency % S.O.....	54.3	51.7	73.1	69.3
	23.6	23.3	28.0	28.9
FUEL:				
Coal Consumed—Tons.....	661,422	627,192	697,516	542,081
Average Per Unit Sent Out—lb.....	1.237	1.263	1.131	1.079
Calorific Value B. Th. U./lb.....	11,710	11,600	10,790	10,950
Total Cost—Rand.....	3,190,000	2,848,000	1,757,000	1,331,000
Cost per ton—Rand.....	4.82	4.54	2.52	2.46
Port Shepstone Power Station (oil)				
			1966	1965
Electricity Units sent out.....			22,779	55,567
Maximum } Half Hour.....			1,820	3,326
Demand KWS.O. } 2 Minute.....			2,100	3,400
Load Factor %.....				
Thermal Efficiency % S.O.....				
FUEL:				
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.....			13,860	32,824
Fuel oil per U.S.O.—lb.....			0.608	0.591

M O C H A M B I O U E



EASTERN TRANSVAAL UNDERTAKING

REFERENCE

Area of Supply (35,700 Square Miles)

E.S.C. Power Stations ● WILGE ● CAMDEN

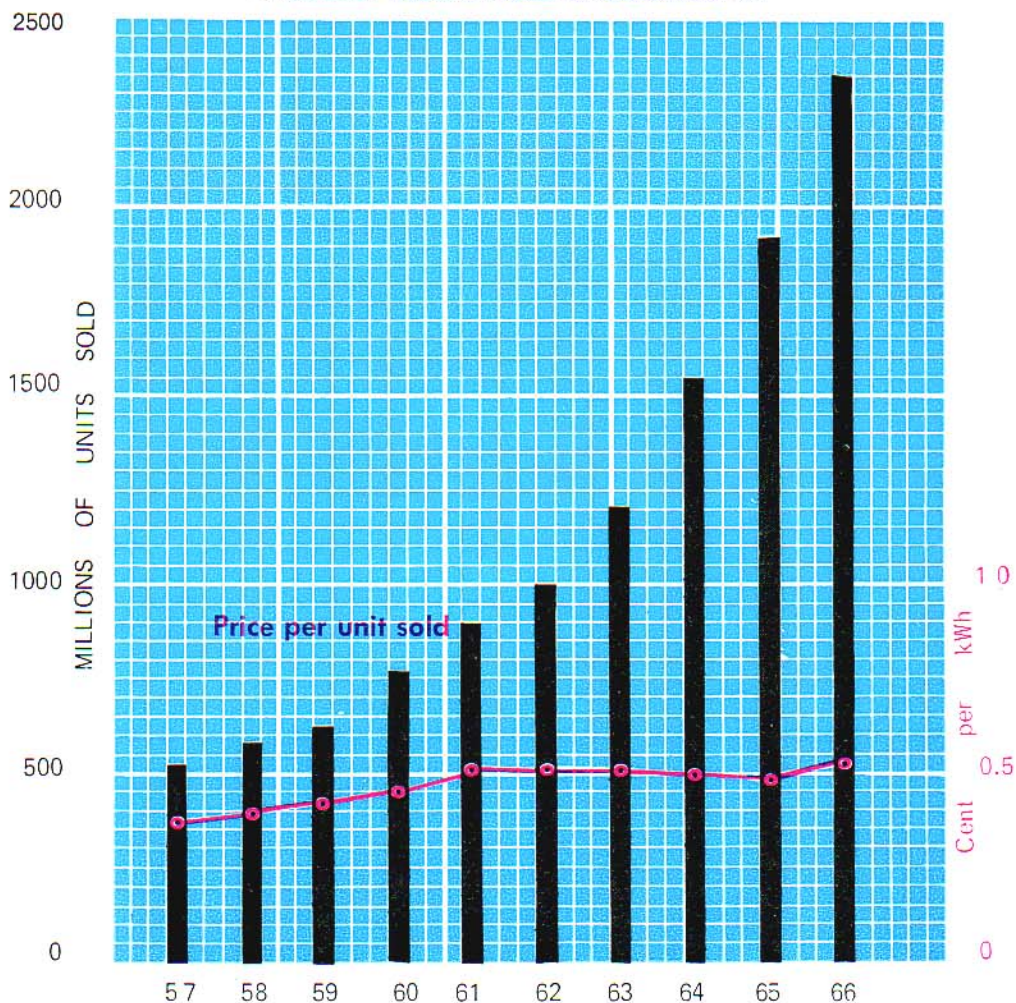
Transmission lines

Transmission lines under construction



SCALE

EASTERN TRANSVAAL UNDERTAKING



Expansion of the Eastern Transvaal Undertaking

The phenomenal rate of expansion of the Eastern Transvaal Undertaking which serves the area shown on page 42, was maintained.

Total sales of electricity have increased to 2,351 million units in 1966 i.e. an increase of 24.6 per cent above the previous year. (These figures do not include units for traction on the Germiston/Pretoria Section.)

The price of electricity sold is shown by the red line superimposed on the graph which reflects the average price per unit sold, there being an increase from 0.4897 to 0.5300 cents per unit during 1966. This is partially due to the price of coal which increased by approximately 8 per cent at Witbank and 6 per cent at Komati Power Station.

Sales of Electricity

Details of units sold to the major classes of consumers, the revenue received and operating expenses during 1966 appear in the tables on pages 46. Units for traction purposes increased from 62.6 million in 1965 to 157.4 million in 1966. (These figures exclude the Germiston/Pretoria Section.)

This relatively large increase is due to the commissioning of the last nine substations on the Witbank/Komatipoort section which is now served by sixteen substations.

The Palabora Mining Company increased their purchases to nearly 195 million units during 1966 and

the following consumers registered relatively large increases in consumption.

Consumer	Increase in Units Millions
Union Corporation (Gold Mines)	56
Rand Carbide	31.5
Transalloys	25.5

The Municipality of Middelburg increased its demand to such an extent that it became necessary to start construction of a new 88/11 kV substation to replace the existing 22/11 kV substation. It is anticipated that this will be completed in June, 1967. New supplies were provided for the Municipalities of Tzaneen and Nelspruit, the latter being connected at the end of April, 1967.

Power Stations

With the commissioning of No. 8 turbo-alternator set and boiler in March, 1966, followed by No. 9 unit in April, 1966, Komati Power Station was completed to its designed installed capacity of 1,000 MW. Units sent out by this power station increased by approximately 13 per cent during 1966 with an increase in load factor and improvement in overall thermal efficiency from 28.1 per cent to 28.5 per cent.

Units sent out by the Witbank Power Station decreased by 25 per cent during the year. Output from this station was restricted in order to conserve water in the Doornpoort Dam during the drought.

Transmission Lines

A considerable amount of work was carried out, as in past years on the development of the transmission system to meet the growing demand for electricity.

The 132 kV line between Marathon and Komati-poort Distribution Stations has been completed, supplying the last five traction substations on the Johannesburg/Komati-poort traction line.

Two 250 MVA 275/132 kV transformers were commissioned at Kruispunt Distribution Station, the third being almost ready at the end of April, 1967.

The 56 miles 275 kV transmission line between Komati and Camden Power Stations was energised in May, 1966.

Increased loading at the Palabora Mining Company was met by installing a second 132 kV line from Acornhoek to Foskor Distribution Station, while the operating voltage of the Marathon/Acornhoek section was increased from 132 kV to 275 kV.

A third 38 MVA transformer is being installed at the Palabora Mining Company Substation.

The transmission system between Foskor/Selati and Selati/Gravelotte was commissioned during the year enabling permanent supplies to be made available to the Municipality of Tzaneen and the Consolidated Murchison (Transvaal) Goldfield and Development Company.

Permanent supplies to the Phalaborwa Health Committee and Water Board, Bosveld Kunsmis as well as other consumers were provided from the Selati Substation.

Good progress has been made with the expansion of the system in the Nelspruit area and supplies to S.A. Pulp and Paper Industries Ltd. paper mill at Ngodwana were made available in March, 1966.

The rapid expansion in the sugar industry was met by enlarging the Malelane Distribution Station and a supply was provided to the Malelane sugar mill as well as several farmers for large scale spray irrigation purposes.

The demand for electricity from companies and private farmers planting sugar cane in the Komati-poort area was so urgent that a temporary 132/22 kV substation has been erected and 22 kV lines are being built to supply the pumping stations.

The 66 kV system from Noordkaap to Msauli mine was completed and a supply to the mine made available in April, 1967.

The 22 kV line at Graskop has been extended and 1,000 kVA was made available to Transvaal Gold Mining Estates while the substation at Penge (Cape Asbestos S.A. (Pty.) Ltd.) has been enlarged by the addition of a third 132/21 kV 7.5 MVA transformer.

The following large extensions were constructed in the Highveld area:

The second 132 kV Kudu/ Rockdale line was commissioned in November, 1966, in order to meet the rising loads of R.M.B. Alloys (Pty.) Ltd. and Southern Cross Steel Company (Pty.) Ltd. new stainless steel factory near Middelburg. Four heavy 22 kV lines were built from Rockdale Distribution Station to Southern Cross Substation. Rockdale Distribution Station is now equipped with four 30 MVA transformers.

The 2 × 88 kV lines to supply the new substation for the Municipality of Middelburg from Rockdale via Athlone was approximately 15 per cent complete

at the year end. The 88 kV line between Athlone and Groblersdal will be diverted at Middelburg Substation so that this point will actually be the commencement of the line. The Roosenekal 88 kV line supplying electricity to Ironstone Minerals (Pty.) Ltd. will also commence at Middelburg Substation. This line was approximately 10 per cent complete at the year end and it is expected to have the line and terminal substation ready for connection in December, 1967.

The supply to the two Usutu Collieries providing coal for Camden Power Station was installed during the year after completion of the Uitkomst Switching Station as well as Usutu West and Usutu South Substations. A supply to the Department of Water Affairs was provided from the Jericho Substation in August, 1966.

The Municipality of Piet Retief and Spaanderbord-vervaardigers Bpk. accepted terms early in 1967 and the 88 kV network from Jericho over Morgenstond will be extended to provide for this.

Two short 88 kV lines were built in the gold mine area of Kinross and a temporary substation has been built to supply the mine in the early stages of development. The permanent substation was approximately 30 per cent complete at the year end and in April, 1967, it was approximately 80 per cent complete.

The 88 kV substation at Delmas Colliery was completed in the middle of the year and a supply made available to the mine.

Klippoortje Koolmyne Bpk. and New Clydesdale Collieries requested duplication of their existing supplies and short 21 kV lines together with substations were built for this purpose.

Good progress has been made with the preliminary work in connection with the permanent supply to Highveld Steel & Vanadium Co. Ltd. The site for the substation has been levelled and all the material ordered. The target date for this project is February 1968.

Rural Electrification

Very good progress has been made during the year with rural electrification and 215 miles of distribution lines of voltages ranging from 22 kV and 2.2 kV and 15 miles of low voltage lines have been built. A total of 263 farms and 140 other consumers in rural areas were given supply and an additional 254 consumers in urban areas were also connected up.

During the year possible new schemes have been investigated in the area between Bronkhorstspuit and Groblersdal, in the Brondal area between Nelspruit and Sabie and in the Ofcolaco area 25 miles south east from Tzaneen. The investigation into the Ofcolaco scheme has been completed and 44 farmers and other consumers accepted Escom's tariffs. This scheme commenced in February, 1967, and approximately 6 miles of line had been built at the end of April, 1967. A new rural scheme was investigated during February and March in the Piet Retief/ Amsterdam/Lothair area.

Financial

Revenue for the year amounted to R12,856,101 with an average price per unit of 0.5300.

A surplus of R433,000 was shown in the 1966 accounts as compared with a surplus of R237,000 for 1965.






