

Electricity Supply Commission

Escom Centre, 204 Smit Street, Johannesburg

The Minister of
Economic Affairs
House of Parliament
Cape Town

7 July 1976

Sir,

As required by Section 19 of the Electricity Act, 1958, the Commission has the honour to present its fifty-third Annual Report and Accounts covering its work for the financial year ended 31 December 1975.



R.A. Mngani

Members of Commission and Management

Members of the Electricity Supply Commission

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Dr. A. J. du Toit

D. J. Malan

E. Pavitt

H. H. L. Abrahamse

A. Anson Lloyd

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Senior Manager (Operations)

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C.I.S.

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Personnel Manager

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Managers of the Commission's Undertakings

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Pr.Eng., B.Sc.(Eng.)(Witwatersrand)

Cape Eastern

F. O. Pearce

Cape Northern

J. P. Rodger

Pr.Eng., B.Sc.(Eng.)(Cape Town)

Cape Western

G. D. G. Davidson

Pr.Eng., M.Sc.(Tech.)(Manchester), B.Sc.(Eng.)(Witwatersrand)

Central Generating

I. C. McRae

Pr.Eng., B.Sc.(Eng.)(Witwatersrand)

Eastern Transvaal

J. S. van Velden (Until 14/9/75)

Pr.Eng., B.Sc.(Eng.)(Witwatersrand)

T. P. O'Connor (From 15/9/75)

Pr.Eng., B.Sc.(Eng.)(Natal)

Natal

H. P. Alexander

Pr.Eng., B.Sc.(Eng.)(Witwatersrand)

Orange River

F. O. Pearce

Rand and Orange Free State

J. H. Harden

Pr.Eng., B.Sc.(Eng.)(Witwatersrand)

Swawek

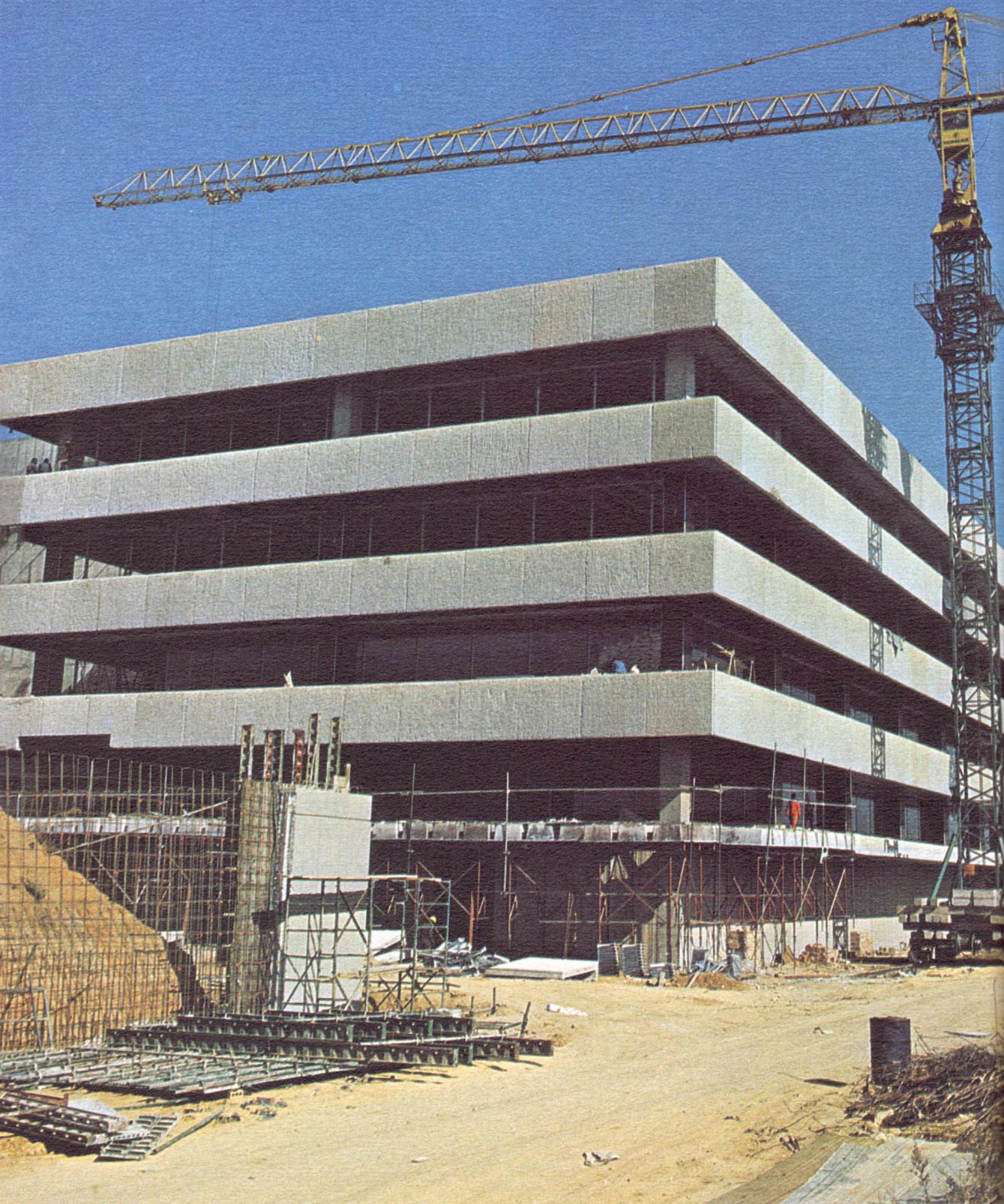
J. P. Brand

Pr.Eng., M.Sc.(Eng.)(Cape Town)

