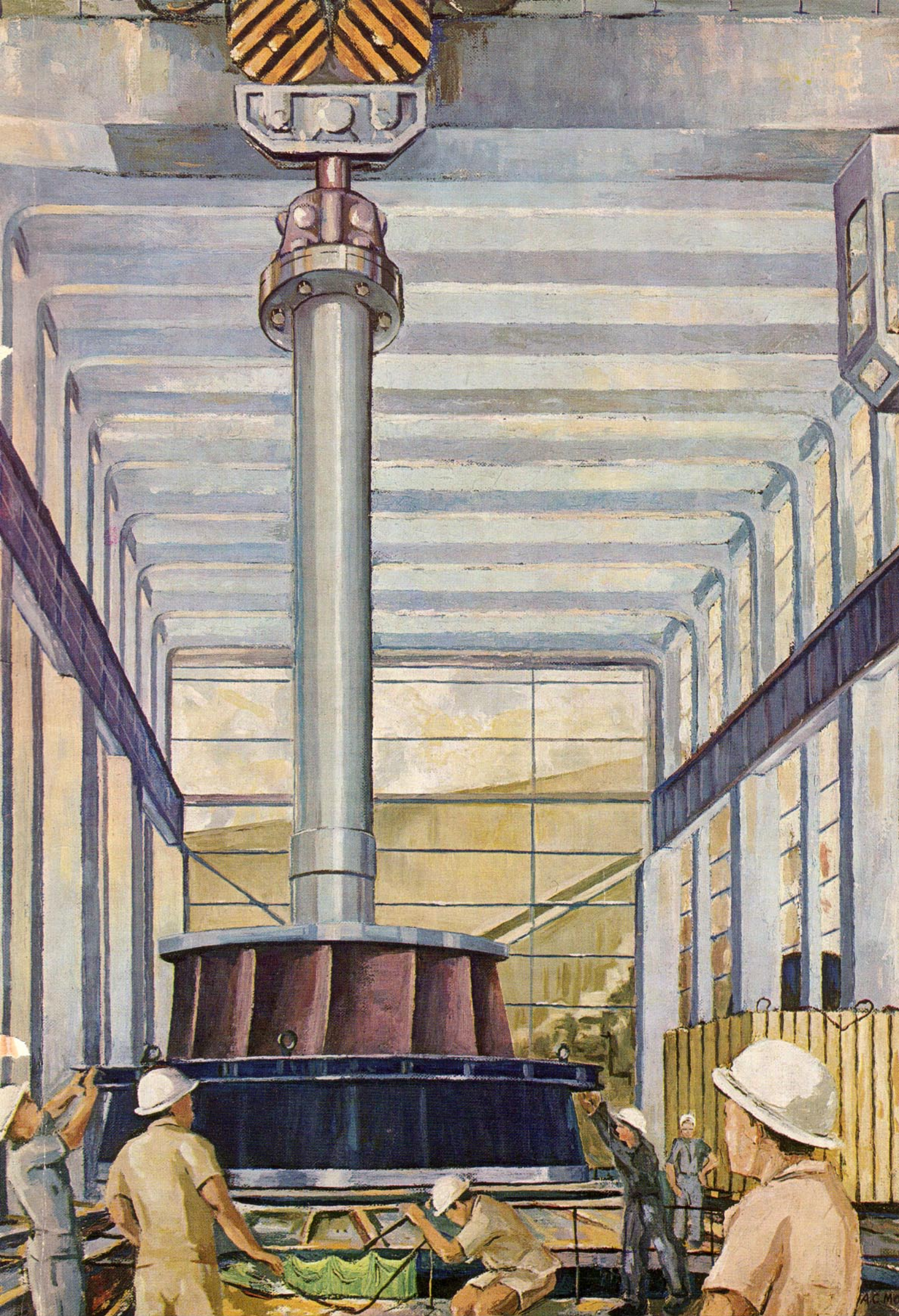


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Installing the Turbine Runner of unit 2 at the Hendrik Verwoerd Hydro-Electric Power Station

MEMBERS OF THE ELECTRICITY SUPPLY COMMISSION

DR. R. L. STRASZACKER
(Chairman)

MR. W. H. ANDRAG

MR. A. J. DU TOIT

MR. G. R. D. HARDING
(retired 1/8/70)

MR. D. J. MALAN

MR. E. PAVITT

MR. H. H. L. ABRAHAMSE

MR. K. F. MORRISON
(appointed 20/8/70)

MEMBERS OF THE MANAGEMENT COMMITTEE

MR. H. J. DE VILLIERS	General Manager
MR. JAN H. SMITH	Assistant General Manager
MR. J. A. BOTHMA	Financial Manager
MR. A. J. LEVY	Acting Commercial Manager
MR. P. J. T. OOSTHUIZEN	Secretary
MR. F. W. STUTTERHEIM	Chief Engineer (Operations and Maintenance)
MR. H. M. TORR	Economic Consultant
DR. N. TROOST	Chief Engineer (Electrical)
MR. J. L. VAN DER WALT	Personnel Manager
MR. N. T. VAN DER WALT	Chief Engineer (Mechanical)

MANAGERS OF THE COMMISSION'S UNDERTAKINGS

Rand and Orange Free State	MR. A. W. TOMLIN
Eastern Transvaal	MR. J. S. VAN VELDEN
Natal	MR. H. P. ALEXANDER
Cape Western	MR. G. D. G. DAVIDSON
Border	MR. F. O. PEARCE
Cape Eastern	MR. F. O. PEARCE (Acting)
Cape Northern	MR. C. R. BURTON
Orange River	MR. J. L. ROTHMAN

SWAWEK

Manager, Electricity Department	MR. T. A. THERON
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ELECTRICITY SUPPLY COMMISSION

To the Honourable
THE MINISTER OF ECONOMIC AFFAIRS
HOUSE OF PARLIAMENT
CAPE TOWN

2nd June, 1971

Sir,

As required by Section 19 of the Electricity Act, 1958, the Commission has the honour to present its forty-eighth Annual Report and Accounts covering its work for the financial year ended 31st December, 1970.



PRINCIPAL FEATURES AND EVENTS OF THE YEAR

Total sales of electricity during 1970 amounted to 34 891 million kWh reflecting an increase of more than 10,7 per cent for the year. This was the highest annual growth in electricity sales experienced by Escom since 1955. The average growth rate in total electricity sales during the decade ended in 1970 was 8,0 per cent per annum: but there has been a significant increase in the growth rate in the last four years which reflect an average of 9,2 per cent over these years.

Escom's programme of power station construction has had to be stepped up to meet these new demands. During 1970, an additional 600 MW was added to the system, comprising the third 200 MW set at Grootvlei power station and the first two 200 MW sets at Hendrina power station. Further extensions to these power stations are in progress. Construction at Arnot power station was maintained according to programme, and testing of the first 350 MW unit is in progress with a view to commissioning in May, 1971. The first two 80 MW turbines at Hendrik Verwoerd hydro-power station will be commissioned during 1971. Preliminary construction work on the 3 000 MW Kriel power station has been put in hand.

Capital expenditure during the year 1970 rose to the record figure of R163,9 million, which marginally exceeded the capital expenditure of R163,1 million during 1969. Included in the figure for 1970 is the sum of R98,2 million for new power stations and power station extensions.

Financing of this large programme has become a major problem. During 1970 Escom raised R66 million by the issue of loans in the local market and the balance of its funding requirements was obtained from foreign sources.

The Economic Development Programme for the Republic of South Africa published by the Minister of Planning in December, 1970, postulates a moderation of the growth rate of the national economy during the next five years, and the Commission has given careful attention to the question of the future financing of Escom's activities. In computing Escom's future needs, provision must also be made for the growth component and replacement of old plant in the Municipalities of Cape Town, Johannesburg, Pretoria, Bloemfontein and Port Elizabeth, which are now to be connected to the national grid. The partial supply to the City of Cape Town was commenced in 1970 and arrangements have been completed for supplies to Johannesburg and Pretoria commencing in 1971, Bloemfontein commencing in 1972 and Port Elizabeth in 1973. In addition, the completion of the national 400 kV grid system to inter-connect the coastal Undertakings with the northern stations will during the next five years require large capital expenditures.

The world wide shortage of capital is reflected in rising interest rates. Borrowing at these high rates imposes a heavy burden upon tariffs and it has therefore become necessary for the Commission to give greater attention to internal capital formation. Public utilities in all countries of the world have been compelled to move in this direction in recent years

and the Commission has submitted to the Minister a request for an amendment to the Electricity Act which will authorise Escom, within statutory limitations, to generate capital by a charge against revenue.

In the last Annual Report attention was drawn to the proposed interconnection of Escom's Undertakings and the establishment of a national transmission system. The interconnection between the Transvaal power stations and the Cape Western Undertaking by means of a single 400 kV line was completed to Muldersvlei in August, 1970, and some of the consequences of this development are revealed in the 1970 accounts. In spite of the limitations imposed by single line operation, more than one-third of the power required by the Cape Western Undertaking was in 1970 imported from the pooled power stations in the northern Undertakings and it is estimated that a saving of R1,57 million was achieved in overall coal cost (including railage), as a result of this import. This saving is of course offset by the capital charges on the transmission system. A nett saving in overall cost to the Cape Western Undertaking will only be realised when the 400 kV system is fully developed and growth of the load in the Cape Western region makes it economically possible to take advantage of the full capacity of the interconnection.

Interconnection between the Rand and O.F.S. Undertaking and the Natal Undertaking was established during 1970, by the early completion, as an interim measure, of the 132 kV line required for electrification of the railway system between Kroonstad and Bethlehem. When effective interconnection by means of the 400 kV transmission system is established during 1971, a similar pattern of savings in coal cost will be seen in the Natal accounts.

The time has thus arrived when the structure of Escom's Undertakings must be adapted to interconnection between the coastal generating stations and the large power stations in the hinterland. The Commission has put forward a request to the Minister for amendments to the Electricity Act which will make it possible to combine all Escom's power stations in a new Generating Undertaking which will supply power in bulk to Escom's Distribution Undertakings. The change in the Act will enable Escom to operate all its power stations in a manner aimed at the achievement of the lowest overall cost of generation.

Reference was made in the last Report to the import and export of power from and to neighbouring territories. The existing supplies furnished to the Portuguese Government and to the Government of Lesotho showed important increases during 1970. Preparations are continuing for the import of power from the Cabora Bassa hydro-electric scheme in the Portuguese territory of Mocambique, which is to commence in 1975. Arrangements have been concluded with the Swaziland Electricity Board for an Escom supply to this Board in 1972. No decision has been taken on the proposal to import power from a major coal-fired power station in Swaziland, but it is understood that a feasibility study is being conducted by the Government of Swaziland.

The Commission continues to strive towards a

lowering of costs and the overall Escom average price per unit sold decreased marginally from 0,556 5 cents per unit sold in 1969 to 0,554 5 cents per unit sold in 1970. The reduction is due to the saving in coal cost, which is explained on page 17, but attention must be drawn to the higher interest charges applicable to all current borrowings. A rise in financial costs is likely to continue for some years, since there is a substantial difference between the interest rates on new money and the average interest rate for past loans. Inflation in the cost of plant and equipment is another feature for concern. The present indications are that, despite the economies of scale associated with the increase in unit size, the final cost of Kriel power station, with 500 MW sets, will exceed R95 per kW. For comparison, Komati power station with 100 MW and 125 MW sets was completed in 1966 at a cost of R81 per kW, and Camden power station with 200 MW sets cost R87 per kW.

The cost of coal is the largest single item of working cost and continues to receive the close attention of the Commission. The overall cost of coal burnt in Escom's power stations, including railage, has been reduced by 5 per cent from R2,37 per metric ton in 1969 to R2,28 per metric ton in 1970. The interconnection of Escom power stations on a Republic-wide basis is the major factor in achieving this saving, in the face of rising costs of production on the collieries.

A policy of conservation of coal resources has been encouraged whenever opportunity offers. It is worthy of note that the transfer of loading from coastal power stations to the large pithead power stations in the Transvaal will result in the substitution of low calorific coals for high quality coals previously railed to the coastal power stations. At Hendrina a substantial increase in the percentage of coal extracted has been made possible by opencast mining and this mining procedure has proved to be more adaptable to variations in the output required during the construction period of the station. The Commission has participated in discussions with the Transvaal Coal Owner's Association on the possible export of high quality coal to Japan and other countries. While the Commission has made it clear that the interests of its consumers must be fully safeguarded, it has agreed in principal to co-operate with colliery companies which may be able to participate in these export contracts.

During the year investigations into the economics and possible siting of nuclear power stations were continued in collaboration with the Atomic Energy Board. The site investigations and plans are proceeding for the proposed Koeberg nuclear power station 25 km north of Cape Town. In May 1969, a report was

presented by the Atomic Energy Board describing the investigations made by the Nuclear Power Committee into the possible introduction of nuclear power in the Republic of South Africa. This report recommended that only power reactors capable of operating on natural uranium should be considered for the country's first nuclear power station. Since that date both Escom and the Nuclear Power Committee of the Atomic Energy Board, on which Escom is represented, have carried out further studies into the possibility of using enriched fuel reactors and the Atomic Energy Board has published a report thereon. However, up to the present no definite decision has been taken.

During 1970 and the early months of 1971 Escom's programme of transmission line construction suffered a serious setback mainly due to shortages of steel and cement. The resulting delay in the completion of the 400 kV circuits interconnecting the Natal system with the northern pooled power stations is a matter of particular concern in view of the important industrial developments in Natal. The delay in construction of other transmission lines has also restricted the output of the newly commissioned generating plant in Hendrina power station.

A preliminary run-up of the No. 5 set at Grootvlei power station was done in April, 1971. This 200 MW set is associated with a "dry" cooling tower, and there are great expectations that this new method of cooling will lead to substantial savings of water. The "dry" cooling installation is expected to use only fifteen percent of the water used in the conventional wet type of cooling tower; but some two years of operating experience will be necessary before a final assessment can be made.

A re-assessment has been made of the potential for hydro-electric power generation at the Hendrik Verwoerd dam and at the proposed P. K. le Roux dam. On the revised hydrological data Escom now proposes to install four 80 MW turbines at the Hendrik Verwoerd power station and two 110 MW turbines at the Vanderkloof power station at the P. K. le Roux dam.

In common with other organisations Escom finds itself hampered by a shortage in skilled manpower. To meet these difficulties the Commission is making provision for increased training facilities within its organisation and at South African Universities and technical colleges. During 1970 there were, at different universities, 92 students holding Escom bursaries.

Fuller details of the generation and sale of electricity by Escom and the development of the Escom Undertakings in different parts of the country are given in later sections of this Report.

SALES OF ELECTRICITY

Escom's total sales of electricity during the year 1970 amounted to 34 891 million units reflecting an increase of 10,7 per cent for the year. There has been a marked increase in annual growth over the last five years; the relevant figures are as follows:

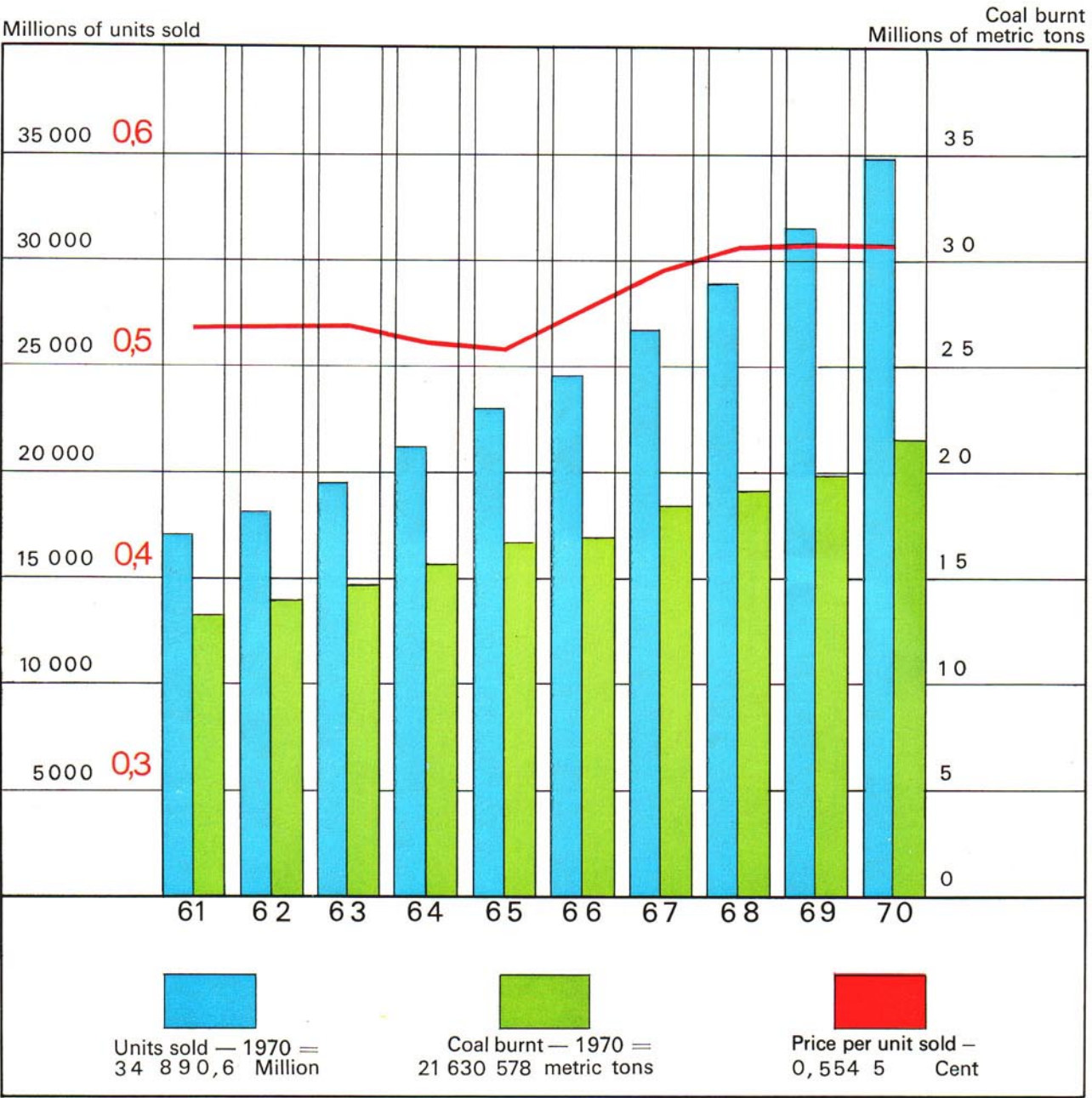
1966: 6,1 per cent
1967: 8,6 per cent

1968: 8,4 per cent
1969: 9,1 per cent
1970: 10,7 per cent

The mining industry continues to be Escom's largest consumer, purchasing 40 per cent of all units sold, but the industrial sector shows the greatest percentage increase as well as the greatest increase

in units purchased over the last five year period. Sales to industrial consumers were 9 608 million units this year and showed an average increase of 11,1 per cent per year over the last five year period. Bulk supplies to municipalities have nearly matched this growth and increased by an average of 10,5 per cent per year over the same period. A considerable

proportion of bulk supplies to municipalities is resold to industrial consumers in the municipal areas. The growth of Escom's sales over the ten year period 1961 to 1970 inclusive, together with the total coal burnt and the average price per unit sold is depicted in the diagram below:



The average price per kWh sold decreased slightly this year to 0,554 5 cents per unit as compared with 0,556 5 cents per unit during 1969. This decrease was achieved in spite of a tariff increase in the Rand and Orange Free State Undertaking during the year and can be attributed to an overall decrease of 5 per cent in the average delivered price of coal used in Escom's power stations.

The figures represented in the above diagram are the average for all Undertakings. The prices for individual Undertakings and for different classes of consumers in each Undertaking are given in the section of this report relating to the Undertakings. The cost per unit sold averaged 0,563 7 cents during the year 1970 which is slightly higher than the figure of 0,556 6 cents for the previous year.

SALES OF ELECTRICITY TO THE MAIN CONSUMER CATEGORIES

The total sales of electricity for the year 1970 in the main categories of supply, with the corresponding figures for 1969 and the rate of increase during the

year under review are shown in the following table. The final column reflects the average rate of growth over the ten year period ending in 1970.

TOTAL UNITS SOLD

	1969	1970	Increase %	Average Annual Increase in 10 Years %
<i>Bulk Supplies;</i>				
Municipalities	7 263 525 063	8 108 090 324	11,63	9,59
<i>Direct Supplies;</i>				
Traction	2 307 011 643	2 409 721 639	4,45	8,71
Mining	12 641 947 564	13 947 871 059	10,33	5,24
Industrial.	8 573 769 566	9 607 732 985	12,06	11,70
Domestic	708 458 537	805 472 702	13,69	12,55
Street Lighting	10 878 997	11 686 376	7,42	6,74
Total	<u>31 505 591 370</u>	<u>34 890 575 085</u>	<u>10,74</u>	<u>8,05</u>

Growth of Industrial Activity

Although industrial consumers maintained a high rate of growth of 12,1 per cent during the year this did not equal the record growth of 15,3 per cent recorded during 1969. A contributing factor to the large increase during 1969 was the increase in sales to new industrial consumers in the Eastern Transvaal and the increased production of a large steel works in that area.

Escom's figures for industrial supplies do not represent a complete picture, since they do not include supplies of electricity furnished to industrial

consumers by municipalities or supplies generated by industrial undertakings themselves, but they do give a broad picture of industrial development.

The iron, steel and base metal industries continue to be Escom's largest consumer group in the industrial sector but sales to the building industry and the consumer goods section showed increases of about 29 per cent compared to last year's sales.

Sales by Escom to the main categories of industry are given in the table below:

ELECTRICITY SOLD TO INDUSTRIAL SECTOR

	Units Sold (millions)				
	1966	1967	1968	1969	1970
Building and Cement (Including quarrying)	530	562	646	716	924
Chemical (Including pharmaceutical)	1 098	1 214	1 241	1 272	1 376
Engineering (Including the Motor Industry)	415	544	562	535	569
Foodstuffs, Consumer Goods and Commercial	935	1 022	1 111	1 088	1 407
Iron, Steel and Base Metals	2 435	2 680	2 967	3 672	4 114
Paper and Paper Products	416	469	493	542	485
Other	240	238	419	749	733
Total	<u>6 069</u>	<u>6 729</u>	<u>7 439</u>	<u>8 574</u>	<u>9 608</u>

Expansion of Mining Activity

The mining industry remains the major consumer although its relative importance is slowly decreasing in favour of industrial supplies. In 1970 the mining sector purchased 40 per cent of the total number of units sold by Escom.

Sales to all classes of mining consumers reflected an increase of 10,3 per cent during the year as

compared with 5,4 per cent last year. This large increase is due in part to the temporary supply required for de-watering the Bank compartment of the West Driefontein mine.

The increase in sales over the last five years is given in the following table:

ELECTRICITY SOLD TO MINING SECTOR

		Units Sold (millions)			
	1966	1967	1968	1969	1970
Gold Mining (Including Uranium)	9 432	9 946	10 339	10 645	11 504
Coal Mines	412	453	480	495	535
Diamond, Platinum and other Mines.	910	1 042	1 176	1 500	1 908

The increase in sales to the mining industry was general to all Escom Undertakings where mining supplies are given.

In the Eastern Transvaal the Palabora Mining Company as well as the asbestos mines increased their consumption and the Rustenburg platinum mines in the Rand and Orange Free State Undertaking showed exceptional increases.

In the Northern Cape the largest percentage increase in sales to the mining industry was reflected by the manganese and asbestos mines but the De Beer's Company's new Finsch mine together with

their four Kimberley diamond mines are still the largest mining group in this area. The Anglo-Vaal new copper-zinc mine near Prieska commenced taking a supply in November, 1970 and is expected to develop rapidly during the next few years.

Sales to coal mines in Natal increased by 15,5 per cent to 154 million units during 1970. This increase can be attributed in part to the increased requirements of Escom's Ingagane power station and in part to increased coal exports.

Sales to the gold mines in various areas over the last five-year period are given in the following table:

ELECTRICITY SOLD TO GOLD MINING INDUSTRY

	1966	Units Sold (millions)			
		1967	1968	1969	1970
Witwatersrand	2 491	2 492	2 329	2 186	2 144
Klerksdorp	1 702	1 851	1 987	2 177	2 283
Far West Rand	2 271	2 410	2 639	2 758	3 439
Orange Free State	2 538	2 700	2 804	2 913	3 002
Eastern Transvaal	430	493	580	611	636
Totals	<u>9 432</u>	<u>9 946</u>	<u>10 339</u>	<u>10 645</u>	<u>11 504</u>

Electrification of the Railways

Electricity purchased by the South African Railways for traction increased by 4,5 per cent to 2 410 million units during 1970. This is less than the increase last year of 5,8 per cent and well below the average increase over the last ten year period of 8,7 per cent.

In the Orange Free State supplies were made available to a total of eight new traction substations between Harrismith and Arlington, while an additional three will be required between Arlington and Kroonstad early in the new year. Two further traction supplies were made available on the Natal upper South Coast. Supplies are being planned to five traction substations on the North Coast between Mandini and Richards Bay and a further eleven along the route of the proposed railway line from Vryheid to Empangeni. These supplies will be required in stages up to the end of 1975.

Sales to the South African Railways for pumping petroleum products and crude oil totalled 87 million units during 1970 as compared to 51 million units in 1969.

The following table gives the sales to the South African Railways in each Undertaking.

ELECTRICITY SOLD: S.A.R. TRACTION

Undertaking	Units Sold (millions)		Per cent Increase
	1969	1970	
Cape Northern	179,5	178,3	-0,7
Cape Western	397,0	412,6	3,9
Eastern Transvaal	270,2	270,3	—
Natal	667,9	751,5	12,5
Rand and O.F.S.	792,4	796,9	0,6

Purchase and Sales Outside the Republic

The following lists the sales of electricity made across the borders of the Republic during the year:—

Electricity Sold to Neighbouring Territories. (kWh).

	1969	1970
Lesotho	7 275 983	8 824 906
Mozambique	114 600	576 800

A supply was made available to the Portuguese border village of Ressano Garcia on the 29th July, 1969, and sales during 1970 increased to more than half a million units. Sales to the Government of Lesotho increased by 21,3 per cent during the year.

SALES BY UNDERTAKING

The total sales of each Undertaking with the corresponding figures for 1969 and the percentage increase for the year and over the last ten year period

are given in the table below. The Cape Eastern and Orange River Undertakings have only recently come into operation and no figures are available for the increase over the last ten year period.

TOTAL SALES OF ELECTRICITY — ESCOM UNDERTAKINGS

Undertaking	UNITS SOLD			Average Annual Increase in 10 Years
	1969	1970	Increase %	
Cape Western	1 824 333 711	2 101 027 765	15,17	9,20
Cape Northern	657 860 386	714 894 199	8,67	14,46
Cape Eastern	5 719 118	6 117 397	6,96	—
Border	330 521 872	360 352 465	9,03	7,66
Natal	4 636 693 454	5 073 498 149	9,42	9,44
Eastern Transvaal	3 824 413 840	4 294 062 785	12,28	18,88
Rand & O.F.S..	20 218 068 013	22 293 351 775	10,26	6,35
Orange River	7 980 976	47 270 550		
Total Escom	<u>31 505 591 370</u>	<u>34 890 575 085</u>	<u>10,74</u>	<u>8,05</u>

SUPPLIES TO FARMERS

The steady expansion of Escom's rural networks was continued and a total of 1 898 new farm supplies were connected during 1970.

In certain areas, the demand for farm electricity supplies is slowing down. In the Western Cape, where the great majority of farms in the wine-growing areas have already been connected, further expansion must take place in areas of larger and less intensively cultivated farms. In other areas the pressure on Escom to provide electricity on farms continued and every effort was made by the various Undertakings to connect as many farm supplies as possible. The shortage of trained personnel however means that line construction work cannot be progressed as quickly as Escom would desire.

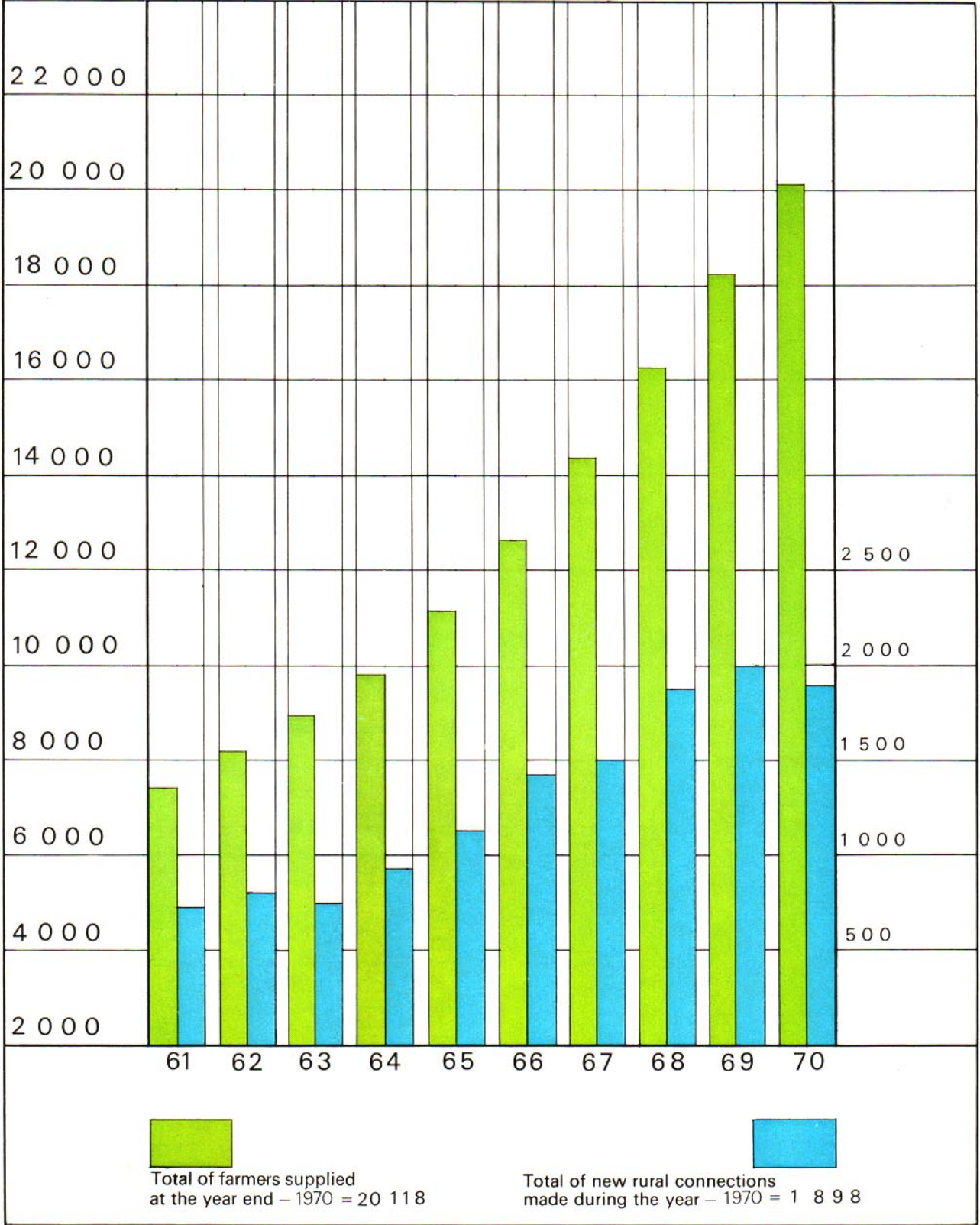
It is unavoidable that the increases in the cost of materials and labour should be reflected in the prices Escom must quote to cover its costs, and the reluctance of many to accept the terms offered may be due not only to Escom's prices but also to the rise in the cost

of electrical wiring that may be needed on the farm.