EASTERN TRANSVAAL UNDERTAKING

CONSUMER		SALES				REVENUE FROM SALES		AVERAGE PRICE/U.S.	
		Units		% Change					
Class	Number	1966	1965	1966/65	65/64	1966	1965	1966	1965
Traction.....	7	214,971,314	113,125,279	+90.029	+27.038	1,474,000	684,000	0.6855	0.6045
Bulk.....	16	115,622,682	92,531,642	+24.955	+18.100	666,000	501,000	0.5764	0.5418
Mining.....	68	884,545,752	639,448,623	-38.329	+11.141	4,842,000	3,296,000	0.5473	0.5154
Industrial.....	1,403	1,167,489,619	1,068,572,256	+9.257	+35.256	5,339,000	4,606,000	0.4573	0.4310
Domestic and Street Lighting.....	4,221	25,603,493	23,100,603	+10.830	+11.063	443,000	398,000	1.7302	1.7253
Total.....	5,715	2,408,232,860	1,936,778,403	+24.342	+24.665	12,764,000	9,485,000	0.5300	0.4897
						1966		1965	
						R	R	R	R
Total Revenue.....						12,856,000	9,574,000	9,337,000	1,166,000
Working costs.....						12,423,000	433,000	—	132,007,000
Surplus.....						—	7,967,000	—	—
Deficit.....						—	—	—	—
Capital Expenditure.....						—	—	—	—
						Komati Power Station		Sabie Gorge Hydro Power Station	
						1966	1965	1966	1965
						R	R	R	R
Electricity Units Sent Out.....						4,468,198,858	693,733	20,400	28,000
Maximum Demand kWS, O. } Half Hour.....		473,131,889	598,188,062		5,817,350,662	1,170	900	1,170	900
} 2 Minute.....		119,835	122,919		910,403	1,180	—	1,180	1,025
Load Factor %.....		45.1	55.6		72.9	73.5	—	—	—
Thermal Efficiency % S.O.....		14.5	15.0		28.5	28.1	—	—	—
						Witbank Power Station		Sabie Gorge Hydro Power Station	
						1966	1965	1966	1965
						R	R	R	R
Electricity Units Sent Out.....						4,468,198,858	693,733	20,400	28,000
Maximum Demand kWS, O. } Half Hour.....		473,131,889	598,188,062		5,817,350,662	1,170	900	1,170	900
} 2 Minute.....		119,835	122,919		910,403	1,180	—	1,180	1,025
Load Factor %.....		45.1	55.6		72.9	73.5	—	—	—
Thermal Efficiency % S.O.....		14.5	15.0		28.5	28.1	—	—	—
						Witbank Power Station		Sabie Gorge Hydro Power Station	
						1966	1965	1966	1965
						R	R	R	R
Coal Consumed—Tons.....		520,840	630,900		3,426,477	2,657,741	1,190	20,400	28,000
Average Per Unit Sent Out—lb.....		2.202	2.109		1.178	1.190	—	1,170	900
Calorific Value B. Th. U./lb.....		10,420	10,780		10,180	10,220	—	1,180	1,025
Total Cost—Rand.....		712,000	800,000		4,238,000	3,117,000	—	—	—
Cost Per Ton—Rand.....		1.37	1.27		1.24	1.17	—	—	—

Station on caretaker basis used in emergencies only.

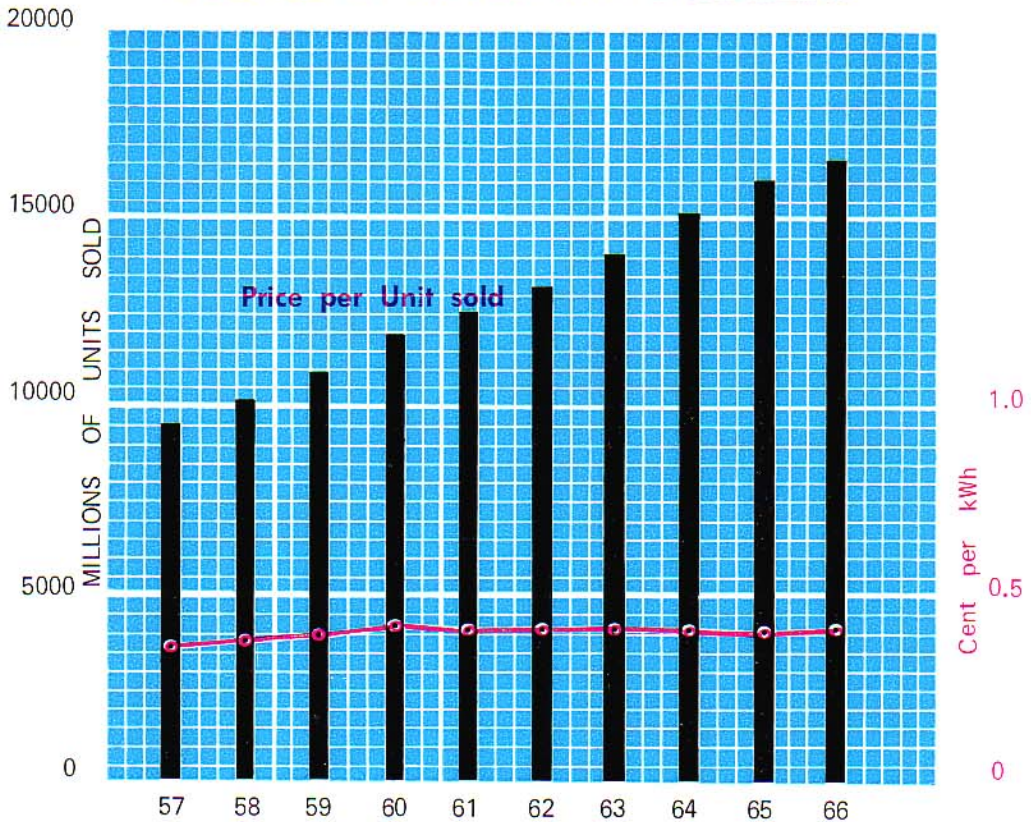


RAND AND ORANGE FREE STATE UNDERTAKING
REFERENCE

Area of Supply (31,000 Square Miles) 
 E.S.C. Power Stations  **EZEP**  **GEOTTYLEI**
 (under construction)
 Transmission Lines 
 Transmission Lines under construction 



RAND AND ORANGE FREE STATE UNDERTAKING



Expansion of the Rand and Orange Free State Undertaking

Sales for the year 1966 reflect an appreciable slowing down in the growth of supplies to all classes of consumer: but it appears that the different classes of consumers were affected by different economic factors.

The growth of supply to industrial consumers which was 11.3 per cent in 1965 fell to a figure of only 2.4 per cent in 1966. This comparison of total sales to industrial consumers is misleading as an economic index. Due to the severe restrictions placed upon the use of water from the Vaal River, the units to the Rand Water Board for pumping in 1966 were lower by some 108 million units than the sales to this consumer in 1965. If these supplies for pumping are excluded, the overall growth of industrial supplies is seen to be 5.9 per cent.

The increase in supply to the mining industry dropped to only 2.2 per cent as compared with a figure of 3.5 per cent for 1965. The decline in units consumed in the old mining areas of the Witwatersrand has continued; only one new mine, the Kloof Gold Mine Co. Ltd. was given a supply during the year. When this mine is fully developed it is expected to take a supply of the order of 500 million units a year.

Considerable expansion of Rustenburg Platinum mines has been notified for which re-enforcement of the system in that area will be necessary.

Over the 10 years represented by the above graph, the total units sold has increased from 9,493 million units to 16,524 million units which represents an average increase of 6.1 per cent over the last 10 year period. Present forecasts indicate that the load

growth will continue at that rate.

The price per unit sold is depicted by the red line superimposed on the graph. This increased by 2.7 per cent from 0.4020 cents per unit in 1965 to 0.4117 cents per unit in 1966.

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.

The 275 kV transmission yard at Camden Power Station was energised from Komati for the first time on the 4th April, 1966, and the Camden 400 kV transmission yard followed in September. This was the first time that equipment at this voltage had been energised in the Southern hemisphere.

The output from the pooled power stations in 1966 was 20,116 million units being an increase of only 2.5 per cent over the output for that of 1965. (The increase in 1965 was 8.7 per cent).

The maximum simultaneous demand on these stations was 3,044,905 kW being an increase of 158,680 kW (or 5.2 per cent over 1965).

Output from the pooled power stations, however, was affected by the water restrictions, in that output from the power stations drawing cooling water from the Vaal Catchment Area was limited as much as possible in order to conserve water. In order to meet the shortfall it was necessary to purchase 625.8 million units from the Johannesburg and Pretoria Municipalities.

If these purchases are included, the combined in-

crease amounted to 5·1 per cent for 1966. The supplies taken by the four undertakings which drew their

power either wholly or in part from the pooled system were as follows:—

	Maximum demand in a year	Total Units Million
Rand and O.F.S.	2,644,365	17,187·8
Eastern Transvaal	368,379	2,467·1
Cape Northern	79,181	461·4
Natal	4,680	0·2

These figures do not include units purchased from the Johannesburg and Pretoria Municipalities.

Witwatersrand which has been evident in recent years, continues.

Sales of Electricity and Compressed Air

The only mining area which shows an increase in units sold was Klerksdorp.

The sales of electricity to consumers of the Rand and Orange Free State Undertaking increased to a total of 16,524 million units in 1966 as compared with 16,024 million units in 1965, an increase of only 3·1 per cent.

The following table shows the units sold in the main mining areas.

	Units Sold (in millions)			
	1963	1964	1965	1966
Witwatersrand	2,815	2,716	2,663	2,491
Klerksdorp	1,412	1,488	1,560	1,702
Far West Rand	1,949	2,040	2,193	2,271
Orange Free State	2,282	2,449	2,534	2,538

The sale of compressed air was terminated to all consumers in July, 1966, but by arrangement, plant at Robinson and Canada Compressor Station continued to be operated as necessary to augment supplies provided by the new Air Compressor station erected by City Deep Limited.

The growth of supplies to industrial consumers which amounted to 11·3 per cent in 1965, fell to a figure of only 2·4 per cent in 1966.

The increase in units sold to the mining industry (2·2 per cent) overall showed a considerable drop from the figure of 3·5 per cent in 1965 and the falling away of consumption in the old mining areas of the

The biggest increase was in sales to domestic users. Sales to these consumers increased by 16·5 per cent over 1965.

The units sold to the main groups of consumers were as follows:—

	Units Sold in (millions)			
	1963	1964	1965	1966
Building and Cement (including quarrying)	327	447	508	530
Chemical (including pharmaceutical)	849	868	1,023	1,098
Engineering (including the motor industry)	201	357	393	415
Foodstuffs, Consumer goods & Commercial	560	624	751	935
Iron, Steel & Base Metals	1,659	1,991	2,326	2,535
Paper and Paper products	212	212	267	416

Major Transmission Lines

Rural Electrification

Erection of the main Camden/Atlas 400 kV transmission line No. 1, scheduled for completion in December, 1966, was 80 per cent completed at that date and was commissioned on the 21st March, 1967.

During 1966 a total of 785 miles of overhead lines for voltages of 31 kV and 6·6 kV was erected as well as 37 miles of low voltage lines.

The commencement of a supply to the Municipality of Warmbaths in May marked the first step in the development of a new high voltage transmission system to serve the Northern Transvaal. This supply is being made available on a temporary basis at 88 kV from Eerste Fabriek pending completion of the remaining section of the transmission line to Esselen. This last section was completed in January, 1967, but has not yet been energised, pending construction of 132 kV terminal equipment at Warmbaths and Esselen.

Supply was given to 664 farmers and also to 1,485 other consumers on small holdings (not classified as farmers) and in peri-urban areas.

The new substation for the supply to the Alberton Municipality at 33 kV was brought into commission in June, 1966, and additional points of supply provided for the Municipality of Brakpan (Bantu Township), Boksburg and Germiston.

The demand for supplies in the rural areas continued unabated and in addition to extensions to existing schemes, construction was commenced on several new schemes during the year; the major one being in the Brits area where 262 consumers were connected. The potential consumers in the scheme exceed 1,000.

An 11 kV supply was made available to Elsburg Municipality to replace the existing 3·3 kV supply.

Terms were accepted in the case of six schemes where construction will commence in due course and which will cater for 230 consumers in various parts of the Undertaking.

Financial

In a southerly direction the system was extended to the limit of the licensed area to give a supply to a S.A.B.C. F.M. station at Boesmanskraal.

There was no change in tariffs during the year and the change in the revenue per unit was mainly as a result of the adjustment of the unit rates on account of coal costs which increased from R1.45 in 1965 to R1.54 per ton in 1966.

Total revenue from the sale of electricity and air increased from R65,732,000 to R69,432,000. A deficit of R2,086,000 was shown on the year's operation and the accumulated surplus of R1,147,000 was converted into a deficit of R939,000.

RAND AND ORANGE FREE STATE UNDERTAKING

CONSUMER		SALES				REVENUE FROM SALES			AVERAGE PRICE PER UNIT SOLD		
		Number		Units		% Change		R	R	c	c
Class		1966	1965	1966	1965	66/65	65/64	1966	1965	1966	1965
ELECTRICITY:											
Traction.....	2	2	715,047,541	724,386,112	715,047,541	+ 1.306	+21.198	3,615,000	3,517,000	0.4990	0.4918
Bulk.....	111	109	2,336,120,888	2,336,120,888	2,164,241,678	+ 7.942	-10.760	10,435,000	9,550,000	0.4467	0.4413
Mining.....	107	107	9,580,135,984	9,373,418,255	9,373,418,255	+ 2.205	+ 3.514	37,416,000	35,940,000	0.3906	0.3834
Industrial.....	1,434	1,213	3,718,401,151	3,629,863,541	3,629,863,541	+ 2.439	+11.260	14,784,000	13,923,000	0.3976	0.3836
Domestic and Street Lighting.....	15,056	12,799	164,874,215	141,549,810	141,549,810	+ 16.478	+26.702	1,774,000	1,487,000	1.0762	1.0503
Total Electricity.....	16,710	14,230	16,523,918,350	16,024,120,825	16,024,120,825	+ 3.119	+7.017	68,024,000	64,417,000	0.4117	0.4020
AIR:											
Bulk.....	1	1	625,775	4,394,046	4,394,046		- 3.110				
Mining.....	8	8	37,454,186	73,745,571	73,745,571		- 7.913				
Industrial.....	20	20	1,395,392	9,029,455	9,029,455		- 2.877				
Total Air.....	29	29	39,475,353	87,169,072	87,169,072		- 7.182	1,079,000	1,024,000	2.7342	1.1745
Total Electricity and Air ..	16,739	14,259	16,563,393,703	16,111,289,897	16,111,289,897		+ 6.929	69,103,000	65,441,000	0.4172	0.4062
						1966		1965		Accumulated to 31/12/1966	
						R		R		R	
						69,432,000		65,732,000		939,000	
						71,518,000		67,305,000		443,820,000	
						2,086,000		1,573,000			
						60,392,000		29,010,000			
Total Revenue.....											
Working Costs.....											
Deficit.....											
Capital Expenditure.....											