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New Head Office complex, Sandton



The year in brief

Electricity supplied

Escom's total sales of electricity for the year 1975 reached 57 869 million kWh, an increase of 10,0 per cent over the total sales in 1974. The corresponding growth rate for 1974 was 12,9 per cent. The year 1975 was the seventh successive year in which a growth rate of more than 9 per cent in the number of kWh of electricity sold was recorded. However, towards the end of the year a general easing in the growth rate became noticeable.

The demand on the integrated Escom system reached a peak of 9 185 MW on 24 July 1975. The total sent-out capacity of Escom power stations in commercial service at that date was 10 192 MW. Despite the relatively low gross generating plant reserve of only some 11 per cent, a satisfactory level of reliability of supply was generally achieved. The failures of supply which occurred to certain coastal areas are referred to later in this report. The overall average yearly load factor for power station plant on a sent-out basis, which is a measure of the utilisation of potential power station output, reached a record figure of 68,6 per cent.

Revenue and cost

Against a total revenue of R460 million, Escom incurred costs amounting to R487 million, resulting in a deficit of R27 million. The average price per kWh sold increased by 16,5 per cent from 0,682 cents a kWh in 1974 to 0,795 cents a kWh in 1975. On the other hand the average cost per kWh sold in 1975 was 0,842 cents, an increase of 21,7 per cent above the 0,692 cents a kWh recorded in 1974.

A number of factors combined to account for this deterioration in Escom's trading results for the year. However, the main cause was an unprecedented rise in the cost of fuel per kWh sold of 39,3 per cent above the figure for the preceding year (19,4 per cent in 1974). There was also an increase of 12,4 per cent in the capital-related cost per kWh sold, but considerable fluctuation in this element of cost is to be expected from year to year under conditions of rapid expansion.

Capital expenditure

Escom's capital expenditure for 1975 was a record R426 million (R235 million in 1974).

Electricity imports

The small generating plant reserve margin and the corresponding higher power station plant load factor resulted from the planned power imports from the Cabora Bassa hydro-electric scheme in Mozambique during 1975 not materialising. Technical difficulties which have delayed the commissioning of the first stage of the project are now being overcome and the large-scale import of electricity on a firm basis is expected to commence during the second half of 1976.

Gas turbine stations

Three 57 MW gas-turbine generating sets were ordered for installation at Acacia distribution station near Cape Town, and three similar sets for a new power station named Port Rex at East London.

This generating plant – the first of its kind to be installed by Escom – will provide valuable peak load and emergency supply in two areas remote from the main generating centre in the Eastern Transvaal, and has the added advantage that the turbines can be uncoupled, allowing the generators to be operated as synchronous condensers for voltage control.

Nuclear power

An outline enquiry for either a pressurised water reactor system or a boiling water reactor system was issued in February 1974. In April 1975 three tenderers were selected from five who had submitted tenders and these three were invited to make final submissions for the construction, on a turnkey basis, of Escom's first nuclear power station on the west coast some 28 km north of Cape Town. The final submissions, received in November 1975, were for the supply and construction of two nuclear reactor-turbine generator sets, each having a capacity of between 900 and 1 000 MWe. The first set was required for commercial service in September 1982 and the second a year later.

Statistical highlights

Operating statistics for the year

The power stations operated by Escom produced 87,4 per cent of all electricity generated in the Republic of South Africa in 1975.

Maximum one-hour simultaneous demand on total interconnected system (24 July 1975)	9 185 MW
Total electricity sold	57 869 million kWh
Total coal burnt	34 231 735 metric tons
Total water consumed	180 044 megalitres

Plant in service at 31 December 1975

Total nominal generating capacity:

- 188 boilers with a total steam-raising output of 12 744 kg/s
- 139 turbo-generators with a total power output of 11 241,5 MW

Major overhead transmission lines:

Direct current:

533 kV	1 030 km
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Alternating current:

400 kV	5 099 km
275 kV	4 702 km
220 kV	639 km
132 kV	9 839 km
88 kV and below	67 158 km

Underground cables:

132 kV	16 km
33-88 kV	319 km
22 kV and under	5 109 km
Capacity of transformers	72 445 MVA

Financial

Total revenue for the year	R460 072 768
Total expenditure for the year	R487 149 568
Total capital investment in commercial operation at 31 December 1975	R2 008 916 702
Average cost per kWh sold	0,842 cents
Average price per kWh sold	0,795 cents

Staff – total employed at 31 December 1975

Whites	12 394
Non-whites	21 605

Commercial

Sales of electricity

The sales of electricity to the various categories of consumers and to the various sectors of the different categories in the years 1970 to 1975 are tabulated in Tables 1 to 4.