The following table shows the increase in the number of farming supplies connected to Escom's various Undertakings during the last decade:—

	Total number of farming supplies at the year end		
	1960	1965	1970
Cape Western	3 763	4 556	5 527
Natal	1 449	2 164	3 707
Rand and O.F.S. . . .	544	1 765	5 862
Cape Northern	340	998	1 662
Border	179	320	571
Cape Eastern	—	233	378
Eastern Transvaal. . .	397	1 095	2 411
	<u>6 672</u>	<u>11 131</u>	<u>20 118</u>

Supplies to farmers



NEW AREAS OF SUPPLY

The licensed areas of supply of Escom's Undertakings are shown on the map on page 14, and include extensions to the Natal Undertaking licences and the Cape Western licence which were approved by the Electricity Control Board during 1970.

Alteration to Tariffs

As a result of rising costs Escom was obliged to

suspend the discount of 2 per cent on the Rand and Orange Free State Undertaking tariff as from July, 1970. In addition this tariff was raised by five per cent as from the beginning of 1971.

The Cape Western Undertaking tariff was also increased by five per cent as from the beginning of 1971 while the surcharge on the Border Undertaking tariff will be increased from five per cent to ten per cent as from the 1st July, 1971.

GENERATION OF ELECTRICITY

The total units generated in all Escom's Undertakings during 1970 amounted to 39 796 million which represents an increase of 10,6 per cent over the corresponding figure for 1969.

Purchases from outside sources amounted to 7,3 million units. Approximately 7 million of these units were purchased from the Port Elizabeth Municipality at Aloes and Loerie for sale in the Cape Eastern Undertaking. With the commissioning of the Department of Water Affairs' hydro station in the Gamtoos Valley the Cape Eastern Undertaking will purchase an increasing portion of its requirements for the Gamtoos Valley from the Department of Water Affairs.

The figures for units generated, purchased and sent out for all Undertakings were as follows:—

	1969	1970
Units Generated	35 966 956 724	39 796 184 973
Units Purchased	7 969 311	7 260 727
Units Sent Out	33 598 182 607	37 320 784 837

The installed generating capacity in Escom's power stations at the end of 1970 was as follows:—

	Total at the end of 1970 MW
Pooled power stations of the Rand and O.F.S. Undertaking and Eastern Transvaal Undertaking	5 902
Natal Undertaking	1 111
Cape Western Undertaking	450
Border Undertaking	120
	<u>7 583</u>

The corresponding figure for 1969 was 6 984 MW.

HOURLY MAXIMUM DEMAND (MW SENT OUT) OF ESCOM'S UNDERTAKINGS OVER THE LAST FIVE YEARS

Undertaking	1966	1967	1968	1969	1970
Rand and Orange Free State	2 644,4	2 863,0	3 114,7	3 277,1	3 624,4
Natal	613,3	660,0	712,0	794,0	867,0
Eastern Transvaal	368,4	424,7	485,2	575,5	615,3
Cape Western	257,5	276,6	298,6	326,8	389,8
Cape Northern	79,2	102,2	117,5	127,3	139,8
Border	54,6	58,9	64,9	67,7	70,2
Orange River	—	—	—	7,6	12,4
Cape Eastern	1,1	1,5	1,7	2,0	2,6

PLANT CAPACITY

Major items of power station equipment taken into service during 1970 and under construction or on order as at 31st December, 1970, are given in the

following table. Principal equipment installed is detailed in "Statement No. 1" on pages 64 to 68 of this Report. Other statistical statements appear on pages 69 to 77.

	Plant taken into service in 1970		Plant under construction or on order	
	Boilers kg/s	Generators MW	Boilers kg/s	Generators MW
Grootvlei Power Station	214,2	200	444,8	400
Hendrina Power Station	428,4	400	1 713,6	1 600
Arnot Power Station	—	—	1 998,8	2 100
Hendrik Verwoerd	—	—	—	160
Kriel	—	—	2 640,0	3 000
Sabie Gorge (Decommissioned)	—	—1,3	—	—

LICENSED AREAS OF SUPPLY



POWER STATION OPERATION

In terms of licences granted by the Electricity Control Board the power stations of the Rand and Orange Free State Undertaking together with the power stations in the Eastern Transvaal are operated as a single system of pooled power stations. During 1970 all power station development took place in this northern pool which now includes 78 per cent of Escom's generating capacity. The Hendrik Verwoerd hydro-power station and the hydro station to be built at the P. K. le Roux dam will also form part of the Northern pooled system.

During the present decade most of Escom's new power stations will be built on the coal fields of the

Eastern Transvaal but further planning will include the construction of nuclear power stations in the coastal areas. Present indications are that the first of these nuclear power stations will be in operation in the Western Cape towards the end of the seventies. Site investigations have started for a possible nuclear power station in Natal. Escom's studies in connection with nuclear power generation are carried out in collaboration with the Atomic Energy Board.

The units generated in all Escom's power stations during 1970 amounted to 77,7 per cent of the total units generated in the Republic of South Africa.

OPERATION OF NORTHERN POOLED POWER STATIONS

Interconnection of the northern pooled generating system with the power stations in the Cape Western Undertaking was achieved in 1969 with the building of the first 400 kV line to the Western Cape, and in May, 1970, a limited interconnection with the Natal system was effected between Taaibos power station and Bloukrans substation in Natal, by making use of the 132 kV line required for railway electrification between Kroonstad and Bethlehem.

The northern pooled power stations generated 32 253 million units during the year which represents an increase of 13,3 per cent above the units generated during 1969. The bulk of this increase was met by the new power stations Grootvlei, Camden and Hendrina.

The following Undertakings obtained their supplies either wholly or partly from the northern pooled power stations:—

Northern Pooled Power Stations: Allocation of Output

Undertaking	Maximum Demand		Total Units (millions)	
	1969	1970	1969	1970
Rand & Orange Free State.	3 277	3 624	21 791	24 038
Eastern Transvaal	575	615	3 916	4 408
Cape Northern	127	139	717	797
Orange River	8	12	8	53
Natal (Partial Supply)	5	57	2	136
Cape Western (Partial Supply).	86	208	118	798

Power Generation in Cape Western Undertaking

As a result of the power imported from the Northern pooled stations, which increased considerably during the latter half of 1970 on completion of the extension of the 400 kV system to Muldersvlei, the number of units generated in the Salt River and Hex River power stations of the Cape Western Undertaking dropped from 1 960,6 million in 1969 to 1 606,5 million in 1970 and the coal consumed in these power stations decreased from 956 369 metric tons in 1969 to 796 883 metric tons in 1970 despite an increase of 15,2 per cent in the number of units sold by the Undertaking.

Power Generation in Natal Undertaking

The Natal Undertaking generated 5 556 million units during the year of which 59,3 per cent represents generation at Ingagane power station. The system generated maximum demand of 918 MW was met with the assistance of 15 MW from the interconnector between Taaibos power station and Bloukrans substation.

Power Generation in Border Undertaking

The number of units generated in West Bank No. 1 and West Bank No. 2 power stations increased from 350,7 million in 1969 to 380,5 in 1970.

Serious flooding in August caused considerable damage to equipment, but it was possible to keep the station in operation with relatively short interruptions in supply.

The King William's Town power station was not operated during the year but is being kept in commission for emergency standby purposes, pending connection of the Border Undertaking network to the main national 400 kV system in 1973.

WATER SUPPLIES TO ESCOM'S POWER STATIONS

The quantities and source of water used in the power stations of the Commission's Undertakings are shown in the table below. Water drawn from the Vaal River decreased from 154 megalitres per day in 1969 to 143 megalitres per day in 1970. The corresponding figure for 1968 was 156 megalitres per day.

In spite of this decrease in water consumption the power stations which draw their water supplies from the Vaal Dam increased their output by 13,5 per cent over the 1969 figure, the main increase being at the new Grootvlei power station. This power station generates 384 000 units of electricity for every megalitre of water consumed compared with 269 000 units per megalitre for the older power stations. This conservation of Vaal Dam water will continue in future years as the new power stations in the Eastern Transvaal are brought into operation and in particular during 1971 when the 200 MW dry cooling tower set is commissioned at Grootvlei power station.

POLLUTION

Anti-pollution measures are continuing and all boilers commissioned during the year were equipped

with electrostatic precipitators to decrease dust emission. Monitoring of pollution around power stations was commenced in collaboration with the Council for Scientific and Industrial Research. It consisted of an exhaustive survey of dust and sulphur dioxide concentration around Komati power station, together with measurements of climatic conditions during the same period. Developments in air pollution measurement and control in Europe and the United States are being closely followed and an Escom representative was sent to the Second International Clean Air Conference in the United States.

Considerable work has been done on methods of avoiding water pollution. This has led to a thermal power station water circuit being developed which virtually eliminates water effluents from certain power stations and has also given a saving of 25 per cent in water consumption at these power stations.

WATER USED IN ESCOM POWER STATIONS (Megalitre)

Source	Potable Water		Crude River Water		Water from other Sources including Boreholes, Dams and Sewage		Sea Water Circulated (Estimated)	
	1969	1970	1969	1970	1969	1970	1969	1970
Cape Western								
Cape Town Municipality	363	289						
Worcester Municipality	1 405	1 158						
Sea Water (estimated)							336 411	330 619
	1 768	1 447					336 411	330 619
Border								
East London Municipality	114	105					95 013	110 900
Sea Water (estimated)								
	114	105					95 013	110 900
Natal								
Durban Municipality	3 851	3 862						
Sea Water (estimated)							245 266	254 110
Tugela			1 991	2 460				
Ngagane			8 433	9 560				
	3 851	3 862	10 424	12 020			245 266	254 110
Rand & O.F.S. and Eastern Transvaal								
Vaal River	927	877	56 144	52 121				
Olifants River	50		2 841	9				
Bronkhorstspuit			6 787	7 005				
Komati			20 794	21 030				
Usutu Complex			20 780	22 262				
Other	50	59			5	5		
Arnot			423	1 587				
Hendrina			386	3 919				
	1 027	936	108 155	107 933	5	5		
Total—All Undertakings	6 760	6 350	118 579	119 953	5	5	676 690	695 629

COAL SUPPLIES

Escom's plans for the establishment of a national power grid, by which the large pithead power stations are connected to non-pithead power stations can now be seen to bear fruit in the form of a reduction of 5 per cent in the cost per metric ton of coal used during 1970. As a result of this policy, expenditure on coal at R48 807 000 was lower by R2 555 000 than it would have been had the average 1969 prices and consumption ratios applied. This saving arose from the decrease in expenditure on coal at all non-pithead power stations, except West Bank, and an increase to 82 per cent, from 77 per cent in 1969, in the proportion of coal burnt at pithead power stations.

The estimated saving of R2 555 000 in overall coal costs including railage, which makes no allowance for inflation, has been achieved as follows:—

	Estimated saving in coal costs	Reasons
Cape Western	R1 571 000	Imported power replacing railed coal.
Natal	601 000	Full use of Ingagane Power Station and imported power.
Rand and O.F.S. and Eastern Transvaal	383 000	Increased loads and rationalisation of supplies.
Total	<u>R2 555 000</u>	

In addition to the direct financial benefit on coal costs, transmission of electricity over the national grid has given some advantage to the Railways in that rolling stock and traction power have become available for other uses.

It should also be noted that the plant load factors at the large pithead power stations in the Transvaal are increasing, but in spite of this there have been wide fluctuations of the load at individual power stations and thus in their coal requirements. A close liaison with the contracted collieries continues to

play an important part in ensuring that coal is always available, and has been responsible in the past year for the result that the price of coal to Escom was not only contained but, in fact, reduced.

The most noteworthy operating features of the collieries supplying pithead power stations were the delivery of over 4.0 million metric ton of coal by Usutu to Camden power station, the rapid build-up in 6 months from 194 000 metric ton to 296 000 metric ton per month in the coal supplied by Springfield colliery, reductions in colliery operating costs and the coal supply to Hendrina coming entirely from opencast instead of underground working. There have, unfortunately, been plant difficulties at Hendrina power station, but the opencast operation has proved to be most flexible not only in meeting fluctuating demands but also in containing costs through being able to do stripping, or coaling, as required. This is in contrast to underground mining where work must stop if the demand for coal drops. Hendrina power station commissioning was also unique in that the early requirements were met by coal imported from Blinkpan, the colliery supplying Komati power station, thus allowing a later start-up of Optimum colliery with a considerable saving in capital costs.

With the increase in the number of power stations operating in the Transvaal a policy of transferring coal from one power station to another offers new opportunities to keep collieries producing at their most economical levels. Reductions in colliery operating costs arose from various measures. At Blinkpan for example, costs were reduced by 8 cents per metric ton despite reduced output. This was achieved by the rationalisation of the underground workings to operate on No. 2 seam only and by the use of a ground stockpile to meet peak coal demands and mining fluctuations. Whilst detailed costs of this exercise are not yet available there is no doubt that the security of a large stockpile has enabled the colliery to reduce the number of production sections to a minimum, and has thereby reduced costs. At Clydesdale collieries a reduction in Escom's peak coal demands has made it possible for the colliery to cut down on standby sections and thus reduce expenditure.

DEVELOPMENT OF ESCOM'S POWER STATIONS

Kriel Power Station

Work has started on Escom's latest power station situated half-way between Ogies and Bethal in the Eastern Transvaal. This station will have an ultimate capacity of 3 000 MW made up of six reheat units of 500 MW each, operating under steam conditions of 160 bar and 510 degrees celsius with reheat to 510 degrees celsius. The water supplies for this station are to be provided by the Department of Water Affairs. Initially water will be drawn from the Jericho-Westoe system in the Usutu River complex. Additional water will be required from the Morgenstond dam, to be built on the Ngwempisi river, when the third set is commissioned. The total water requirements of the completed station will be 145 megalitre per day.

Grootvlei Power Station

Grootvlei power station, situated in the Southern Transvaal between Balfour and Villiers has been designed for six non-reheat units each with a capacity of 200 MW and operating under steam conditions of 103 bar and 538 degrees celsius. The first two sets were commissioned during 1969 while the third was brought into service in 1970.

The fourth set was commissioned in March, 1971. This unit is Escom's first using a dry-cooling tower and is at present believed to be the largest dry-cooling installation in the Western world.

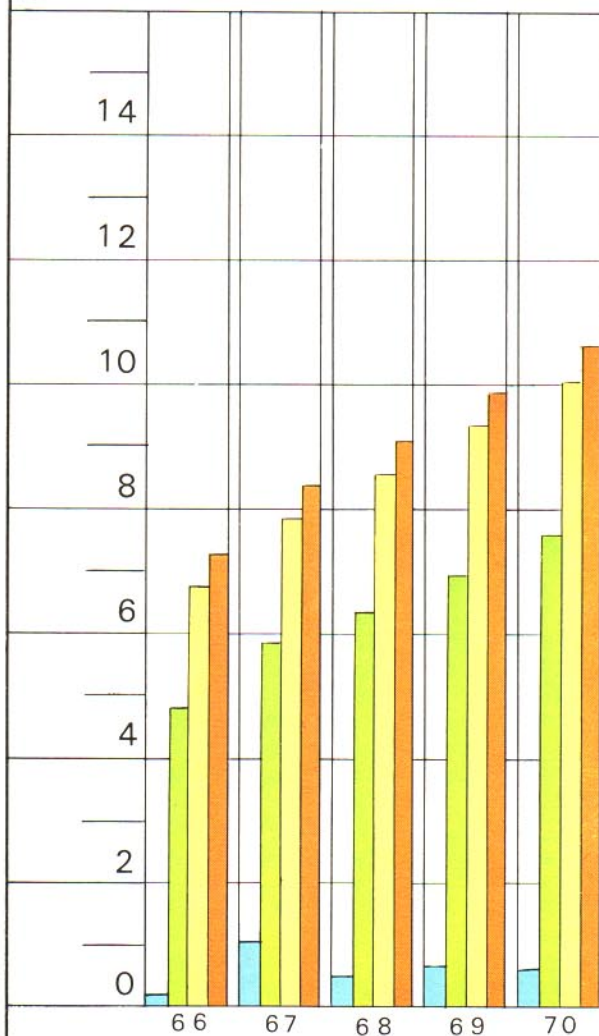
Hendrina Power Station

This power station which is being constructed near

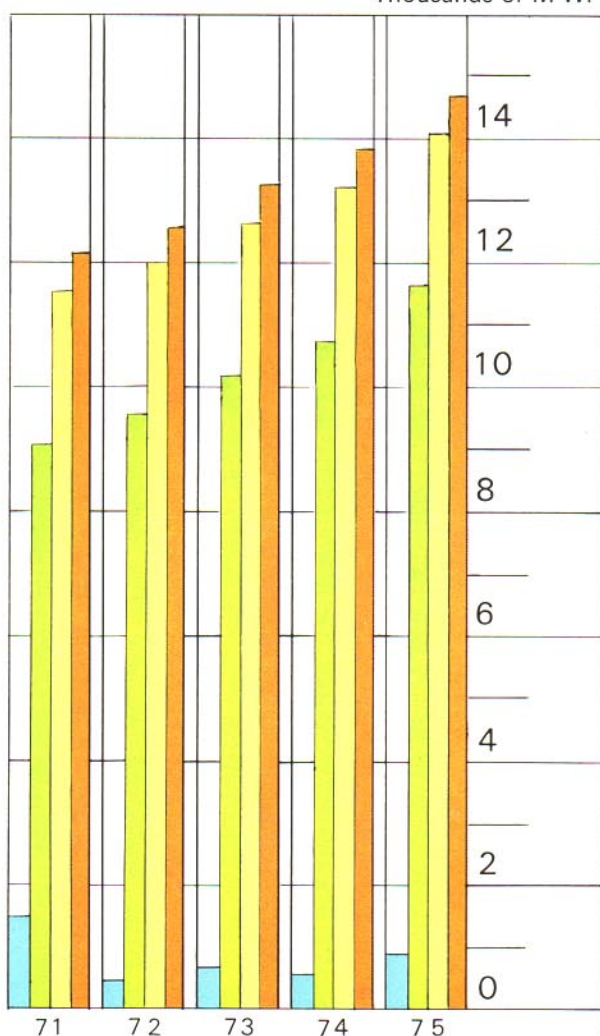
Capacity of the Republic's Power Stations



Expansion over the last five years
Thousands of M W.

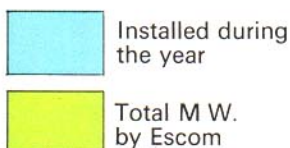


Planned expansion over the next five years
Thousands of M W.

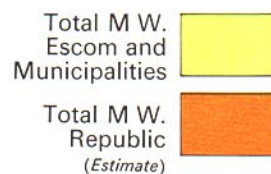


6 6	0,181	4,806	6,730	7,230
6 7	1,039	5,845	7,820	8,330
6 8	0,500	6,345	8,510	9,040
6 9	0,640	6,985	9,310	9,850
7 0	0,598	7,583	10,050	10,610

7 1	1,460	9,043	11,540	12,110
7 2	0,465	9,508	12,000	12,590
7 3	0,664	10,172	12,660	13,260
7 4	0,550	10,722	13,210	13,830
7 5	0,898	11,620	14,070	14,700



Forecast to 1975 is
on best information
available.



Hendrina in the Eastern Transvaal has been designed for ten 200 MW non-reheat units operating under steam conditions of 103 bar and 538 degrees celsius.

The first two sets were commissioned during the year under review while a further two are planned for 1971. Thereafter one set is planned to be commissioned each year.

Arnot Power Station

Arnot power station is being built about 19 km south-west of the Wonderfontein railway station and 24 km north-east of Hendrina power station. This power station has been designed for six reheat units, each with a capacity of 350 MW and operating under steam conditions of 159 bar and 510 degrees celsius, and reheat to 510 degrees celsius.

The first set is ready for commissioning and should be in commercial operation by June, 1971. The second

set is about 85 per cent complete and is planned for commissioning in September, 1971. One set should be placed into service thereafter at yearly intervals.

Hydro Electric Power Stations

Considerable progress has been made at the Hendrik Verwoerd hydro-electric power station being constructed at the Hendrik Verwoerd dam on the Orange River. The first two 80 MW turbines are scheduled to be commissioned in the second half of 1971.

Design work has started on the Vanderkloof hydro-electric power station at the P. K. le Roux dam, where it is proposed to install two 110 MW turbines.

Witbank Power Station

This power station, which was first commissioned in 1926, was finally closed down early in 1970.

DISTRIBUTION OF ELECTRICITY

Development of Escom's High Voltage Transmission System

The development of the national high voltage transmission system has now reached the point where power generated in the Eastern Transvaal is being delivered to Muldersvlei in the Western Cape. The power input to the Western Cape from the north increased considerably during the latter half of the year when the section of 400 kV line between Beaufort West and Muldersvlei was commissioned. Escom's construction programme provides for the duplication of the 400 kV line (from the Transvaal to the Cape) by the end of 1972. A branch from this 400 kV line is to be built from Hydra distribution station near De Aar to a distribution station named Poseidon to be built near Cookhouse. From here one 220 kV line will supply Port Elizabeth while a further 220 kV line will supply the Border Undertaking. These two supplies are planned to be ready by 1973.

The most important development of the high voltage transmission system in the Rand and Orange Free State Undertaking centred around the Apollo distribution station near Pretoria. The 275 kV section of this distribution station was energised on the 18th November, 1970 by means of a 275 kV transmission line from Esselen distribution station, north of Johannesburg. Complete commissioning of Apollo distribution station has been held up by delays in line work caused by shortages in steel and cement: in particular the first line from the Hendrina power station to Apollo will not be complete until mid 1971.

In order to receive power from the Cabora Bassa project two \pm 533 kV single pole direct current lines are to be built from Apollo to Pafuri on the border between the Republic and Mocambique. These lines are planned for completion during the second half of 1974 in order that the necessary testing may be carried out before they are required for service in 1975.

The extension of the 275 kV Apollo-Esselen system to Jupiter distribution station, east of Johannesburg, will provide the supply to Johannesburg City Council at their John Ware substation (west of central Johan-

nesburg) by early 1972 and at their Prospect substation (in south eastern Johannesburg) early in 1974. In addition, a supply will be made available from Jupiter distribution station to Germiston and Alberton late in 1971. Two transmission lines are also being built from Apollo to supply Pretoria West during 1971 and Pretoria East by 1977. Future planning also provides for a supply from Apollo to Johannesburg at Craighall by 1978.

A 275 kV transmission line is being constructed from the Bernina distribution station on the West Rand to Trident distribution station in order to reinforce supplies to the platinum mines in the Rustenburg area. Completion should be by mid 1971.

An additional 275 kV transmission line is planned from Arnot power station to Marathon and Acornhoek in the Eastern Transvaal as well as a line from Marathon to provide a supply to Mocambique at a point on the border near Komatipoort.

Extension of the 400 kV system from the Camden power station to Natal is urgently needed to supplement the capacity of generating plant in Natal, particularly when the aluminium smelter at Richards Bay comes into operation. Work on the Chivelston 400/275 kV substation near Ingagane is well advanced but completion of the 400 kV line from the Camden power station to Chivelston was delayed by shortages of material and is not expected before the second half of 1971.

Arrangements are also being made to supply power for industrial development in the Newcastle and Ladysmith areas. The town of Newcastle and the third Iscor Plant will be supplied from the 400 kV system.

On the Natal system development is centering around the Mersey distribution station near Pietermaritzburg. This development includes provision for the requirements of the aluminium smelter at Richards Bay. The first 275 kV transmission line from Mersey to the Impala substation near the site of the smelter is planned for April, 1971 with the second following

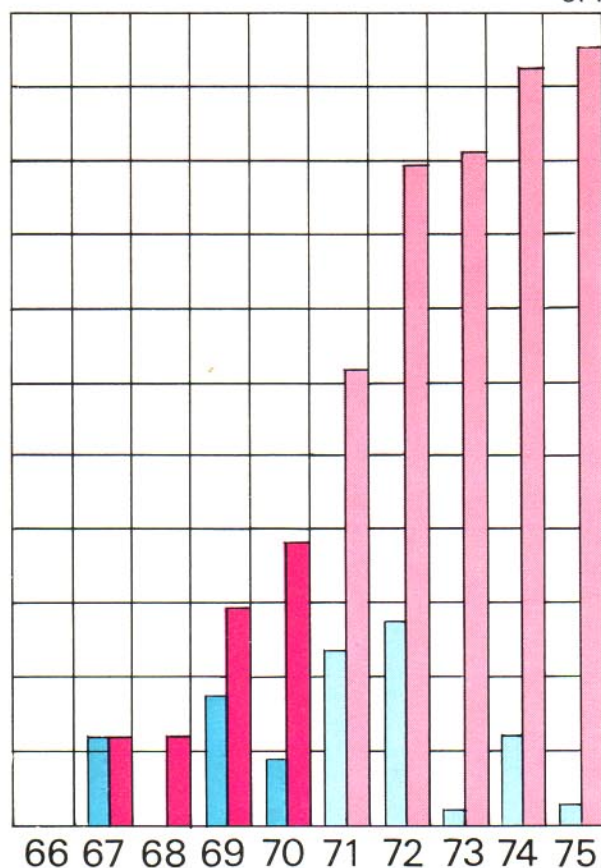
Expansion of Escom's Transmission System



400 kV Lines

Hundreds
of kilometres

275 kV Lines



Kilometres installed
during year



Planned annual installation



Total kilometres in service



Planned total in service



400 kV Lines	
Installed during year	Total
596,6	596,6
	596,6
879,9	1 476,5
439,3	1 915,8
1 174,0	3 089,8
1 377,6	4 467,4
97,0	4 564,4
561,6	5 126,0
138,4	5 264,4

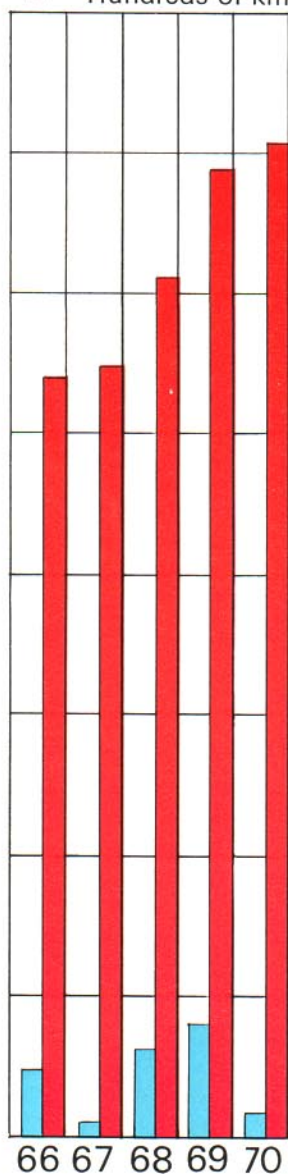
275 kV Lines	
Installed during year	Total
66	13 3,0
67	0,3
68	21 8,3
69	139,4
70	46,8
71	648,1
72	281,3
73	112,0
74	217,8
75	25,8

Expansion of Escom's Distribution System



Lines and
cables 132 kV

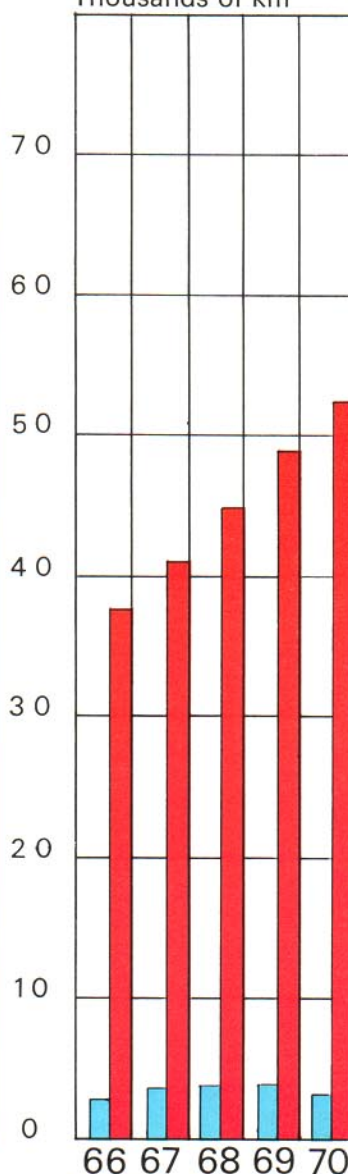
Hundreds of km



Kilometres installed
during year

Lines and cables
88 kV and lower

Thousands of km



Total kilometres in service

Lines and cables 132 kV	
Installed during year	Total
4 66,1	5 387,4
98,4	5 485,8
5 94,5	6 080,3
8 17,7	6 898,0
1 64,9	7 062,9

Year	Lines and cables 88 kV and lower	
	Installed during year	Total
6 6	2 704,2	37 592,4
6 7	3 665,5	41 257,9
6 8	3 670,2	44 928,1
6 9	3 993,5	48 921,6
7 0	3 396,5	52 318,1

six months later. It was originally intended to have both lines completed in April but due to shortages of material this will not be possible.