RAND AND ORANGE FREE STATE UNDERTAKING

	Highveld Power Station		Klip Power Station	
	1966	1965	1966	1965
Electricity Units Sent Out.....				
Maximum	3,040,855,592	3,174,966,097	1,957,529,755	2,199,218,564
Demand kWS.O. } One Hour	459,670	451,279	381,911	380,505
Load Factor %.....	75.5	80.3	58.5	65.8
Thermal Efficiency % S.O.....	28.2	28.4	19.8	20.3
FUEL:				
Coal Consumed—Tons.....	2,026,979	2,162,532	1,805,827	1,989,722
Average Per Unit Sent Out—lb.....	1.333	1.362	1.845	1.809
Calorific Value B. Th. U./lb.....	8,510	8,820	9,040	9,290
Total Cost—Rand.....	3,317,000	3,506,000	4,490,000	4,323,000
Cost Per Ton—Rand.....	1.64	1.62	2.49	2.17

	Rosherville Power Station		Taabis Power Station	
	1966	1965	1966	1965
Electricity Units Sent Out.....				
Maximum	773,864	3,989,873	3,083,203,616	3,202,129,355
Demand kWS.O. } One Hour	16,546	19,789	444,072	448,675
Load Factor %.....	0.9	2.3	79.3	81.5
Thermal Efficiency % S.O.....	7.1	7.6	25.8	26.3
FUEL:				
Coal Consumed—Tons.....				
Average Per Unit Sent Out—lb.....				
Calorific Value B. Th. U./lb.....				
Total Cost—Rand.....				
Cost Per Ton—Rand.....				

RAND AND ORANGE FREE STATE UNDERTAKING

	Vaal Power Station		Vereeniging Power Station	
	1966	1965	1966	1965
Electricity Units Sent Out.....	2,026,163,771	2,065,833,437	474,693,730	605,861,730
Maximum Demand kWS.O. } One Hour.....	290,753	290,948	130,774	135,145
Load Factor %.....	79.6	81.0	41.4	51.2
Thermal Efficiency % S.O.....	21.0	20.9	13.7	14.4
FUEL:				
Coal Consumed—Tons.....	1,987,207	1,983,907	686,064	863,030
Average Per Unit Sent Out—lb.....	1.962	1.921	2.891	2.849
Calorific Value B. Th. U./lb.....	8,200	8,500	8,420	8,310
Total Cost—Rand.....	2,168,000	2,065,000	905,000	914,000
Cost Per Ton—Rand.....	1.09	1.04	1.32	1.06
<hr/>				
	Vierfontein Power Station		Wilge Power Station	
	1966	1965	1966	1965
Electricity Units Sent Out.....	1,686,650,616	1,721,897,217	1,556,174,400	1,585,198,163
Maximum Demand kWS.O. } One Hour.....	331,494	341,703	217,904	220,572
Load Factor %.....	58.1	57.5	81.5	82.0
Thermal Efficiency % S.O.....	22.3	22.4	24.3	25.1
FUEL:				
Coal Consumed—Tons.....	1,442,514	1,476,529	1,146,012	1,129,314
Average Per Unit Sent Out—lb.....	1.711	1.715	1.473	1.425
Calorific Value B. Th. U./lb.....	8,690	8,890	9,530	9,550
Total Cost—Rand.....	2,425,000	2,282,000	1,248,000	1,118,000
Cost Per Ton—Rand.....	1.68	1.55	1.09	0.99

MUNICIPAL ELECTRICITY SUPPLY SCHEMES

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

New Schemes

Extensions

TRANSVAAL:

Phalaborwa
Piet Retief (2)
Pretoria
Thabazimbi
Warmbad (2)

ORANGE FREE STATE:

Luckhoff

Fouriesburg
Heilbron
Hertzogville
Petrus Steyn
Rouxville
Winburg

CAPE:

Dordrecht
Kakamas
Port Elizabeth
Port St. Johns
Prieska
Riversdale
Steynsburg

SOUTH WEST AFRICA

Gobabis
Keetmanshoop

Up to the 31st December, 1966, a total of 1,885 reports on municipal supply schemes had been submitted by the Commission. Of these, 300 were in respect of new schemes, 957 were in respect of extension schemes and 628 were reports on tenders.

ANNEXURES

The Commission submits for the 1966 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 Com-
mission's undertakings as at 31st
December, 1966.

Statement No. 2—Summary of principal plant and
equipment in course of installation
or on order as at 31st December,
1966.

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

Statement No. 4—Units sold and number of con-
sumers, 1966.

Statement No. 5—Power Station Statistics, 1966.

Statement No. 6—Power purchased, 1966.

Statement No. 7—Water consumed by power stations,
1966.

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 1966.

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,
28th April, 1967

Gentlemen,

We have completed the audit of the books and accounts of the Commission for the year ended 31st December, 1966.

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, 1966, we have taken into account the market value of the investments at that date. The value of the Fund at 31st December, 1966 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 date from which provision for redemption of Loan 54 commenced at 1st September, 1966. 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, 1966.

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 eight and a half 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 raised in the Federal Republic of Germany is repayable by ten annual instalments from 1971 to 1980. Provision is being made for repayment by setting aside amounts over the period of the loan, i.e. 15 years from October 1965.

The Commission entered into a loan agreement, dated 8th September, 1966, to borrow from the International Bank for Reconstruction and Development the sum of U.S. \$20,000,000 (Loan No. 59). The loan bears interest at the rate of $6\frac{1}{4}\%$ per annum and is repayable in half-yearly instalments from 1st June, 1968 to 1st December, 1976. At 31st December, 1966 amounts totalling U.S. \$6,300,925 (R4,525,357) had been drawn under the agreement.

Verification of landed Properties, Rights and Investments

We have verified the existence of the titles of the landed properties and of the rights and investment 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 1965 and 1966—

	Surplus + Deficit —		Amounts set aside to Reserve Fund	
	1965	1966	1965	1966
Cape Western.....	—	179,000	600,000	726,000
Cape Northern.....	+ 360,000	—	210,000	224,000
Cape Eastern.....	—	6,000	1,000	1,000
Border.....	+ 90,000	+ 101,000	90,000	135,000
Natal.....	+ 351,000	+ 792,000	1,000,000	1,550,000
Eastern Transvaal.....	+ 237,000	+ 433,000	1,072,000	1,230,000
Rand & O.F.S.....	— 1,573,000	— 2,086,000	3,945,000	3,870,000
	<u>— R714,000</u>	<u>— 983,000</u>	<u>R6,918,000</u>	<u>R7,736,000</u>
Brought Forward from previous year.....		4,265,000		
Net Accumulated Surplus at end of year as detailed in Balance Sheet.....		<u>R3,282,000</u>		

Operations during the year resulted in surpluses at Cape Northern, Border, Natal and Eastern Transvaal Undertakings and deficits at Cape Western, Cape Eastern and Rand and Orange Free State Undertakings. The deficits at Cape Western and Rand and Orange Free State Undertakings exceeded the accumulated surpluses brought forward by R6,000 and R939,000 respectively. At the Cape Northern Undertaking charges were reduced during the year and the small surplus of R58,000 increased the accumulated surplus to R1,136,000.

General

As a result of our audit of the books and accounts of the Commission for the year 1966 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 had 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,

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

ACCOUNTS

STATISTICAL AND OTHER STATEMENTS
NATIONAL STATISTICS

Electricity Supply Commission

Established under the Electricity Act, 1922

BALANCE SHEET AT 31st DECEMBER, 1966

1965 R702,790,000	Loans Outstanding..... (Schedule No. 3)		R749,619,000
56,521,000	Loans Repaid Less Assets Sold.....		74,545,000
71,586,000 15,065,000	Loans repaid (Schedule No. 3)..... Less: Cost of Assets sold proceeds credited to Redemption Fund.....	R92,350,000 17,805,000	
187,534,000	Redemption Fund..... (Account No. 1)		198,114,000
59,093,000	Reserve Fund..... (Account No. 2)		68,270,000
4,265,000	Balance on Revenue Accounts..... (Accounts Nos. 3 to 9)		3,282,000
269,000 1,078,000 Dr. 1,000 Dr. 14,000 1,053,000 733,000 1,147,000	Cape Western Undertaking..... Cape Northern Undertaking..... Cape Eastern Undertaking..... Border Undertaking..... Natal Undertaking..... Eastern Transvaal Undertaking..... Rand & Orange Free State Undertaking.....	Dr. 6,000 1,136,000 Dr. 7,000 87,000 1,845,000 1,166,000 Dr. 939,000	
33,840,000	Creditors and Provisions.....		45,506,000
21,535,000 7,123,000 5,182,000	Creditors..... Interest accrued on loans..... Provisions including provisions for repayment of overseas loans.....	31,725,000 8,061,000 5,720,000	
	Temporary Borrowings.....		18,832,000
	Amount due to Bankers less Cash on Current Accounts and on hand.		
NOTE:			
In addition to the liabilities shown above, the Commission is committed in the following matters:—			
(i) Expenditure of approximately R417,800,000 on Capital account and R3,100,000 chargeable against Reserve Fund.			
(ii) An annual payment of R130,000 to the Electricity Supply Commission Pension and Provident Fund for the period ending 31st December, 1969, and R22,000 during 1970, in addition to the annual contributions.			
(iii) The purchase from certain Stockholders of Electricity Supply Commission 6½ per cent. Local Registered Stock 1991 at R97 per cent:—			
(a) R4,500,000 not later than September, 1976.			
(b) R2,000,000 in five annual instalments of R400,000, at the option of the Stockholder.			
The Commission has indemnified the Electricity Supply Commission Pension and Provident Fund against any loss resulting from the negligence, dishonesty or fraud of any of the Fund's officers or of the Trustees.			
R1,044,043,000			R1,158,168,000

Johannesburg,
31st March, 1967.

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

	Capital Expenditure at Cost..... (Schedule No. 1)		R840,782,000
	Land and Rights..... Buildings and Civil Works..... Machinery and Plant.....	R10,464,000 178,369,000 651,949,000	9,344,000 155,343,000 576,422,000
	Stores and Movable Plant.....		38,449,000
	Stores and Materials at cost..... Movable plant and equipment at cost less depreciation.....	33,610,000 4,839,000	28,609,000 4,466,000
	Investment of Redemption Fund..... (Schedule No. 2)		196,225,000
	Nominal Value Market Value		
	1966 R197,945,000 R175,101,000		
	1965 R188,700,000 R165,908,000		
	Investment of Reserve Fund.....		66,382,000
	Stocks of Electricity Supply Commission, Republic of South Africa and Municipalities including Interest Accrued		57,146,000
	Nominal Value Market Value		
	1966 R66,998,000 R59,477,000		
	1965 R57,554,000 R50,617,000		
	Sundry Investments.....		4,482,000
	Electricity Supply Commission Swiss Loan Bonds including Interest Accrued.....	678,000	822,000
	Nominal Value Market Value		
	1966 R662,000 R681,000		
	1965 R842,000 848,000		
	Entire Share capital of the Rand Mines Power Supply Company Limited.....	1,000	1,000
	Housing Loans to Employees secured by First Mortgages.....	3,803,000	3,332,000
	Debtors and Payments in Advance.....		11,848,000
	Debtors..... Payments in advance.....	11,259,000 589,000	9,742,000 328,000
	Cash at Bankers and on hand.....		11,393,000
			R1,158,168,000
			R1,044,043,000

Referred to in our report of 28th April, 1967.