Table 1 reveals that the mining category, which up to 1974 had dominated the sales picture, was surpassed both by sales to the industrial consumers and by bulk sales to municipalities in 1975. In the mining category, the percentage increase in 1975 dropped almost to half that recorded the previous year. Industrial sales, on the other hand, maintained a relatively better percentage growth

compared with the preceding years.

Bulk supplies to the municipalities increased during the year, but at a diminished rate compared with the growth experienced in 1974. Sales to neighbouring territories increased, as shown in Table 1, but at a very modest rate compared with the rapid growth over the past five years. The reason, as shown in Table 2, was a reduction in the supplies taken by Mozambique, the largest foreign consumer.

There was little change in the rate of growth of traction supplies compared with the preceding five years.

Table 1
Sales of electricity to categories of consumers

Category of supply	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Millions of kWh (GWh)								
Bulk supplies								
To municipalities	8 099	9 252	10 684	12 572	15 256	17 772	16,5	17,0
To neighbouring territories	9	13	32	179	266	283	6,4	99,3
Direct supplies								
Traction	2 410	2 616	2 782	2 895	3 108	3 307	6,4	6,5
Mining	13 948	14 227	14 509	15 800	16 941	17 444	3,0	4,6
Industrial	9 608	11 014	12 641	14 026	16 105	18 049	12,1	13,4
Domestic and street lighting	817	918	1 001	1 106	909	1 014	11,6	4,4
Total	34 891	38 040	41 649	46 578	52 585	57 869	10,0	10,6
Per cent of total								
Bulk supplies								
To municipalities	23,2	24,3	25,6	27,0	29,0	30,7		
To neighbouring territories	0,0	0,0	0,1	0,4	0,5	0,5		
Direct supplies								
Traction	6,9	6,9	6,7	6,2	5,9	5,7		
Mining	40,0	37,4	34,8	33,9	32,2	30,1		
Industrial	27,6	29,0	30,4	30,1	30,7	31,2		
Domestic and street lighting	2,3	2,4	2,4	2,4	1,7	1,8		
Total	100,0	100,0	100,0	100,0	100,0	100,0		

Table 2
Sales of electricity to neighbouring territories, millions of kWh

Neighbouring territories	1970	1971	1972	1973	1974	1975
Lesotho	8,8	12,2	16,6	19,7	26,2	31,4
Mozambique	0,6	0,8	15,5	151,2	215,5	203,1
Swaziland	*	*	*	8,4	19,1	38,6
Rhodesia	—	—	—	—	4,8	9,6
Total	9,4	13,0	32,1	179,3	265,6	282,7

*Supply first taken in 1973

Table 3
Sales of electricity to sectors of the mining industry, millions of kWh

Sector of mining industry	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Gold and uranium	11 504	11 662	11 773	12 263	12 803	13 108	2,4	2,6
Diamonds	288	297	325	334	338	346	2,4	3,7
Coal	535	563	589	620	648	705	8,8	5,7
Platinum	941	962	990	1 581	1 978	2 001	1,2	15,3
Copper	343	374	422	565	653	679	4,0	14,6
Iron and manganese	88	92	101	113	134	158	17,9	12,4
Chrome	20	25	31	33	52	42	-19,2	16,0
Asbestos	137	152	161	168	193	238	23,3	11,7
Other	91	100	117	123	142	167	17,6	12,9
Total	13 947	14 227	14 509	15 800	16 941	17 444	3,0	4,6

Table 4
Sales of electricity to sectors of industry, millions of kWh

Sector of industry	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Building cement and quarrying	782	824	878	1 096	1 148	1 115	-2,9	7,4
Chemical	1 376	1 444	1 639	1 921	2 160	2 382	10,3	11,6
Engineering, iron, steel and base metals	4 683	5 652	6 863	7 687	8 835	10 180	15,2	16,8
Paper and paper products	485	494	520	575	603	583	-3,3	3,7
Foodstuffs, consumer goods, commercial, and other	2 282	2 600	2 741	2 747	3 359	3 790	12,8	10,7
Total	9 608	11 014	12 641	14 026	16 105	18 050	12,1	13,4

Table 5
Total sales of electricity in Escom distribution undertakings, millions of kWh

Undertaking	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Rand and O.F.S.	22 294	23 620	25 209	27 938	31 147	33 914	8,9	8,8
Natal	5 074	6 072	6 938	7 581	8 500	9 166	7,8	12,6
Eastern Transvaal	4 294	4 562	5 235	6 098	6 527	7 267	11,3	11,1
Cape Western	2 101	2 494	2 771	3 149	3 852	4 656	20,9	17,3
Cape Northern	715	790	896	1 060	1 211	1 340	10,6	13,4
Border	360	400	448	504	551	598	8,5	10,7
Orange River	47	95	144	239	786	915	16,4	81,1
Cape Eastern	6	7	8	9	11	13	18,2	16,7
Total	34 891	38 040	41 649	46 578	52 585	57 869	10,0	10,6

Tables 3 and 4 give a breakdown of the supplies of electricity taken by the various sectors of the mining and industrial consumer groups respectively.