In the Eastern Transvaal an important distribution station named Vulcan is being built near Witbank. Vulcan will be supplied from the 400 kV lines between Hendrina power station and the Apollo distribution station and is to be a supply point to Highveld Steel

and Vanadium Corporation, Ferrometals and other industrial consumers in the Witbank area. The planned completion date is July, 1972 and in order to provide for the growing demand of Rand Carbide and Ferrometals temporary arrangements are being made to supply these consumers from the Highveld Steel and Vanadium Corporation substation pending completion of Vulcan.

During 1970 the Commission incurred capital expenditure of R163,9 million of which R98,2 million was in respect of power stations under construction R23 million in respect of 400 kV transmission lines and R43,2 million for extensions to transmission and distribution systems. Assets taken out of service, which included Witbank Power Station, amounted to R5,9 million.

A total net asset value of R108,7 million was placed into commission during the year thereby increasing assets in commission from R1 056,6 million to R1 165,3 million. Expenditure incurred for the expansion of future output is reflected in completed works not yet in commission and works still under construction which increased from R215,1 million to R264,5 million, an addition of R49,4 million. Stores, including coal stocks and movable plant, showed a rise from R48 million to R54 million.

Despite the heavy capital expenditure incurred during the year and the tight conditions on long term capital markets throughout the world, the 1970 Balance Sheet reveals that Escom's finances continue to be on a sound basis. The different types of assets were adequately covered by a balanced range of financing facilities. Although liability backed assets in commission increased by R77 million from R918 million to R995 million in 1970, they are more than adequately covered on a cost basis by long term loans. The increase of R49 million in works not yet earning revenue has been covered by a step-up in short term borrowings of R60 million from R81 million to R141 million. These borrowings include suppliers' and import financing facilities, other short term advances and amounts due to bankers on current account.

Local Capital Market

Because of the strategic role played by electricity in the South African economy and the unstable nature of overseas capital markets susceptible as they are to a wide range of international influences, and because the maturity periods of South African long term loans are well suited to an electricity utility, Escom will continue to look to the local capital market for funds to finance its power stations and allied capital works.

Although Escom raised local loans amounting to R66 million, 1970 was an especially difficult year for Escom in this market. During the first half of the year Escom increased its long term yield rate first to 7,50 per cent and later to 8 per cent and 8,50 per cent when the rate on Government stock was raised to 7 per cent and 7,75 per cent respectively. Escom's loans in the second half of the year were floated on a yield basis of 8,75 per cent.

Foreign Capital Markets

After the complete cessation of foreign borrowing on the German public bond market at the beginning of 1970, Escom was in April the first foreign borrower permitted to float a DM issue. With a coupon of $8\frac{1}{2}$ per cent and an issue price of $96\frac{1}{4}$ per cent Escom was able to raise DM 100 million. The measure of improvement in the DM market since that date is

reflected in the terms of the further Escom DM 100 million bond issue placed at the beginning of March, 1971 with a coupon of 8 per cent and an issue price of 100 per cent.

Escom raised a European Unit of Account loan of UA 12 million with a coupon of $9\frac{1}{4}$ per cent and an issue price of 100 per cent in June, 1970 and hopes to raise a further loan of this nature during 1971.

Escom had no difficulty in raising short term funds abroad in 1970, but Escom's need basically is for long term finance.

Self-financing

It is apposite to draw attention to the fact that Parliament has been requested to consider an amendment to the Electricity Act to enable Escom to generate capital for new projects by a charge against revenue. This subject was given special attention by the Commission of Enquiry into Fiscal and Monetary Policy in South Africa ("Franzsen Commission"), and the following extracts dealing with this matter are taken from the Third Report of the Franzsen Commission:

190. The Commission has found that the capital expenditure of the various government bodies are financed most often by means of borrowed funds. The result is that interest payments impose a large burden on the revenue resources of these bodies. As far as the South African Railways and Harbours were concerned, interest as a percentage of current revenue amounted to about 14 per cent in the 1968/69 financial year, and the corresponding percentage for Escom was almost 30 per cent in the 1969 calendar year. What is more important is that the interest burden as a percentage of total revenue tends to increase. This state of affairs would become progressively worse if new expansions and the replacement of existing capacity has to be financed from loans entered into at relatively high interest rates.

191. The result of more self-financing in the public sector will be that the consumer of the public goods and services in question will be held responsible for a larger contribution to the financing of essential capital expenditure. The claims on the capital market made by the public sector will thus be reduced. In this connection it might also be noted that the International Bank for Reconstruction and Development, which has, amongst other things, granted loans to Escom, has recommended, by way of guidance, that in developed countries, public utility corporations should be responsible for financing between 40 and 50 per cent of their total capital expenditure from internal funds. In developing countries this ratio should amount to about 30 or 40 per cent.

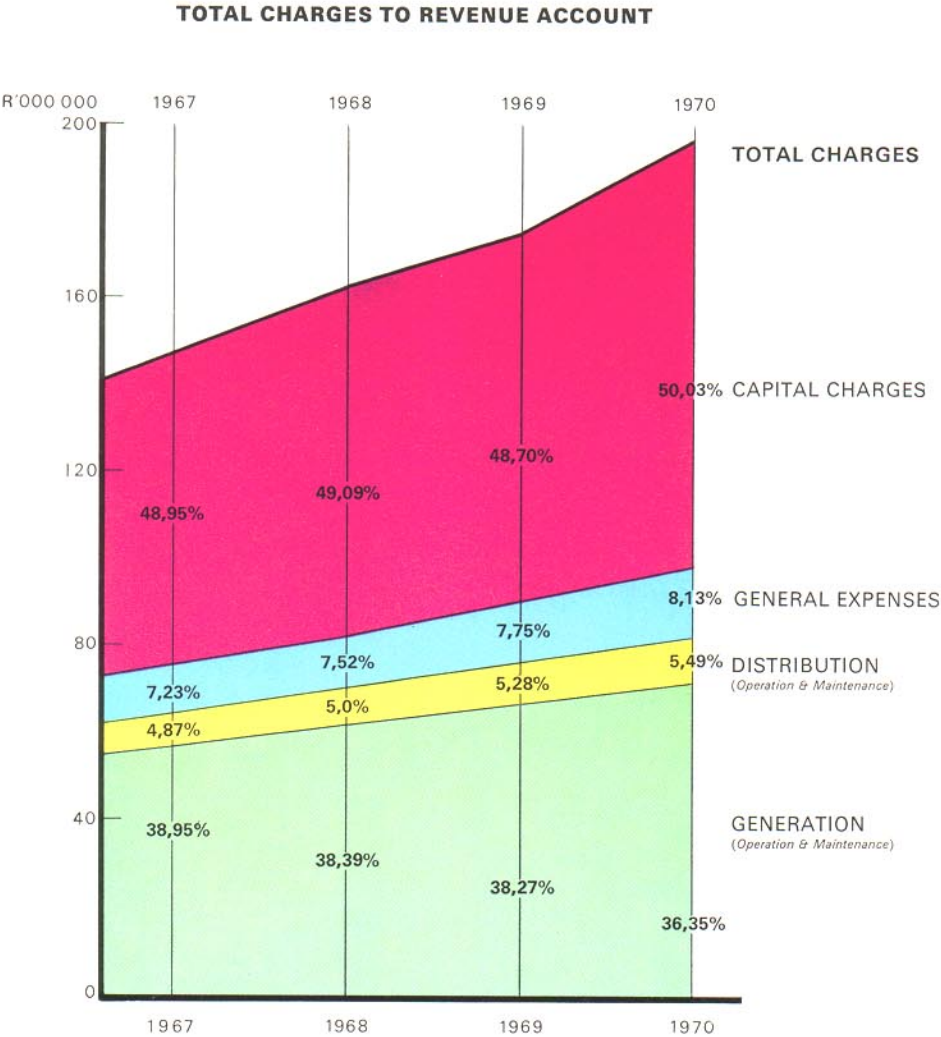
192. The Bank therefore relates the self-financing of public utility enterprises to the

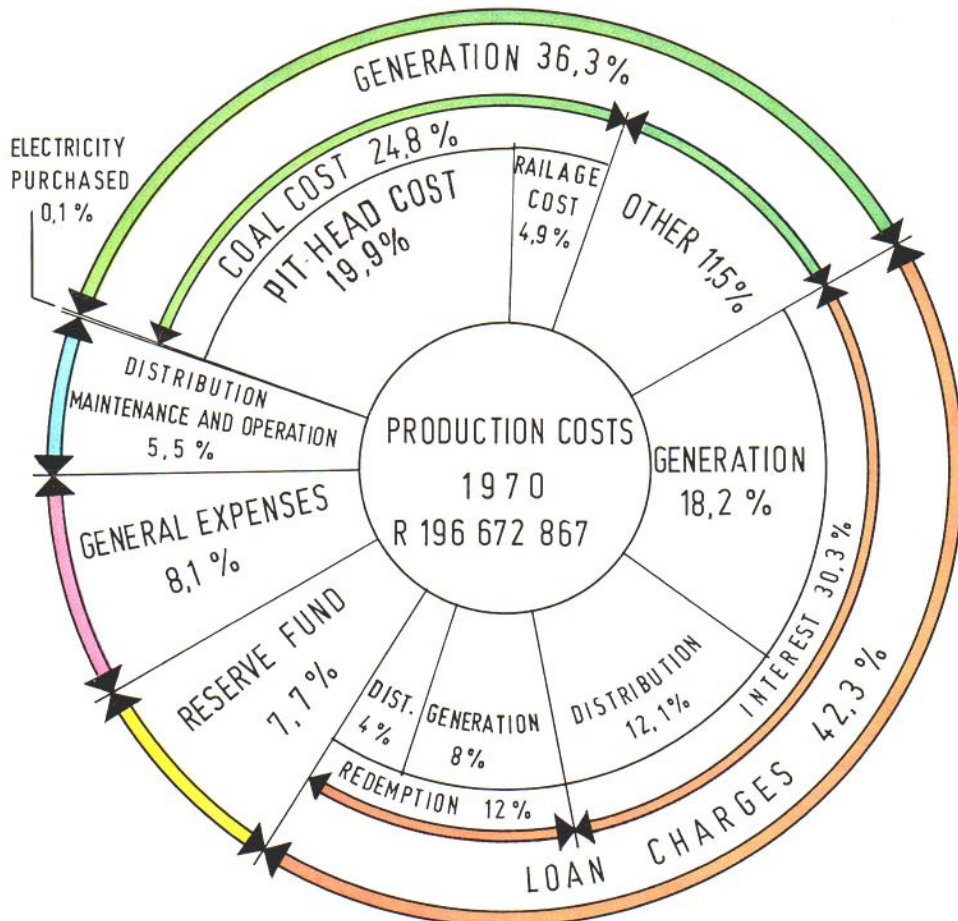
degree of development in the economy in question. As far as Escom is concerned, so great is the expansion of the demand for electric power that to keep up with it, the Supply Commission's generating capacity will have to increase at an expected rate of 8 to 9 per cent annum until 1982. This means that it will have to double its fixed assets every eight years. Escom's fixed assets amounted to R1 272 million at the end of 1969; in other words, over the next eight years some R1 300 million will be required for expansion.

Revenue Account

Escom operates on a basis of no profit and no loss and it is of interest to note the variation of the different items making up total cost of electricity as delivered to the consumer.

It will be noted from the accompanying graph that while the three cost items: distribution, general expenses and capital charges all show an increasing ratio to total cost, operating costs related to the actual generation of electricity are declining as a portion of the whole.





RESERVE FUND

GENERATION 5,1 %
DISTRIBUTION 2,6 %

GENERAL EXPENSES

GENERAL EXPENSES 3,5 %
LOCAL ADMINISTRATION 2,4 %
HEAD OFFICE ENGINEERING 0,8 %
HEAD OFFICE ADMINISTRATION 1,1 %
RESEARCH EXPENSES 0,3 %

STAFF AND GENERAL

Personnel

The staff employed by the Commission at the 31st December, 1970, numbered 22 700 employees. The increase in this number over the corresponding total on the 31st December, 1969, is shown in the table below.

	1969	1970	Increase
Whites	7 684	8 014	330
Coloured and Bantu . . .	13 960	14 686	726
	<u>21 644</u>	<u>22 700</u>	<u>1 056</u>

The Commission wishes to record its appreciation of the loyalty and conscientious service of its employees.

Home Ownership Scheme

The balance at 31st December, 1970, 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 R7 292 000.

Municipal Electricity Supply Schemes

Reports submitted during the year by Escom to

the Administrators of the various Provinces on the proposals of local authorities to establish or enlarge existing Undertakings were as follows:—

Province	New Schemes	Extensions
Transvaal	—	—
Orange Free State	Koffiefontein Viljoenskroon	Bothaville Deneysville Heilbron Reddersburg Vrede
Cape	Marydale Port Nolloth Rosendal	Barkly East Calvinia Hanover Heidelberg (Cape) Keimoes Mount Frere Philipstown Riversdale Umtata
Natal	—	—

Up to the 31st December, 1970, a total of 1 976 reports on municipal supply schemes had been submitted by Escom. Of these, 310 were in respect of new schemes, 1 038 were in respect of extension schemes and 628 were reports on tenders.

STATISTICAL SUMMARY

Revenue, costs, output and sales, and other figures relating to the operation of the Commission's Undertakings during the years 1966 to 1970 are as follows:—

	1966		1967	1968	1969	1970	Increase 1970 over 1969
TOTAL REVENUE	129 517 000	146 783 000		161 475 000	176 106 000	194 282 000	10.3 %
TOTAL COSTS	130 500 000	146 928 000		161 993 000	175 374 000	196 673 000	12.1 %
Difference between Revenue and Costs	—983 000	145 000		—518 000	732 000	—2 391 000	—3 123 000
Sales of Electricity	129 009 000	146 135 000		160 757 000	175 338 000	193 475 000	10.3 %
Net Costs (less Sundry Revenue)	129 992 000	146 280 000		161 275 000	174 606 000	195 866 000	12.2 %
Average Price per Unit Sold	0.4254c	0.5467c		0.5550c	0.5565c	0.5545c	—0.359 %
Average Cost per Unit Sold	0.5315c	0.5512c		0.5608c	0.5566c	0.5637c	1.276 %
Average Net Cost per Unit Sold	0.5294c	0.5488c		0.5583c	0.5542c	0.5614c	1.299 %
Cost of Coal Consumed (including railage)	37 901 000	42 053 000		44 604 000	47 453 000	48 807 000	2.9 %
Railage on Coal Consumed	9 524 000	10 462 000		10 571 000	10 647 000	9 577 000	—10.050 %
Coal Consumed (Metric tons)	16 982 579	18 307 721		19 133 931	19 982 911	21 630 578	8.245 %
Units Generated	27 395 479 555	30 421 691 463		33 061 253 244	35 966 956 724	39 796 184 973	10.647 %
Units Sent Out	25 528 081 820	28 370 890 385		30 843 479 863	33 598 182 607	37 320 784 837	11.080 %
Units Purchased	629 876 210	69 604 511		7 911 573	7 969 311	7 260 727	—8.891 %
Units Sold	24 554 347 088	26 657 111 958		28 885 008 545	31 505 591 370	34 890 575 085	10.744 %

AUDITORS' REPORT AND ACCOUNTS

STATISTICAL AND OTHER STATEMENTS
NATIONAL STATISTICS

THE REPORT OF THE AUDITORS

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

Johannesburg,
30th April, 1971

Gentlemen,

We have completed the audit of the books and accounts of the Commission for the year ended 31st December, 1970.

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.

The State President has, in terms of Section 10 (2) of the Act, directed that the provisions relating to the establishment of the Redemption Fund should not apply to each of the loans listed under the heading "Foreign Bond Issues" and "Direct Placements" on Schedule No. 3.

The Redemption Fund provisions have not been applied to short term loans included under the heading "Other Borrowings", as these loans were raised under the provisions of paragraph 1 (3) of the Schedule to the Electricity Act, which relates to borrowings in anticipation of the raising of loans.

The Commission has fixed redemption periods of 30 years from the date of issue of the relevant loans in respect of the portions of loans used to finance the erection of certain high-voltage transmission lines; in respect of the remainder of the loans, the redemption periods fixed do not exceed 25 years from the dates of issue of the respective loans.

In the records of the Commission, the Fund is divided into sections corresponding to its Undertakings but investments are held in a common pool. The Commission has invested the moneys accruing to the Fund in the investments prescribed in the Schedule to the Act. In valuing the Fund at 31st December, 1970, we have taken into account the market value of the investments at that date. The value of the Fund at 31st December, 1970, was in excess of the sum required, in terms of the Schedule to the Act, for the redemption of the respective loans.

Foreign Loans

The loan periods of the Foreign Bond Issues are either 10 years or 15 years. Provision is being made for repayment by setting aside amounts over periods of 15 years except in the cases of Loans Nos. 562 and 574 where the period is 19 years. The differences, if any, between the amounts set aside and instalments payable are being met from temporary borrowings.

Loans Nos. 548 and 559 listed under "Direct Placements" are repayable by half-yearly instalments over periods of eight and a half years from 1st December, 1963, and nine years from 1st June, 1968, respectively, 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.

Verification of Landed Properties, Rights and Investments

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

Head Office Administration, Engineering and General Expenses

The net expenditure under this heading, after crediting fees for reporting on power schemes of local authorities and amounts chargeable to Revenue Accounts under other headings, has been allocated to:—

- (a) Capital and Reserve Fund Expenditure;
- (b) Revenue Accounts of Undertakings.

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 1969 and 1970:—

		<i>Surplus + Deficit -</i>			<i>Accumulated Surplus + Deficit -</i>		<i>Amounts set aside to Reserve Fund</i>	
		1969	1970		at 31/12/1970	1969	1970	
Cape Western	+	102 000	+	156 000	-	412 000	964 000	1 008 000
Cape Northern	-	108 000	-	243 000	+	661 000	400 000	400 000
Cape Eastern	-	24 000	-	41 000	-	97 000	4 000	4 000
Border	-	11 000	-	240 000	-	344 000	190 000	190 000
Orange River	-	52 000	-	117 000	-	171 000	4 000	20 000
Natal	-	231 000	+	764 000	+	1 764 000	2 200 000	2 200 000
Eastern Transvaal	+	1 027 000	+	301 000	+	3 640 000	2 064 000	2 213 000
Rand and O.F.S.	+	29 000	-	2 971 000	-	4 081 000	7 779 000	9 167 000
	+	<u>R732 000</u>	-	<u>R2 391 000</u>	+	<u>R960 000</u>	<u>R13 605 000</u>	<u>R15 202 000</u>

Operations during the year resulted in surpluses at Cape Western, Natal and Eastern Transvaal Undertakings and deficits at the other Undertakings.

We have been advised by officials of the Commission of their proposals for dealing with the accumulated surpluses and deficits stated above and have no comments to offer on the proposals.

General

As a result of our audit of the books and accounts of the Commission for the year 1970, and, subject to the foregoing remarks, in terms of Section 18 (8) of the Electricity Act, 1958, we report 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, in terms of the Act, has been made for the redemption and repayment of moneys borrowed by or advanced to the Commission.
- (d) As formerly, the Land and Rights, Buildings and Civil Works, and Machinery and Plant are set out in the Balance Sheet on a cost basis.
- (e) Sums fixed by the Commission have been set aside to the Reserve Fund under Section 13 as prescribed.
- (f) All our requirements as Auditors have been complied with and carried out.

Yours faithfully,

Halsey, Button & Perry
Alex. Aiken & Carter

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

Electricity Supply Commission

Established under the Electricity Act, 1922

BALANCE SHEET AT 31st DECEMBER, 1970

[illegible]

The Notes to the Balance Sheet appear on page 32.

		1969
Capital Expenditure at Cost	R1 429 862 000	R1 271 785 000
(Schedule No. 1)		
Land and Rights	R13 423 000	12 200 000
Buildings and Civil Works	247 782 000	207 000 000
Machinery and Plant	904 155 000	837 456 000
Total in Commission	1 165 360 000	1 056 656 000
Completed Works—proportion not in Commission	15 500 000	17 847 000
Works under Construction	249 002 000	197 282 000
Stores and Movable Plant	53 987 000	48 011 000
Stores and Materials at cost	46 584 000	41 475 000
Movable plant and equipment at cost less depreciation	7 403 000	6 536 000
Investments of Redemption Fund	214 805 000	217 833 000
(Schedule No. 2)		
Nominal Value Market Value		
1970 R232 474 000 R184 932 000		
1969 R236 174 000 R210 882 000		
Investments of Reserve Fund	122 793 000	104 301 000
(Schedule No. 4)		
Nominal Value Market Value		
1970 R130 175 000 R105 935 000		
1969 R111 991 000 R101 340 000		
Sundry Investments	9 170 000	7 956 000
Electricity Supply Commission Foreign Loan Bonds including Interest accrued	1 877 000	1 643 000
Nominal Value Market Value		
1970 R1 960 000 R1 956 000		
1969 R1 653 000 R1 606 000		
Entire Share Capital of the Rand Mines Power Supply Company Limited	1 000	1 000
Housing Loans to Employees secured by First Mortgage	7 292 000	6 312 000
Debtors and Payments in Advance	24 669 000	19 543 000
Debtors	19 918 000	15 979 000
Payments in Advance	4 751 000	3 564 000
	<u>R1 855 286 000</u>	<u>R1 669 429 000</u>

NOTES TO THE BALANCE SHEET

NOTE 1

- (a) Future expenditure, including commitments, of approximately R608 000 000 on Capital Account and R5 000 000 chargeable against the Reserve Fund, has been approved by the Commission.
- (b) The Commission is committed to:—
 - (1) The payment of approximately R606 000 in respect of loans granted under the Commission's Home Ownership Scheme and not yet paid, and,
 - (2) The purchase from certain Stockholders of Electricity Supply Commission 6½ per cent. Local Registered Stock 1991 at R97 per cent, as follows:—
 - (i) R4 500 000 not later than September, 1976.
 - (ii) R2 000 000 in five annual instalments of R400 000 at the option of the Stockholder.

NOTE 2

The instalments which fall due in respect of the repayment of overseas loans raised in European Units of Account are payable in the currency of the bondholders' choice.

An additional amount of R926 000 would accrue to the bondholders should the repayment of the outstanding balances on these loans be made in the currency most favourable to the bondholders at 31st December, 1970.

NOTE 3

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.

Electricity Supply Commission

SCHEDULE No. 1

Capital Expenditure at 31st December, 1970

R '000

	Total	Cape			Orange River	Natal	Eastern Transvaal	Rand and O.F.S.		Head Office
		Western	Northern	Eastern				Genera- tion	Distribution	
Totals at 31st December, 1969										
Spent during 1970	R1 271 785 163 945	122 022 9 091	21 513 2 361	1 193 —46	15 622 10 545	173 297 14 899	146 099 8 735	525 355 92 285	237 005 25 037	8 524 278
<i>Less Assets withdrawn</i>	1 435 730 5 868	131 113 119	23 874 1	1 147 —	26 167 —	188 196 205	154 834 4 983	617 640 293	262 042 267	8 802 —
Totals at 31st December, 1970	R1 429 862	130 994	23 873	1 147	26 167	187 991	149 851	617 347	261 775	8 802

Consisting of:—

Land and Rights	13 423	1 509	397	11	172	228	1 641	1 327	5 194	1 223
Buildings and Civil Work	247 782	17 452	1 008	51	2 853	982	30 947	135 326	18 699	4 837
Machinery and Plant	904 155	101 442	20 954	1 083	18 439	4 293	108 107	315 900	200 578	—
In Commission	1 165 360	120 403	22 359	1 145	21 464	5 503	140 695	452 553	224 471	6 060
Completed Works not in Com- mission	15 500	4 871	—	—	—	8 635	—	—	1 994	—
Works under Construction ...	249 002	5 720	1 514	2	451	12 029	9 156	164 794	35 310	2 742

Electricity Supply Commission

SCHEDULE No. 2

Schedule of Investments of the Redemption Fund

at 31st December, 1970

Description	Loan No.	Nominal Value	Book Value
ESCOM LOCAL REGISTERED STOCKS			
3 per cent 1967/73 13		R127 000	R119 000
3½ per cent 1968/73 15		1 636 000	1 522 000
3½ per cent 1969/74 16		49 000	44 000
3¾ per cent 1969/74 17		26 000	23 000
5 per cent 1971/74 31		161 000	152 000
5 per cent 1971/75 32		172 000	151 000
4⅝ per cent 1975/80 33		9 251 000	7 941 000
4⅞ per cent 1975/80 34		8 078 000	7 050 000
5½ per cent 1976/81 35		4 167 000	3 667 000
5½ per cent 1977/82 36		1 028 000	896 000
5½ per cent 1976/82 37		4 117 000	3 580 000
5½ per cent 1977/83 38		9 959 000	8 597 000
5⅝ per cent 1978/83 39		3 972 000	3 492 000
5⅝ per cent 1979/84 40		5 128 000	4 597 000
5⅞ per cent 1979/84 42		7 068 000	6 173 000
5⅞ per cent 1979/85 43		5 971 000	5 180 000
5⅞ per cent 1980/85 44		7 251 000	6 258 000
5½ per cent 1980/86 45		4 953 000	4 314 000
5⅞ per cent 1981/86 46		7 442 000	6 722 000
6¼ per cent 1981/86 47		6 192 000	5 821 000
6⅞ per cent 1982/87 49		6 340 000	5 858 000
5½ per cent 1982/87 50		6 539 000	5 466 000
5 per cent 1983/88 51		10 391 000	8 359 000
5 per cent 1980/83 52		6 373 000	5 427 000
5 per cent 1982/84 53		3 517 000	2 946 000
5½ per cent 1982/84 54		3 267 000	2 878 000
5⅞ per cent 1983/85 55		10 218 000	9 405 000
6½ per cent 1983/85 56		6 817 000	6 567 000
6½ per cent 1989/91 58		9 281 000	8 789 000
6¾ per cent 1991 60		5 111 000	4 971 000
6⅞ per cent 1992 61		5 855 000	5 771 000
6 per cent 1971 63		3 500 000	3 500 000
6½ per cent 1992 64		3 147 000	2 971 000
6⅞ per cent 1992 65		3 889 000	3 761 000
6½ per cent 1993 70		2 874 000	2 637 000
6⅞ per cent 1993 71		5 530 000	5 330 000
6½ per cent 1993 75		1 038 000	964 000
6⅞ per cent 1993 76		15 000	13 000
Carried forward		R180 450 000	R161 912 000

Description	Loan No.	Nominal Value	Book Value
Brought forward		R180 450 000	R161 912 000
ESCOM LOCAL REGISTERED STOCK			
6½ per cent 1994 78		3 935 000	3 686 000
6⅞ per cent 1994 79		11 429 000	11 196 000
6 per cent 1974 80		10 154 000	9 741 000
6½ per cent 1994 81		4 098 000	3 750 000
6⅞ per cent 1994 82		9 373 000	8 975 000
8¾ per cent 1995 85		8 972 000	8 972 000
8½ per cent 1995 86		1 200 000	1 170 000
		229 611 000	209 402 000
REPUBLIC OF SOUTH AFRICA			
5¼ per cent 1979		300 000	284 000
6 per cent 1985		500 000	484 000
MUNICIPAL STOCK			
Bloemfontein			
5⅞ per cent 1975/80		80 000	69 000
Cape Town			
3 per cent 1976 167		200 000	161 000
5⅞ per cent 1980/85 203		300 000	253 000
Durban			
3¼ per cent 1962/72 47		231 000	219 000
3¼ per cent 1965/75 48		90 000	76 000
3¼ per cent 1966/76 49		100 000	82 000
3 per cent 1967/77 50		668 000	521 000
5⅞ per cent 1974/79 68		120 000	105 000
Germiston			
5⅞ per cent 1985 16		20 000	16 000
Johannesburg			
3 per cent 1967/77 21		60 000	47 000
5⅞ per cent 1974/79 36		194 000	171 000
		<u>R232 474 000</u>	<u>R211 890 000</u>
INTEREST ACCRUED			
			2 915 000
			<u>R214 805 000</u>
MARKET VALUE		<u>R184 932 000</u>	

Electricity Supply Commission

SCHEDULE No. 3

Loans at

31st December, 1970

Loan No.	Local Registered Stocks	Outstanding
13	R6 000 000 3 per cent 1967/73	R6 000 000
14	R6 000 000 3 per cent 1968/74	R6 000 000
15	R30 000 000 3½ per cent 1968/73	R30 000 000
16	R6 000 000 3½ per cent 1969/74	R6 000 000
17	R6 000 000 3½ per cent 1969/74	R6 000 000
31	R16 000 000 5 per cent 1971/74	R16 000 000
32	R20 000 000 5 per cent 1971/75	R20 000 000
33	R16 000 000 4½ per cent 1975/80	R16 000 000
34	R16 000 000 4½ per cent 1975/80	R16 000 000
35	R16 500 000 5½ per cent 1976/81	R16 500 000
36	R20 000 000 5½ per cent 1977/82	R20 000 000
37	R22 000 000 5½ per cent 1976/82	R22 000 000
38	R24 000 000 5½ per cent 1977/83	R24 000 000
39	R24 000 000 5½ per cent 1978/83	R24 000 000
40	R22 000 000 5½ per cent 1979/84	R22 000 000
42	R20 000 000 5½ per cent 1979/84	R20 000 000
43	R16 000 000 5½ per cent 1979/85	R16 000 000
44	R16 000 000 5½ per cent 1980/85	R16 000 000
45	R17 000 000 5½ per cent 1980/86	R17 000 000
46	R16 000 000 5½ per cent 1981/86	R16 000 000
47	R18 000 000 6½ per cent 1981/86	R18 000 000
49	R18 000 000 6½ per cent 1982/87	R18 000 000
50	R22 000 000 5½ per cent 1982/87	R22 000 000
51	R29 000 000 5 per cent 1983/88	R29 000 000
52	R40 000 000 5 per cent 1980/83	R40 000 000
53	R20 000 000 5 per cent 1982/84	R20 000 000
54	R20 000 000 5½ per cent 1982/84	R20 000 000
55	R32 000 000 5½ per cent 1983/85	R32 000 000
56	R38 000 000 6½ per cent 1983/85	R38 000 000
58	R30 000 000 6½ per cent 1989/91	R30 000 000
60	R35 000 000 6½ per cent 1991	R35 000 000
61	R35 000 000 6½ per cent 1992	R35 000 000
63	R5 000 000 6 per cent 1971	R5 000 000
64	R12 000 000 6½ per cent 1992	R12 000 000
65	R37 000 000 6½ per cent 1992	R37 000 000
70	R10 000 000 6½ per cent 1993	R10 000 000
71	R70 000 000 6½ per cent 1993	R70 000 000
75	R22 000 000 6½ per cent 1993	R22 000 000
76	R48 000 000 6½ per cent 1993	R48 000 000
78	R20 000 000 6½ per cent 1994	R20 000 000
79	R30 000 000 6½ per cent 1994	R30 000 000
80	R20 000 000 6 per cent 1974	R20 000 000
81	R10 000 000 6½ per cent 1994	R10 000 000
82	R25 000 000 6½ per cent 1994	R25 000 000
83	R18 000 000 7½ per cent 1995	R18 000 000
84	R3 000 000 7 per cent 1995	R3 000 000
85	R35 000 000 8½ per cent 1995	(a) R33 422 000
86	R10 000 000 8½ per cent 1995	(a) R7 264 000

Brought forward..... R1 043 186 000

(a) Payable in full not later than 25th February, 1971, in terms of the prospectus.