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

Electricity Supply Commission

SCHEDULE No. 1

Schedule of Capital Expenditure at 31st December, 1966

Expenditure in connection with Electricity Undertakings	Total at 31st December, 1965	Year Ended 31st December, 1966	Total at 31st December, 1966
Cape Western Undertaking			
Land and Rights.....	R 899,000	R 163,000	R 1,062,000
Buildings and Civil Works.....	14,605,000	1,047,000	15,652,000
Machinery and Plant.....	59,412,000	12,432,000	71,844,000
	R 74,916,000	R 13,642,000	R 88,558,000
Cape Northern Undertaking			
Land and Rights.....	R 207,000	R 42,000	R 249,000
Buildings and Civil Works.....	602,000	195,000	797,000
Machinery and Plant.....	15,525,000	2,604,000	18,129,000
	R 16,334,000	R 2,841,000	R 19,175,000
Cape Eastern Undertaking			
Land and Rights.....	R 10,000	—	R 10,000
Buildings and Civil Works.....	33,000	—	33,000
Machinery and Plant.....	406,000	R 139,000	545,000
	R 449,000	R 139,000	R 588,000
Border Undertaking			
Land and Rights.....	R 61,000	R 98,000	R 159,000
Buildings and Civil Works.....	2,107,000	601,000	2,708,000
Machinery and Plant.....	10,686,000	830,000	11,516,000
	R 12,854,000	R 1,529,000	R 14,383,000
Natal Undertaking			
Land and Rights.....	R 1,222,000	R 34,000	R 1,256,000
Buildings and Civil Works.....	27,330,000	2,788,000	30,118,000
Machinery and Plant.....	94,568,000	10,350,000	104,918,000
	R 123,120,000	R 13,172,000	R 136,292,000
Eastern Transvaal Undertaking			
Land and Rights.....	R 1,331,000	R 182,000	R 1,513,000
Buildings and Civil Works.....	28,333,000	1,077,000	29,410,000
Machinery and Plant.....	94,376,000	6,708,000	101,084,000
	R 124,040,000	R 7,967,000	R 132,007,000

Johannesburg,
31st March, 1967.

Expenditure in connection with Electricity Undertakings	Total at 31st December, 1965	Year Ended 31st December, 1966	Total at 31st December, 1966
Rand and Orange Free State Undertaking			
Land and Rights.....	R 4,391,000	R 601,000	R 4,992,000
Buildings and Civil Works.....	77,588,000	17,327,000	94,915,000
Machinery and Plant.....	301,449,000	42,464,000	343,913,000
	R 383,428,000	R 60,392,000	R 443,820,000
Head Office			
Land.....	R 1,223,000	—	R 1,223,000
Buildings and Equipment.....	4,745,000	Cr.R 9,000	4,736,000
	R 5,968,000	Cr. R 9,000	R 5,959,000
Summary			
Land and Rights.....	R 9,344,000	R 1,120,000	R 10,464,000
Buildings and Civil Works.....	155,343,000	23,026,000	178,369,000
Machinery and Plant.....	576,422,000	75,527,000	651,949,000
	R 741,109,000	R 99,673,000	R 840,782,000

J. A. BOTHMA, *Chief Accountant.*

Electricity Supply Commission

SCHEDULE No. 2

Schedule of Investments of the Redemption fund at 31st December, 1966

INVESTMENTS			Nominal Value	Book Value
LOCAL REGISTERED STOCKS				
Electricity Supply Commission				
3½ per cent	1957/67		R923,000	R868,000
3¼ per cent	1965/70		1,498,000	1,424,000
3 per cent	1967/73		1,382,000	1,300,000
3 per cent	1968/74		2,386,000	2,307,000
3½ per cent	1968/73		13,639,000	13,488,000
3½ per cent	1969/74		691,000	648,000
3¾ per cent	1969/74		225,000	203,000
3¾ per cent	1965/67		723,000	687,000
3¾ per cent	1964/67		2,545,000	2,422,000
3¾ per cent	1964/68		711,000	666,000
5 per cent	1966/68		1,551,000	1,530,000
5 per cent	1967/69		1,445,000	1,423,000
5 per cent	1968/70		1,551,000	1,522,000
5 per cent	1967/70		5,795,000	5,674,000
5 per cent	1971/74		1,961,000	1,926,000
5 per cent	1971/75		3,556,000	3,495,000
4⅝ per cent	1975/80		9,790,000	9,740,000
4⅞ per cent	1975/80		8,167,000	8,108,000
5⅛ per cent	1976/81		4,890,000	4,801,000
5⅛ per cent	1977/82		1,011,000	992,000
5⅛ per cent	1976/82		3,937,000	3,880,000
5⅛ per cent	1977/83		10,078,000	9,984,000
5⅝ per cent	1978/83		3,861,000	3,810,000
5⅝ per cent	1979/84		5,079,000	5,047,000
5⅝ per cent	1979/84		7,013,000	6,857,000
5⅝ per cent	1979/85		6,023,000	5,914,000
5⅝ per cent	1980/85		7,117,000	6,993,000
5½ per cent	1980/86		5,035,000	4,904,000
5¾ per cent	1981/86		7,357,000	7,304,000
6¼ per cent	1981/86		6,181,000	6,117,000
6⅛ per cent	1982/87		6,297,000	6,242,000
5¼ per cent	1982/87		6,415,000	6,332,000
5 per cent	1983/88		10,301,000	10,209,000
5 per cent	1980/83		6,297,000	6,121,000
5 per cent	1982/84		3,664,000	3,560,000
5½ per cent	1982/84		3,120,000	3,050,000
5⅞ per cent	1983/85		10,102,000	9,919,000
6½ per cent	1983/85		6,589,000	6,409,000
6½ per cent	1989/91		9,108,000	8,859,000
6¾ per cent	1989/91		4,855,000	4,649,000
Republic of South Africa				
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>			R194,586,000	R191,060,000

Johannesburg,
31st March, 1967.

	Nominal Value	Book Value
<i>Brought Forward</i>	R194,586,000	R191,060,000
Municipal — Johannesburg		
3½ per cent 1962/67	258,000	234,000
3¼ per cent 1965/70	588,000	567,000
3 per cent 1967/77	60,000	60,000
5⅝ per cent 1974/79	194,000	193,000
Municipal — Cape Town		
3½ per cent 1962/67	450,000	445,000
3 per cent 1976	200,000	190,000
5⅝ per cent 1980/85	300,000	296,000
Municipal — Durban		
3½ per cent 1962/72	231,000	180,000
3¼ per cent 1965/75	90,000	82,000
3¼ per cent 1966/76	100,000	100,000
3 per cent 1967/77	668,000	635,000
5⅝ per cent 1974/79	120,000	118,000
Municipal — Bloemfontein		
5⅝ per cent 1975/80	80,000	79,000
Municipal — Germiston		
5⅝ per cent 1985	20,000	20,000
	<u>R197,945,000</u>	<u>R194,259,000</u>
Interest Accrued		1,966,000
		<u>R196,225,000</u>
Market Value	<u>R175,101,000</u>	
ALLOCATION OF INVESTMENTS TO UNDERTAKINGS		
	<i>Nominal Value</i>	<i>Book Value including Interest accrued</i>
Cape Western Undertaking	R20,098,000	R19,961,000
Cape Northern Undertaking	3,402,000	3,369,000
Cape Eastern Undertaking	18,000	17,000
Border Undertaking	3,940,000	3,899,000
Natal Undertaking	30,211,000	29,919,000
Eastern Transvaal Undertaking	13,014,000	12,880,000
Rand and Orange Free State Undertaking	118,066,000	116,963,000
Undertaking which has been sold	6,500,000	6,526,000
Head Office	2,696,000	2,691,000
	<u>R197,945,000</u>	<u>R196,225,000</u>

J. A. BOTHMA, Chief Accountant.

Electricity Supply Commission

Loans at 31st December, 1966

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.....		R1,000,000
4	R5,000,000 4½ per cent 1953.....		5,000,000
5	R13,500,000 3¾ per cent 1954/64.....		13,500,000
6	R5,000,000 3½ per cent 1959/64.....		5,000,000
7	R4,000,000 3¼ per cent 1956/66.....		4,000,000
8	R4,000,000 3¼ per cent 1957/67.....	R4,000,000	
9	R4,000,000 3¾ per cent 1959/64.....		4,000,000
10	R3,000,000 3¾ per cent 1960/65.....		3,000,000
11	R4,000,000 3¾ per cent 1961/66.....		4,000,000
12	R5,000,000 3¼ 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 3¾ per cent 1969/74.....	6,000,000	
18	R10,500,000 3¾ per cent 1965/67.....	10,500,000	
19	R6,000,000 3¾ per cent 1964/67.....	6,000,000	
21	R10,000,000 3¾ 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 4¾ per cent 1975/80.....	16,000,000	
34	R16,000,000 4¾ 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	
58	R30,000,000 6½ per cent 1989/91.....	30,000,000	
60	R35,000,000 6¾ per cent 1991.....		
(Payable in full not later than 31.1.1967 in terms of the Prospectus.)			
	Amount received.....	33,966,000	
R771,000,000	Total local Registered Stocks.....	R711,466,000	R58,500,000

Johannesburg,
31st March, 1967

Loan No.	Description	Outstanding	Repaid
R771,000,000	Brought forward.....	R711,466,000	R58,500,000
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT			
20	R21,465,000 \$30,000,000 4 per cent. Repayable by half-yearly instalments 1954/70.....	6,419,000	15,047,000
28	R2,822,000 \$30,000,000 4¾ per cent. Repayable by half-yearly instalments 1955/63.....		
	Less repaid out of local loans.....	R21,454,000	18,632,000
		R2,822,000	2,822,000
48	R7,240,000 \$14,000,000 5¾ per cent. Repayable by half-yearly instalments 1963/71.....		
	Less repaid out of local loans.....	R10,012,000	2,772,000
		R7,240,000	6,463,000
59	R14,400,000 \$20,000,000 6½ per cent. Repayable by half-yearly instalments 1968/76. To be taken up before 31.3.68. Amount received.....	4,525,000	
EXPORT-IMPORT BANK OF WASHINGTON			
24	R14,017,000 \$19,600,000 4 per cent. Repayable by half-yearly instalments 1956/70.....	4,585,000	9,432,000
COMMONWEALTH DEVELOPMENT FINANCE COMPANY LIMITED			
30	R4,000,000 5 per cent. Repayable by half-yearly instalments 1954/68.....	620,000	3,380,000
SWISS LOAN			
41	R8,275,000 Swiss Francs 50,000,000 5 per cent Repayable by annual instalments 1965/74.....	6,620,000	1,655,000
GERMAN LOAN			
57	R8,921,000 German Marks 50,000,000 6½ per cent. Repayable by Annual instalments 1971/80	8,921,000	
		R852,140,000	
	Sundry Loans.....		737,000
		R749,619,000	R91,613,000
			R92,350,000

J. A. BOTHMA, Chief Accountant.

Electricity Supply Commission

Redemption Fund Account for the Year ended 31st December, 1966

1965			
R13,000,000	Repayment of Local Registered Stock.....	R17,000,000	
3,000,000	3½ per cent. 1956/66 Loan No. 7).....	R4,000,000	
10,000,000	3½ per cent. 1961/66 (Loan No. 11).....	4,000,000	
	4½ per cent. 1964/67 (Loan No. 22).....	9,000,000	
	3½ per cent. 1960/65 (Loan No. 10).....		
	5 per cent. 1964/67 (Loan No. 23).....		
187,534,000	Balance as per Balance Sheet.....	198,114,000	
20,556,000	Cape Western Undertaking.....	20,102,000	
2,797,000	Cape Northern Undertaking.....	3,440,000	
8,000	Cape Eastern Undertaking.....	21,000	
3,417,000	Border Undertaking.....	3,977,000	
28,783,000	Natal Undertaking.....	30,227,000	
10,627,000	Eastern Transvaal Undertaking.....	13,358,000	
112,018,000	Rand and Orange Free State Undertaking.....	118,061,000	
2,828,000	Head Office.....	2,428,000	
6,500,000	Original Cost of an Undertaking which has been sold.....	6,500,000	
R200,534,000		R215,114,000	

			1965
	Balance Brought Forward.....		R175,658,000
	Cape Western Undertaking.....	R20,556,000	18,945,000
	Cape Northern Undertaking.....	2,797,000	2,348,000
	Cape Eastern Undertaking.....	8,000	1,000
	Border Undertaking.....	3,417,000	2,995,000
	Natal Undertaking.....	28,783,000	25,878,000
	Eastern Transvaal Undertaking.....	10,627,000	8,308,000
	Rand and Orange Free State Undertaking.....	112,018,000	107,994,000
	Head Office.....	2,828,000	2,689,000
	Assets Sold.....	6,500,000	6,500,000
	Amounts Contributed During the year		
	As per Revenue Accounts.....	17,480,000	15,847,000
	Cape Western Undertaking.....	1,898,000	1,752,000
	Cape Northern Undertaking.....	481,000	391,000
	Cape Eastern Undertaking.....	12,000	6,000
	Border Undertaking.....	342,000	321,000
	Natal Undertaking.....	2,908,000	2,725,000
	Eastern Transvaal Undertaking.....	2,837,000	2,120,000
	Rand and Orange Free State Undertaking.....	9,002,000	8,532,000
	Other Contributions.....	121,000	98,000
	Proceeds of sales of fixed property.....	351,000	143,000
	Profit on redemption of investment.....	230,000	112,000
	Interest earned on investments.....	9,398,000	8,676,000
		R215,114,000	R200,534,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant*

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 28th April, 1967.