Table 5 indicates the total sales of electricity in each of Escom's distribution undertakings for the six years 1970 to 1975.

The Rand and O.F.S. Undertaking is by far the largest Escom distribution undertaking, having accounted for 58,6 per cent of the total sales in 1975. The 8,9 per cent growth of this Undertaking's sales in 1975, although considerably lower than the high growth of 11,5 per cent achieved in 1974, was nevertheless slightly above the yearly average since 1970. The reduced rate of growth of overall sales in this Undertaking in 1975 was due largely to a retardation of growth in the mining sector, which is still this Undertaking's largest single category of consumer.

The 1975 sales in the Natal Undertaking showed an increase of 7,8 per cent (12,1 per cent in 1974), illustrating once again the fluctuation of growth rates from year to year in this Undertaking, as a result of the dominance of a few very large consumers in the industrial sector. The pattern of growth over a period of years is dictated largely by the expansion and development programmes of these few large consumers. The significance of a few large industrial consumers has a similar effect in the Eastern Transvaal Undertaking, where the sales grew in 1975 by 11,3 per cent (7,0 per cent in 1974).

The high rates of growth experienced in recent years in the Cape Western Undertaking continued with a rate of increase in sales of 20,9 per cent in 1975 (22,3 per cent in 1974). These high rates of growth in 1974 and 1975 were due to substantial increases in the bulk supplies to the City of Cape Town.

The growth rate of 10,6 per cent in sales in the Cape Northern Undertaking (14,2 per cent in 1974) was somewhat below the average yearly rate of 13,4 per cent over the past five years. In this Undertaking mining and traction supplies play a dominant role and both categories contributed towards the decline in the growth rate. However, a similar downswing in the growth rate was recorded in the bulk supplies to municipalities.

There was a fall during 1975 in the percentage growth of sales in the Border Undertaking to a rate of 8,5 per cent (9,3 per cent in 1974). Bulk sales to municipalities remains the dominant category of consumer, with the Municipality of East London accounting for 65,9 per cent of the Undertaking's total sales in 1975. Vigorous growth continued in the Orange River Undertaking, with a rate of 16,4 per cent in 1975 (228,9 per cent in 1974). The surge of growth in 1974 was due to the bulk supplies to the City of Port Elizabeth from November 1973 onwards. Sales in the Cape Eastern Undertaking increased in 1975 by 18,2 per cent (22,2 per cent in 1974). Bulk supplies to municipalities and industrial supplies both contributed towards the reduction in the rate of growth experienced in 1975.

Progress with rural electrification continued in 1975, although Escom's limited resources of skilled manpower for the planning and construction of extensions to the rural networks remained a problem, as in previous years. As a result it has not been possible in recent years to extend existing rural networks at the rate desired. Nevertheless, as indicated in Table 6, a total of 2 744 new farming supplies were provided, an increase during the year of 9,4 per cent (9,1 per cent in 1974).

The main reasons for the continuing impetus towards rural electrification are the high price of petroleum fuels, the