Loan No.	Brought forward.....	Outstanding
		R1 043 186 000
FOREIGN BOND ISSUES		
541	S.F. 50 000 000 (R8 274 721) 5 per cent 1965/74	R3 310 000
557	D.M. 50 000 000 (R8 921 403) 6½ per cent 1971/80	R8 921 000
562	U.S. \$15 000 000 (R10 775 862) 7 per cent 1968/77	R7 543 000
574	15 000 000 Units of account (R10 905 694) 7 per cent 1969/78	R9 451 000
577	D.M. 100 000 000 (R18 033 777) 6½ per cent 1974/83	R18 034 000
578	D.M. 100 000 000 (R19 582 885) 8½ per cent 1976/85	R19 583 000
580	12 000 000 Units of account (R8 626 750) 9½ per cent 1971/80	R8 627 000
DIRECT PLACEMENTS		
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT		
548	U.S. \$14 000 000 (R10 011 734) 5½ per cent 1963/71	R1 450 000
559	U.S. \$20 000 000 (R14 356 822) 6½ per cent 1968/76	R10 432 000

R1 130 537 000

Electricity Supply Commission

SCHEDULE No. 4

Investments of the Reserve Fund

at 31st December, 1970

Description	Loan No.	Nominal Value	Book Value
ESCOM LOCAL REGISTERED STOCKS			
3 per cent 1968/74 14.....		R13 000	R12 000
3½ per cent 1968/73 15.....		700 000	651 000
5 per cent 1971/75 32.....		186 000	176 000
4½ per cent 1975/80 33.....		500 000	429 000
4¾ per cent 1975/80 34.....		1 380 000	1 205 000
5½ per cent 1976/81 35.....		1 500 000	1 321 000
5¼ per cent 1977/82 36.....		516 000	450 000
5½ per cent 1976/82 37.....		1 500 000	1 306 000
5½ per cent 1977/83 38.....		2 280 000	1 969 000
5½ per cent 1978/83 39.....		2 000 000	1 761 000
5½ per cent 1979/84 40.....		1 420 000	1 273 000
5½ per cent 1979/84 42.....		1 400 000	1 223 000
5½ per cent 1979/85 43.....		200 000	174 000
5½ per cent 1980/85 44.....		1 000 000	864 000
5½ per cent 1980/86 45.....		1 800 000	1 568 000
5½ per cent 1981/86 46.....		2 582 000	2 334 000
6¼ per cent 1981/86 47.....		2 650 000	2 493 000
6½ per cent 1982/87 49.....		2 000 000	1 850 000
5¼ per cent 1982/87 50.....		3 500 000	2 927 000
5 per cent 1983/88 51.....		5 055 000	4 071 000
5 per cent 1980/83 52.....		4 000 000	3 407 000
5 per cent 1982/84 53.....		2 400 000	2 018 000
5½ per cent 1982/84 54.....		2 182 000	1 926 000
5½ per cent 1983/85 55.....		3 700 000	3 407 000
6½ per cent 1983/85 56.....		2 600 000	2 509 000
6½ per cent 1989/91 58.....		4 200 000	3 980 000
6¾ per cent 1991 60.....		4 500 000	4 385 000
6¾ per cent 1992 61.....		5 000 000	4 929 000
6¾ per cent 1992 65.....		9 000 000	8 838 000
6¾ per cent 1993 71.....		7 235 000	6 964 000
6½ per cent 1993 75.....		1 665 000	1 535 000
6¾ per cent 1993 76.....		8 781 000	8 460 000
6½ per cent 1994 78.....		2 002 000	1 877 000
6¾ per cent 1994 79.....		6 998 000	6 855 000
6 per cent 1974 80.....		2 000 000	1 918 000
6½ per cent 1994 81.....		2 000 000	1 831 000
6¾ per cent 1994 82.....		3 500 000	3 352 000
7½ per cent 1995 83.....		3 714 000	3 714 000
7 per cent 1995 84.....		2 587 000	2 444 000
8¾ per cent 1995 85.....		9 000 000	9 000 000
8½ per cent 1995 86.....		800 000	780 000
		<u>R120 046 000</u>	<u>R112 186 000</u>
REPUBLIC OF SOUTH AFRICA			
5¼ per cent 1979		700 000	662 000
<i>Carried forward</i>		<u>R120 746 000</u>	<u>R112 848 000</u>

Description	Loan No.	Nominal Value	Book Value
<i>Brought forward</i>		R120 746 000	R112 848 000
MUNICIPAL STOCK			
Bloemfontein			
5½ per cent 1975/80		100 000	86 000
Cape Town			
5½ per cent 1980/85 203.....		600 000	506 000
5½ per cent 1981/86 208.....		850 000	711 000
5¼ per cent 1983/88 219.....		610 000	504 000
5½ per cent 1980 227.....		100 000	88 000
6½ per cent 1981 240.....		210 000	198 000
Durban			
3¾ per cent 1964/74 41.....		1 000	1 000
3¾ per cent 1962/72 47.....		4 000	4 000
3 per cent 1967/77 50.....		1 000	1 000
5½ per cent 1974/79 68.....		600 000	528 000
5½ per cent 1976/80 70.....		800 000	696 000
6 per cent 1972/77 74.....		334 000	313 000
5 per cent 1984 84.....		500 000	402 000
5½ per cent 1982 87.....		450 000	388 000
6 per cent 1980 88.....		500 000	456 000
6 per cent 1981 91.....		1 000 000	906 000
6½ per cent 1981 93.....		1 000 000	943 000
Germiston			
5½ per cent 1985 16.....		150 000	122 000
Johannesburg			
5½ per cent 1974/79 36.....		120 000	106 000
Pretoria			
5 per cent 1961/81 7.....		246 000	206 000
5½ per cent 1975/78 44.....		100 000	90 000
5½ per cent 1975/78 47.....		100 000	89 000
6½ per cent 1977/82 49.....		200 000	184 000
5½ per cent 1980/83 56.....		200 000	171 000
6½ per cent 1981/84 59.....		200 000	187 000
Withank			
3½ per cent 1948/72 29.....		2 000	2 000
3½ per cent 1947/71 31.....		1 000	1 000
RAND WATER BOARD			
6½ per cent 1984 33.....		250 000	233 000
7 per cent 1987 35.....		200 000	195 000
		<u>R130 175 000</u>	<u>R121 165 000</u>
Interest Accrued			1 628 000
			<u>R122 793 000</u>
Market Value		<u>R105 935 000</u>	

Electricity Supply Commission

ACCOUNT No. 1

Redemption Fund Account for the

Year Ended 31st December, 1970

1969			
R19 000 000	Repayment of Local Registered Stock		R29 500 000
	3¼ per cent 1965/70 (Loan No. 12)	R5 000 000	
	5 per cent 1968/70 (Loan No. 27)	8 500 000	
	5 per cent 1967/70 (Loan No. 29)	16 000 000	
8 000 000	5 per cent 1967/69 (Loan No. 26)	—	
11 000 000	6½ per cent 1969 (Loan No. 67)	—	
213 621 000	Balance per Balance Sheet		216 409 000
20 901 000	Cape Western Undertaking	21 079 000	
5 470 000	Cape Northern Undertaking	5 481 000	
77 000	Cape Eastern Undertaking	98 000	
4 771 000	Border Undertaking	4 815 000	
14 000	Orange River Undertaking	119 000	
33 851 000	Natal Undertaking	34 114 000	
22 741 000	Eastern Transvaal Undertaking	25 268 000	
117 654 000	Rand and Orange Free State Undertaking	116 976 000	
2 554 000	Head Office	2 735 000	
5 588 000	Undertaking which has been sold	5 724 000	
	NOTE: The Book Values of all Investments were adjusted to Market Value on 1st January, 1968, to facilitate the pooling of Investments previously allocated to the separate sections of the Fund.		
	The Book Values are adjusted at the end of each year having regard to the par values and periods to maturity.		
R232 621 000		R245 909 000	

1969			
R213 621 000	Balance at Beginning of Year		R203 489 000
R20 901 000	Cape Western Undertaking	18 384 000	
5 470 000	Cape Northern Undertaking	4 744 000	
77 000	Cape Eastern Undertaking	58 000	
4 771 000	Border Undertaking	4 145 000	
14 000	Orange River Undertaking	—	
33 851 000	Natal Undertaking	30 670 000	
22 741 000	Eastern Transvaal Undertaking	19 306 000	
117 654 000	Rand and Orange Free State Undertaking	118 321 000	
2 554 000	Head Office	2 346 000	
5 588 000	Undertaking which has been sold	5 515 000	
	Amounts Contributed during the Year		
17 440 000	per Revenue Accounts	15 024 000	
2 373 000	Cape Western Undertaking	2 066 000	
439 000	Cape Northern Undertaking	414 000	
16 000	Cape Eastern Undertaking	14 000	
388 000	Border Undertaking	348 000	
100 000	Orange River Undertaking	14 000	
3 156 000	Natal Undertaking	3 028 000	
1 770 000	Eastern Transvaal Undertaking	2 007 000	
9 198 000	Rand and Orange Free State Undertaking	7 133 000	
92 000	Other Contributions	94 000	
643 000	Proceeds of Sales of Fixed Property	219 000	
13 240 000	Interest Earned on Investments	12 577 000	
873 000	Adjustment of Values of Investments at 31st December, 1970 (See Note)	1 218 000	
R245 909 000		R232 621 000	

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 30th April, 1971.

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

Electricity Supply Commission

ACCOUNT No. 2

Reserve Fund Account for the Year

Ended 31st December, 1970

1969		
R6 020 000	Expenditure During the Year on Replacements and Betterment	R3 769 000
66 000	Cape Western Undertaking	R42 000
42 000	Cape Northern Undertaking	—
12 000	Border Undertaking	19 000
530 000	Natal Undertaking	467 000
1 763 000	Eastern Transvaal Undertaking	1 145 000
3 607 000	Rand and Orange Free State Undertaking	2 096 000
104 386 000	Balance per Balance Sheet	123 518 000
8 704 000	Cape Western Undertaking	10 317 000
3 040 000	Cape Northern Undertaking	3 668 000
11 000	Cape Eastern Undertaking	16 000
1 231 000	Border Undertaking	1 494 000
4 000	Orange River Undertaking	25 000
14 760 000	Natal Undertaking	17 595 000
10 543 000	Eastern Transvaal Undertaking	12 382 000
66 093 000	Rand and Orange Free State Undertaking	78 021 000
<p>NOTE: The Book Values of all Investments were adjusted to Market Value on 1st January, 1968, to facilitate the pooling of Investments previously allocated to the separate sections of the Fund. The Book Values are adjusted at the end of each year having regard to the par values and periods to maturity.</p>		
<u>R110 406 000</u>		<u>R127 287 000</u>

1969		
R104 386 000	Balance at Beginning of Year	R90 035 000
R8 704 000	Cape Western Undertaking	7 258 000
3 040 000	Cape Northern Undertaking	2 496 000
11 000	Cape Eastern Undertaking	7 000
1 231 000	Border Undertaking	974 000
4 000	Orange River Undertaking	—
14 760 000	Natal Undertaking	12 171 000
10 543 000	Eastern Transvaal Undertaking	9 534 000
66 093 000	Rand and Orange Free State Undertaking	57 595 000
15 202 000	Amounts set aside during the year per revenue accounts	13 605 000
1 008 000	Cape Western Undertaking	964 000
400 000	Cape Northern Undertaking	400 000
4 000	Cape Eastern Undertaking	4 000
190 000	Border Undertaking	190 000
20 000	Orange River Undertaking	4 000
2 200 000	Natal Undertaking	2 200 000
2 213 000	Eastern Transvaal Undertaking	2 064 000
9 167 000	Rand and Orange Free State Undertaking	7 779 000
7 375 000	Interest Earned on Investments	6 425 000
324 000	Adjustment of Values of Investments at 31st December, 1970 (See Note)	341 000
<u>R127 287 000</u>		<u>R110 406 000</u>

Electricity Supply

Consolidated Revenue Account for

1969		
R67 073 000	Generation	R71 464 000
48 035 000	Operation—	
1 879 000	Fuel	R49 440 000
6 612 000	Water and Stores	2 024 000
558 000	Salaries and Wages	7 666 000
	Other Expenses	610 000
2 949 000	Maintenance—	
6 290 000	Stores	3 278 000
750 000	Salaries and Wages	7 300 000
	Other Expenses	1 146 000
102 000	Purchase of Electricity	90 000
9 264 000	Distribution	10 792 000
	Operation and Maintenance—	
1 542 000	Stores	1 803 000
6 386 000	Salaries and Wages	7 304 000
1 336 000	Other Expenses	1 685 000
13 578 000	General Expenses	15 980 000
4 035 000	Local Administration and Technical Management	4 602 000
5 987 000	General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.)	6 952 000
1 638 000	Head Office Administration	2 119 000
1 285 000	Head Office Engineering Expenses	1 628 000
633 000	Research Expenses	679 000
85 357 000	Capital Charges	98 347 000
50 943 000	Interest	59 491 000
15 024 000	Redemption Fund	17 440 000
5 785 000	Instalments and Provision for Repayment of Overseas Loans	6 214 000
13 605 000	Reserve Fund	15 202 000
732 000	Surplus carried down	—
<u>R176 106 000</u>		<u>R196 673 000</u>
—	Deficit brought down	R2 391 000
3 351 000	Accumulated surplus per Balance Sheet	960 000
<u>R3 351 000</u>		<u>R3 351 000</u>

Commission

the Year Ended 31st December, 1970

	1969	
Sales of Electricity	R193 475 000	R175 338 000
Traction	R18 223 000	17 417 000
Bulk	48 659 000	43 495 000
Mining	62 774 000	57 457 000
Industry	52 826 000	47 118 000
Domestic and Lighting	10 993 000	9 851 000
Other Revenue	807 000	768 000
	194 282 000	176 106 000
Deficit carried down	2 391 000	—
	<u>R196 673 000</u>	<u>R176 106 000</u>
Accumulated surplus brought forward	R3 351 000	R2 619 000
Surplus brought down	—	732 000
	<u>R3 351 000</u>	<u>R3 351 000</u>

Electricity Supply

Cape Western

Commission

Undertaking

ACCOUNT No. 3

Revenue Account for the Year

Ended 31st December, 1970

1969		
R8 204 000	Generation	R8 992 000
340 000	Proportion of cost of Pooled Power Stations	R1 747 000
55 000	Transmission costs payable to Other Undertakings	343 000
6 292 000	Operation—	5 238 000
108 000	Fuel	94 000
607 000	Water and Stores	695 000
24 000	Salaries and Wages	21 000
	Other Expenses	
83 000	Maintenance—	79 000
590 000	Stores	687 000
105 000	Salaries and Wages	88 000
	Other Expenses	
1 507 000	Distribution	1 746 000
	Operation and Maintenance—	
171 000	Stores	184 000
1 085 000	Salaries and Wages	1 264 000
251 000	Other Expenses	298 000
2 215 000	General Expenses	2 499 000
807 000	Local Administration and Technical Management	838 000
1 000 000	Other Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.)	1 141 000
188 000	Head Office Administration Expenses	249 000
220 000	Head Office Engineering Expenses	271 000
8 197 000	Capital Charges	9 450 000
4 974 000	Interest	5 894 000
2 066 000	Redemption Fund	2 373 000
193 000	Provision for Repayment of Overseas Loans	175 000
964 000	Reserve Fund	1 008 000
R20 123 000	Surplus carried down	R22 687 000
102 000		156 000
<u>R20 225 000</u>		<u>R22 843 000</u>
R670 000	Accumulated deficit brought forward	R568 000
<u>R670 000</u>		<u>R568 000</u>

[illegible]

ACCOUNT No. 4

Revenue Account for the Year Ended 31st December, 1970

[illegible]

Revenue Account for the Year Ended 31st December, 1970

[illegible]

Electricity Supply Commission

ACCOUNT No. 6

Border Undertaking

Revenue Account for the Year

Ended 31st December, 1970

1969			
R1 731 000	Generation		R1 969 000
	Operation—		
1 183 000	Fuel.....	R1 278 000	
19 000	Water and Stores	23 000	
254 000	Salaries and Wages.....	281 000	
2 000	Other Expenses	2 000	
	Maintenance—		
47 000	Stores	59 000	
202 000	Salaries and Wages.....	228 000	
24 000	Other Expenses	98 000	
227 000	Distribution		282 000
	Operation and Maintenance—		
24 000	Stores	38 000	
158 000	Salaries and Wages.....	201 000	
45 000	Other Expenses	43 000	
410 000	General Expenses		474 000
163 000	Local Administration and Technical Management	194 000	
167 000	Other Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.)	181 000	
37 000	Head Office Administration Expenses	48 000	
43 000	Head Office Engineering Expenses	51 000	
1 599 000	Capital Charges		1 853 000
1 061 000	Interest	1 275 000	
348 000	Redemption Fund.....	388 000	
190 000	Reserve Fund.....	190 000	
<u>R3 967 000</u>		<u>R4 578 000</u>	
R11 000	Deficit brought down	R240 000	
93 000	Accumulated deficit brought forward	104 000	
<u>R104 000</u>		<u>R344 000</u>	

1969			
R3 325 000	Sales of Electricity		R3 950 000
	Bulk.....	R3 296 000	3 023 000
	Industry	521 000	478 000
	Domestic and Lighting.....	508 000	449 000
	Other Revenue		6 000
		13 000	
	Deficit carried down	4 338 000	3 956 000
		240 000	11 000
<u>R4 578 000</u>		<u>R4 578 000</u>	<u>R3 967 000</u>
	Accumulated deficit per Balance Sheet.....	R344 000	R104 000
		<u>R344 000</u>	<u>R104 000</u>

Electricity Supply Commission

ACCOUNT No. 7

Orange River

Undertaking

Revenue Account for the Year

Ended 31st December, 1970

1969		
R31 000	Generation	
	Proportion of costs of Pooled Power Stations	R218 000
14 000	Electricity Purchased	—
10 000	Distribution	36 000
	Operation and Maintenance—	
—	Stores	R1 000
7 000	Salaries and Wages	29 000
3 000	Other Expenses	6 000
32 000	General Expenses	60 000
20 000	Local Administration and Technical Management	39 000
11 000	Other Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.)	20 000
1 000	Head Office Administration Expenses	—
—	Head Office Engineering Expenses	1 000
100 000	Capital Charges	505 000
82 000	Interest	385 000
14 000	Redemption Fund	100 000
4 000	Reserve Fund	20 000
187 000		819 000
36 000	<i>Less: Transmission Costs Adjusted between Undertakings</i>	171 000
<u>R151 000</u>		<u>R648 000</u>
R52 000	Deficit brought down	R117 000
2 000	Accumulated deficit brought forward	54 000
<u>R54 000</u>		<u>R171 000</u>

1969		
R520 000	Sales of Electricity	R98 000
	Bulk	88 000
R416 000	Industry	10 000
104 000		
	Other Revenue	1 000
11 000		1 000
531 000		99 000
117 000	Deficit carried down	52 000
<u>R648 000</u>		<u>R151 000</u>
R171 000	Accumulated deficit per Balance Sheet	R54 000
—		—
<u>R171 000</u>		<u>R54 000</u>

ACCOUNT No. 8

Revenue Account for the Year Ended 31st December, 1970

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ACCOUNT No. 9

Undertaking

Ended 31st December, 1970

[illegible]

Electricity Supply Commission

ACCOUNT No. 10

Rand and Orange Free State

Undertaking

Revenue Account for the Year

Ended 31st December, 1970

1969		
R72 338 000	Generation	R80 908 000
	Proportion of Costs of Pooled Power Stations	
4 082 000	Distribution	4 292 000
	Operation and Maintenance—	
899 000	Stores	R931 000
3 226 000	Salaries and Wages	3 519 000
356 000	Other Expenses	474 000
4 481 000		4 924 000
399 000	Less Amount charged to Undertakings	632 000
2 219 000	General Expenses	2 633 000
1 569 000	Local Administration and Technical Management	1 888 000
2 947 000	Other Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Claims, Insurance, Pension Fund Contributions, etc.)	3 550 000
757 000	Head Office Administration Expenses	1 009 000
887 000	Head Office Engineering Expenses	1 098 000
6 160 000		7 545 000
3 941 000	Less Amount charged to Pooled Costs	4 912 000
14 041 000	Capital Charges	16 747 000
27 366 000	Interest	33 890 000
7 133 000	Redemption Fund	9 198 000
4 417 000	Provision for Repayment of Overseas Loans	4 917 000
7 779 000	Reserve Fund	9 167 000
46 695 000		57 172 000
32 654 000	Less Amount charged to Pooled Costs	40 425 000
92 680 000		
29 000	Surplus carried down	—
<u>R92 709 000</u>		<u>R104 580 000</u>
—	Deficit brought down	R2 971 000
R1 139 000	Accumulated deficit brought forward	1 110 000
<u>R1 139 000</u>		<u>R4 081 000</u>

		1969
Sales of Electricity	R101 253 000	R92 352 000
Traction	R4 412 000	4 340 000
Bulk	17 637 000	16 007 000
Mining	51 907 000	47 406 000
Industry	23 488 000	21 340 000
Domestic and Lighting	3 809 000	3 259 000
Electricity Supplied to Other Undertakings	318 000	323 000
Eastern Transvaal Undertaking	316 000	318 000
Natal Undertaking	2 000	5 000
Other Revenue	38 000	34 000
Other Revenue	368 000	350 000
Less Amount Credited to Pooled Costs	330 000	316 000
Deficit carried down	101 609 000 2 971 000	92 709 000 —
	<u>R104 580 000</u>	<u>R92 709 000</u>
Surplus brought down	—	R29 000
Accumulated deficit per Balance Sheet	R4 081 000	1 110 000
	<u>R4 081 000</u>	<u>R1 139 000</u>

Electricity Supply Commission

Rand and Orange Free State and

Eastern Transvaal Undertakings

Statement of Pooled Costs and Allocation

for the Year Ended 31st December, 1970

[illegible][illegible]

Electricity Supply Commission

POWER STATIONS: PRINCIPAL EQUIPMENT INSTALLED AS AT 31st DECEMBER, 1970

Undertaking and Area (sq. km)	Electric Power Station	Type	STATION CAPACITY		BOILERS		MAIN GENERA- TORS		HOUSE SETS	
			Boilers kg/s	Genera- tors MW	No.	Conti- nuous Maxi- mum Rating Each kg/s	No.	Normal Rating Each MW	No.	Normal Rating Each MW
Border (55 700 sq. km.)	King William's Town	Steam	1,3 4,5	3,0	1 3	1,3 1,5	2	1,5		
	Total		5,8	3,0	4		2			
	West Bank No. 1 ...	Steam	16,3 27,7	1,5 8,0 22,5	6 4	2,7 6,9	1 2 3	1,5 4,0 7,5		
	Total		44,0	32,0	10		6			
	West Bank No. 2 ...	Steam	85,7 52,9	45,0 40,0	4 2	21,4 26,5	3 2	15,0 20,0		
	Total 1 & 2		138,6 182,6	85,0 117,0	6 16		5 11			
	Total		188,4	120,0	20		13			
Cape Eastern (8 000sq. km.)	No Generating Plant									
Cape Western (88 300 sq. km.)	Salt River No. 1 ...	Steam	15,1 75,6	30,0 60,0 0,3	2 6	7,6 12,6	3 3	10,0 20,0	1	0,3
	Total		90,7	90,3	8		6		1	
	Salt River No. 2 ...	Steam	327,6	120,0 120,0	10	32,8	4 2	30,0 60,0		
	Total 1 & 2		327,6 418,3	240,0 330,3	10 18		6 12		1	
	Hex River	Steam	100,8 69,3	60,0 60,0	4 2	25,2 34,6	3 2	20,0 30,0		
			170,1	120,0	6		5			
Cape Western	Total		588,4	450,3	24		17		1	0,3

Undertaking and Area (sq. km)	Electric Power Station	Type	STATION CAPACITY		BOILERS		MAIN GENERA- TORS		HOUSE SETS	
			Boilers kg/s	Genera- tors MW	No.	Conti- nuous Maxi- mum Rating Each kg/s	No.	Normal Rating Each MW	No.	Normal Rating Each MW
Natal (104 100 sq. km.)	Colenso Nos. 1 & 2	Steam	60,5		8	7,6				
			40,3	60,0	4	10,1	5	12,0		
			113,4	75,0	5	22,7	3	25,0		
			50,4	30,0	2	25,2	1	30,0		
	Total		264,6	165,0	19		9			
	Ingagane	Steam	567,0	500,0	5	113,4	5	100,0		
	Congella Nos. 1 & 2	Steam		36,0			3	12,0		
			37,8	20,0	5	7,6	1	20,0		
			50,4	30,0	4	12,6	1	30,0		
			201,6	120,0	8	25,2	3	40,0		
	Total		289,8	206,0	17		8			
	Umgeni	Steam	181,4	120,0	8	22,7	4	30,0		
			163,8	120,0	5	32,8	2	60,0		
	Total		345,2	240,0	13		6			
Natal	Total		1 466,6	1 111,0	54		28			
Orange River (139 300 sq. km.) Orange River	No Generating Plant									
Cape Northern (60 100 sq. km.) Cape Northern	No Generating Plant									
Eastern Transvaal (92 500 sq. km.)	Komati	Steam	567,0	500,0	5	113,4	5	100,0		
			567,0	500,0	4	141,7	4	125,0		
Eastern Transvaal	Total		1 134,0	1 000,0	9		9			

Undertaking and Area (sq. km)	Electric Power Station	Type	STATION CAPACITY		BOILERS		MAIN GENERATORS		HOUSE SETS	
			Boilers kg/s	Generators MW	No.	Continuous Maximum Rating Each kg/s	No.	Normal Rating Each MW	No.	Normal Rating Each MW
Rand & O.F.S. (189 600 sq. km.)	Camden	Steam	1 814,4	1 600,0	8	226,8	8	200,0		
	Grootvlei	Steam	665,3	600,0	3	221,8	3	200,0		
	Hendrina	Steam	428,4	400,0	2	214,2	2	200,0		
	Highveld	Steam	554,4	480,0	8	69,3	8	60,0		
	Klip	Steam	567,0	396,0 28,0	25	22,7	12	33,0	4	7,0
	Total		567,0	424,0	25		12		4	
	Taaibos	Steam	584,6	480,0	8	73,1	8	60,0		
	Vaal	Steam	430,9	297,0 21,0	18	23,9	9	33,0	3	7,0
	Total		430,9	318,0	18		9		3	
	Vierfontein	Steam	502,7	360,0	19	26,5	12	30,0		
	Wilge	Steam	63,0 201,6 73,1	60,0 180,0	4 4 1	15,7 50,4 73,1	2 3	30,0 60,0		
	Total		337,7	240,0	9		5			
	Total		5 885,4	4 902,0	100		67			
	Total		7 019,4	5 902,0	109		76			
E.T.U. + R. & O.F.S.U.	Total all Escom	Hydro Steam Steam	— 9 262,8 —	— 7 534,0 49,3	— 207 —		— 134 —		8 8	
			9 262,8	7 583,3	207		134		8	

**TRANSMISSION LINES AND CABLES: CIRCUIT KILOMETRES (EXCLUDING SERVICE CONNECTIONS
ON RETICULATION SYSTEMS) AT 31st DECEMBER, 1970**

(a) TRANSMISSION LINES

Undertaking	400 kV	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.....					276,92		57,47	420,12	1 077,14		5,71		181,02	2 018,38
Cape Eastern.....		94,59	1 318,77		575,86			194,92	206,01				9,11	410,04
Cape Northern.....	648,21		932,49		1 377,41			719,05	1 278,06				72,00	4 058,33
Cape Western.....	26,00	409,84	1 086,56	822,37	261,14		159,70	723,45	4 633,72	522,72			2 083,78	11 081,48
Eastern Transvaal.....		589,45	859,37	2 102,62			654,86	2 894,35	3 062,66	69,13	13,52	76,38	313,58	9 035,53
Natal.....	282,57		138,87		298,03			122,59	5 784,52	93,95		1,53	724,99	10 933,88
Orange River.....	959,02	1 504,59	2 711,29	5 147,89	16,90	2 354,02		153,33	7 183,50	506,93			1 148,91	872,80
Rand & O.F.S.								906,22						22 439,27
Totals	1 915,80	2 598,47	7 047,35	8 072,88	2 806,26	2 354,02	872,03	6 134,03	23 225,61	1 192,73	19,23	77,91	4 533,39	60 849,71
A	1 915,80	2 598,47	7 047,35		14 105,19					35 182,90				

(b) UNDERGROUND CABLES

Border.....								0,02	49,50		2,51		29,79	81,82
Cape Eastern.....									3,20				29,44	32,64
Cape Northern.....			15,54		38,68		115,61	4,26	426,37	12,98	4,51	0,18	559,05	1 177,00
Cape Western.....							10,88	40,77	54,98	2,53	1,67		151,57	251,70
Eastern Transvaal.....				1,89				0,06	207,89	14,92	0,47	0,02	106,00	342,13
Natal.....				5,09		64,45		157,12	182,85	515,55	0,11	1,48	233,56	1,160,21
Orange River.....			15,54	6,98	38,68	64,45	126,49	202,23	924,79	545,98	9,27	1,68	1 109,41	3 045,50
Rand & O.F.S.														
Totals			15,54		236,60			2793,36						

(c) TOTAL LINES AND CABLES

A + B - C	1 915,80	2 598,47	7 062,89	8 079,86	2 844,94	2 418,47	998,52	6 336,26	24 150,40	1 738,71	28,50	79,59	5 642,80	63 895,21
1970	1 915,80	2 598,47	7 062,89		14 341,79						37 976,26			
D	1 476,56	2 551,70	6 897,95		13 976,11					34 945,50				59 847,82
C - D - E	439,24	46,77	164,94		365,68					3 030,76				4 047,39

CAPACITY OF TRANSFORMERS IN SERVICE AT 31st DECEMBER, 1970

Undertaking	Number		M.V.A.	
	1969	1970	1969	1970
Border	786	882	162,140	174,400
Cape Eastern	391	408	10,890	11,490
Cape Northern	1 631	1 967	886,730	911,095
Cape Western	6 716	7 166	2 071,261	2 971,508
Eastern Transvaal	3 102	3 569	2 899,530	3 062,960
Natal	4 910	5 405	4 007,874	4 161,483
Orange River	30	33	569,615	571,125
Rand & Orange Free State	11 748	10 829	19 588,838	19 926,310
Compressor Stations Rand	36	24	233,325	145,030
Pooled Power Stations	799	973	8 970,107	11 071,620
Totals	30 149	31 256	39 400,310	43 007,021

UNITS SOLD BY UNDERTAKINGS TO ALL CONSUMERS DURING THE PAST FORTY-THREE 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
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		171,1	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	957,7		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	16 111,3			23 143,3
1966	272,4	2,5	442,4	1 367,0	2 408,2		—	—	3 498,5	16 563,4			24 554,3
1967	294,2	3,2	519,9	1 533,1	2 829,6		—	—	3 720,6	17 755,4	1,1		26 657,1
1968	310,5	4,1	609,6	1 666,2	3 191,4		—	—	4 121,5	18 979,3	2,4		28 885,0
1969	330,5	5,7	657,9	1 824,3	3 824,4		—	—	4 636,7	20 218,1	8,0		31 505,6
1970	360,4	6,1	714,9	2 101,0	4 294,1		—	—	5 073,5	22 293,4	47,3		34 890,6

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. Do—commissioned November, 1964.