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

Electricity Supply Commission

ACCOUNT No 2

Reserve Fund Account for the Year 31st December, 1966

1965				1965
R1,885,000	Expenditure during the year on Replacements and Betterment.....	R1,998,000	Balance brought forward.....	R59,093,000
238,000	Cape Western Undertaking.....	R41,000	Cape Western Undertaking.....	R5,500,000
2,000	Cape Northern Undertaking.....	17,000	Cape Northern Undertaking.....	1,459,000
—	Cape Eastern Undertaking.....	1,000	Cape Eastern Undertaking.....	1,000
24,000	Border Undertaking.....	292,000	Border Undertaking.....	1,000
668,000	Natal Undertaking.....	631,000	Natal Undertaking.....	135,000
170,000	Eastern Transvaal Undertaking.....	111,000	Natal Undertaking.....	1,550,000
783,000	Rand and Orange Free State Undertaking.....	905,000	Eastern Transvaal Undertaking.....	1,230,000
			Rand and Orange Free State Undertaking.....	3,870,000
				<u>39,435,000</u>
59,093,000	Balance as per Balance Sheet.....	68,270,000	Amounts set aside during the year as per revenue accounts.....	7,736,000
5,500,000	Cape Western Undertaking.....	6,508,000	Cape Western Undertaking.....	726,000
1,459,000	Cape Northern Undertaking.....	1,754,000	Cape Northern Undertaking.....	224,000
1,000	Cape Eastern Undertaking.....	1,000	Cape Eastern Undertaking.....	1,000
801,000	Border Undertaking.....	684,000	Border Undertaking.....	135,000
7,713,000	Natal Undertaking.....	9,079,000	Natal Undertaking.....	1,550,000
4,184,000	Eastern Transvaal Undertaking.....	5,636,000	Eastern Transvaal Undertaking.....	1,230,000
39,435,000	Rand and Orange Free State Undertaking.....	44,608,000	Rand and Orange Free State Undertaking.....	3,870,000
				<u>3,870,000</u>
			Special contributions set aside during the year.....	636,000
			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
				<u>636,000</u>
			Interest earned on investments.....	3,431,000
			Profit on redemption of investments.....	8,000
<u>R60,978,000</u>		<u>R70,268,000</u>		<u>R70,268,000</u>
				<u>R60,978,000</u>

Johannesburg,
31st March, 1967.

J. A. BOTHMA, Chief Accountant.

Electricity Supply Commission

Cape Western

Undertaking

Revenue Account for the

Year ended 31st December, 1966

1965					1965
R5,392,000	Generation.....		R6,076,000	Sales of Electricity.....	R14,523,000
	Operation—				R13,160,000
4,214,000	Fuel.....	R4,749,000		Traction Supplies.....	3,555,000
98,000	Water and Stores.....	108,000		Bulk Supplies.....	2,412,000
423,000	Salaries and Wages.....	462,000		Industrial Supplies.....	4,438,000
60,000	Other Expenses.....	90,000		Domestic and Lighting Supplies.....	2,755,000
	Maintenance—				
72,000	Stores.....	74,000		Other Revenue.....	43,000
466,000	Salaries and Wages.....	506,000			14,566,000
59,000	Other Expenses.....	87,000		Balance carried down.....	275,000
	Purchase of Electricity.....		202,000		13,199,000
	Distribution.....		1,059,000		179,000
	Operation and Maintenance—				
75,000	Stores.....	99,000			
664,000	Salaries and Wages.....	778,000			
153,000	Other Expenses.....	182,000			
	General Expenses.....		1,436,000		
1,379,000	Local Administration and Technical Management.....	485,000			
467,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.).....	733,000			
680,000	Head Office Administration Expenses.....	123,000			
129,000	Head Office Engineering Expenses.....	95,000			
103,000	Capital Charges.....		6,068,000		
	Interest.....	3,273,000			
5,715,000	Redemption Fund.....	1,898,000			
3,198,000	Instalments and Provision for Repayment of Overseas Loans.....	171,000			
1,752,000	Reserve Fund.....	726,000			
165,000					
600,000					
			R14,841,000		R14,841,000
R13,378,000	Balance brought down.....		R275,000	Balance brought forward.....	R269,000
	Balance as per Balance Sheet.....		—	Balance as per Balance Sheet.....	6,000
			R275,000		R448,000
			R448,000		R448,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA *Chief Accountant.*

Referred to in our report of 28th April, 1967.

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

Electricity Supply Commission

Cape Northern Undertaking

Revenue Account for the Year ended 31st December, 1966

1965		R1,856,000
R1,716,000	Generation	R1,856,000
1,317,000	Proportion of Pooled Costs of Rand and Orange Free State and Eastern Transvaal Undertakings.....	R1,493,000
174,000	Proportion of Transmission Costs charged by Rand and Orange Free State Undertaking.....	198,000
98,000	Operation —	
15,000	Fuel.....	52,000
65,000	Water and Stores.....	8,000
7,000	Salaries and Wages.....	53,000
3,000	Other Expenses.....	10,000
34,000	Maintenance —	
3,000	Stores.....	1,000
	Salaries and Wages.....	38,000
	Other Expenses.....	3,000
132,000	Distribution	157,000
24,000	Operation and Maintenance —	
77,000	Stores.....	28,000
31,000	Salaries and Wages.....	92,000
	Other Expenses.....	37,000
190,000	General Expenses	222,000
63,000	Local Administration and Technical Management.....	79,000
67,000	General Expenses (including Stores Expenses, Rates, Insurances, Pension Fund Contributions, etc.).....	78,000
33,000	Head Office Administration Expenses.....	37,000
27,000	Head Office Engineering Expenses.....	28,000
1,337,000	Capital Charges	1,587,000
736,000	Interest.....	882,000
391,000	Redemption Fund.....	481,000
210,000	Reserve Fund.....	224,000
3,375,000	Balance carried down.....	3,822,000
360,000		58,000
R3,735,000		R3,880,000
R1,078,000	Balance as per Balance Sheet.....	R1,136,000
R1,078,000		R1,136,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

		R3,871,000	1965
	Sales of Electricity	R3,871,000	R3,731,000
	Traction Supplies.....	R428,000	409,000
	Bulk Supplies.....	811,000	824,000
	Mining Supplies.....	1,893,000	1,767,000
	Industrial Supplies.....	538,000	548,000
	Domestic and Lighting Supplies.....	201,000	183,000
	Other Revenue	9,000	4,000
	Balance brought forward.....		R718,000
	Balance brought down.....	58,000	360,000
		R1,136,000	R1,078,000
		R3,880,000	R3,735,000

Referred to in our report of 28th April, 1967.

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

Electricity Supply Commission

Cape Eastern Undertaking

Revenue Account for the Year Ended 31st December, 1966

1965			
R18,000	Electricity Purchased.....		R25,000
5,000	Distribution.....		8,000
1,000	Operation and Maintenance—		
2,000	Stores.....	R1,000	
2,000	Salaries and Wages.....	4,000	
	Other Expenses.....	3,000	
11,000	General Expenses.....		11,000
5,000	Local Administration and Technical Management.....	4,000	
5,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund, Contributions, etc.).....	6,000	
1,000	Head Office Engineering Expenses.....	1,000	
21,000	Capital Charges.....		41,000
14,000	Interest.....	28,000	
6,000	Redemption Fund.....	12,000	
1,000	Reserve Fund.....	1,000	
R55,000			R85,000
—	Balance brought down.....		R6,000
1,000	Balance brought forward.....		1,000
R1,000			R7,000

1965			
R55,000	Sales of Electricity.....		R79,000
19,000	Bulk Supplies.....	R20,000	
20,000	Industrial Supplies.....	28,000	
16,000	Domestic Supplies.....	31,000	
	Balance carried down.....		6,000
			R85,000
	Balance as per Balance Sheet.....		R7,000
			R7,000
			R1,000
			R1,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our Report of 28th April 1967.

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

Electricity Supply Commission

ACCOUNT No. 6

Border Undertaking

Revenue Account for the

Year ended 31st December, 1966

1965		
R1,292,000	Generation	R1,436,000
	Operation—	
892,000	Fuel.....	R998,000
13,000	Water and Stores.....	13,000
178,000	Salaries and Wages.....	202,000
11,000	Other Expenses.....	18,000
	Maintenance—	
48,000	Stores.....	43,000
128,000	Salaries and Wages.....	139,000
22,000	Other Expenses.....	23,000
156,000	Distribution	166,000
	Operation and Maintenance—	
19,000	Stores.....	16,000
104,000	Salaries and Wages.....	118,000
33,000	Other Expenses.....	32,000
221,000	General Expenses	237,000
90,000	Local Administration and Technical Management.....	98,000
109,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions etc.).....	115,000
12,000	Head Office Administration Expenses.....	14,000
10,000	Head Office Engineering Expenses.....	10,000
1,008,000	Capital Charges	1,116,000
597,000	Interest.....	639,000
321,000	Redemption Fund.....	342,000
90,000	Reserve Fund.....	135,000
2,677,000		2,955,000
90,000	Balance carried down.....	101,000
R2,767,000		R3,056,000
R104,000	Balance brought forward.....	R14,000
R104,000	Balance as per Balance Sheet.....	87,000
		R101,000

1965		
R2,764,000	Sales of Electricity	R3,052,000
	Bulk Supplies.....	R2,364,000
	Industrial Supplies.....	362,000
	Domestic and Lighting Supplies.....	326,000
	Other Revenue	4,000
		3,000
		R3,056,000
	Balance brought down.....	R101,000
	Balance as per Balance Sheet.....	R104,000
		R104,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our report of 28th April, 1967.

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

Electricity Supply Commission

ACCOUNT No. 7

Natal Undertaking

Revenue Account for the Year ended 31st December, 1966

1965					1965
R10,515,000	Generation		R11,780,000	Sales of Electricity	R25,617,000
	Operation—				R22,845,000
7,997,000	Fuel.....	R8,997,000		Traction Supplies.....	4,109,000
232,000	Stores.....	288,000		Bulk Supplies.....	13,621,000
892,000	Salaries and Wages.....	952,000		Mining Supplies.....	663,000
176,000	Other Expenses.....	234,000		Industrial Supplies.....	3,454,000
	Maintenance—			Domestic and Lighting Supplies.....	998,000
375,000	Stores.....	387,000			
774,000	Salaries and Wages.....	859,000			
69,000	Other Expenses.....	63,000			
237,000	Electricity Purchased		18,000	Other Revenue	122,000
3,000	Electricity supplied by Rand and Orange Free State Undertaking		1,000		110,000
1,150,000	Distribution		1,313,000		
	Operation and Maintenance—				
294,000	Stores.....	298,000			
646,000	Salaries and Wages.....	750,000			
210,000	Other Expenses.....	265,000			
1,503,000	General Expenses		1,615,000		
	Local Administration and Technical Management.....	565,000			
501,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.).....	687,000			
666,000	Head Office Administration Expenses.....	206,000			
187,000	Head Office Engineering Expenses.....	157,000			
149,000					
9,196,000	Capital Charges		10,220,000		
	Interest.....	5,459,000			
5,180,000	Redemption Fund.....	2,908,000			
2,725,000	Instalments and Provision for Repayment of Overseas Loans.....	303,000			
291,000	Reserve Fund.....	1,550,000			
1,000,000					
22,604,000	Balance carried down.....		24,947,000		
351,000			792,000		
R22,955,000			R25,739,000		
R1,053,000	Balance as per Balance Sheet.....		R1,845,000		
				Balance brought forward.....	R1,053,000
				Balance brought down.....	792,000
R1,053,000			R1,845,000		

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our Report of 28th April, 1967.

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

Electricity Supply Commission

Eastern Transvaal Undertaking

Revenue Account for the Year Ended 31st December, 1966

1965		R7,478,000
R5,857,000	Generation	R7,478,000
5,854,000	Proportion of Pooled Costs (Statement attached).....	R7,474,000
	Other Operation and Maintenance Costs—	
	Operation—	
1,000	Salaries and Wages.....	2,000
1,000	Other Expenses.....	1,000
	Maintenance—	
1,000	Salaries and Wages	1,000
238,000	Electricity Supplied by Rand and Orange Free State Undertaking	275,000
453,000	Distribution	547,000
	Operation and Maintenance—	
50,000	Stores.....	69,000
302,000	Salaries and Wages.....	354,000
101,000	Other Expenses.....	124,000
453,000	General Expenses	531,000
	Local Administration and Technical Management.....	315,000
286,000	General Expenses (including Maintenance of Quarters Stores Expenses Rates	
480,000	Insurance Pension Fund Contributions etc.).....	555,000
154,000	Head Office Administration Expenses.....	170,000
122,000	Head Office Engineering Expenses.....	129,000
1,042,000		1,169,000
589,000	Less charged to Pooled Costs.....	638,000
2,336,000	Capital Charges	3,592,000
	Interest.....	6,340,000
4,832,000	Redemption Fund.....	2,837,000
2,120,000	Instalments and Provision for Repayment of Overseas Loans.....	722,000
444,000	Reserve Fund.....	1,230,000
1,072,000		11,129,000
8,468,000	Less Charged to Pooled Costs.....	7,537,000
6,132,000		12,423,000
9,337,000		433,000
237,000	Balance carried down.....	R12,856,000
R9,574,000		R1,166,000
R733,000	Balance as per Balance Sheet.....	R1,166,000
R733,000		R1,166,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

1965		R12,764,000	1965
R9,485,000	Sales of Electricity	R12,764,000	R9,485,000
	Traction Supplies.....	R1,474,000	684,000
	Bulk Supplies.....	666,000	501,000
	Mining Supplies.....	4,842,000	3,296,000
	Industrial Supplies.....	5,339,000	4,606,000
	Domestic and Lighting Supplies.....	443,000	398,000
	Other Revenue	92,000	89,000
	Other Revenue.....	158,000	145,000
	Less Credited to Pooled Costs.....	66,000	56,000
	Balance brought forward.....	R733,000	R496,000
	Balance brought down.....	433,000	237,000
		R1,166,000	R733,000

Referred to in our report of 28th April, 1967.