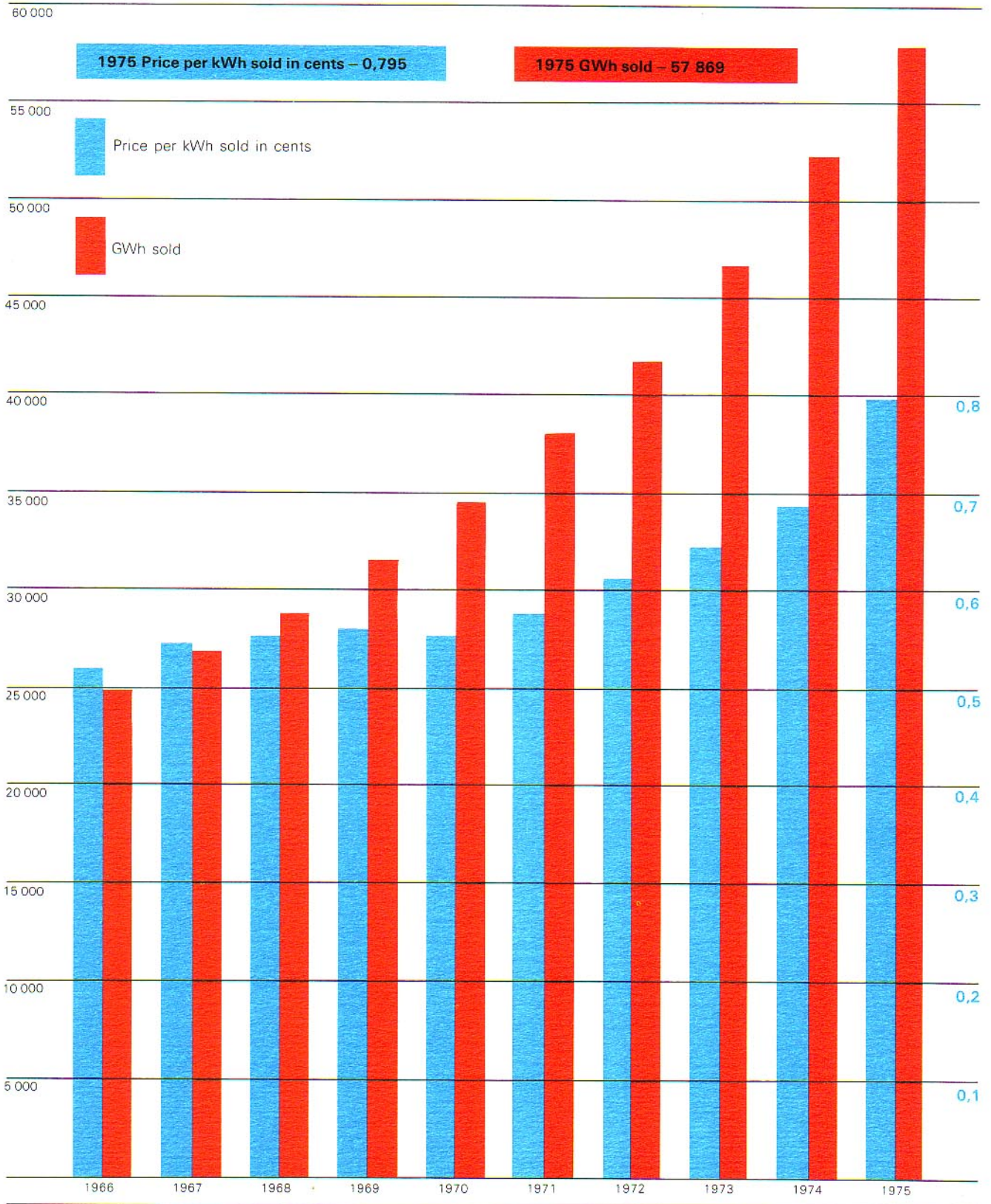
Table 6
Total number of farm supplies at the year end

Undertaking	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Rand and O.F.S.	5 862	6 719	7 570	8 398	9 248	10 065	8,8	11,4
Cape Western	5 527	5 805	6 071	6 389	6 772	7 533	11,2	6,4
Natal	3 787	4 140	4 652	5 080	5 578	6 150	10,3	10,2
Eastern Transvaal	2 411	2 717	3 187	3 634	4 080	4 474	9,7	13,2
Cape Northern	1 653	1 777	2 033	2 130	2 240	2 336	4,3	7,2
Border	571	642	688	716	773	805	4,1	7,1
Cape Eastern	378	387	388	432	475	511	7,6	6,2
Orange River	*	4	25	73	137	173	26,3	**
Total	20 189	22 191	24 614	26 852	29 303	32 047	9,4	9,7