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

UNITS SOLD AND NUMBER OF CONSUMERS, 1970

STATEMENT No. 3

Undertakings	TRACTION			BULK			MINING		
	Units	Per cent Traction	No. Cons.	Units	Per cent Bulk	No. Cons.	Units	Per cent Mining	No. Cons.
Border.....	—	—	—	308 077 044	3,80	14	—	—	—
Cape Eastern.....	—	—	—	1 309 380	0,02	1	—	—	—
Cape Northern.....	178 304 112	7,40	3	159 586 700	1,97	15	264 407 352	1,90	77
Cape Western.....	412 648 552	17,12	6	525 697 093	6,48	35	—	—	—
Eastern Transvaal.....	270 335 915	11,22	7	247 257 261	3,05	23	1 380 943 206	9,90	84
Natal.....	751 538 499	31,19	13	3 201 063 980	39,48	28	153 865 475	1,10	32
Orange River.....	—	—	—	38 999 900	0,48	10	—	—	—
Rand & O.F.S.....	796 894 561	33,07	2	3 626 098 966	44,72	139	12 148 655 026	87,10	101
Total Electricity.....	2 409 721 639	100,00	31	8 108 090 324	100,00	265	13 947 871 059	100,00	294
Per cent of Total.....		6,91			23,24			39,97	

Cape.....	558 267 508		8	1 061 541 802		73	260 291 322		69
Lesotho.....				8 824 906		2			
Natal.....	685 115 799		11	3 121 763 650		20	153 865 475		32
O.F.S.....	90 972 630		2	431 655 747		53	3 095 792 177		23
Mozambique.....				576 800		1			
Transvaal.....	1 075 365 702		10	3 483 727 419		116	10 437 922 085		170
Total.....	2 409 721 639		31	8 108 090 324		265	13 947 871 059		294

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	
24 575 789	0,26	462	27 699 632	3,39	4 422	360 352 465	1,03	4 898
2 809 613	0,03	109	1 998 404	0,24	433	6 117 397	0,02	543
93 722 966	0,98	472	18 873 069	2,31	2 639	714 894 199	2,05	3 206
871 972 822	9,07	6 960	290 709 298	35,58	45 253	2 101 027 765	6,02	52 254
2 355 391 959	24,51	2 405	40 134 444	4,91	5 090	4 294 062 785	12,31	7 609
871 982 629	9,08	3 688	95 047 566	11,63	14 890	5 073 498 149	14,54	18 651
8 270 650	0,09	4	—	—	—	47 270 550	0,14	14
5 379 006 557	55,98	2 236	342 696 665	41,94	25 428	22 293 351 775	63,89	27 906
9 607 732 985	100,00	16 336	817 159 078	100,00	98 155	34 890 575 085	100,00	115 081
	27,54			2,34			100,00	

1 000 315 373		8 003	339 112 925		52 735	3 219 528 930		60 888
						8 824 906		2
864 029 411		3 295	88 035 183		13 280	4 912 809 518		16 638
432 295 993		385	25 119 352		2 474	4 075 835 899		2 937
						576 800		1
7 311 092 208		4 653	364 891 618		29 666	22 672 999 032		34 615
9 607 732 985		16 336	817 159 078		98 155	34 890 575 085		115 081

POWER STATION OPERATING

STATISTICS YEAR 1970

STATEMENT No. 4

Undertaking and Power Station	Units Generated	Units Sent Out	MAXIMUM DEMANDS		Stn. L.F. % S.O.	OVERALL THERMAL EFFICIENCY %	
			$\frac{1}{2}$ Hour (or Hour) sent out kW	2 Min. Peak kW		Gen.	Sent Out
Border Undertaking							
King William's Town.....							
West Bank Nos. 1 & 2.....	380 540 550	363 186 420	72 230	75 400	59,1	23,9	22,8
Total.....	380 540 550	363 186 420					
Cape Western Undertaking							
Hex River.....	323 307 700	303 564 050	114 000	120 000	30,2	25,8	24,2
Salt River No. 1.....	16 046 390	13 783 400	51 000	55 000	3,1	14,8	12,7
Salt River No. 2.....	1 267 166 400	1 205 766 900	233 000	248 000	59,1	27,8	26,4
Total.....	1 606 520 490	1 523 114 350					
Natal Undertaking							
Colenso Nos. 1 & 2.....	560 713 200	522 950 200	117 260	136 000	50,9	18,7	17,5
Congella Nos. 1 & 2.....	702 391 900	644 480 000	143 350	168 000	51,3	21,2	19,4
Ingagane.....	3 296 518 000	3 105 756 700	462 400	492 000	76,7	32,1	30,2
Umgeni.....	996 507 100	931 468 100	213 200	240 000	49,9	24,1	22,5
Total.....	5 556 130 200	5 204 655 000					
Eastern Transvaal Undertaking							
Komati.....	6 248 509 056	5 795 104 204	906 705		78,2	31,0	28,8
Witbank.....	701 943	21 606					
Total.....	6 249 210 999	5 795 082 598					
Rand & O.F.S. Undertaking							
Arnot.....							
Camden.....	9 326 919 974	8 877 966 627	1 341 843		75,5	34,1	32,5
Grootvlei.....	3 199 510 748	3 053 143 302	568 676		61,3	34,5	32,9
Hendrina.....	849 332 393	797 007 413	280 638		56,0	30,4	28,6
Highveld.....	2 621 322 032	2 442 679 152	441 467		63,2	29,9	27,8
Klip.....	1 742 626 164	1 605 345 657	381 765		48,0	21,9	20,2
Taaibos.....	2 592 476 623	2 390 833 011	446 156		61,2	27,0	24,9
Vaal.....	2 002 754 621	1 869 327 562	283 555		75,2	22,2	20,7
Vierfontein.....	2 041 062 493	1 894 421 727	341 471		63,3	24,0	22,3
Wilge.....	1 627 771 686	1 504 016 018	216 982		79,1	25,9	23,9
Total.....	26 003 776 734	24 434 740 469					
Total E.T.U.+R. & O.F.S.U.	32 252 987 733	30 229 823 067					
Total B.U. + C.W.U. + N.U.	7 543 191 240	7 090 955 770					
Grand Total.....	39 796 178 973	37 320 778 837					

Coal Burnt Metric Ton	KG OF COAL		Calorific Value of Coal Mj per kg as Received (Wtd. Ave.)	MJ PER UNIT		COAL COST			
	Per Unit Generated	Per Unit Sent Out		Generated	Sent Out	Total Rand	Per Metric Ton Rand	Per Unit Generated cent	Per Unit Sent Out cent
208 249	0,547	0,573	27,54	15,06	15,78	1 277 563	6,13	0,335 7	0,351 8
208 249	0,547	0,573	27,54			1 277 563	6,13	0,335 7	0,351 8
166 586	0,515	0,549	27,05	13,93	14,85	1 071 182	6,43	0,331 3	0,352 9
14 647	0,944	1,098	26,73	25,23	29,35	4 169 536	6,61	0,324 9	0,341 9
615 650	0,485	0,510	26,73	12,96	12,63				
796 883	0,496	0,523	26,80	13,29	14,02	5 240 718	6,58	0,326 2	0,344 1
410 178	0,732	0,784	26,31	19,26	20,63	1 800 810	4,39	0,321 2	0,344 4
477 754	0,680	0,747	25,03	17,02	18,55	2 513 335	5,26	0,357 8	0,390 0
1 430 361	0,434	0,461	25,91	11,25	11,95	3 586 504	2,51	0,108 8	0,115 5
552 496	0,554	0,593	26,98	14,95	16,00	3 077 889	5,57	0,308 9	0,330 4
2 870 789	0,517	0,552	26,03			10 978 538	3,82	0,197 6	0,210 9
2 878 354	0,461	0,497	25,27	11,59	12,46	3 822 659	1,33	0,061 2	0,066 0
1 379						2 167	1,57	0,308 7	—
2 879 733	0,461	0,497	25,27			3 824 826	1,33	0,061 2	0,066 0
4 160 475	0,446	0,469	23,66	10,55	11,10	7 572 109	1,82	0,081 2	0,085 3
1 598 819	0,500	0,524	20,89	10,43	10,94	2 671 516	1,67	0,083 5	0,087 5
426 532	0,502	0,537	23,48	11,79	12,62	831 266	1,95	0,098 1	0,104 3
1 441 127	0,550	0,590	21,91	12,05	12,93	3 210 501	2,23	0,122 5	0,131 4
1 411 715	0,812	0,882	20,30	16,94	18,40	3 860 973	2,74	0,221 6	0,240 5
1 625 060	0,627	0,680	21,24	13,32	14,44	3 311 695	2,04	0,127 7	0,138 5
1 695 825	0,847	0,907	19,17	16,24	17,39	1 989 958	1,17	0,099 4	0,106 5
1 500 607	0,736	0,793	20,35	14,98	16,14	2 641 170	1,76	0,129 4	0,139 4
1 014 764	0,623	0,675	22,29	13,89	15,05	1 395 812	1,38	0,085 7	0,092 8
14 874 924			21,67			27 485 000	1,85	0,105 7	0,112 5
17 754 657	0,550	0,587	22,25			31 309 826	1,76	0,097 1	0,103 6
3 875 921	0,514	0,547	26,27			17 496 819	4,51	0,232 0	0,246 7
21 630 578	0,544	0,580	22,97			48 806 645	2,26	0,122 6	0,130 8

Power Station	Units Generated	Units Sent Out	Maximum Demand—kW		Stn. Load Factor Sent Out
			1 Hour Sent Out	2 Minutes Generated	
Sabie Gorge	6 000	6 000	400	—	—
Sabie Falls	NIL	NIL	—	—	—
Totals	6 000	6 000	—	—	—

(3) GENERATION SUMMARY

		Units Generated	Units Sent Out	Coal Burnt Metric Ton
Electricity Total Units	} Steam Hydro Diesel	39 796 178 973	37 320 778 837	21 630 578
		6 000	6 000	—
Grand Total 1970		39 796 184 973	37 320 784 837	21 630 578
Total for 1969		35 966 956 724	33 598 182 607	19 982 911
Change on 1969 (Units or Tons)		3 829 228 249	3 722 602 230	1 647 667
Per cent		10,65	11,08	8,25

POWER PURCHASED FROM OUTSIDE SOURCES IN 1970

STATEMENT No. 5

Undertaking	Purchased From	Maximum Demands	Units
Cape Eastern	Port Elizabeth Municipality (1) Aloes .. (2) Summit	1 477 kVA 648 kVA	4 559 484 2 510 960
Eastern Transvaal	Water Affairs (Paul Sauer Dam) (Kouga) Transvaal Sugar Corporation	— —	46 283 144 000
Total Units Purchased			7 260 727
Total Units Sold			34 890 575 085
Purchased as % of Sales			0,021 %

FOREIGN SUPPLIES 1970

STATEMENT No. 6

Undertaking	Sold to	Maximum Demand	Units
Eastern Transvaal	Ressano Garcia (Soncfè)	160 kVA	576 800
Rand & O.F.S.	Lesotho	—	8 824 906
Total			9 401 706

COAL USED AT COMMISSION'S POWER STATIONS
AVERAGE COST PER METRIC TON

Power Station	1960		1961		1962		1963		1964		1965		1966		1967		1968		1969		1970	
	R		R		R		R		R		R		R		R		R		R		R	
Brakpan.....	1,87	1	1,95		2,01		2,03		—		—		—		—		—		—		—	
Colenso.....	3,43	2	3,43		3,70		3,84		3,71		4,16		4,31		4,30		4,20		4,39		4,39	
Congella.....	4,18	3	4,13		4,31		3,96		3,58		3,77		3,92		4,01		4,19		5,24		5,26	
Hex River.....	5,16	4	5,25		5,43		5,74		5,70		5,88		6,14		6,38		6,22		6,36		6,43	
Highveld.....	1,60	5	1,76		1,69		1,71		1,83		1,79		1,81		1,95		2,07		2,23		2,23	
Ingagane.....	—	6	—		—		2,50		2,49		2,71		2,78		2,78		2,77		2,53		2,51	
Kimberley Central.....	4,16	7	4,13		4,30		4,54		4,52		4,49		4,67		2,91		3,12		2,93		2,74	
Klip.....	2,30	8	2,36		2,35		2,25		2,23		2,39		2,74		—		—		—		—	
King William's Town.....	—	9	5,05		—		5,05		—		—		5,02		—		—		—		—	
Komatati.....	—	10	1,31		1,42		1,69		1,48		1,29		1,37		1,27		1,40		1,41		1,33	
Rosherville.....	2,05	11	2,09		2,30		2,35		2,37		2,41		2,74		—		—		—		—	
Salt River.....	5,32	12	5,35		5,54		5,91		5,86		5,97		6,23		6,56		6,48		6,64		6,61	
Taatbos.....	2,02	13	2,18		1,93		1,87		1,74		1,72		1,82		1,96		2,05		2,11		2,04	
Ungeni.....	4,45	14	4,42		4,72		4,82		4,76		5,00		5,31		5,61		5,58		5,45		5,57	
Vaal.....	0,87	15	1,03		1,05		1,14		1,15		1,15		1,20		1,28		1,27		1,22		1,17	
Vereeniging.....	0,96	16	1,06		1,12		1,18		1,16		1,17		1,46		1,42		1,45		1,01		—	
Vierfontein.....	1,65	17	1,72		1,61		1,58		1,57		1,70		1,85		1,82		1,87		1,72		1,76	
West Bank.....	5,08	18	5,03		5,26		5,53		5,52		5,62		5,75		5,85		5,84		6,04		6,13	
Wilge.....	0,99	19	1,04		1,07		1,05		1,06		1,09		1,20		1,44		1,47		1,36		1,38	
Witbank.....	1,17	20	1,16		1,26		1,27		1,28		1,40		1,51		1,50		1,55		1,76		1,57	
Camden.....	—	21	—		—		—		—		—		—		2,00		—		1,79		1,82	
Grootvlei.....	—	22	—		—		—		—		—		—		—		—		1,84		1,67	
Hendrina.....	—	23	—		—		—		—		—		—		—		—		—		1,95	

ESCOM AND REPUBLIC

Calendar Year	Census year for National Statistics	Escom				Units Generated Millions of kWh (gross)			Units Sold or Used Millions of kWh		
		Total Staff	Capital Expenditure at Cost Thousands of Rand	Installed Capacity MW	Coal burnt Thousands of Metric Tons	Escom + V.F.P.	Republic of S.A.	g h %	Escom	Escom + V.F.P.	Republic of S.A.
a	b	c	d	e	f	g	h	i	j	k	l
1925	1925-26		1 879	1.3			1 761		0.1		1 517
1926	1926-27		4 181	61.3			1 889		161.7		1 694
1927	1927-28		12 973	121.3			2 110		551.0		1 807
1928	1928-29		14 582	175.6	1 755.3	1 422.2	2 300	61.8	627.9	1 411.4	2 008
1929	1929-30	633	15 310	194.6	1 892.5	1 516.7	2 454	61.8	797.0	1 560.5	2 127
1930	NA	688	15 429	215.6	1 965.3	1 766.3	NA		889.6	1 632.4	NA
1931	NA	664	15 863	215.6	2 029.5	1 857.4	NA		867.1	1 689.5	NA
1932	NA	645	16 095	227.6	2 166.4	2 028.7	NA		890.7	1 814.2	NA
1933	1932-33	678	16 547	247.6	2 306.1	2 246.4	2 947	76.2	974.1	1 929.0	2 462
1934	1933-34	706	18 273	287.6	2 568.5	2 525.9	3 309	76.3	985.2	2 140.3	2 854
1935	1934-35	778	22 468	307.6	2 859.7	2 848.4	3 773	75.5	1 119.2	2 414.9	3 246
1936	1935-36	862	26 591	486.8	3 251.6	3 406.7	4 603	74.0	1 688.0	2 820.6	3 768
1937	1936-37	1 024	30 050	519.8	3 487.4	3 980.6	5 336	74.6	2 535.6	3 288.5	4 361
1938	1937-38	1 097	34 297	623.3	3 788.8	4 452.8	5 933	75.1	2 985.4	3 639.7	4 898
1939	1938-39	1 100	36 645	737.6	4 000.0	4 740.7	6 574	72.1	3 573.7	4 095.6	5 453
1940	1939-40	1 189	38 662	770.6	4 196.6	5 098.3	7 168	71.1	4 070.2	4 516.9	6 122
1941	1940-41	NA	40 808	771.3	4 448.6	5 444.9	7 592	71.7	4 254.0	4 833.5	6 505
1942	1941-42	NA	43 763	770.5	4 637.4	5 538.9	7 799	71.0	4 320.8	4 920.0	6 768
1943	1942-43	1 238	46 574	795.4	4 515.6	5 404.0	7 700	70.2	4 275.6	4 795.8	6 638
1944	1943-44	1 328	48 036	796.8	4 684.9	5 597.8	8 043	69.6	4 415.8	4 970.5	6 920
1945	1944-45	1 531	49 913	862.8	4 816.4	5 748.7	8 329	69.0	4 706.1	5 101.1	7 142
1946	1945-46	1 836	52 852	975.7	4 827.9	5 895.6	8 557	68.9	5 002.4	5 218.8	7 338
1947	1946-47	2 169	57 650	1 033.1	5 443.4	6 035.9	8 788	68.7	5 114.5	5 341.7	7 494
1948	1947-48	2 692	90 816	1 385.0	5 557.4	6 553.5	9 481	69.1	5 576.9	5 787.0	8 089
1949	1948-49	8 764	100 234	1 411.9	5 774.8	7 075.3	10 013	70.7	6 222.2		8 829
1950	1949-50	9 352	115 129	1 439.8	6 323.4	7 773.6	11 187	69.5	6 910.6		9 750
1951	1950-51	10 336	137 283	1 520.5	6 663.1	8 326.6	11 895	70.0	7 456.5		10 474
1952	1951-52	10 889	176 539	1 624.5	7 113.3	8 778.0	12 517	70.1	8 080.6		11 234
1953	1952-53	11 518	218 739	1 806.0	7 393.8	9 442.0	13 744	68.7	8 732.2		11 806
1954	1953-54	12 317	270 621	2 051.0	8 025.0	10 651.9	15 184	70.2	9 676.6		12 820
1955	1954-55	12 490	304 342	2 377.7	8 999.7	12 214.5	17 172	71.1	10 964.0		14 310
1956	1955-56	12 977	342 068	2 734.8	9 688.6	13 578.4	18 535	73.3	12 019.5		15 781
1957	1956-57	13 421	377 265	2 826.7	10 220.5	14 638.8	20 133	72.7	12 763.1		17 321
1958	1957-58	14 312	417 701	3 036.5	10 784.1	15 582.6	21 165	73.6	13 602.2		18 132
1959	1958-59	13 947	453 130	3 289.4	11 548.7	16 926.5	22 561	75.0	14 724.5		19 334
1960	1959-60										
1960	1960-61	14 654	491 471	3 408.9	12 512.6	18 543.3	24 365	76.1	16 094.1		20 968
1961	1961-62	15 441	529 565	3 558.9	13 194.8	19 575.4	25 699	76.2	17 013.2		22 066
1962	1962-63	16 467	581 579	3 758.9	13 955.5	20 805.5	26 969	77.1	18 121.0		23 706
1963	1963-64	16 804	637 076	4 175.9	14 721.1	22 312.4	29 399	75.9	19 500.0		25 257
1964	1964	17 172	679 193	4 499.6	15 654.7	24 355.3	32 020	76.1	21 247.5		NA
1965	1965	17 851	741 109	4 624.7	16 726.8	26 440.4	34 500	76.6	23 143.3		NA
1966	1966	18 579	840 782	4 806.3	16 982.6	27 395.5	36 590	74.9	24 554.3		NA
1967	1967	19 817	950 863	5 845.3	18 307.7	30 421.7	39 860	76.3	26 657.1		NA
1968	1968	20 893	1 114 390	6 344.6	19 123.9	33 061.2	43 100	76.7	28 885.0		NA
1969	1969	21 644	1 271 785	6 982.6	19 982.9	35 967.0	46 560	77.2	31 505.6		NA
1970	1970	22 696	1 429 862	7 583.3	21 630.6	39 796.2	51 240	77.7	34 890.6		NA

FOOTNOTES

- (i) The definition of census year changed as from 1932-33 and again as from 1957-58.
- (ii) The national statistics shown in columns (h) and (l) are compiled by the Department of Statistics, except for the figures for 1964 to 1970. The particulars in respect of these years are estimates of the total electricity generated, calculated by Escom, based on the results of a sample survey conducted by the Department of Statistics.

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 1970.

(see previous Annual Report for Rights or Interests in or over land acquired prior to 1969.)

Cape Western Undertaking

Immovable property acquired for considerations amounting to	R8 107-53
Servitudes acquired—capitalised payments amounting to.....	R4 687-00

Cape Northern Undertaking

Immovable property acquired for considerations amounting to	R11 971-40
Servitudes acquired—capitalised payments amounting to.....	R31 000-00

Cape Eastern Undertaking

Immovable property acquired for considerations amounting to	NIL
Servitudes acquired—capitalised payments amounting to.....	NIL

Natal Undertaking

Immovable property acquired for considerations amounting to	R42 844-83
Servitudes acquired—capitalised payments amounting to.....	R107 319-33

Eastern Transvaal Undertaking

Immovable property acquired for considerations amounting to	R988-00
Servitudes acquired—capitalisation payments.....	R74 135-00

Border Undertaking

Immovable property acquired for considerations amounting to	R488-11
Servitudes acquired—capitalised payments amounting to.....	R198-89

Orange River Undertaking

Immovable property acquired for considerations amounting to	R250-00
Servitudes acquired for capitalised payments amounting to.....	R17 250-00

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

The licensed area of supply of the Undertaking has been increased during the year to allow for supplies to be made available to the municipalities of Oudtshoorn, Mossel Bay, George and Knysna and is represented on the map on page 80.

During the year 798 million units were imported via the 400 kV system from the north and 1 607 million units were generated in the Undertaking's Salt River and Hex River power stations. The power import from the north increased considerably during the latter half of the year when on 20th August, the 400 kV line between Muldersvlei and Droërvier was commissioned and the input was increased from some 70 MW to an average in excess of 115 MW.

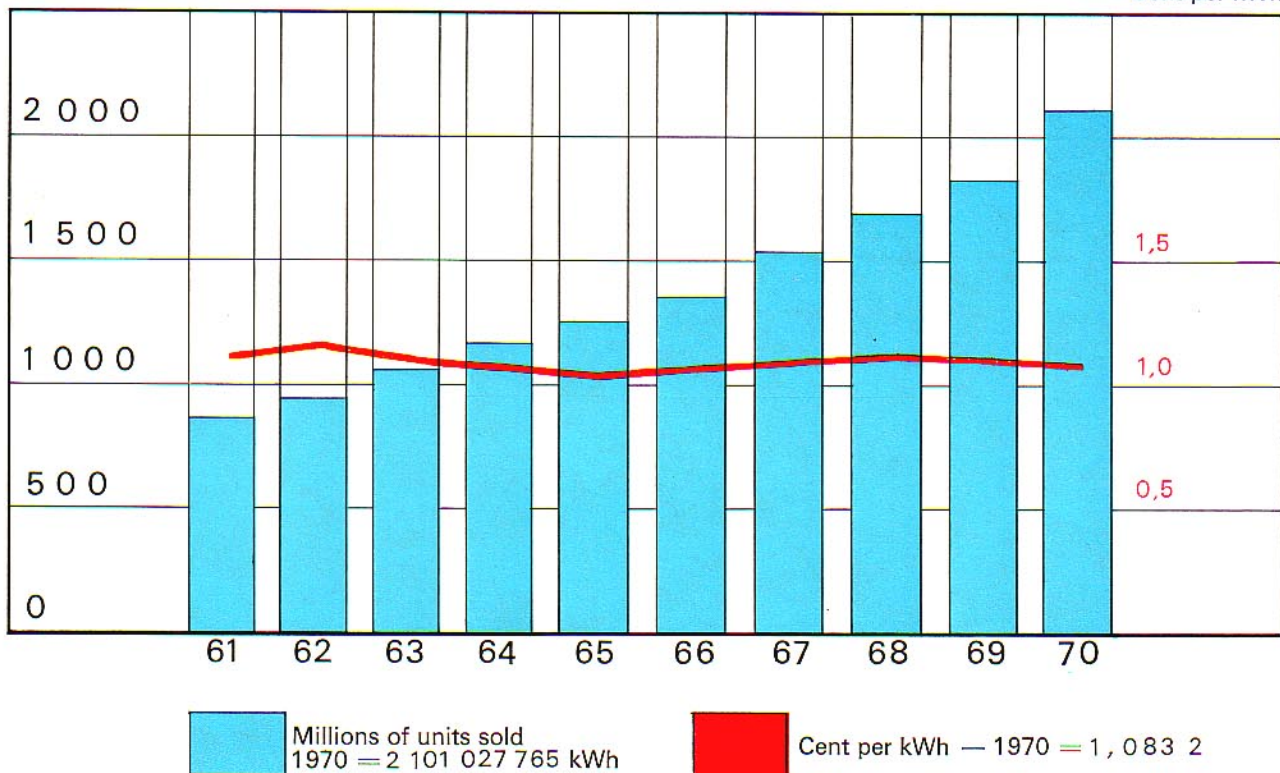
Sales of Electricity

From the table on page 83 it can be seen that the total units sold in 1970 increased by 15,2 per cent over the 1969 figure. This very high percentage however includes an increase of 36,5 per cent in bulk units which was brought about largely by the supply given to the City Council of Cape Town at Montagu Gardens. The following graph indicates the increase in sales of electricity over the period 1961 to 1970, the red line being the average price per unit sold:

In the urban areas of Bellville, Parow and Goodwood units sold increased by 10,2 per cent over those sold during 1969 and represent about 20 per cent of the Undertaking's total sales.

Millions of units sold

Cent per kWh



Development of the Undertaking

A supply was given to the Municipality of Cape Town on the 6th February of the review year at its Montagu Gardens substation. This load commenced at some 8 MW but increased during the year to about 28 MW at the year end.

The Malmesbury 132 kV stepdown substation was completed at the end of 1970.

During the year construction of the 66 kV line from Eendekuil to Graafwater and Lamberts Bay and associated substations were completed but supplies will only be given early in the new year as soon as the consumers have their installations completed.

A start was also made during the latter half of the year with the construction of the 132 kV and 66 kV networks which will link the towns of Oudtshoorn, Mossel Bay, George and Knysna. This system when completed will be fed via a 132 kV line — still to be

built — from Droërvier over the Swartberg mountains and it is planned to furnish all the above supplies towards the middle of 1972.

The Undertaking's Construction Department also commenced in February of the review year with the erection of 220 kV substations, on behalf of the S.W.A. Water and Electricity Corporation (Pty.) Limited in South West Africa, at the following places:

1. Otjikoto (near Tsumeb).
2. Tsumeb Corporation (at Tsumeb).
3. Gerus (near Otjiwarongo).
4. Omburu (near Omaruru).
5. Walmund (near Swakopmund).

Of these the first four substations were structurally completed and all busbars strung by the year end. This work will continue during the new year as

equipment becomes available. The Undertaking's Test Department also commenced manufacture of all the protection and associated panels for the above projects towards the year end. Work on these will continue during 1971.

Development of Rural Electrification

During the year extensions to the rural supply networks were added totalling:

206,0 km high voltage lines (22, 11 and 6,6 kV).

35,6 km low voltage lines.

12,3 km street light mains.

A total of 258 farming supplies were connected during the year in addition to 59 rural consumers who are not farmers. This brought the total number of farm supplies connected to 5 527 and the total number of rural consumers who are not farmers to 2 002.

The development of supplies to the Oudtshoorn-

George-Mossel Bay areas has made it economically possible also to furnish supplies to the towns of Albertinia, Riversdale, Heidelberg and Stilbaai. At the year end terms were quoted to these towns and acceptances are expected early in the new year.