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

Electricity Supply Commission

Rand and Orange Free State

Undertaking

Revenue Account for the Year

Ended 31st December, 1966

1965		R51,950,000
	Generation	R54,842,000
51,474,000	Proportion of Pooled Costs (Statement attached).....	R54,474,000
	Other Operation and Maintenance Costs: Operation—	
159,000	Fuel.....	85,000
27,000	Water and Stores.....	22,000
138,000	Salaries and Wages.....	112,000
3,000	Other Expenses.....	2,000
	Maintenance—	
25,000	Stores.....	18,000
122,000	Salaries and Wages.....	127,000
2,000	Other Expenses.....	2,000
<u>2,677,000</u>	Distribution	3,046,000
	Operation and Maintenance—	
576,000	Stores.....	692,000
2,231,000	Salaries and Wages.....	2,451,000
126,000	Other Expenses.....	197,000
<u>2,933,000</u>		3,340,000
	Less charged to:—	
82,000	Pooled Costs (Interconnector).....	96,000
174,000	Cape Northern Undertaking.....	198,000
<u>1,246,000</u>	General Expenses	1,392,000
	Local Administration and Technical Management.....	1,060,000
978,000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.).....	1,989,000
2,156,000	Head Office Administration Expenses.....	365,000
316,000	Head Office Engineering Expenses.....	279,000
252,000		<u>3,693,000</u>
<u>3,702,000</u>	Less Charged to Pooled Costs.....	2,301,000
2,456,000		<u>12,238,000</u>
<u>11,432,000</u>	Capital Charges	
	Interest.....	15,334,000
15,348,000	Redemption Fund.....	9,002,000
8,532,000	Instalments and Provision for Repayment of Overseas Loans.....	2,880,000
2,823,000	Reserve Fund.....	3,870,000
3,945,000		<u>31,086,000</u>
<u>30,648,000</u>	Less Charged to Pooled Costs.....	18,848,000
19,216,000		<u>R71,518,000</u>
<u>R67,305,000</u>	Balance brought down.....	R2,086,000
R1,573,000	Balance as per Balance Sheet.....	<u>R2,086,000</u>
1,147,000		
<u>R2,720,000</u>		

		R68,024,000	1965
	Sales of Electricity		R64,417,000
	Traction Supplies.....	R3,615,000	3,517,000
	Bulk Supplies.....	10,435,000	9,550,000
	Mining Supplies.....	37,416,000	35,940,000
	Industrial Supplies.....	14,784,000	13,923,000
	Domestic and Lighting Supplies.....	1,774,000	1,487,000
	Sales of air and steam	1,079,000	1,024,000
		69,103,000	65,441,000
	Electricity supplied to Undertakings	276,000	241,000
	Eastern Transvaal Undertaking.....	275,000	238,000
	Natal Undertaking.....	1,000	3,000
	Other Revenue	53,000	50,000
	Other Revenue.....	255,000	258,000
	Less Credited to Pooled Costs.....	202,000	208,000
		69,432,000	65,732,000
	Balance carried down.....	2,086,000	1,573,000
		<u>R71,518,000</u>	<u>R67,305,000</u>
	Balance brought forward.....	R1,147,000	R2,720,000
	Balance as per Balance Sheet.....	939,000	R2,720,000
		<u>R2,086,000</u>	<u>R2,720,000</u>

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our Report of 28th April, 1967.

ALEX. AIKEN & CARTER
HALSEY, BUTTON & PERRY,
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, 1966

1965			
R30,112,000	Generation		R32,559,000
	Operation—		
21,902,000	Fuel.....	R23,318,000	
545,000	Water and Stores.....	590,000	
2,917,000	Salaries and Wages.....	3,153,000	
322,000	Other Expenses.....	481,000	
	Maintenance—		
1,522,000	Stores.....	1,741,000	
2,694,000	Salaries and Wages.....	3,153,000	
210,000	Other Expenses.....	123,000	
	Electricity Purchased		1,730,000
322,000			
	Interconnector		96,000
82,000			
	Operation and Maintenance—		
15,000	Stores.....	19,000	
63,000	Salaries and Wages.....	71,000	
4,000	Other Expenses.....	6,000	
	General Expenses		2,939,000
3,045,000			
	Local Administration and Technical Management.....	821,000	
826,000	General Expenses (including Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.).....	1,567,000	
1,688,000	Head Office Administration and Engineering Expenses.....	551,000	
531,000			
	Capital Charges		26,385,000
25,348,000			
	Interest.....	13,134,000	
12,838,000	Redemption Fund.....	7,076,000	
6,497,000	Instalments and Provision for Repayment of Overseas Loans.....	3,338,000	
3,006,000	Reserve Fund.....	2,837,000	
3,007,000			
			R63,709,000
			R58,909,000

			1965
	Sundry Revenue	R268,000	R264,000
	Allocation	63,441,000	58,645,000
	Rand and Orange Free State Undertaking.....	R54,474,000	51,474,000
	Eastern Transvaal Undertaking.....	7,474,000	5,854,000
	Cape Northern Undertaking.....	1,493,000	1,317,000
			R63,709,000
			R58,909,000

Johannesburg,
31st March, 1967.

J. A. BOTHMA, *Chief Accountant.*

Referred to in our Report of 28th April, 1967.

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

Electricity Supply Commission

ANNEXURE B

POWER STATIONS: PRINCIPAL EQUIPMENT INSTALLED AS AT 31st DECEMBER, 1966

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	3.0	1	10.0	2	1.5				
			36.0		3	12.0						
		Oil	46.0	3.0	4		2	1.0				
			—	1.0	—							
		King William's Town Total.....		46.0	4.0	4	3					
	West Bank No. 1...	Steam	129.0	1.5	6	21.5	1	1.5				
			220.0	8.0	4	55.0	2	4.0				
			22.5			3	7.5					
West Bank No. 2...	Steam	349.0	32.0	10	170.0	6	15.0					
		510.0	45.0	3		3						
	West Bank Total...	859.0	77.0	13		9						
	Border Undertaking Total.....	905.0	81.0	17		12						
Cape Eastern (3,100)	No Generating Plant											
Cape Western (24,200)	Salt River No. 1....	Steam	120.0	30.0	2	60.0	3	10.0	1	0.3		
			600.0	60.0	6	100.0	3	20.0				
				0.3								
	Salt River No. 2....		720.0	90.3	8	260.0	6	30.0	1			
			1 560.0	120.0	6		4					
		Salt River Total....	2 280.0	210.3	14		10		1			
Hex River.....	Steam	800.0	60.0	4	200.0	3	20.0					
		550.0	60.0	2	275.0	2	30.0					
	Hex River Total.....	1 350.0	120.0	6		5						
	C.W. Undertaking Total.....	3 630.0	330.3	20		15		1	0.3			
Natal (33,600)	Colenso Nos. 1 & 2	Steam	480.0		8	60.0	5	12.0				
			320.0	60.0	4	80.0						
			900.0	75.0	5	180.0					3	25.0
			400.0	30.0	2	200.0					1	30.0
		Colenso Total.....	2 100.0	165.0	19		9					
		Ingagane.....	1 800.0	200.0	2	900.0	2	100.0				
Congella Nos. 1 & 2	Steam	360.0	36.0		60.0	3	12.0					
		400.0	20.0	6		1	20.0					
		1 600.0	30.0	4		100.0	1			30.0		
			120.0	8		200.0	3			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				
Natal Undertaking Total.....			9 000.0	813.7	52		28			
Eastern Transvaal (35,700)	Komati.....	Steam	4 500.0	500.0	5	900.0	5	100.0		
			4 500.0	500.0	4	1125.0	4	125.0		
	Komati Total.....		9 000.0	1 000.0	9		9			
	Witbank.....	Steam	1 400.0	120.0	20	70.0	6	20.0	1	8.0
			160.0	8.0	2	80.0				
	Witbank Total.....		1 560.0	128.0	22		6		1	
Sabie Gorge.....	Hydro		1.35			3	0.45			
Eastern Transvaal Total.....			10 560.0	1 129.35	31		18		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	4	7.0
				28.0						
	Klip Total.....		4 500.0	424.0	25		12		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	3	7.0
				21.0						
	Vaal Total.....		3 420.0	318.0	18		9		3	
	Vereeniging.....	Steam	900.0	60.0	20	45.0	3	20.0		
				60.0	90.0	1	60.0	3	30.0	
Vereeniging Total..		1 080.0	150.0	27	180.0	6				
Vierfontein.....	Steam	3 990.0	360.0	19	210.0	12	30.0			
Wilge.....	Steam	500.0	60.0	4	125.0	2	30.0			
			1 600.0	180.0	4	400.0	3	60.0		
Wilge Total.....		580.0	240.0	1	580.0	5				

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
	Rand and O.F.S. Total.....		25 670.0	2 452.0	114		60		7	
Cape Northern (23,200)	Central Kimberley..	Steam		3.0			1	3.0		
			240.0	15.0	8	30.0	3	5.0		
			300.0	12.0	4	75.0	2	6.0		
	Central Kimberley Total.....		540.0	30.0	12		6			
	E.T.U. + N.C.U. + R. & O.F.S.U. Total		36 230.0	3 581.35	145		78		8	
	Total all Escom.....	Oil Hydro Steam Steam		3.7			4			
49 765.0			1.35	4 744.0	234	3	126		9	
			57.3							
			49 765.0	4 806.35	234		133		9	

Major Items of Plant Commissioned 1966.

Eastern Transvaal	Komati.....	Steam	1 125.0	250.0	1	1 125.0	2	125.0		
-------------------	-------------	-------	---------	-------	---	---------	---	-------	--	--

TRANSMISSION LINES AND CABLES: CIRCUIT MILES (EXCLUDING SERVICE CONNECTIONS
ON RETICULATION SYSTEMS) AT 31st DECEMBER, 1966.

(a) TRANSMISSION LINES

Undertaking	275 kV	132 kV	88 kV	66 kV	42 kV	33 kV	22 kV 21 kV	11 kV	6.6 kV	3.3 kV	2.0 kV 2.1 kV 2.2 kV	380/220 V	Total
Border.....	—	—	—	139.10	—	35.70	94.74	656.85	—	4.97	—	93.69	1,025.05
Cape Eastern.....	—	—	—	—	—	—	26.00	99.63	—	—	—	—	125.63
Cape Northern.....	150.00	574.33	—	295.84	—	—	822.87	—	—	—	—	—	1,843.04
Cape Western.....	—	497.11	—	666.38	—	150.77	229.08	2,183.30	302.02	—	—	1,137.37	5,166.03
Eastern Transvaal.....	251.96	595.36	411.75	122.56	—	343.52	1,110.54	1,236.81	39.88	8.40	47.47	175.21	3,999.94
Natal.....	332.03	321.11	968.99	—	—	—	34.30	2,388.27	296.26	1.55	0.95	442.15	5,129.13
Rand & O.F.S.....	629.11	1,355.61	2,991.18	—	1,332.06	—	273.05	2,132.79	261.94	—	—	572.77	9,548.51
Totals.....	1,363.10	3,343.52	4,371.92	1,223.88	1,332.06	529.99	2,590.58	8,697.65	900.10	14.92	48.42	2,421.19	26,837.33

(b) UNDERGROUND CABLES

Border.....	—	—	—	—	—	—	0.82	27.42	—	2.34	—	7.51	38.09
Cape Eastern.....	—	—	—	—	—	—	—	1.20	—	—	—	3.90	5.10
Cape Northern.....	—	—	—	—	—	67.79	—	152.89	6.40	2.40	—	211.60	468.84
Cape Western.....	—	4.08	—	23.68	—	—	25.34	17.84	1.57	1.04	0.11	83.43	129.33
Eastern Transvaal.....	—	—	1.17	—	—	4.73	—	59.40	4.89	0.32	0.38	28.69	99.58
Natal.....	—	—	—	—	17.08	—	82.63	81.01	223.10	—	0.06	87.40	491.28
Rand & O.F.S.....	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals.....	—	4.08	1.17	23.68	17.08	72.52	108.79	339.76	235.96	6.10	0.55	422.53	1,232.22

CAPACITY OF TRANSFORMERS IN SERVICE AT 31ST DECEMBER, 1966.