*Before existence of Orange River Undertaking

**Growth rates not meaningful

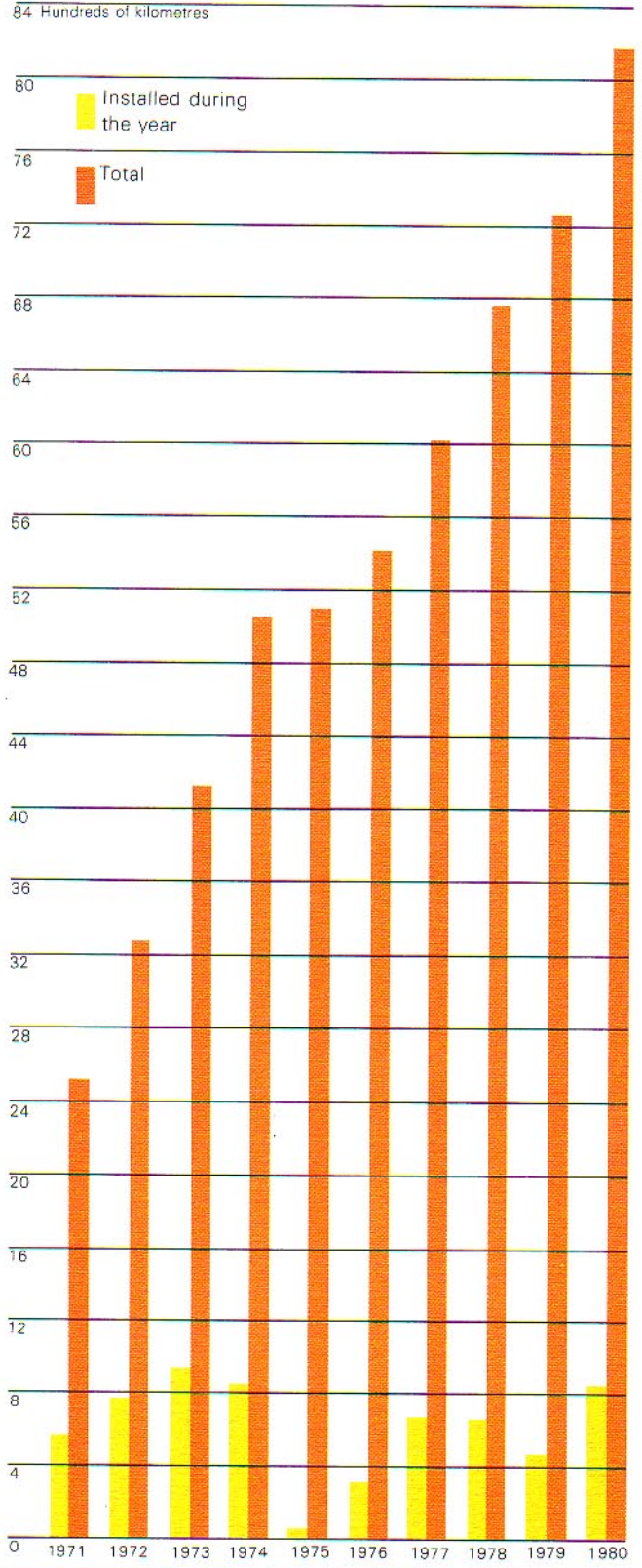
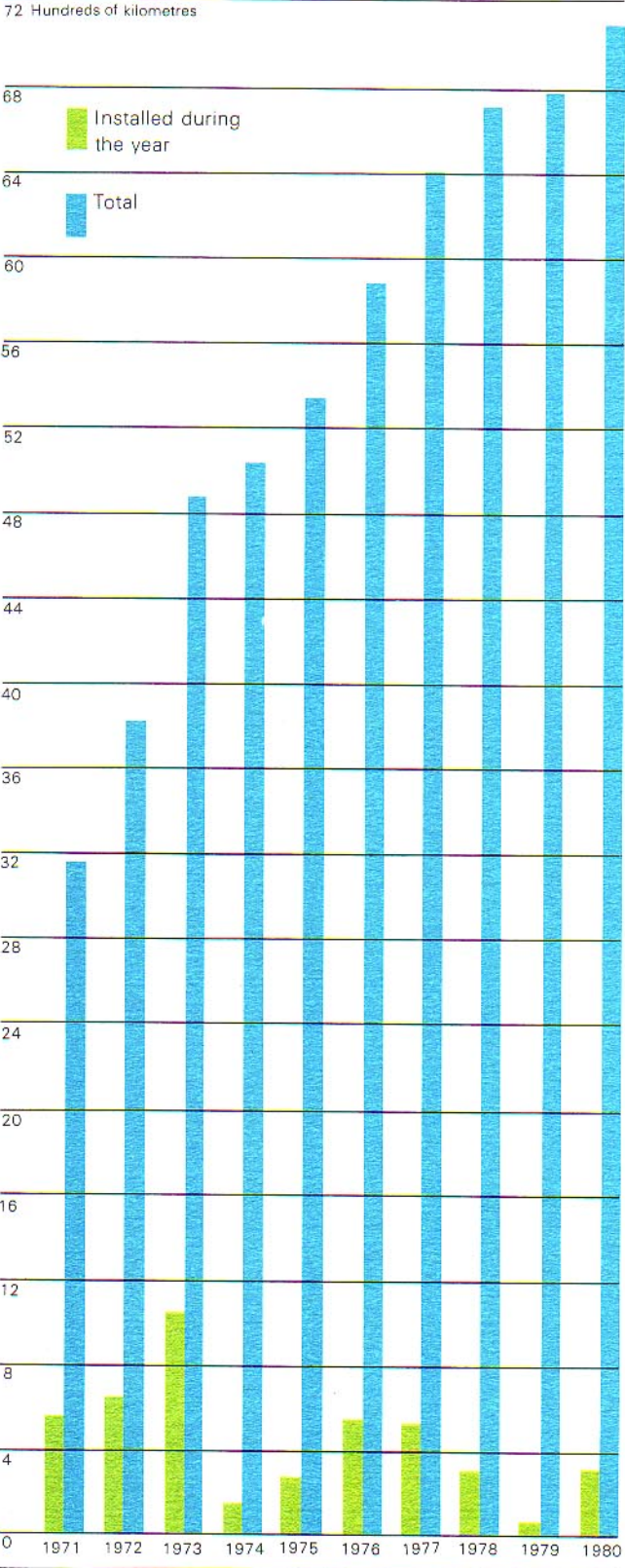
Electricity sales