Financial

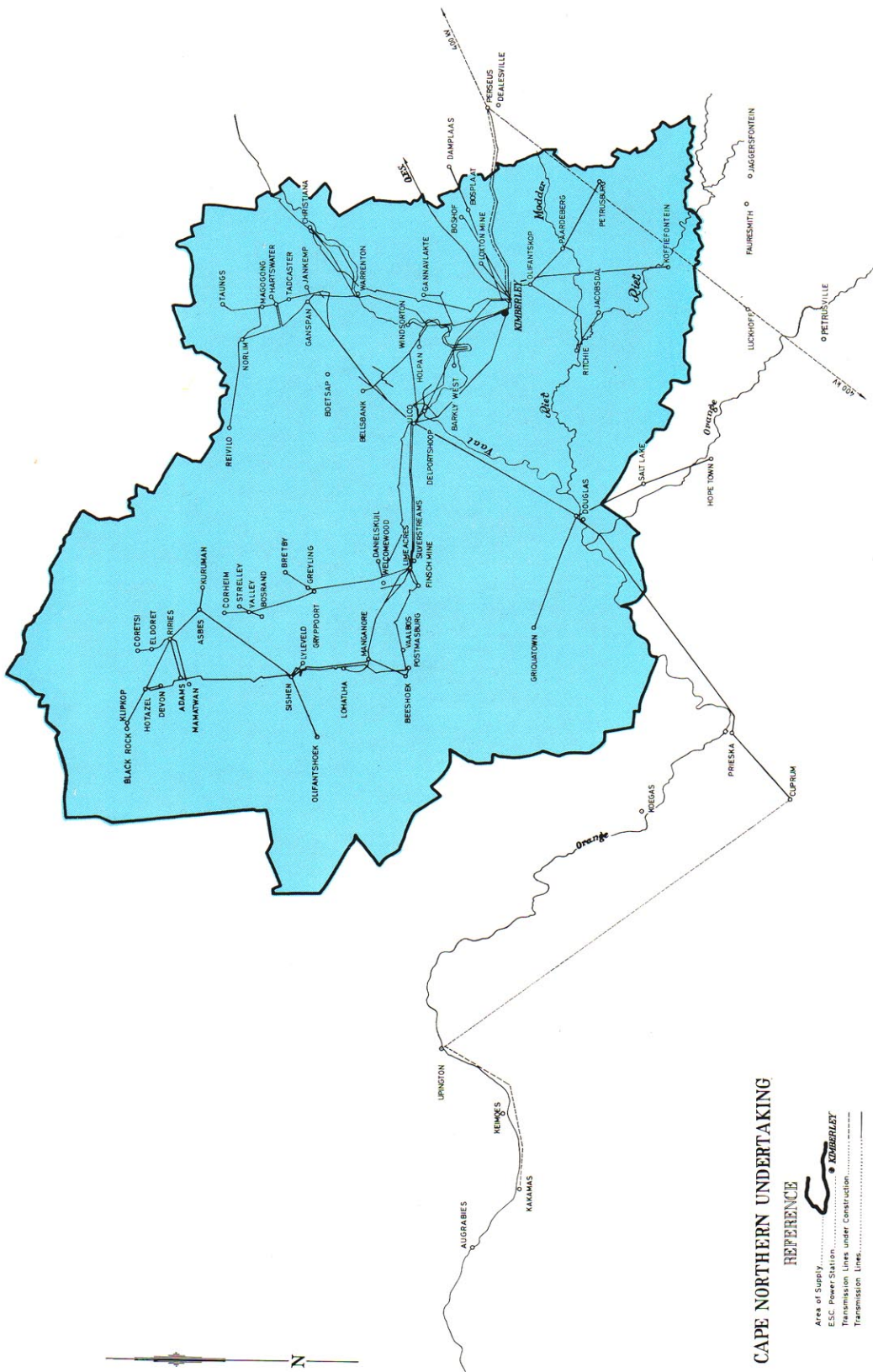
Details of the units sold to the different classes of consumers, the total revenue derived therefrom and the working costs are shown in the table on page 83.

The average price per unit sold during the year is slightly less than that of the previous year having decreased from 1,103 2 cents per kWh sold to 1,083 2 cents per kWh sold.

Total income for the year amounted to R22 844 000 and total working costs to R22 687 000 resulting in a surplus of R157 000 for the year. The total accumulated deficit on the Undertaking's Revenue Account was thus reduced to R412 000.

CAPE WESTERN UNDERTAKING

CONSUMER			SALES				REVENUE FROM SALES		AVERAGE PRICE PER kWh SOLD	
Class	Number		Proportion %		kWh		%Change		Rand	
	1969	1970	1969	1970	1969	1970	69/68	70/69	1969	1970
Traction.....	6	6	21,76	19,64	397 011 612	412 648 552	+ 1,45	+ 3,94	4 168 592	1,055 1
Bulk.....	34	35	21,11	25,02	385 102 792	525 697 093	+ 8,04	+ 36,51	3 539 939	0,863 9
Mining.....										
Industrial.....	6 542	6 960	42,53	41,50	775 960 893	871 972 822	+ 15,42	+ 12,37	8 515 147	1,097 4
Domestic.....	43 162	45 211	14,19	13,46	258 853 365	282 715 927	+ 8,26	+ 9,22	3 732 264	1,441 8
Street Lighting.	41	42	0,41	0,38	7 405 049	7 993 371	+ 5,46	+ 7,94	169 379	2,287 3
Total	49 785	52 254	100,00	100,00	1 824 333 711	2 101 027 765	+ 9,49	+ 15,17	20 125 321	1,103 2
							1970		Accumulated to 31/12/70	
							1969		R	
Total Revenue.....							20 223 822		22 843 866	
Working Costs.....							20 122 705		22 687 164	
Surplus.....							101 117		156 702	
Deficit.....									—	
Capital Expenditure.....							14 610 188		8 971 275	
									411 672	



CAPE NORTHERN UNDERTAKING

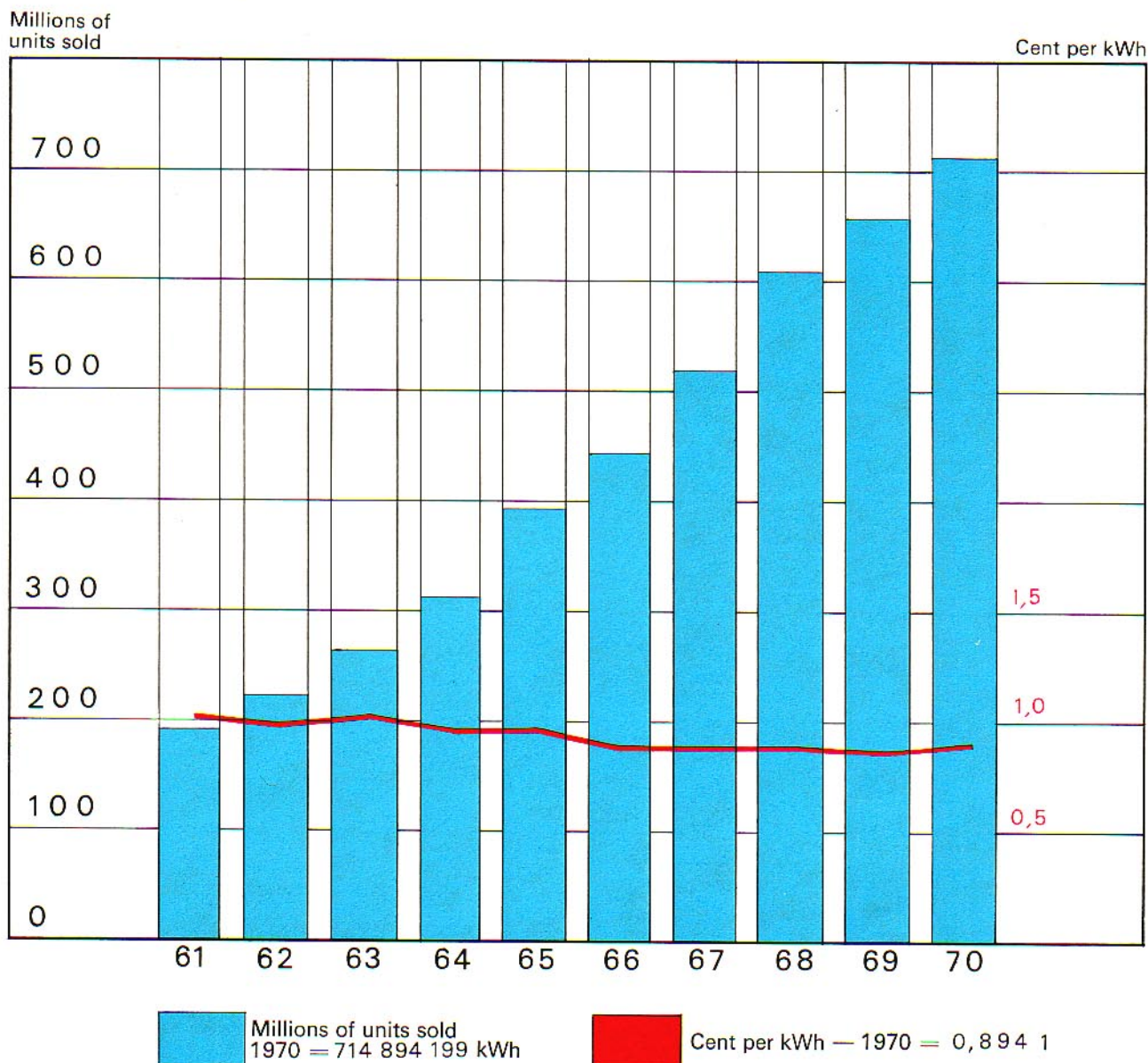
The licensed area of supply of the Cape Northern Undertaking is shown on the map on page 84.

Sales of Electricity

During the year under review, sales increased by

8,7 per cent to almost 715 million units.

The following graph indicates the increase in sales over the period 1961 to 1970. The red line indicates the average price per unit sold.



The South African Railways purchased 178,3 million units for traction purposes during the year, compared with 179,5 million during 1969.

The consumption at the De Beers Company's new Finsch mine increased by 2,6 million units to 26,2 million units, while their four Kimberley diamond mines continued to operate at full output, consuming 87 million units. The re-opened Koffiefontein mine consumed 2,6 million units for dewatering and is expected to be producing diamonds by mid 1971, and to consume some 25 million units per annum.

Sales to the manganese mines between Postmasburg and Black Rock areas increased to 13,5 million units during the year. The blue asbestos mines continued to increase consumption by 11,7 per cent to 51,6 million units. The Anglo-Vaal's new copper-zinc mine near Prieska commenced by taking a supply in November and is expected to develop rapidly during the next few years.

The following table shows a break-down of energy used for mining quarrying and cement manufacture.

	Total Units 1970—714,9 millions		
	Million Units 1970	% Increase of Units during year 1970	% or total units sold 1970
Diamonds	133,4	8,0	18,6
Lime, Cement and Gypsum	93,7	19,5	13,1
Blue Asbestos	51,6	11,7	7,2
Iron Ore	37,1	3,1	5,2
Manganese	13,5	19,5	1,9
Copper, Zinc	0,4	—	0,1
Total	329,7	11,6	46,1

The Kimberley Municipality consumed 126,3 million units, an increase of 8,8 per cent.

Sales to the smaller municipalities increased by 7 million to 33,3 million units. This increase includes some 2,7 million units supplied to Prieska and Koffiefontein Municipalities which were connected during the second half of the year.

Riparian farmers on the Vaal, Harts, Modder and Riet Rivers continue to instal spray irrigation plants at an increasing rate. The total consumption for river pumping and spray irrigation has increased to some 9,2 million units per annum.

Development of the Undertaking

The 131 km extension of the 132 kV line from Herbert to Burchell distribution station (near Prieska) was completed during the year and extended some 58 km to the Cuprum distribution station to supply the new copper-zinc mine.

From the Cuprum distribution station work commenced on the 210 km — 132 kV line to Gordonia distribution station to supply Upington Municipality by the beginning of 1972. From Herbert distribution station a 22 kV line, 77 km in length, was erected and a bulk supply given to the Hopetown Municipality in May. Prieska Municipality was given a bulk supply in May, 1970 by means of a 22 kV line from Burchell.

With the development of copper and other base mineral exploitation in the Prieska — Upington area, it has now become necessary to construct an additional 180 km transmission line from Hydra (De Aar) to the new Cuprum distribution station to reinforce

the network. This line is planned to be in operation by 1973.

The Municipality of Koffiefontein was supplied by a short 11 kV line in June, 1970. Negotiations are taking place to supply Pomfret, situated some 190 km north of Kuruman. This is the last asbestos mine in the Northern Cape still generating its own electricity.

Development of Rural Supplies

Continued development took place in the Douglas area where 41 new river pumping farmers were connected. In this area some 47 km of 22 kV lines were added to the network. Work also proceeded in the Paardeberg area where 41 km of 22 kV lines were erected and 14 pumping installations and 20 domestic consumers added. During the year a total of 235 rural supplies including 131 farming supplies were added throughout the Undertaking.

Between Boegoeberg-Upington-Keimoes and Kakamas a rural network along the Orange River is being planned to supply irrigation farmers.

Financial

No changes in tariffs were made during the year and the discount remained at 20 per cent.

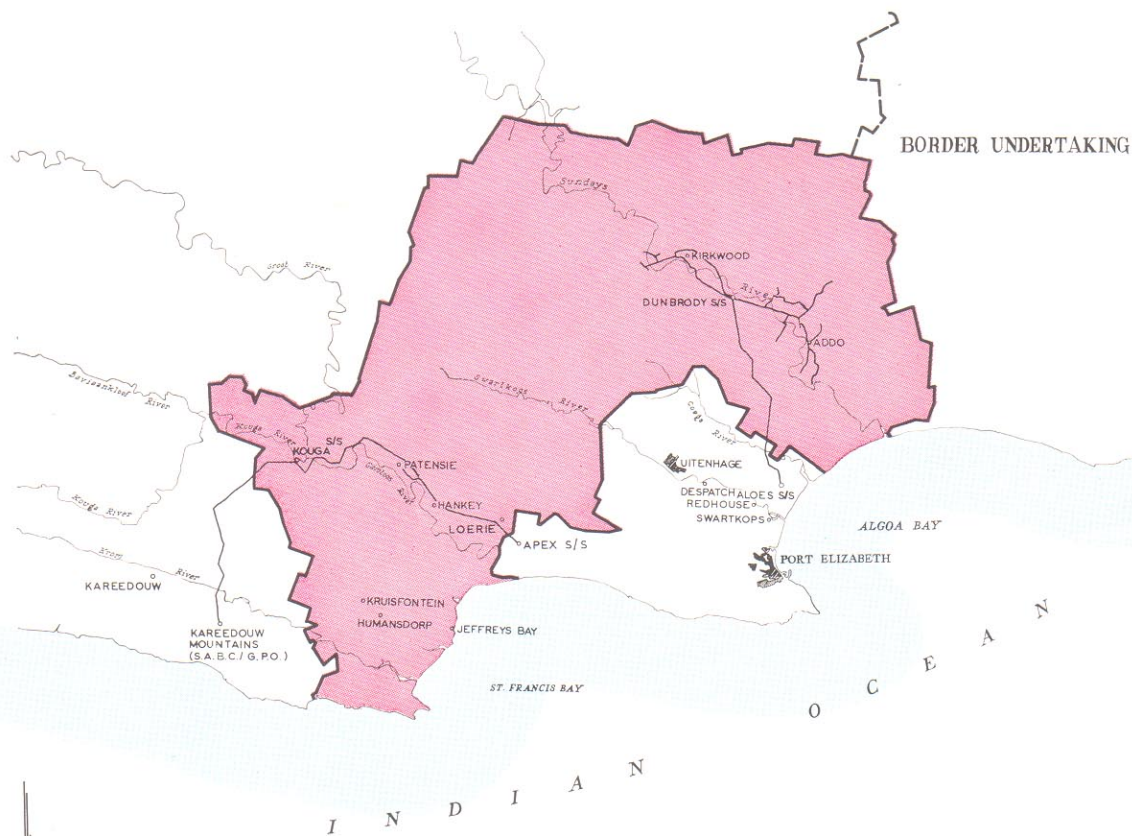
Details of units sold to various classes of consumer, total income received, and operating cost for 1970 are given in the table on page 87.

The total revenue for the year amounted to R6 403 000.

The deficit of R243 000 reduces the accumulated surplus on the Undertaking's Revenue Account to R661 000.

CAPE NORTHERN UNDERTAKING

CONSUMER			SALES					REVENUE FROM SALES		AVERAGE PRICE PER kwh SOLD	
Class	Number		Proportion %		kWh		%Change	Rand	Rand	Cents	Cents
	1969	1970	1969	1970	1969	1970					
Traction.....	3	3	27,30	24,94	179 499 150	178 304 112	— 0,67	1 609 825	1 633 316	0,896 8	0,916 0
Bulk.....	12	15	21,77	22,32	142 409 600	159 586 700	+12,06	1 014 310	1 162 348	0,712 2	0,728 3
Mining.....	72	77	36,80	36,99	242 111 609	264 407 352	+ 6,62	2 159 648	2 476 250	0,892 0	0,936 5
Industrial.....	393	472	11,80	13,11	77 773 938	93 722 966	+ 6,09	664 758	824 169	0,854 7	0,879 4
Domestic.....	2 482	2 630	2,30	2,61	15 871 095	18 646 737	+20,51	255 603	290 654	1,610 5	1,558 7
Street Lighting.	9	9	0,03	0,03	194 994	226 332	+17,49	4 238	5 163	2,173 4	2,281 2
Total	2 971	3 206	100,00	100,00	657 860 386	714 894 199	+16,07	5 708 382	6 391 900	0,867 7	0,894 1
			1969		1970		Accumulated to 31/12/70				
Total Revenue.....			R		R		R		R		
Working Costs			5 716 306		6 403 097		6 403 097		660 645		
Surplus.....			5 824 214		6 646 354		6 646 354				
Deficit.....			—		—		—				
Capital Expenditure.....			107 908		243 257		243 257				
			2 048 606		2 359 476		2 359 476				



CAPE EASTERN UNDERTAKING REFERENCE

- Area of Supply.....
- Border Undertaking.....
- Transmission Lines.....
- Transmission Lines Under Construction.....
- Substation Site.....



AREA OF SUPPLY.....3,100 SQUARE MILES (8,000 SQUARE KILOMETRES)

CAPE EASTERN UNDERTAKING

The licensed area of supply of the Cape Eastern Undertaking is shown on the map on page 88.

For consumers in the Gamtoos Valley, Escom purchases power from the hydro-electric power station of the Department of Water Affairs at the Paul Sauer dam. When power from this source is not available a supply is purchased from the Port Elizabeth Municipality at Summit substation.

Electricity for the network in the Sundays River

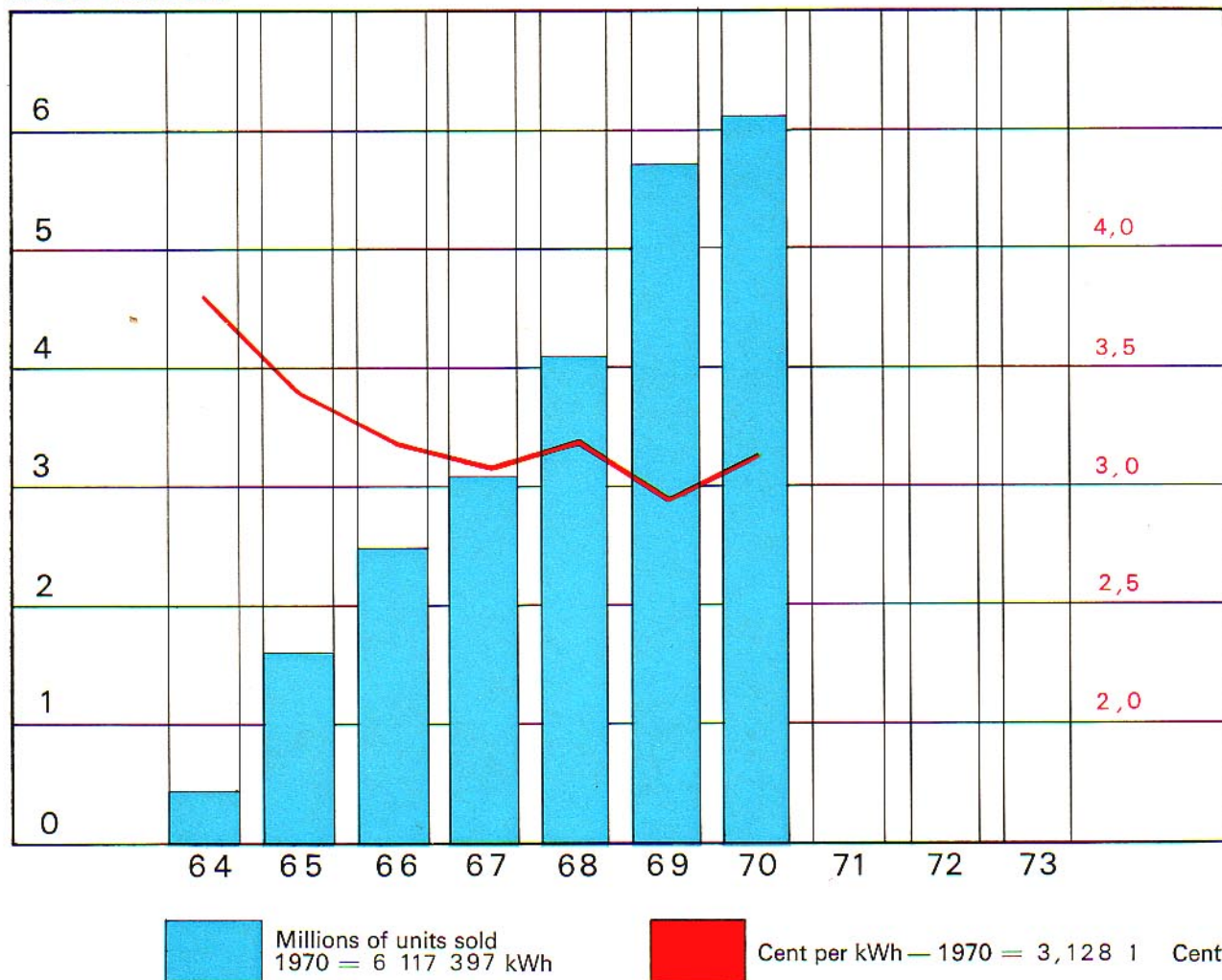
Valley is purchased from the Port Elizabeth Municipality at Aloes substation.

Sales of Electricity

The graph below indicates the increase in sales of electricity in the Undertaking since it came into operation in 1964. The red line on the graph shows the average price per unit sold.

Millions of units sold

Cent per kWh



In 1970 there was an increase in the total sales of electricity of 6,96 per cent, 5 719 118 units being sold in 1969 and 6 117 397 in 1970. This is a relatively small increase compared with previous years and the low growth rate may be attributed mainly to the severe drought which the area has experienced.

Sales in the Sundays River valley amounted to 3 840 188 units and in the Gamtoos River valley to 2 277 209 units.

There is only one bulk consumer in this Undertaking, namely Kirkwood Municipality, and sales to

this consumer dropped by 2,8 per cent to 1 309 380 units in 1970.

For the Sundays River valley 4 559 484 units were purchased from Port Elizabeth Municipality at Aloes, the maximum demand being 1 477 kVA compared with 1 377 kVA in 1969.

For the Gamtoos River valley 2 510 960 units were purchased from Port Elizabeth Municipality at Summit, the maximum demand being 648 kVA against 576 kVA in 1969. A total of 46 283 units were also purchased from the Department of Water Affairs.

Development of the Undertaking

Sundays River Valley:

There was a low rate of activity in this Valley in 1970 and only 7 consumers were connected to the network, bringing the total at the year end to 341.

The supplies which had been made available to the two radio navigation stations in the Valley in 1969 were taken in August, 1970, these supplies being large power user supplies. The other consumers connected were in the domestic and small power user class.

Gamtoos River Valley:

Further tests were carried out on the plant in the Paul Sauer hydro-electric power station and during this period supply was drawn from the station for use in the Valley. More work was required to be done before the station could be brought into permanent operation. Final commissioning is expected to take place early in 1971. The output of the station will depend on the quantity of water released from the dam for irrigation purposes in the Valley and the water required for supply to the Port Elizabeth Municipality at Loerie.

There was a slowing down in the rate of development of supplies in the Valley. Three additional consumers were connected to the reticulation system in Patensie bringing the total at the year end to 85 and in Hankey 8 were connected bringing the total to 60.

The 22 kV line from Kouga substation to supply the South African Broadcasting Corporation F.M. Station and the General Post Office micro-wave station at Kareedouw was completed and these supplies were connected in July.

The total number of consumers connected to the system at the year end was 202. Seven of these were large power users. Negotiations are in progress for supplies to industrial and domestic consumers in the village of Kareedouw and in the surrounding area.

Supplies to Rural Consumers

The whole of the system in the Sundays River valley is effectively a rural network. Five farming supplies and two large user supplies were connected during 1970.

In the Gamtoos River valley, five farmers and two other rural consumers as well as three large users were given supplies during the year. Terms were offered to a number of farmers in the Vensterhoek area but due to the poor response the scheme fell through. Applications from farmers in the Kareedouw area and at Zuuranys are being investigated.

Financial

The table on page 91 gives details of the units sold to the various classes of consumers, the total income received and the operating costs.

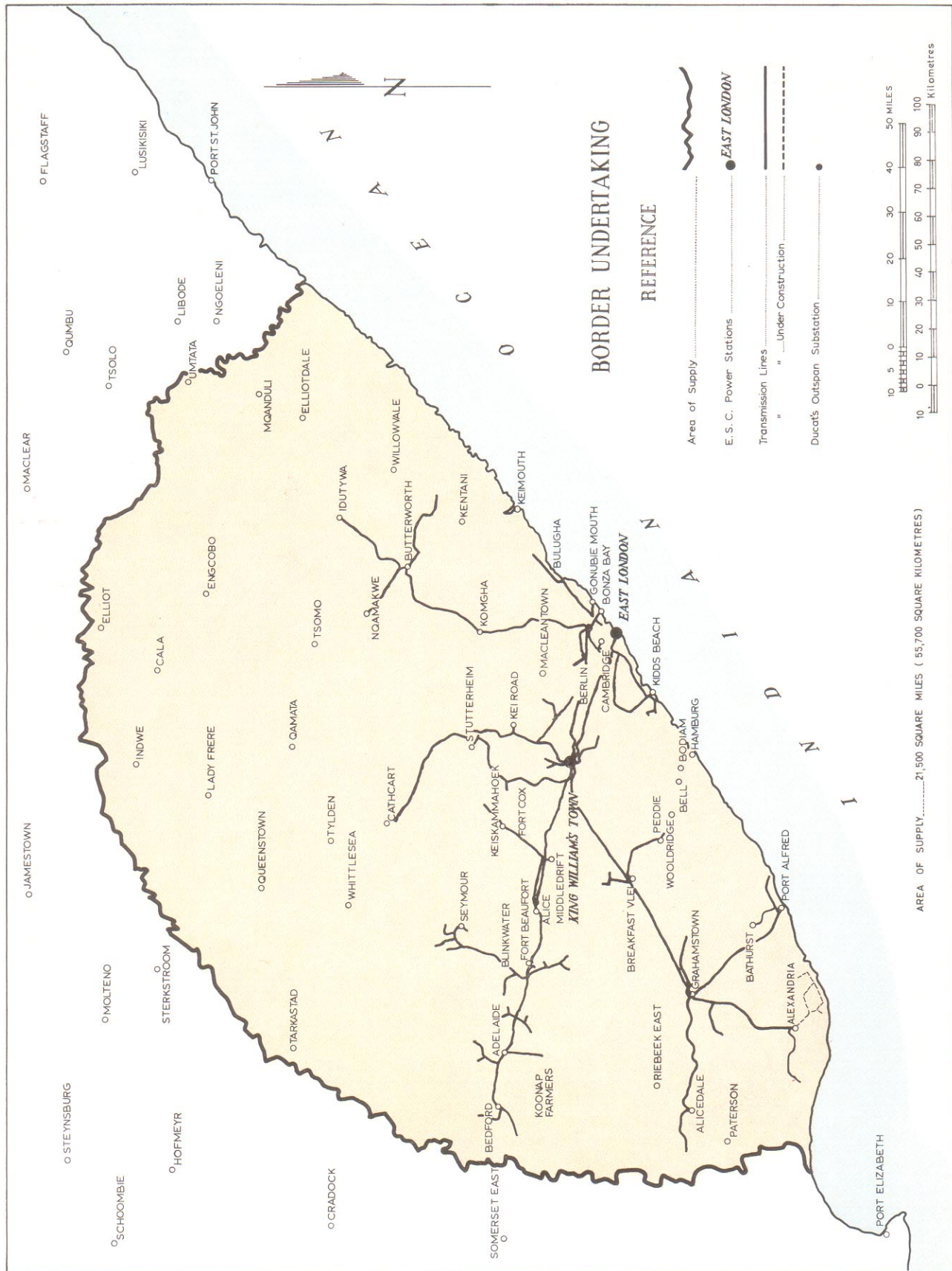
The average price per unit sold was 3,128 1 cents which was 5,83 per cent higher than the figure for 1969.

The total revenue for the year amounted to R192 000 and the total working costs to R233 000, resulting in a deficit of R41 000. The accumulated deficit at the end of 1970 was R97 000, which is a large amount for this small Undertaking.

The cost of electricity purchased will be reduced appreciably when the Paul Sauer power station is in permanent operation.