Undertaking	Number	MVA
Border.....	589	117.575
Cape Eastern.....	258	5.605
Cape Northern.....	1,303	859.020
Cape Western.....	4,996	1,106.674
Eastern Transvaal.....	2,909	2,414.150
Natal.....	3,760	2,589.581
Rand & O.F.S.....	8,242	19,385.534
At Compressor Stations, Rand.....	42	336.321
TOTALS.....	22,099	26,814.460

COMPRESSED AIR POWER STATIONS: RAND UNDERTAKING 1966.

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 Electric Motor
	3	Turbo	4,800		
Robinson Compressor Station.....	2	Turbo	2,000	9,150	Electric Motor Electric Motor Electric Motor
	1	Turbo	2,150		
	1	Turbo	3,000		
<i>Steam Driven</i>					
Rosherville Power Station.....			Decommissioned at 10.15 on the 28th July, 1966.		
Total Compressed Air Sets.....	8		26,550		

POWER STATIONS: PRINCIPAL EQUIPMENT ON ORDER AS AT 31ST DECEMBER, 1966.

Undertaking	Electric Power Station	Type	INCREASE IN STATION CAPACITY		BOILERS		MAIN GENERATORS		HOUSE SETS	
			Boilers Thousands lb./hr.	Generators MW	No.	Continuous maximum rating each. Thousands lb./hr.	No.	Normal rating each MW	No.	Normal rating each MW
Border	West Bank No. 2	Steam	380	40	1 1	170 210	2	20	—	—
Cape Eastern	—	—	—	—	—	—	—	—	—	—
Cape Northern	—	—	—	—	—	—	—	—	—	—
Cape Western	Salt River No. 2....	Steam	1 040	120	4	260	2	60	—	—
Eastern Transvaal	—	—	—	—	—	—	—	—	—	—
Natal	Ingagane.....	Steam	2 700	300	3	900	3	100	—	—
Rand & O.F.S.	Arnot.....	Steam	5 240	700	2	2 620	2	350	—	—
	Camden.....	Steam	14 400	1 600	8	1 800	8	200	—	—
	Grootvlei.....	Steam	6 800	800	4	1 700	4	200	—	—
	Hendrina.....	Steam	6 800	800	4	1 700	4	200	—	—
Total all Escom.....		Steam	37 360	4 360	27	—	25	—	—	—

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	557.0	171.5	170.5			6.9		1,688.0
1937				94.0	684.5	1,349.9	210.6	189.4			7.2		2,535.6
1938				98.8	768.1	1,666.9	234.9	209.5			7.2		2,985.5
1939				106.5	767.7	2,193.2	266.2	233.7			6.4		3,573.7
1940				119.8	853.3	2,566.5	281.1	242.7			6.7		4,070.2
1941				136.2	862.6	2,675.9	302.4	270.3			6.6		4,254.0
1942				151.8	873.4	2,707.8	307.7	273.7			6.3		4,320.8
1943				145.7	849.1	2,669.1	312.4	293.4			5.9		4,275.6
1944				158.7	889.2	2,703.6	336.0	321.6			6.7		4,415.8
1945				165.9	830.7	2,643.0	333.2	348.8			6.6	377.9	4,706.1
1946				184.6	896.9	2,614.3	347.0	369.7			7.4	582.5	5,002.4
1947	56.2			198.6	887.7	2,547.2	346.0	402.6			7.6	668.6	5,114.5
1948	69.2			222.4	633.2	1,207.4	367.9	448.7		2,185.7	7.3	435.1	5,576.9
1949	68.7			249.5	358.2		371.8	513.0		4,653.9	7.0		6,222.2
1950	79.9		53.9	271.9	378.5		406.5	561.8		5,151.8	6.3		6,910.6
1951	88.1		58.5	303.5	386.8		433.4	617.0		5,563.2	6.1		7,456.5
1952	97.7		61.3	341.2	425.0		454.0	655.6		6,039.6	6.1		8,080.6
1953	107.8		67.1	375.5	409.9		492.3	713.2		6,559.9	6.4		8,732.2
1954	118.2		70.7	436.2	270.5		532.5	777.7		7,465.2	5.6		9,676.6
1955	130.8		73.2	527.1	394.6		546.4	870.8		8,416.3	5.7		10,964.0
1956	139.1		78.7	585.1	505.9		595.4	957.8		9,151.6	6.0		12,019.5
1957	143.1		86.1	698.6	536.6		621.7	1,018.7		9,652.5	5.9		12,763.1
1958	152.9		115.2	826.0	584.1		616.1	1,104.1		10,200.6	3.0		13,602.2
1959	165.0		171.4	861.8	633.3		629.4	1,228.6		11,034.8			14,724.5
1960	172.3		185.2	871.6	762.0		649.3	1,409.0		12,044.8			16,094.1
1961	178.8		191.3	860.0	901.5		684.0	1,497.5		12,700.0			17,013.2
1962	188.6		224.9	945.0	1,012.2		731.0	1,589.5		13,429.8			18,121.0
1963	204.9		264.9	1,051.4	1,212.1		779.0	1,764.6		14,223.1			19,500.0
1964	228.8	0.4	311.4	1,163.9	1,553.6				2,922.1	15,067.3			21,247.5
1965	250.5	1.6	393.2	1,267.4	1,936.8				3,182.5	16,024.1			23,056.1
1966	272.4	2.5	442.4	1,367.0	2,408.2				3,498.5	16,523.9			24,514.9

Notes: (1) Klip & Vaal are now included in Rand & 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 1966, (Electricity, Air and Steam)

Statement No. 4

Energy Used:—
ELECTRICITY — 99.839% 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.....	—	—	—	237,354,531	4.442	14	—	—	—
Cape Eastern.....	—	—	—	977,320	.018	1	—	—	—
Cape Northern.....	47,981,433	2.614	2	113,480,990	2.124	9	203,013,768	1.884	59
Cape Western.....	351,671,494	19.156	7	307,498,630	5.755	33	—	—	—
Eastern Transvaal.....	214,971,314	11.710	7	115,622,682	2.163	16	884,545,752	8.209	68
Natal.....	496,790,749	27.061	9	2,232,512,623	41.779	24	107,419,512	.997	25
Rand & O.F.S.....	724,386,112	39.459	2	2,336,120,888	43.719	111	9,580,135,984	88.910	107
Total Electricity.....	1,835,810,102	100.000	27	5,343,567,664	100.000	208	10,775,115,016	100.000	259
Per cent of Total.....	7.489			21.797			43.953		

AIR & STEAM = 0.161% of Total

Rand & O.F.S.....				625,775		(1)	37,454,186		(8)
Total Air.....									
Per cent of Total.....				1.585			94.880		

ELECTRICITY AIR & STEAM = 100% () as at 23/7/1966

Grand Total All Sales..	1,835,801,102		27	5,344,193,439		208	10,812,569,202		259
Per cent of Grand Total	7.476			21.765			44.035		

Energy used by Provinces:—
ELECTRICITY, AIR & STEAM: Number of Consumers as at 31/12/66

Cape.....	399,652,927		9	681,245,090		57	202,419,028		56
Natal.....	460,539,416		7	2,187,503,907		18	107,419,512		25
O.F.S.....	53,964,894		2	312,248,811		44	2,668,152,263		19
Transvaal.....	921,643,865		9	2,163,195,631		89	7,834,578,399		159
Total.....	1,835,801,102		27	5,344,193,439		208	10,812,569,202		259

INDUSTRIAL			DOMESTIC AND STREET LIGHTING			TOTAL UNITS SOLD		Total Number of Consumers
Units	Per cent Ind.	No. Cons.	Units	Per cent Dom & SL	No. Cons.	Units	Per cent Total Units Sold	
16,656,073	.275	391	18,380,256	3.738	3,469	272,390,860	1.111	3,874
788,607	.013	47	715,074	.145	218	2,481,001	.010	266
66,763,760	1.100	275	11,147,275	2.267	2,053	442,387,226	1.804	2,398
499,101,858	8.224	4,567	208,704,355	42.441	39,113	1,366,976,337	5.576	43,720
1,167,489,619	19.238	1,403	25,603,493	5.207	4,221	2,408,232,860	9.824	5,715
599,438,103	9.878	2,161	62,324,114	12.674	12,991	3,498,485,101	14.271	15,210
3,718,401,151	61.272	1,434	164,874,215	33.528	15,056	16,523,918,350	67.404	16,710
6,068,639,171	100.000	10,278	491,748,782	100.000	77,121	24,514,871,735	100.000	87,893
24.755			2.006			100.000		

1,395,392		(20)				39,475,353		(29)
3.535						100.000		

6,070,034,563		10,278	491,748,782		77,121	24,554,347,088		87,893
24.721			2.003			100.000		

582,922,974		5,267	238,497,960		44,749	2,104,737,979		50,138
593,343,719		1,864	53,994,201		10,315	3,402,800,755		12,229
180,928,553		210	9,552,955		1,609	3,224,847,476		1,884
4,712,839,317		2,937	189,703,666		20,448	15,821,960,878		23,642
6,070,034,563		10,278	491,748,782		77,121	24,554,347,088		87,893

POWER STATION OPERATING STATISTICS YEAR 1966

Statement No. 5

ELECTRICITY GENERATION

1—1 STEAM ELECTRIC Stations at 31/12/66—The number of Stations, those with separate Turbine Houses (i.e. not under same roof are counted as two e.g. S.R.I.S. & West-Bank)

Power Station	Units Generated	Units Sent Out	MAXIMUM DEMANDS		Stn. L.F. % S.O.
			½ Hour (Hour) sent out kW	2 Min. Peek kW	
Border Undertaking					
King William's Town.....	159,150	159,150	—	—	—
West Bank Nos. 1 & 2.....	290,960,680	275,243,230	54,610	58,400	57.5
Total.....	291,119,830	275,402,380	—	—	—
Cape Western Undertaking					
Hex River.....	638,389,600	606,482,920	119,000	124,000	58.1
Salt River No. 1.....	175,105,930	165,234,860	83,461	89,000	22.6
Salt River No. 2.....	712,370,300	677,720,800	94,054	100,000	82.3
Total.....	1,525,865,830	1,449,438,580	—	—	—
Natal Undertaking					
Colenso Nos. 1 & 2.....	672,553,380	627,788,130	141,210	155,000	50.8
Congella Nos. 1 & 2.....	762,360,500	705,743,990	137,445	164,000	58.6
Ingagane.....	1,315,338,500	1,233,958,740	192,800	206,000	73.1
Umgeni.....	1,135,883,688	1,069,651,888	224,800	240,000	54.3
Total.....	3,886,136,068	3,637,142,748	—	—	—
Eastern Transvaal Undertaking					
Komati.....	6,251,757,461	5,817,350,662	910,403	—	72.9
Witbank.....	515,780,274	473,131,899	119,835	—	45.1
Total.....	6,767,537,735	6,290,482,561	—	—	—
Rand / O.F.S. Undertaking					
Highveld.....	3,247,177,301	3,040,855,592	459,670	—	75.5
Klip.....	2,112,872,173	1,957,529,755	381,911	—	58.5
Rosherville.....	922,982	773,864	16,546	—	0.9
Taalbos.....	3,328,071,178	3,083,203,616	444,072	—	79.3
Vaal.....	2,158,201,924	2,026,163,771	290,753	—	79.6
Vereeniging.....	520,349,136	474,693,730	130,774	—	41.4
Vierfontein.....	1,816,308,007	1,686,650,616	331,494	—	58.1
Wilge.....	1,688,512,164	1,556,174,400	217,904	—	81.5
Total.....	14,872,414,865	13,826,045,344	—	—	—
Cape Northern Undertaking					
Central Kimberley.....	9,635,200	6,878,890	13,608	15,400	5.8
Total ETU+R & O.F.S.U. + C.N.....	21,649,587,800	20,123,406,795	—	—	—
Total B.U. & C.W.U.+N.U.....	5,703,121,728	5,361,983,708	—	—	—
Grand Total.....	27,352,709,528	25,485,390,503	—	—	—