Expansion of Escom's transmission system

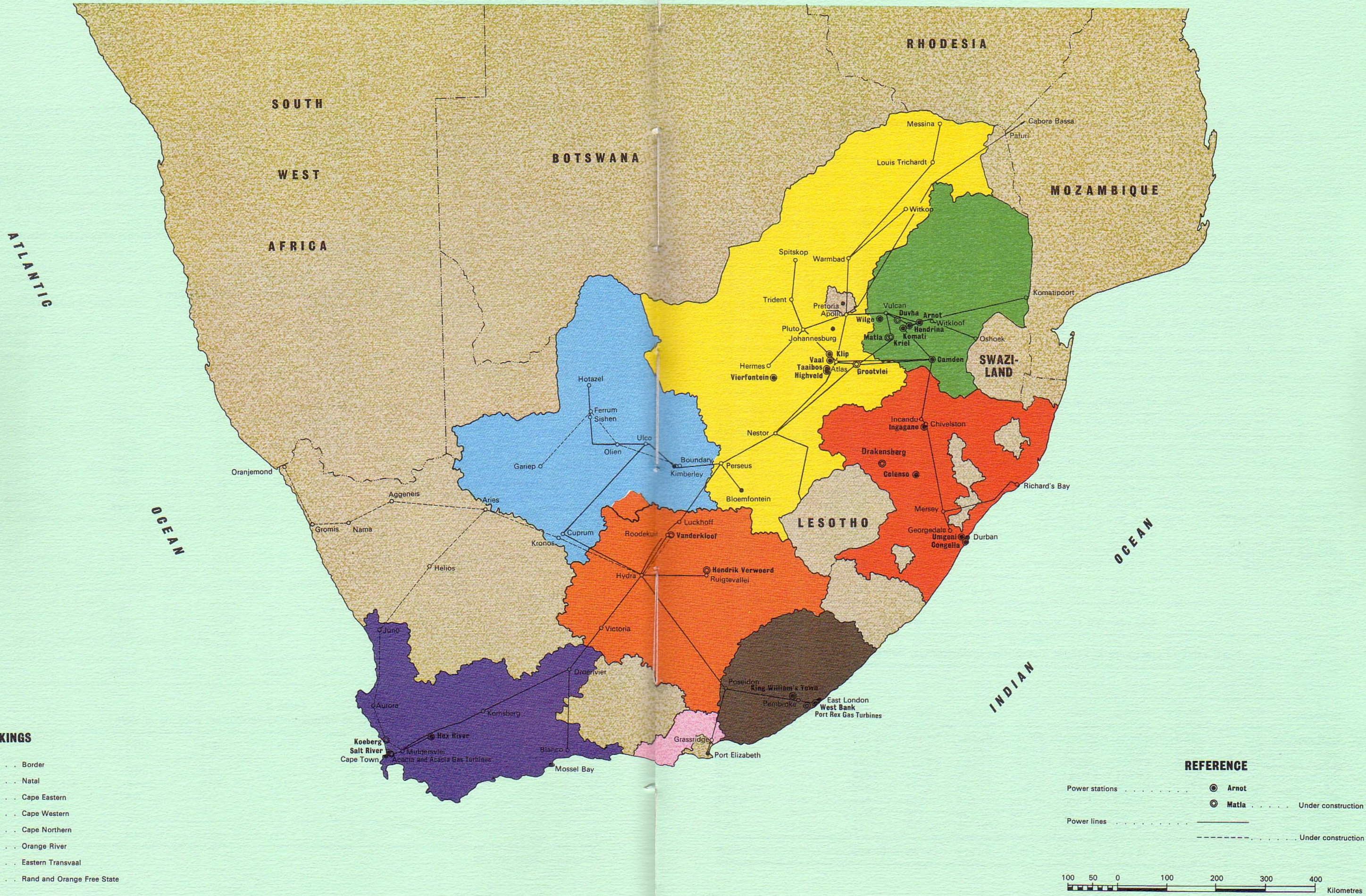
275 and 220 kV lines, km		Planned			
1971	0577,0	3175,5	1976	556,0	5896,4
1972	0650,2	3825,7	1977	552,0	6418,4
1973	1068,5	4894,2	1978	301,0	6719,4
1974	0161,6	5055,8	1979	075,0	6794,4
1975	0284,6	5340,4	1980	315,0	7109,4

400 kV lines, km		Planned			
1971	587,6	2503,4	1976	311,0	5409,8
1972	771,1	3274,5	1977	688,0	6097,8
1973	922,2	4196,7	1978	671,0	6768,8
1974	842,8	5039,5	1979	480,0	7248,8
1975	059,3	5098,8	1980	823,0	8071,8



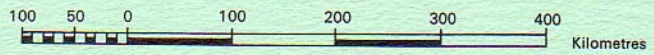
increasing shortage and cost of farm labour, and a recognition of the fact that under inflationary conditions it is advisable to electrify at the earliest opportunity.