CAPE EASTERN UNDERTAKING

CONSUMER			SALES					REVENUE FROM SALES		AVERAGE PRICE PER kWh SOLD	
Class	Number		Proportion %		kWh		%Change	Rand	Rand	Cents	Cents
	1969	1970	1969	1970	1969	1970					
Traction.....	—	—	23,55	21,40	1 346 960	1 309 380	+17,36	—	25 919	27 651	2,111 8
Bulk.....	1	1	—	—	—	—	—	—	—	—	—
Mining.....	—	—	—	—	—	—	—	—	—	—	—
Industrial.....	97	109	45,93	45,93	2 627 028	2 809 613	+69,56	+ 6,95	77 334	91 469	3,255 6
Domestic.....	423	431	30,15	32,32	1 724 094	1 976 780	+23,03	+14,66	64 655	71 127	3,598 1
Street Lighting .	2	2	0,37	0,35	21 036	21 624	—	+ 2,80	1 139	1 111	5,137 8
Total	523	543	100,00	100,00	5 719 118	6 117 397	+39,55	+ 6,96	169 047	191 358	3,128 1
									1969	1970	Accumulated to 31/12/70
									R	R	R
Total Revenue.....									170 277	192 194	
Working Costs									193 923	233 063	
Surplus.....									—	—	
Deficit.....									23 646	40 869	
Capital Expenditure.....									216 106	—45 335	
											96 566



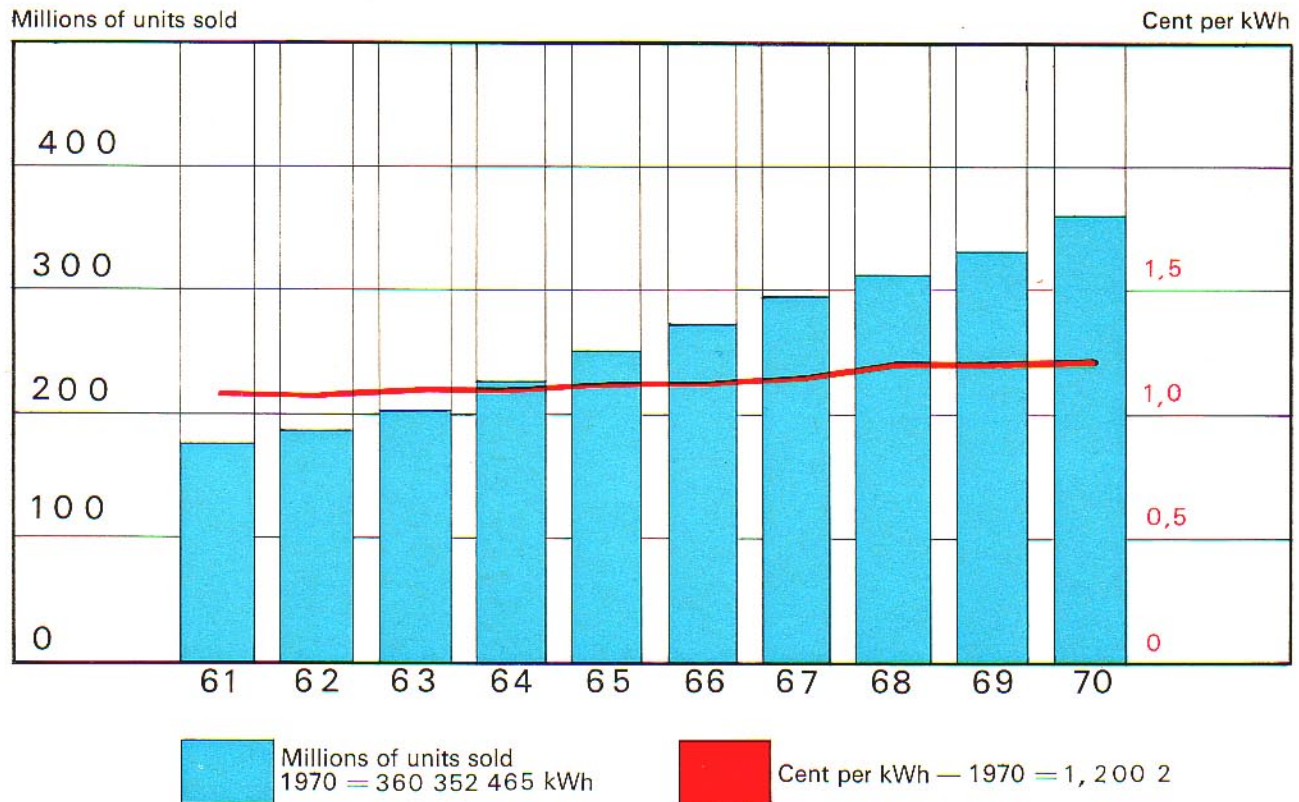
BORDER UNDERTAKING

The licensed area of supply of the Border Undertaking is shown on the map on page 92. Power for the Undertaking is generated at West Bank power station, which has an installed capacity of 117 MW, the small 3 MW power station at King William's Town being retained for standby purposes only. No further generating capacity is to be installed in these stations and future load growth in the Undertaking will be

catered for by a connection to Escom's main 400 kV network. It is planned to bring the supply from this network into service in the first half of 1973.

Sales of Electricity

The graph below indicates the increase in sales of electricity over the period 1961 to 1970, the red line showing the average price per unit sold.



Total sales increased from 178,8 million units in 1961 to 360,4 million units in 1970, an average annual increase over this period of 8,1 per cent, and an increase of 9,03 per cent over the sales figure for 1969.

The system maximum demand increased from 67 720 kW in 1969 to 70 170 kW in 1970.

Sales to the East London Municipality, which is the major bulk consumer on the Undertaking, increased by 7,73 per cent to 267 098 000 units and the maximum demand increased by 4,07 per cent from 53 760 kVA in 1969 to 55 950 kVA in 1970.

The total number of consumers on the Undertaking is 4 898, the net increase during the year being 321.

Development of the Undertaking

Negotiations are in progress for the acquisition of suitable sites for the new major substations to be erected: Pembroke near Berlin, Buffalo on the outskirts of East London, and Riverview near West Bank power station. Pembroke will be the intake

point for the supply from the 400 kV network over a 220 kV line from the 400/220 kV transforming station to be erected at Poseidon near Cookhouse. Buffalo distribution station will be the future bulk supply point for the East London Municipality and Riverview substation will be used to feed the output from West Bank power station into the 66 kV system.

In order to cater for industrial development at Butterworth, preparations are in progress for the erection of a 66 kV line from Ducats substation near East London to Butterworth and for the installation of a 66/22 kV substation at Butterworth with a firm capacity of 7,5 MVA.

The installation of the third 6 MVA 66/11 kV transformer at King William's Town substation was completed and the transformer was commissioned in September. A 2 000 kVA 33/11 kV transformer was installed at Fort Beaufort substation, bringing the firm capacity up to 2 000 kVA.

A new 11 kV terminal substation was erected at Stutterheim to provide increased capacity for the bulk supply to the Municipality. The reticulation

system in King William's Town has been purchased from Escom by the Municipality who will assume responsibility for the system as from 1st January, 1971. A bulk supply will be provided to the Municipality.

Supplies to Rural Consumers

70 farmers and 9 other rural consumers were given supplies during the year. For this purpose 65 kilometres of 11 kV line and 12 kilometres of 22 kV line were constructed.

The scheme to supply farmers in the Zuney area, west of Alexandria was almost complete at the year end and 23 farmers had been connected. The scheme involved the construction of 47,5 kilometres of 11 kV line. The scheme in the Boknes area, south-east of Alexandria, is under construction and is due for completion in the second half of 1971. For this scheme 43 kilometres of 11 kV line will be constructed to supply 22 farmers.

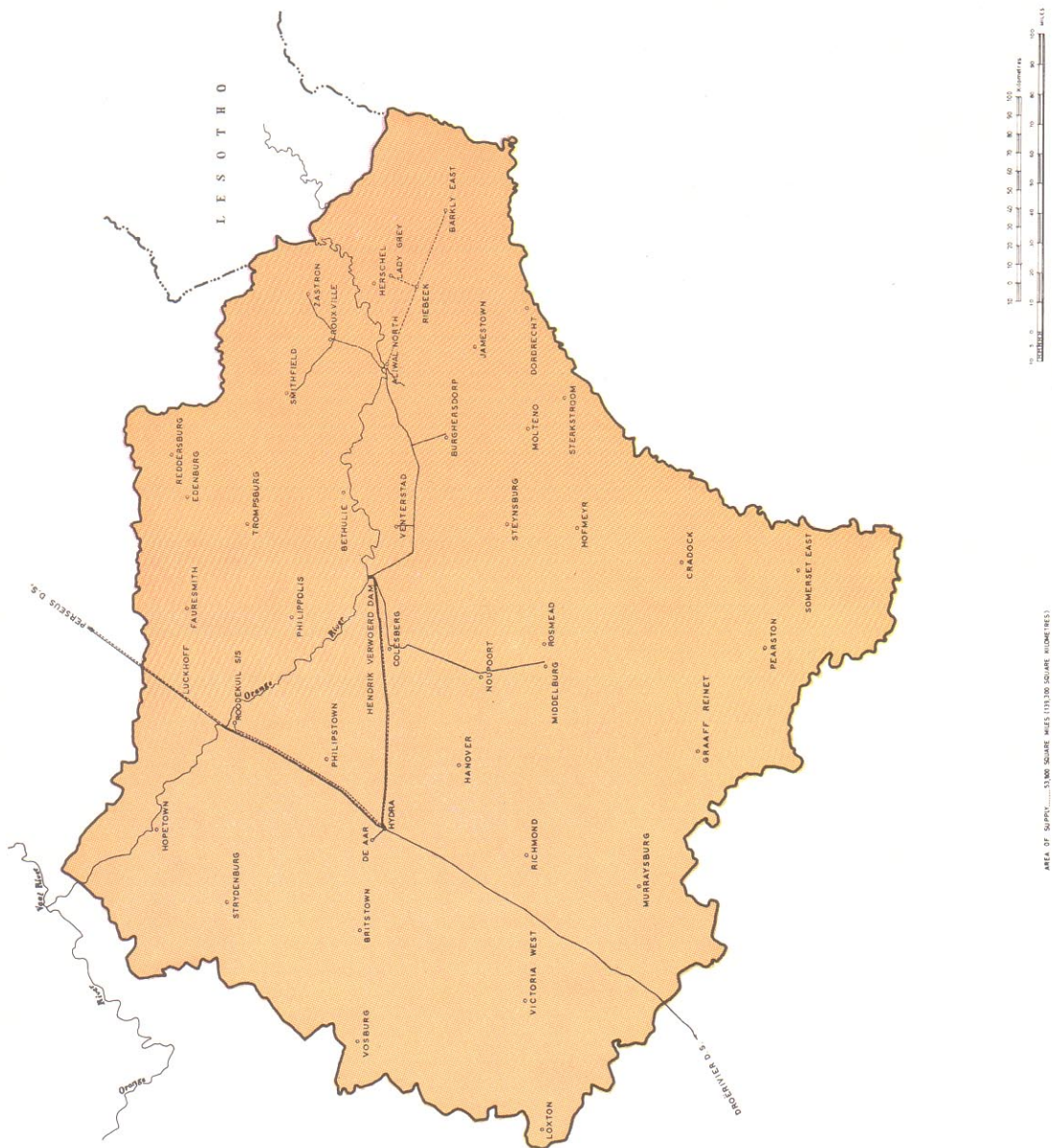
Financial

Details of sales, revenue and costs are given in the table on page 95. The total revenue for the year was R4 338 000 which is 9,7 per cent higher than the figure for 1969. Total costs amounted to R4 578 000 resulting in a deficit of R240 000 on the year's operation. This increased the accumulated deficit to R344 000. Analysis of the trend of revenue and working costs has indicated that due to the general rise in costs there is no possibility of the deficit being eliminated at the current tariffs and the decision has therefore been taken to increase the existing general surcharge of 5 per cent on the Undertaking's tariffs to 10 per cent with effect from July, 1971.

The average price per unit sold in 1970 was 1,200 2 cents which is slightly higher than the 1969 figure of 1,195 0 cents.

BORDER UNDERTAKING

CONSUMER			SALES			REVENUE FROM SALES		AVERAGE PRICE PER kwh SOLD	
Class	Number		Proportion %		kWh		%Change		Cents
	1969	1970	1969	1970	1969	1970	69/68	70/69	
Traction.....	—	—	—	—	—	—	—	—	—
Bulk.....	14	14	85,76	85,49	283 457 527	308 077 044	+ 5,70	+ 8,69	1,069 9
Mining.....	—	—	—	—	—	—	—	—	—
Industrial.....	437	462	6,87	6,82	22 704 561	24 575 789	+ 9,35	+ 8,24	2,103 2
Domestic.....	4 115	4 413	7,18	7,51	23 733 695	27 053 698	+ 13,17	+ 13,99	1,820 6
Street Lighting .	11	9	0,19	0,18	626 089	645 934	+ 4,07	+ 3,17	2,717 7
Total	4 577	4 898	100,00	100,00	330 521 872	360 352 465	+ 6,45	+ 9,03	1,195 0
					3 949 628	4 325 014			
					1969		1970		Accumulated to 31/12/70
Total Revenue.....					R		R		R
Working Costs					3 955 214		4 338 369		
Surplus					3 967 127		4 577 995		
Deficit.....					—		—		
Capital Expenditure.....					11 913		239 626		344 100
					1 251 984		759 756		



ORANGE RIVER UNDERTAKING

REFERENCE

- AREA OF SUPPLY.....
- TRANSMISSION LINES.....
- TRANSMISSION LINES UNDER CONSTRUCTION.....

AREA OF SUPPLY..... 13,000 SQUARE MILES (33,700 SQUARE KILOMETRES)



ORANGE RIVER UNDERTAKING

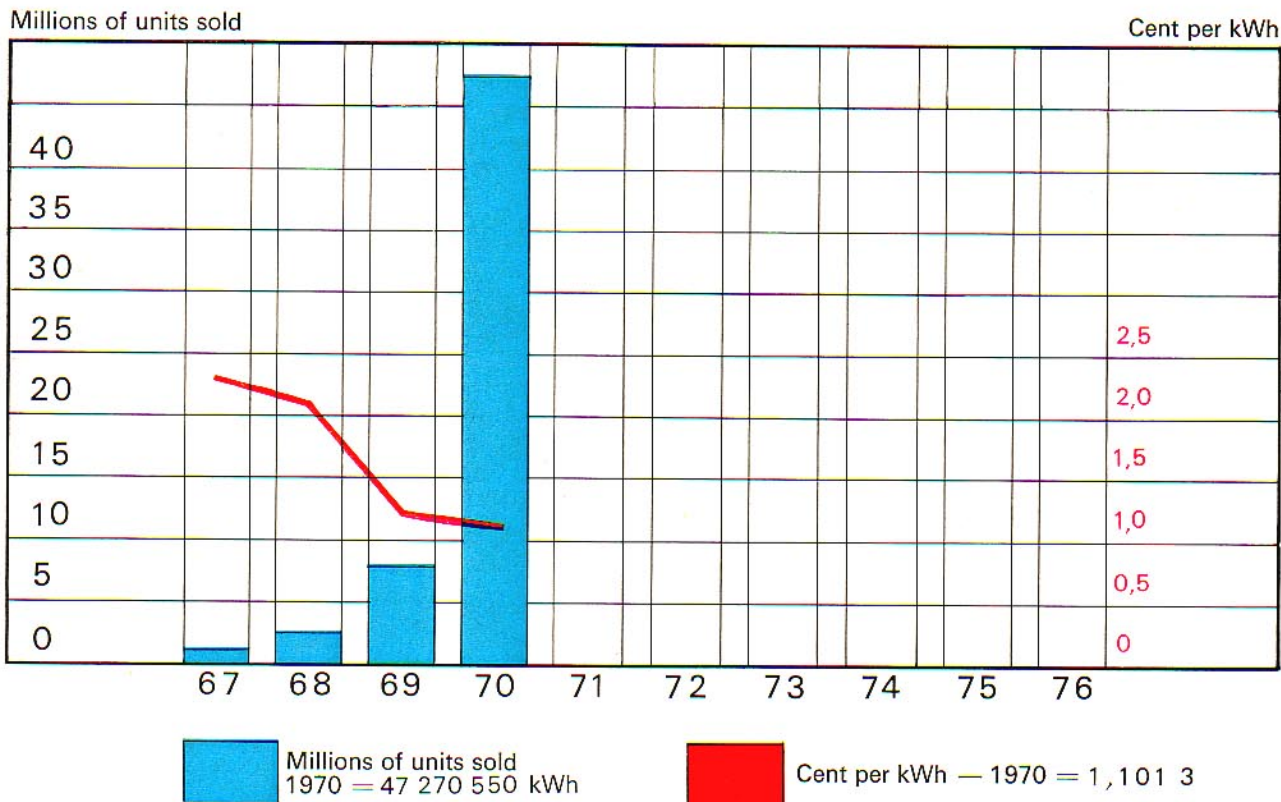
The licensed area of supply of the Orange River Undertaking is shown on the map on the opposite page.

The Undertaking purchases its power requirements from the pooled power stations of the Rand and Orange Free State and Eastern Transvaal Undertakings at a point of supply at Hydra distribution station.

Sales of Electricity

The total sales for 1970 amounted to 47,27 million units compared with 7,98 million units for the previous year. The sales to municipalities increased considerably to 39,00 million units.

Sales of electricity since the Undertaking went into operation are shown on the following graph, the red line being the average price per unit sold.



The large increases in units sold above the previous year's figures are in part due to the connection during October, 1970 of an industrial supply, which increased the monthly sales by 50 per cent.

The system maximum demand increased from 7 625 kW in 1969 to 12 420 kW in 1970 and the average overall price per unit sold decreased by 10 per cent from 1,221 9 cent the previous year to 1,101 3 cent for 1970.

A bulk supply was made available to Burgersdorp Municipality during June and a large power user supply to Orco Consortium during October, 1970.

Development of the Undertaking

The erection of a 25 km 22 kV line between Onverwag substation and Burgersdorp was completed and a supply furnished to this town in June. A 66 kV line of 24 km was erected between Badsfontein substation and Midshaft by the consumer, Orco Consortium, and a 66 kV supply at Badsfontein furnished during October.

Erection of the second Perseus — Hydra 400 kV line, scheduled for completion in October, 1971, was started. Negotiations for the Hydra — Poseidon 400 kV, Poseidon — Grassridge 220 kV and Grassridge — Chatty 132 kV line route servitudes were started. The lines and the associated Poseidon, Grassridge and Chatty distribution stations are scheduled to be erected in time to furnish supply to Port Elizabeth in 1973. In addition the erection of the second Hydra — Ruigtevallei 220 kV line (to be operated at 132 kV initially) was started. The completion of this line is scheduled to coincide with the commissioning of the first generator at Hendrik Verwoerd hydro-electric power station. Two short lengths of 132 kV lines will connect the power station with Ruigtevallei distribution station.

Negotiations were concluded for the takeover of the existing 66/11kV network between Bloemfontein and Oranjekrag by August, 1971. This network supplies electricity to six Southern Free State towns. As an interim measure, to ease the burden on the Bloemfontein municipal power station, supply will be

furnished to this network from Ruigtevallei distribution station from April, 1971.

Erection of a 132 kV line between Hydra and Roodekuil distribution stations was started. This line is scheduled for completion by April, 1971 to furnish supply to the Department of Water Affairs at the P. K. le Roux dam site.

The erection of a 22 kV line to Barkly East from Melkspruit distribution substation via Lady Grey is progressing favourably. Supply will be furnished to Lady Grey by the middle of 1971 and to Barkly East early in 1972.

Approximately 100 km of 22 kV and 11 kV lines are to be erected in the Southern Free State to furnish supplies to Fauresmith and Jagersfontein by August, 1971 and to three Post Office repeater stations during the last quarter of 1971.

Further towards the west negotiations were concluded for supplies to be furnished at 22 kV from Roodekuil to the Municipality of Petrusville and to Orania, the Van der Kloof Canals Township of the Department of Water Affairs, during the last quarter of 1971.

Rural Electrification

It was not possible to make supplies available to

farmers during the past year. This is mainly due to the shortage of manpower of the young developing Undertaking.

Negotiations have however been concluded for supply to the Goedemoed prison farm, some 35 km downstream from Aliwal North on the Orange River, by December, 1971. The erection of a 22 kV line from Melkspruit for this purpose should make it possible to make supplies, totalling about 500 kVA, available to riparian farmers.

Investigation of the Norvalspont/Donkerpoort and the Orania/Hopetown areas is being done and negotiations with a limited number of farmers along the present 22 kV line routes are under way.

Financial

The price per unit sold decreased by 10 per cent to 1,101 3 cent and the total cost per unit sold decreased by 28 per cent to 1,371 8 cent.

Total revenue for the year amounted to R531 000 as compared with total operating costs of R648 000. The resulting deficit of R117 000 on the year's working increased the accumulated deficit on the Undertaking's Revenue Account to R171 000.

ORANGE RIVER UNDERTAKING

CONSUMER			SALES				REVENUE FROM SALES		AVERAGE PRICE PER kWh SOLD	
Class	Number		Proportion %		kWh		%Change		Rand	Cents
	1969	1970	1969	1970	1969	1970	69/68	70/69		
Traction.....	—	—	—	—	—	—	—	—	—	—
Bulk.....	9	10	93,96	82,50	7 498 620	38 999 900	+ 259,23	+ 420,09	87 600	1,168 2
Mining.....	—	—	—	—	—	—	—	—	—	—
Industrial.....	3	4	6,04	17,50	482 356	8 270 650	+ 41,64	+ 1614,64	9 920	2,056 6
Domestic.....	—	—	—	—	—	—	—	—	—	—
Street Lighting.	—	—	—	—	—	—	—	—	—	—
Total	12	14	100,00	100,00	7 980 976	47 270 550	+ 228,71	+ 492,29	97 520	1,221 9
									520 589	1,101 3
									Accumulated to 31/12/70	
									1969	1970
									R	R
Total Revenue.....									99 042	531 332
Working Costs									151 103	648 436
Surplus									—	—
Deficit.....									52 061	117 104
Capital Expenditure.....									6 060 942	10 544 636
									170 866	

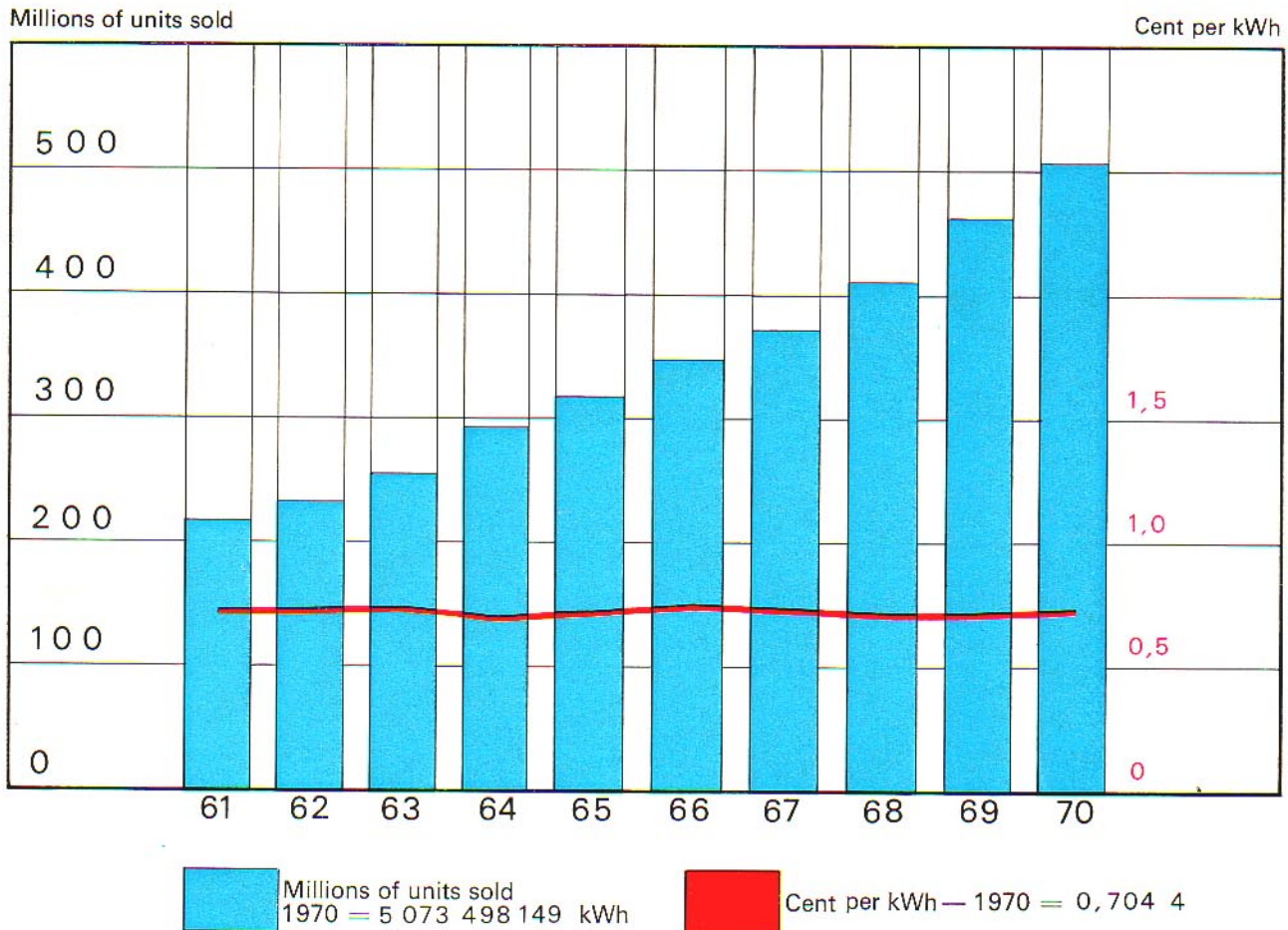
NATAL UNDERTAKING

The licensed area of supply of the Natal Undertaking, which combines the areas of supply of the Natal Central Licence and the Natal Southern Licence, was amended during the year to permit the proposed expansion of the system in the Pongola area, and the S.A.R. electrification between Vryheid and Empangeni. In addition, to allow for the supply to Kokstad, the Mount Currie magisterial area was included in the area of supply. A further application to the Control Board is being made for the inclusion of the magisterial area of Matatiele and it is proposed to construct a transmission line during 1971, from Kokstad, for the supply to Matatiele.

This Undertaking has four power stations, Congella and Umgeni power stations near Durban, Colenso in the Natal Midlands and Ingagane power station in Northern Natal. Import of power via a 400 kV line between Camden power station and Ingagane will be necessary to meet the anticipated system demand in 1971.

Sales of Electricity

The graph indicates the increase in sales of electricity over the period 1961 to 1970, the red line being the average price per unit sold.



Units generated by the pooled power stations of the Natal Undertaking increased from 5 178,3 million units in 1969 to 5 556,1 million units in 1970, an increase of 7,29 per cent. In addition there was a net import of 135,3 million units from the Rand and O.F.S. Undertaking mainly through the 132 kV interconnector between Taaibos power station on the Rand and O.F.S. Undertaking and Bloukrans substation.

Total sales from the interconnected system of the Undertaking increased from 4 637 million units in 1969 to 5 073 million units in 1970. The increase for the year was 9,4 per cent, which is lower than the

12,5 per cent increase recorded for the year 1969.

With the exception of mining, all classes of consumer reflected lower rates of increase in consumption during 1970 than 1969.

Bulk supplies to municipalities showed an increase of 7,6 per cent to 3 201 million units sold during 1970. The Durban Corporation purchased 78,6 per cent of these units, its consumption rising by 7,2 per cent over their 1969 figure. Pietermaritzburg's purchases for the year increased by 8,5 per cent to 332 million units.

Sales to the South African Railways for traction purposes rose by 12,5 per cent to 752 million units.

The increase in industrial supplies during the year

amounted to 12,8 per cent with 872 million units sold to this class of consumer. Sales to the South African Railways for pumping petroleum products and crude oil totalled 87 million units during 1970 as compared to 51 million units in 1969. Ferrolloys increased their consumption by 6 per cent to 281 million units and Union Glass Works at Talana increased their consumption by 16 per cent to 39 million units.

Sales to mines increased by 15,5 per cent from 133 million units in 1969 to 154 million units in 1970.

Sales to domestic consumers increased by 10,8 per cent from 84 million units in 1969 to 93 million units in 1970.

Development of the Undertaking

The programme of major system expansion has continued unabated during 1970. Good progress was made with the third interconnection between Ingagane power station and Georgedale substation. This will be commissioned early in 1971 via the 400 kV line from Ingagane to Mersey substation, (energised initially at 275 kV) the new Mersey substation to the east of Pietermaritzburg and a 275 kV line from Mersey to Georgedale.

Soon after this interconnector has been commissioned work will be started on the Bloukrans 275 kV substation at Colenso. The two existing 275 kV interconnectors will be turned into this substation to provide a new infeed to the system which will supplement and ultimately replace the Colenso power station. Work has started on a second 132 kV line from Bloukrans to Colenso, where the existing 132/88 kV substation will be extended and remodelled.

During 1971 the first of two 400 kV lines from Camden to Chivelston and a short 275 kV link from Chivelston to Ingagane power station are to be completed. Work on the Chivelston 400/275 kV substation is well advanced. A second 400 kV line from Camden is planned for 1972.

At Richards Bay, construction of the Impala and Alusaf substations catering for supplies to the aluminium smelter are approaching completion and will be commissioned as soon as the first of the two 275 kV lines from Mersey to Impala and the first 132 kV line from Impala to Alusaf have been completed in 1971. These lines will be duplicated before the end of 1971 to provide a firm supply.

The existing Zululand system will be strengthened from Impala during 1971 by means of a duplicate 132 kV infeed to the new 132/88 kV substation at present under construction at Empangeni.

For supply to Northern Zululand a 132 kV line of approximately 210 km in length will be erected from Impala substation during 1971, with substations located at Mtubatuba, Hluhluwe and Pongola, feeding extensive new 22 kV rural networks and including supplies to the townships of Kwambonambi, Mtubatuba and Pongola and to the Department of Defence rocket range near Hluhluwe. Work on the rural networks has already commenced. Limited supplies have already been provided to Kwambonambi and Mtubatuba from the existing rural system north of Empangeni.

The Durban Corporation took supply during 1970 from the new 275/132 kV Klaarwater substation and in Durban the South African Railways were given

a limited supply at 88 kV for new harbour extensions in the Bayhead area. The permanent supply suitable for 20 MVA of load will be provided during 1971 from a new switching substation to be built adjacent to Congella Power Station.

To cater for the load development on the Lower South Coast a new 88/11 kV substation at Redhill near Southport was commissioned during the year. Further strengthening with new 11 kV lines from the substation towards Hibberdene will be carried out during 1971.