Coal Burnt Tons (2,000 lbs.)	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
262	—	—	—	—	—	—	—
191,047	1.313	1.388	11,530	—	—	22.5	21.3
191,309	—	—	—	—	—	—	—
347,925	1.090	1.147	11,670	12,720	13,390	26.8	25.5
69,311	1.616	1.712	11,770	19,020	20,150	17.9	16.9
428,013	1.043	1.096	11,770	12,280	12,900	28.2	26.5
845,249	—	—	—	—	—	—	—
530,076	1.576	1.689	11,570	18,230	19,540	18.7	17.5
538,192	1.412	1.525	11,260	15,900	17,170	21.5	19.9
697,516	1.061	1.131	10,790	11,450	12,200	29.8	28.0
661,422	1.165	1.237	11,710	13,640	14,490	25.0	23.6
2,427,206	—	—	—	—	—	—	—
3,426,477	1.096	1.178	10,180	11,157	11,992	30.6	28.5
520,840	2.020	2.202	10,420	21,570	23,520	15.8	14.5
3,947,317	—	—	—	—	—	—	—
2,026,979	1.248	1.333	8,510	11,330	12,100	30.1	28.2
1,805,827	1.709	1.845	9,040	15,930	17,200	21.4	19.8
1,962	4.251	5.070	9,500	40,380	48,170	8.5	7.1
2,167,214	1.302	1.406	8,850	12,250	13,230	27.8	25.8
1,987,207	1.842	1.962	8,200	15,290	16,280	22.3	21.0
686,064	2.637	2.891	8,420	22,650	24,830	15.1	13.7
1,442,514	1.588	1.711	8,690	14,230	15,330	24.0	22.3
1,146,012	1.357	1.473	9,530	12,960	14,070	26.3	24.3
11,263,779	—	—	—	—	—	—	—
12,309	2.555	3.579	11,200	28,620	40,080	8.0	5.7
15,223,405	—	—	—	—	—	—	—
3,463,502	—	—	—	—	—	—	—
18,686,907	—	—	—	—	—	—	—

1.2 HYDRO ELECTRIC

Power Station	Units Generated	Units Sent Out	Maximum Demand—kW		Stn. Load Factor Sent Out	Rain	
			½ Hour Sent Out	2 Minutes Generated		Inches	M.M.
Sabie Gorge.....	20,400	20,400	1,170	1,180	—		
Sabie Falls.....	—	—	—	—	—		
Totals.....	20,400	20,400	—	—	—		

Station started up on 4 occasions during emergencies only

1.3 DIESEL ELECTRIC

Power Stations	Units Generated	Units Sent Out	Maximum Demands kW		Fuel Consumed		Lub. Oil Gal.
			½ Hour	2 Mins.	Total Lb.	Per kWh Sent Out	
King William's Town.....	2,020	2,020	480	500	1,195	0.547	—
Port Shepstone.....	23,207	22,779	1,820	2,100	13,860	0.608	—
Totals.....	25,227	24,799	—	—	15,055	—	—

(2) COMPRESSED AIR GENERATION

Station	Type*	Units Generated	Air Units Sent Out		Coal Burnt	Electric Input		Max. Sust. Ld. Over 1 Hour	L.F. %
			Units	%		Total Tons	Lb. Coal/ Units sent out		
**Central Rand Compressed Air System:									
Rosherville.....	Steam	18,780,500	18,701,800	43.9	32,915	3.52	—	25,580 January	33.6
Robinson.....	Electric	12,253,000	12,253,000	28.7	—	—	16,438,779		
Canada Dam.....	Electric	11,690,900	11,690,900	27.4	—	—	14,917,854		
Air Pipeline Totals:.....	—	42,724,400	42,645,700	100.0	32,915	—	31,356,633		

*Electrically Driven Compressors are fed from the Electric Distribution System of the Rand Undertaking

**Shut down 1,100 hours 23/7/1966

(3) GENERATION SUMMARY

	Units Generated	Units Sent Out	Coal Burnt
Electricity Total Units.....	27,352,709,528 20,400 25,227	25,485,390,493 20,400 25,227	18,687,169 — —
Air Units at Steam Driven Station.....	27,352,755,155	25,485,436,120	18,687,169
Grand Total 1966.....	42,724,400	42,645,700	32,915
Total for 1965.....	27,395,479,555	25,528,081,820	18,720,084
Change on 1965 (Units or Tons).....	25,440,445,395	24,634,982,969	18,438,075
Per cent.....	955,034,160	893,098,851	282,009
	+ 3.612	+ 3.625	+ 1.529

POWER PURCHASED FROM OUTSIDE SOURCES IN 1966

Undertaking	Purchased from	Maximum demands	Units
Cape Eastern.....	Port Elizabeth Municipality.....	1,107	2,918,129
Natal.....	Durban Navigation Coll.....	244	358,830
	Durban Municipality/Canelands.....	4,959	698,040
	Empangeni Municipality.....	46	10,150
Rand & Orange Free State.....	Pretoria Municipality.....	37,700	181,670,156
	Johannesburg Municipality.....	65,000	444,220,905
Total units purchased.....			629,876,210
Total units sold—1966.....			24,554,347,088
Purchased as % of sales.....			3.565

STATEMENT No. 7

WATER (OTHER THAN SEA WATER) CONSUMED BY POWER STATIONS FOR THE YEAR 1966

Undertakings	(Millions of gallons)					
	Potable water		Crude river water		Water from other sources including boreholes, dams and sewage	
	1965	1966	1965	1966	1965	1966
Border.....	28	27	—	—	—	—
Cape Eastern.....	—	—	—	—	—	—
Cape Northern.....	45	28	—	—	—	—
Cape Western.....	413	462	—	—	—	—
Natal.....	853	883	466	524	667	793
Rand (including Komati and Witbank Power Stations)	309	199	20,288	20,573	148	154

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 1966.

(See previous Annual Report for Rights or Interests in or over land acquired prior to 1966).

Cape Western Undertaking

Immovable property acquired for considerations amounting to.....	R108,596.95
Servitudes acquired — capitalised payments amounting to.....	R4,922.87

Cape Northern Undertaking

Immovable property acquired for considerations amounting to.....	R520.00
Servitudes acquired — capitalised payments amounting to.....	R5,878.75

Cape Eastern Undertaking

Immovable property acquired for considerations amounting to.....	NIL
--	-----

Natal Undertaking

Immovable property acquired for considerations amounting to.....	R67,399.80
Servitudes acquired — capitalised payments amounting to.....	R15,750.72
Leases acquired for Annual Rentals amounting to.....	NIL

Eastern Transvaal Undertaking

Immovable property acquired for considerations amounting to.....	R48,020.00
Servitudes acquired — capitalised payments amounting to.....	R1,293.20

Border Undertaking

Immovable property acquired for considerations amounting to.....	R91,000.00
Servitudes acquired — capitalised payments amounting to.....	NIL
Leases acquired for Annual Rentals amounting to.....	R240.00

Rand and O.F.S. Undertaking

Immovable property acquired for considerations amounting to.....	R12,700.00
Servitudes acquired — capitalised payments amounting to.....	R152,727.50
Servitudes acquired — options moneys paid amounting to.....	R36,252.00
Leases acquired for Annual Rentals amounting to.....	R75.40

**COAL USED AT COMMISSION'S POWER STATIONS
AVERAGE COST PER TON (2,000 lb.)**

Power Station	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Brakpan.....	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 3.77	R 3.91
Colenso.....	2.71	2.87	2.97	3.17	3.12	3.11	3.36	3.48	3.37	3.42	3.56
Congella.....	3.25	3.43	3.58	3.82	3.79	3.75	3.91	3.59	3.25	3.42	3.57
Hex River.....	4.06	4.17	4.54	4.70	4.68	4.76	4.93	5.21	5.17	5.33	5.57
Highveld.....	—	—	—	1.33	1.45	1.60	1.53	1.55	1.66	1.62	1.64
Ingagane.....	—	—	—	—	—	—	—	2.27	2.26	2.46	2.52
Kimberley Central.....	3.28	3.40	3.59	3.83	3.78	3.75	3.90	4.12	4.10	4.07	4.24
Klip.....	1.61	1.73	1.79	1.82	2.09	2.14	2.13	2.04	2.02	2.17	2.49
King Williams Town.....	4.68	4.84	4.81	4.54	—	4.58	—	4.58	—	—	4.65
Komati.....	—	—	—	—	—	—	—	—	—	—	—
Rosherville.....	1.72	1.87	1.92	2.04	1.86	1.90	1.29	1.53	1.34	1.17	1.24
Salt River.....	4.22	4.38	4.57	4.86	4.83	4.85	2.08	2.13	2.15	2.19	2.49
Taalbos.....	.73	.76	.84	.93	1.83	1.98	1.75	1.70	1.58	1.56	1.65
Umgeni.....	3.31	3.49	3.72	4.05	4.04	4.01	4.28	4.37	4.32	4.54	4.82
Vaal.....	.71	.73	.73	.74	.79	.93	.95	1.03	1.04	1.04	1.09
Vereeniging.....	.85	.92	.98	.91	.87	.96	1.02	1.07	1.05	1.06	1.32
Vicfontein.....	.96	1.10	1.23	1.23	1.50	1.56	1.46	1.43	1.42	1.55	1.68
West Bank.....	4.08	4.17	4.39	4.66	4.61	4.59	4.77	5.02	5.01	5.10	5.22
Wilge.....	.79	.89	.91	.97	.90	.94	.97	.95	.96	.99	1.09
Witbank.....	1.03	1.03	1.05	1.11	1.06	1.05	1.14	1.15	1.16	1.27	1.37

**POWER SUPPLY IN SOUTH AFRICA
ESCOM AND REPUBLIC**

	Escom		Units Generated (kWh) (Millions)		Escom coal burnt (Tons) (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					0.1			
1926		61.35					161.7			
1927		121.35					551.0			
1928	1,399,678	175.65	1,422.2	2,109.6	1,934.9		627.9		1,411.4	
1929	1,575,492	194.65	1,516.7	2,300.1	2,086.1		797.0		1,560.5	
1930		215.65	1,766.3	2,453.7	2,166.4		889.6		1,632.4	
1931	16,167,114	215.65	1,857.4	N.A.	2,237.2		867.1	N.A.	1,689.5	
1932	16,823,332	227.65	2,028.7	N.A.	2,388.0		890.7	N.A.	1,814.2	
1933	17,275,780	247.65	2,246.4	2,946.6	2,542.0		974.1		1,929.0	
1934	18,786,190	287.65	2,525.9	3,308.6	2,831.3		985.2		2,140.3	
1935	22,980,968	307.65	2,848.4	3,772.5	3,152.3		1,119.2		2,414.9	
1936	27,103,556	486.843	3,406.7	4,602.9	3,584.3		1,688.0		2,820.6	
1937	30,563,380	519.843	3,980.6	5,336.0	3,844.2		2,535.6		3,238.5	
1938	34,296,968	623.346	4,452.8	5,933.0	4,176.4		2,985.4		3,639.7	
1939	36,645,076	737.656	4,740.7	6,574.3	4,409.2		3,573.7		4,095.6	
1940	38,661,664	770.631	5,098.3	7,167.8	4,626.0		4,070.2	1,189	4,516.9	
1941	40,808,068	771.300	5,444.9	7,592.1	4,903.7		4,254.0	N.A.	4,833.5	
1942	43,762,646	770.551	5,538.9	7,798.5	5,111.9		4,320.8	N.A.	4,920.0	
1943	46,573,506	795.456	5,404.0	7,699.8	4,977.6		4,275.6		4,795.8	
1944	48,036,044	796.856	5,597.8	8,042.9	5,164.2		4,415.8		4,970.5	
1945	49,913,496	862.856	5,748.7	8,328.5	5,309.2		4,706.1	1,531	5,101.1	
1946	52,852,490	975.690	5,895.6	8,556.9	5,321.9		5,002.4	1,836	5,218.8	
1947	57,649,694	1,033.190	6,035.9	8,787.8	6,000.3		5,144.5	2,169	5,341.7	
1948	90,815,886	1,385.071	6,553.5	9,480.7	6,126.0		5,576.9	2,692	5,787.0	
1949	100,234,082	1,411.985	7,075.3	10,013.3	6,365.6		6,222.2	8,764		
1950	115,128,520	1,439.985	7,773.6	11,187.0	6,970.4		6,910.6	9,352		
1951	137,283,154	1,520.590	8,326.6	11,895.0	7,344.8		7,456.5	10,336		
1952	176,559,102	1,624.590	8,778.0	12,517.0	7,841.1		8,080.6	10,889		
1953	218,739,074	1,806.070	9,442.0	13,744.0	8,150.3		8,732.2	11,518		
1954	270,621,248	2,051.010	10,651.9	15,184.0	8,846.0		9,676.6	12,317		
1955	304,341,966	2,377.721	12,214.5	17,172.0	9,920.5		10,964.0	14,309.9		
1956	342,068,024	2,734.871	13,578.4	18,535.0	10,679.8		12,019.5	12,977		
1957	377,265,178	2,826.700	14,388.1	19,954.0	11,266.2		12,763.1	13,421		
1958	417,700,898	3,036.550	15,582.6	20,133.0	11,887.4		13,602.2	14,312		
1959	453,130,370	3,289.450	16,926.5	21,165.0	12,730.3		14,724.5	13,947		
1960	491,471,208	3,408.950	18,543.3	22,561.0	13,792.8		16,094.1	14,654		
1961	529,565,151	3,558.950	19,575.4	24,365.0	14,544.8		17,013.2	15,441		
1962	581,579,266	3,758.950	20,805.5	26,105.0	15,383.3		18,121.0	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	32,772.0	18,438.1		23,143.3	17,851		
1966	840,781,679	4,806.350	27,395.5	34,758.0	18,720.1		24,554.3	18,579		