A supply was provided to Kokstad Municipality during 1970 following completion of the 88 kV line from Ingeli to the substation at Kokstad. Construction of a 33 kV line from Kokstad to Matatiele and a stepdown substation at Matatiele for supply to the Municipality will be started early in 1971.

The rapid growth of load in the Vryheid/Hloboane area has necessitated a third 88 kV feeder link with Ingagane. This was achieved by extending the Ingagane/Utrecht line by about 40 km to Bloedrivier. The Vryheid Municipality have asked for a permanent supply which will be provided in 1972 from a new 88/11 kV substation near the town.

In the Orange Free State supplies were made available to a total of eight new traction substations between Harrismith and Arlington. Two others were supplied on the upper South Coast. Supplies are being planned to five traction substations between Mandini and Richards Bay plus a further eleven along the route of the proposed railway line from Vryheid to Empangeni. These supplies will be provided in stages up to the end of 1975.

Major system planning to cater for the requirements of the Iscor Works at Newcastle provides for the establishment by 1973 of a 400/132 kV substation to be known as Incandu, fed from the Camden/Chivelston 400 kV lines. This substation will also cater for the anticipated increased load requirements of the town. A temporary construction supply of 2,5 MVA will be made available to Iscor by the end of 1971.

During 1971 it is proposed to rebuild and increase the capacity of the 88/33 kV interconnector substation at Congella, to permit a larger import from the remainder of the system.

Rural Development — 1970

Development of the rural network took place over a wide area in Natal. A total of 360 new farm supplies were made available during the year. This involved the building of 374,5 km of transmission line. In addition 242 other rural consumers were connected. Of these new farm connections 120 were supplied in the Ixopo/Pietermaritzburg/Greytown area, where 159 km of line were built. The existing system in central Natal was extended to supply an additional 72 farmers involving 47,5 km of line, while in northern Natal and the Bethlehem/Warden/Vrede area 100 km of line were built to supply 65 farms. On the North Coast and Zululand 62,7 km of line were completed to supply 76 farms, while an additional 27 farmers' supplies, involving 5,9 km of line, were given on the South Coast.

It is anticipated that the town of Melmoth and a number of rural consumers will be connected to Escom's supply system by the end of 1971 and a

large number of farmers in the Seven Oaks/Riet Vlei areas will also receive supplies towards the end of the year. Supplies have been made available to a large number of farms in the Grüneek rural area. Construction work is in progress for supplies to the Pongola and Mtubatuba areas and negotiations are being re-opened for supplies in the Hluhluwe area.

Terms have been quoted for a number of other schemes with 763 quotations awaiting replies at the year end. During the year a total of 926 rural consumers, including farmers, accepted Escom's terms for supply.

Financial

Details of units sold to the various classes of

consumers, the total revenue as well as the operating costs for 1970 are given in the table on page 104.

The average price per unit sold increased by 0,76 per cent during 1970 to 0,704 4 cents per unit.

The cost per unit sold decreased from 0,707 9 cents per unit in 1969 to 0,693 5 cents per unit during 1970, an improvement of 2 per cent. This was mainly due to the increased use made of the more economical Ingagane power station which generated more than half the total units sold in the Undertaking.

Total revenue for the year amounted to R35 946 000 as compared with working costs of R35 183 000 resulting in a surplus of R763 000 which increases the accumulated surplus on the Undertaking's Revenue Account to R1 764 000.

NATAL UNDERTAKING

CONSUMER			SALES				REVENUE FROM SALES		AVERAGE PRICE PER kwh SOLD			
Class	Number		Proportion %		kWh		%Change		Rand	Cents		
	1969	1970	1969	1970	1969	1970	69/68	70/69				
Traction.....	12	13	14,41	14,81	667 916 534	751 538 499	+ 15,14	- 12,52	5 280 948	0,790 7		
Bulk.....	26	28	64,19	63,09	2 976 464 052	3 201 063 980	+ 11,05	+ 7,55	18 559 708	0,623 5		
Mining.....	33	32	2,87	3,03	133 242 097	153 865 475	+ 2,04	+ 15,48	1 087 477	0,816 2		
Industrial.....	3 350	3 688	16,68	17,19	773 220 259	871 982 629	+ 18,03	+ 12,77	6 136 354	0,793 6		
Domestic.....	13 704	14 823	1,81	1,84	83 999 814	93 099 657	+ 13,84	+ 10,83	1 315 343	1,565 9		
Street Lighting..	63	67	0,04	0,04	1 850 698	1 947 909	+ 9,72	+ 5,25	35 520	1,919 3		
Total	17 188	18 651	100,00	100,00	4 636 693 454	5 073 498 149	- 12,50	+ 9,42	32 415 350	699 1		
										35 738 840	0,704 4	
										1969	1970	Accumulated to 31/12/70
										R	R	R
Total Revenue.....										32 592 104	35 946 031	
Working Costs										32 822 483	35 182 584	
Surplus.....										—	763 447	1 763 847
Deficit.....										230 379	—	
Capital Expenditure.....										10 941 541	14 695 025	

RAND AND ORANGE FREE STATE UNDERTAKING

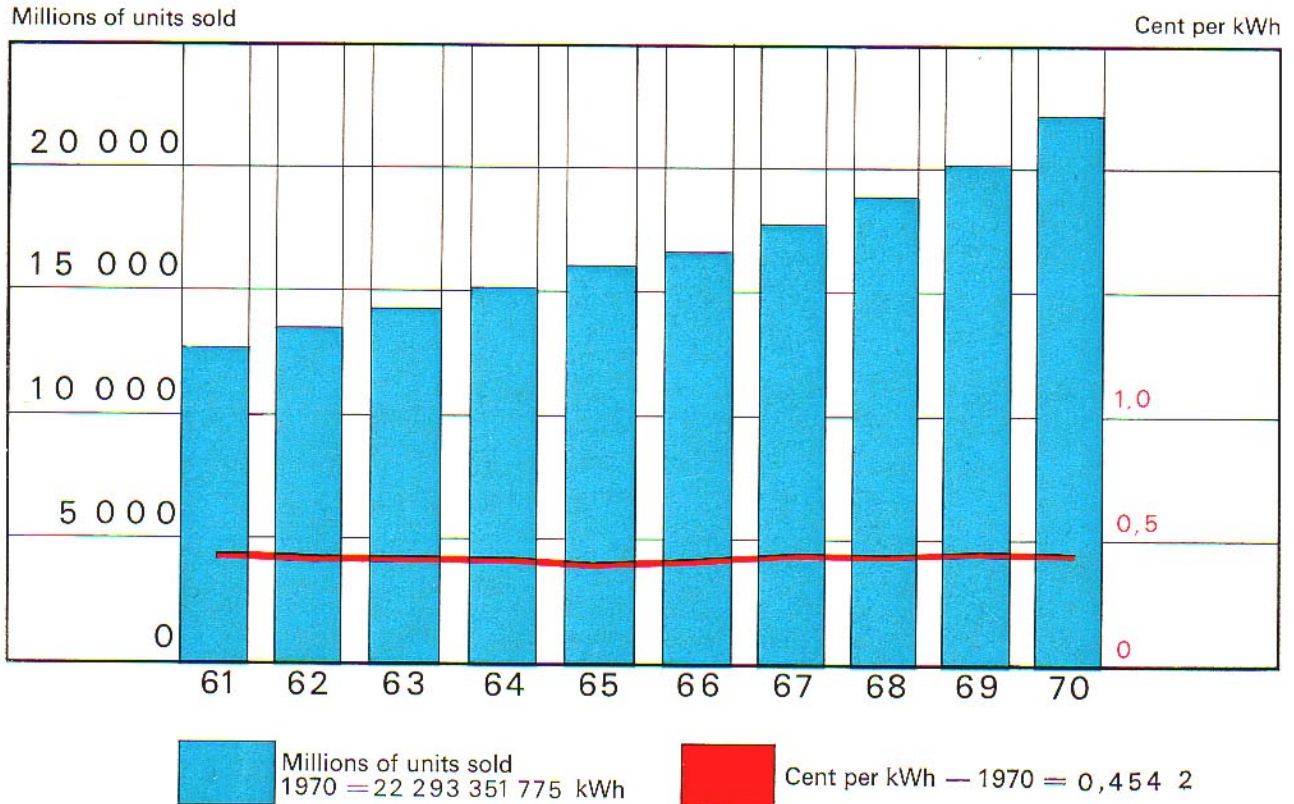
The licensed area of supply of the Rand and Orange Free State Undertaking is shown on the map on page 106.

Applications to the Electricity Control Board are being prepared for extensions to the licensed area to include the northern Transvaal as far as Messina,

areas in the south-western Orange Free State including Bloemfontein and also areas around Pretoria.

Sales of Electricity

The following graph indicates the increase in sales of electricity over the period 1961 to 1970, the red line being the average price per unit sold.



Over the years covered in the graph, the total units sold increased from 12 700 million units in 1961 to 22 293 million units in 1970. The average annual increase over the past 10 years was 6,35 per cent.

The sales of electricity during 1970 was 10,26 per cent above that for 1969 and this growth rate is well over the average for the past 10 years.

Development of the Undertaking

Completion of the 400 kV lines from Vulcan distribution station to Apollo distribution station was delayed due to the shortage of steel and cement. This shortage has also delayed work on the second 400 kV line from Grootvlei power station to Perseus distribution station which it is now anticipated will only be completed in the second half of 1971.

In addition to the proposed Trident distribution station/Northam 275 kV line, plans are now in hand for a further 275 kV line (to be operated initially at 88 kV) from Trident distribution station to the Marikana area to cater for the development in platinum mining.

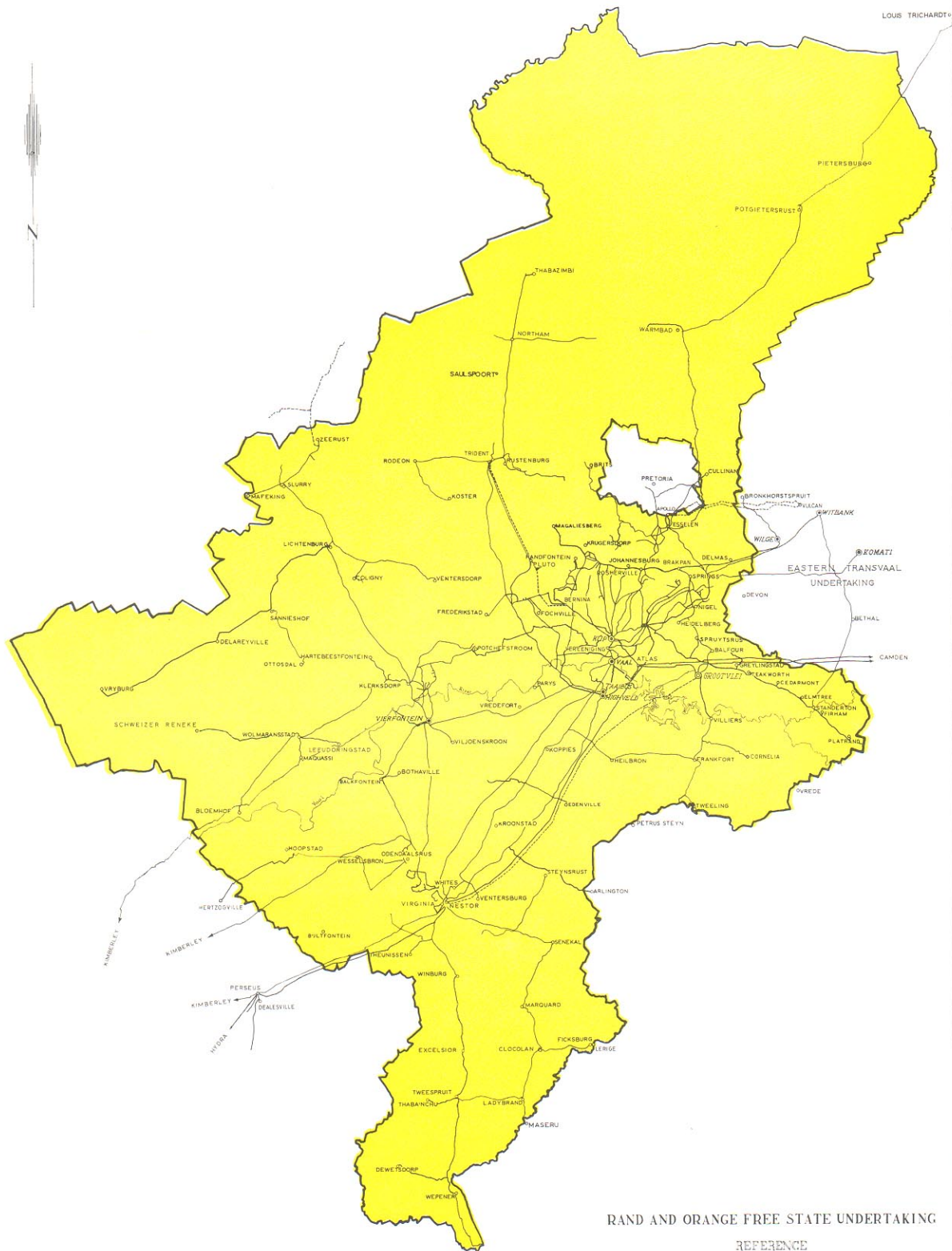
The 132 kV line connecting this Undertaking's system with the Natal Undertaking's system was completed during 1970 and will during 1971 be utilised to supply the South African Railways' electrified system between Kroonstad and Harrismith.

Apollo distribution station was completed in November, 1970 but has not been fully commissioned due to delays in line work. The shortage of steel and cement has also delayed the commissioning of Jupiter and Trident distribution stations which are now only expected to be in operation by July or August, 1971.

In order to reinforce the supplies to Benoni Municipality and Dunswart Iron and Steel Works Limited a new 132/42 kV substation equipped with four 90 MVA transformers and fed by two 132 kV lines was brought into full operation during December, 1970.

Work has commenced on a new 88/22 kV supply for the Springs Municipality which is scheduled for completion early in 1971.

A second supply point was provided to the Virginia Municipality to augment the original supply.



RAND AND ORANGE FREE STATE UNDERTAKING REFERENCE

- Area of Supply
- E.S.C. Power Stations
- Transmission Lines
- Transmission Lines under construction



AREA OF SUPPLY.....73,200 SQUARE MILES (189,600 SQUARE KILOMETRES)

Work was commenced on new 132/11 kV supplies to Vanderbijlpark and Parys Municipalities.

An agreement was concluded with the Messina (Transvaal) Development Company Limited for the provision of a supply during 1972.

An 11 kV supply was given to the Lesotho Electricity Corporation at a point on the border near Ficksburg.

A 33 kV supply via a 90 MVA 132/33 kV transformer was made available in April, 1970 to Iscor at their Vanderbijlpark Works for their new combination mill, and a further 33 kV supply was made available in October via the new 275/33 kV Olympus substation where two 90 MVA 275/33 kV transformers are installed for Iscor's two 60 MVA furnaces. Olympus at this stage is supplied by means of a single 275 kV line from the Scafell distribution station.

The load drawn by the existing platinum mines in the Rustenburg area showed a further large growth with an additional 20 MVA of transformer capacity being installed at Impala platinum mines and a further point of supply being provided to Rustenburg platinum mine.

An initial supply was given to the new Babalegi industrial township, which is being developed by the Bantu Investment Corporation and considerable increase in load in this township is expected during 1971.

An 88/11 kV substation with two 25 MVA transformers was commissioned in November, 1970 for supply to the Nation Petroleum Refiners in Sasolburg.

Rural Electrification

The construction of rural reticulation networks and the investigation and planning of new rural electrification schemes were retarded by a shortage of skilled and technical personnel.

During 1970 a total of 715 new farm supplies were given and 677 kilometres of transmission line were built. The majority of new supplies was furnished by means of extensions to existing schemes, and the greatest development took place in the following areas (the additional numbers of supplies made available being given in brackets):—

Brits (200),
Potchefstroom South (55),
Magaliesburg/Tarlton (76),

Crocodile River Valley (south of Hartebeespoort Dam) (48),

Coligny (43),

Vierfontein/Viljoenskroon/Bothaville (45),

Balfour/Greylingstad (21),

New schemes involving 366 supplies were started in the following areas and a total of 67 consumers were connected by the year end:—

- (i) East of Nigel,
- (ii) Between Heidelberg and Vereeniging,
- (iii) South of Thabazimbi,
- (iv) Hennenman District,
- (v) South of Theunissen,
- (vi) De Pan (to the north of Carletonville).

Terms were accepted in the case of six schemes and construction will commence in due course. These are the following, with the number of consumers included in the initial scheme shown in brackets:—

Janpan (area to the north of Theunissen) (76),

Bultfontein (to the north-west of Bultfontein town) (23),

Villiers area (south and south-east of Villiers) (18),

Rayton and Cullinan area (71),

Area to the north and north-east of Klerksdorp (37),

Area to the west of Bloemhof (50).

Possible new schemes in various parts of the Undertaking were investigated. Terms were offered to potential consumers and the Undertaking is awaiting the response to these offers.

A large number of applications from Farmers' Associations is on hand for consideration as soon as the opportunity offers.

Financial

The price per unit sold as shown by the red line on the graph was 0,454 2 cents for 1970. This includes the effect of a tariff increase of 2 per cent introduced on the 1st July, 1970.

There was a deficit of R2 972 000 on Revenue Account for the year, increasing the accumulated deficit to R4 082 000.

RAND AND ORANGE FREE STATE UNDERTAKING

CONSUMER			SALES					REVENUE FROM SALES		AVERAGE PRICE PER kWh SOLD		
Class	Number		Proportion %		kWh		%Change		Rand	Rand	Cents	Cents
	1969	1970	1969	1970	1969	1970	69/68	70/69				
Traction.....	2	2	3,92	3,57	792 361 077	796 894 561	+ 1,91	1 0,57	4 339 670	4 412 020	0,547 7	0,553 7
Bulk.....	131	137	16,08	16,23	3 251 016 948	3 617 274 060	+ 8,43	+ 11,27	15 969 332	17 569 285	0,491 2	0,485 7
Foreign (Lesotho).....	1	2	0,04	0,04	7 275 983	8 824 906	—	+ 21,29	37 574	67 248	0,516 4	0,762 0
Mining.....	102	101	54,50	54,48	11 019 245 173	12 148 655 026	+ 5,21	+ 10,25	47 406 049	51 906 645	0,430 2	0,427 3
Industrial.....	2 086	2 236	24,04	24,13	4 860 401 182	5 379 006 557	+ 8,54	+ 10,67	21 340 334	23 488 346	0,439 1	0,436 7
Domestic.....	23 184	25 421	1,41	1,54	287 643 347	342 593 545	+ 16,17	+ 19,10	3 257 222	3 806 901	1,132 4	1,111 2
Street Lighting.	7	2 236	0,01	0,01	124 303	103 120	+ 33,97	- 17,04	2 363	2 170	1,901 0	2,104 3
Total	25 513	27 906	100,00	100,00	20 218 068 013	22 293 351 775	+ 6,53	+ 10,26	92 352 564	101 252 615	0,456 8	0,454 2
									1969	1970	Accumulated to 31/12/70	
									R	R	R	
Total Revenue.....									92 709 799	101 608 214		
Working Costs.....									92 680 014	104 579 958		
Surplus.....									29 785	—		
Deficit.....									—	2 971 744		
Capital Expenditure.....									114 995 664	116 534 920	4 081 525	

EASTERN TRANSVAAL UNDERTAKING

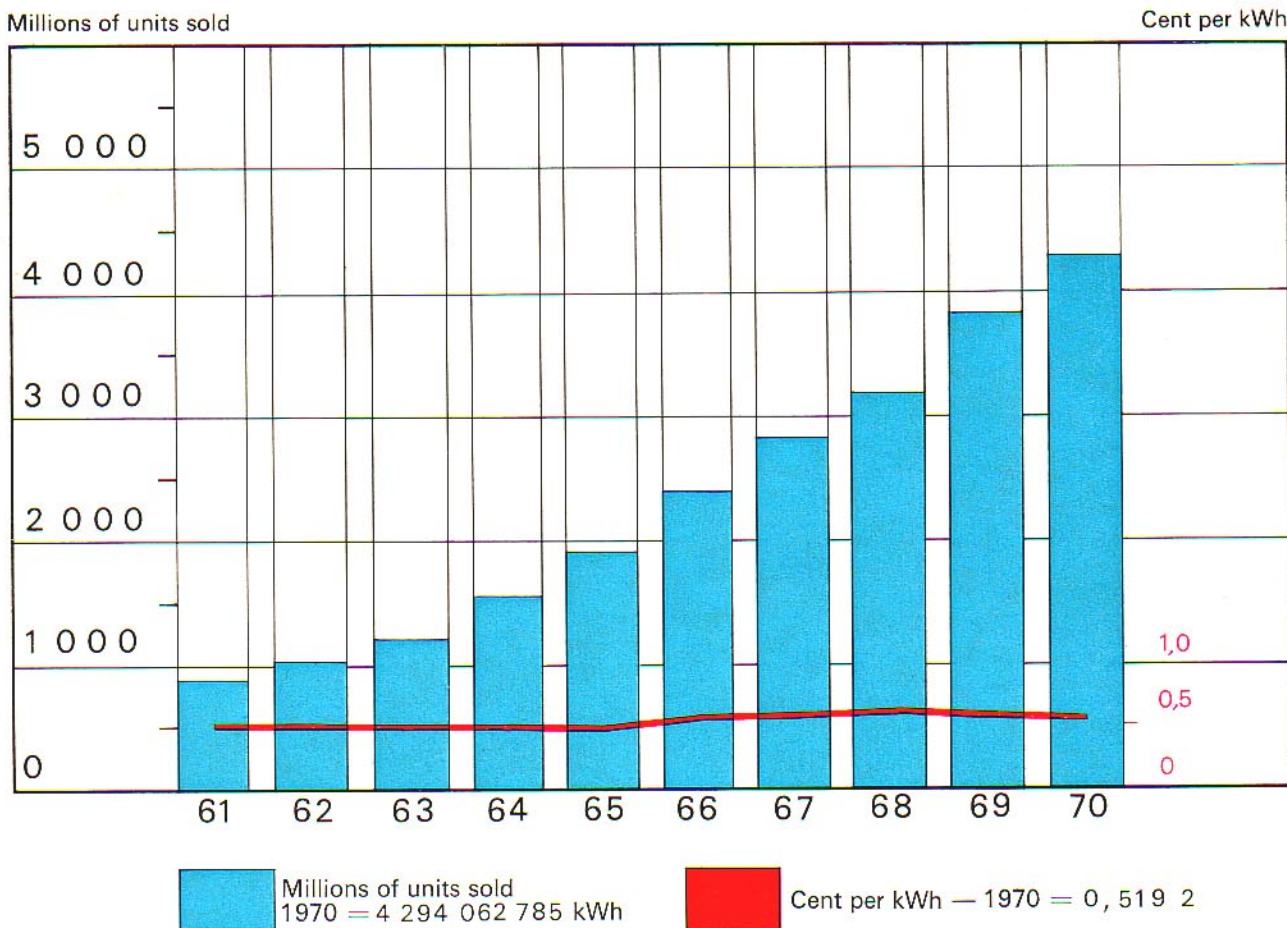
The licensed area of supply of the Eastern Transvaal Undertaking is shown on the map on page 110.

This Undertaking was first established in 1925 when it was known as the Witbank Supply System and the licensed area of supply was confined to a small area centred around the town of Witbank. At the end of 1970 the Undertaking stretched from Bronkhorstspuit and Devon in the west to Komatipoort and Piet Retief respectively on the Mocambique and Swaziland borders in the east and as far north as Phalaborwa.

Sales of Electricity

During 1970 sales of electricity increased by 12,3 per cent, as against 19,8 per cent in 1969. The 1969 figure was however exceptional and was mainly due to a very large steelworks coming into full production. Several large industries in the Undertaking have contracted to take increased supplies in the next year or two and it is therefore likely that the figure of 12,3 per cent will again be exceeded.

The increase in sales over the period 1961 to 1970 is shown in the following graph, the price per unit sold being indicated by the red line:



Two new bulk supplies were given during the year, one to the Transvaal Board for Peri-urban Areas for the supply to the township of Clewer and the other to the town of Lydenburg.

Development of the Undertaking

A large part of the development of the distribution system of the Undertaking which took place in 1970 was associated with the new power stations under construction in the Eastern Transvaal.

At Hendrina power station the first 26 km of two 400 kV lines was completed and energised at 132 kV to enable the first two 200 MW generating sets to feed

into the pooled generation system. A 132 kV line from Witkloof to Wintershoek and a 132/3,3 kV stepdown substation was energised to provide power for the pumps at Nootgedacht dam near Carolina in order to pump water to both Arnot and Hendrina power stations. Good progress has been made with the extension of the 132 kV line beyond Wintershoek to Bosloop booster station and Kafferskraal dam near Badplaas where further water supplies to the two power stations are to be provided. Work also commenced on the substations at Bosloop and Kafferskraal.

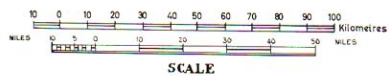
The 400 kV lines being constructed from Hendrina and Arnot power stations are to terminate at Vulcan



EASTERN TRANSSVAAL UNDERTAKING

REFERENCE

- Area of Supply
- E.S.C. Power Stations
- Transmission lines
- Transmission lines under construction



AREA OF SUPPLY.....35,700 SQUARE MILES (92,500 SQUARE KILOMETRES)

400/132 kV distribution station near Witbank and from this point other 400 kV lines are under construction to Apollo substation.

With the closing down of Witbank power station early in 1970, arrangements had to be made to augment supplies to the Witbank area and during the year a 60 MVA, 132/88 kV transformer was commissioned at Kudu distribution station and from there a new 88 kV line was erected via Geluk to Middel drift distribution station. Work is in progress on the installation of additional transformer capacities at Geluk and Middel drift mainly for mining supplies.

In order to make a bulk supply of electricity available to the town of Lydenburg, it was necessary to turn in the Machadodorp/Penge 132 kV line into a new 132/22 kV substation erected for this supply.

It is planned to give a bulk supply to the Portuguese Government on the Mocambique border near Komatipoort by erecting a 275 kV line from Marathon distribution station near Nelspruit. Towards the end of the year excavation work for the extensions required at Marathon were commenced.

In order to give supplies to a large steelworks at present under erection near Machadodorp and to reinforce existing supplies, a 275/132/33 kV distribution station known as Prairie has been planned.

In the Phalaborwa area good progress had been made by the year-end on the construction of the new 132/11 kV distribution station to be known as Chemie. This new supply point has become necessary because of the expansion of the fertiliser and chemical factories nearby. The Foskop/Selati 132 kV line has been turned in to supply this new distribution station. At the same time the opportunity has been taken to re-organise supplies and re-route unsuitable line routes in the area.

A start was made on bush clearing for the new Middelburg/Groblersdal/Marble Hall 88 kV line. Such has been the development in the Groblersdal/Marble Hall area that the delay in building this 88 kV line, through servitude difficulties, has resulted in the temporary suspension of all new and increased supplies in this area.

Several supplies were required for radio communication and domestic purposes at the top of

Mariepskop. In order to make these supplies available in 1970 some unusual construction methods had to be resorted to. A 22 kV line was built as far as possible up the mountain and when it was no longer practicable to excavate holes for planting poles a 22/11 kV regulated stepdown point was established and from there to the top of the mountain the supply was conveyed by a special type of plastic insulated cable. Due to the rocky nature of the ground it was not possible to bury this cable and it is consequently supported just above ground level by a bridle wire which is in turn supported by brackets which had to be grouted into the rock face.

Rural Electrification

As in previous years the demand for rural supplies continues unabated and with the difficulty of obtaining suitable labour and certain items of material the average delay in making rural supplies available is six to nine months.

Probably the greatest demand for rural supplies at present is in the field of spray irrigation which is being used on an increasing scale on the sugar farms of the Lowveld. Extensive development also took place in the Groblersdal/Marble Hall area and on the Highveld.

During the year new supplies were made available to 354 farms and to 64 other consumers in rural areas. In the small towns and villages supplied in the rural areas, 229 new supplies and 27 increased supplies were made available.

Due to increasing labour, material and transport costs and increased interest charges on capital, rural consumers have in general had to be quoted higher extension charges than in previous years.

Financial

Despite increased costs, the average price per unit sold decreased from 0,536 6 cents per unit in 1969 to 0,519 2 cents per unit in 1970. This decrease can be attributed to the lower costs per unit generated in the large new power stations coming into operation and to the increasing industrial loads with high load factors.

EASTERN TRANSVAAL UNDERTAKING

CONSUMER			SALES				REVENUE FROM SALES		AVERAGE PRICE PER kwh SOLD		
Class	Number		Proportion %		kWh		%Change		Rand	Cents	
	1969	1970	1969	1970	1969	1970	69/68	70/69			
Traction.....	7	7	7,07	6,30	270 223 270	270 335 915	+ 0,11	- 0,04	2 017 668	1 964 443	0,726 7
Bulk.....	20	22	5,46	5,74	208 837 981	246 680 461	+13,48	+18,12	1 234 451	1 390 470	0,563 7
Foreign L.M. ...	1	1	—	0,01	114 600	576 800	—	+403,32	3 351	8 658	1,501 0
Mining.....	82	84	32,61	32,16	1 247 348 685	1 380 943 206	- 7,27	+10,71	6 803 777	7 132 506	0,545 5
Industrial.....	2 070	2 405	53,88	54,85	2 060 599 349	2 355 391 959	+33,85	+14,31	9 896 406	11 194 870	0,475 3
Domestic.....	4 773	5 067	0,96	0,92	36 633 127	39 386 358	+ 6,19	+ 7,52	542 782	581 524	1,476 5
Street Lighting.	23	23	0,02	0,02	656 828	748 086	+ 8,40	+13,89	21 667	22 427	2,997 9
Total	6 976	7 609	100,00	100,00	3 824 413 840	4 294 062 785	+19,84	+12,28	20 520 102	22 294 898	0,536 6
Accumulated to 31/12/70											
			1969		1970						
			R		R				R		
Total Revenue.....			20 620 091		22 449 155						
Working Costs			19 594 017		22 147 899						
Surplus.....			1 026 074		301 256				3 639 830		
Deficit.....			—		—						
Capital Expenditure.....			4 797 311		3 751 839						