ESCOM MAP SHOWING UNDERTAKINGS AND NATIONAL GRID



- UNDERTAKINGS**
- Border
 - Natal
 - Cape Eastern
 - Cape Western
 - Cape Northern
 - Orange River
 - Eastern Transvaal
 - Rand and Orange Free State

- REFERENCE**
- Power stations Arnot
 - Matla Under construction
 - Power lines
 - Under construction



Tariffs

Escalating generating costs, high interest rates on capital money and increasing labour costs in recent years compelled Escom to increase electricity tariffs during the year. These increases were imposed from April 1975 and were in the form of adjustments to the discounts and surcharges applicable in the various distribution undertakings. The effects of these increases are shown in Table 7.

The increases shown in Table 7 do not include the effect of the automatic coal cost adjustment to the kWh rate.

The severe escalation of Escom's costs in 1975 and the expectation of further escalation in 1976 made a further rise

in the price of electricity unavoidable. At the end of 1975 two further tariff increases were announced for all the distribution undertakings: an increase of approximately 15 per cent from April 1976 and a further increase of about 13 per cent from September 1976.

The decision to introduce the tariff increase for 1976 in two steps was taken in accordance with the general campaign to combat inflation and is aimed at distributing the impact of the increase over a period. These delayed tariff increases will raise the present tariff surcharge by an average of 16 per cent for the full year. The upward adjustments to the tariff surcharges applicable to the different distribution undertakings are shown in Table 8.

The surcharges are applicable only to the standard tariff charges and not to extension charges and other fixed contractual payments.

Table 7
Discounts and surcharges on tariffs

Distribution Undertaking	Discount or surcharge applicable in 1974 per cent	Discount or surcharge applicable from April 1975 per cent	Effective increase in standard tariff per cent
Rand and O.F.S.	Discount 13	Surcharge 2	17,2
Eastern Transvaal	Discount 15	Discount 7½	8,8
Cape Northern	Discount 7½	Surcharge 7½	16,2
Cape Western	Surcharge 17½	Surcharge 22½	4,3
Natal	Surcharge 15	Surcharge 25	8,7
Border	Surcharge 17½	Surcharge 30	10,6
Orange River	Surcharge 20	Surcharge 40	16,7
Cape Eastern	Surcharge 20	Surcharge 40	16,7

Table 8
Surcharges: present and proposed

Distribution Undertaking	Present discount or surcharge per cent	Surcharge from April 1976 per cent	Surcharge from September 1976 per cent
Rand and O.F.S.	Surcharge 2	17½	32½
Eastern Transvaal	Discount 7½	5	20
Cape Northern	Surcharge 7½	22½	40
Cape Western	Surcharge 22½	40	60
Natal	Surcharge 25	42½	62½
Border	Surcharge 30	50	70
Orange River	Surcharge 40	60	80
Cape Eastern	Surcharge 40	60	80

Operations

The integrated operation of Escom's interconnected power system is aimed at minimising total national generation costs by allocating load among the various power stations in such a way that base load generation is assigned to the large modern and efficient power stations with lowest fuel-related running costs (high-merit stations), while intermediate and peak load are provided by the smaller, older and less efficient power stations with higher fuel-related running costs (lower-merit stations). The power stations of lowest merit are relegated to reserve duty and are therefore operated for the shortest possible time.

A consequence of the delay in receiving supplies from Cabora Bassa was that Escom's reserve generating capacity was reduced from the preferred 17 per cent to approximately 11

per cent in 1975. As a result it was necessary to retain a relatively high load on the low-merit generating plant having a higher operating cost per kWh sent out. The trend in recent years towards a steady reduction of generation at the coal-burning power stations in the coastal provinces could therefore not be maintained in 1975. Thus 27,2 per cent of the Cape Western Undertaking's electricity needs had to be generated in the local power stations (26,2 per cent in 1974). The corresponding percentages were 42,0 per cent for the Border Undertaking (40,4 per cent in 1974), and 45,5 per cent for the Natal Undertaking (42,5 per cent in 1974). Local generation in the coastal power stations had an adverse effect on the overall costs per kWh sold.

Table 9
Source and destination of Escom's supplies of electricity
Millions of kWh (consumption of power station auxiliaries excluded)

	1970	1971	1972	1973	1974	1975
Sent out from Escom power stations	37 320,8	40 739,3	44 475,1	49 759,1	56 251,2	61 498,4
Purchased (see Statement No. 2)	7,3	8,3	9,7	11,3	7,9	34,9
Total supplies sent out	37 328,1	40 747,6	44 484,8	49 770,4	56 259,1	61 533,3
Supplied to Undertakings:						
Rand and O.F.S.	24 038,3	25 499,1	26 959,4	30 036,2	33 459,3	36 304,4
Natal	5 339,9	6 407,6	7 370,2	8 041,1	9 087,1	9 671,5
Eastern Transvaal	4 408,5	4 687,2	5 438,8	6 205,4	6 679,0	7 309,6
Cape Western	2 321,5	2 755,7	3 078,8	3 495,8	4 241,3	5 098,6
Cape Northern	796,7	879,9	999,8	1 182,6	1 345,9	1 494,9
Orange River	52,9	101,8	156,8	257,8	822,3	968,3
Border	363,2	408,0	462,1	520,2	594,3	648,2
Cape Eastern	7,1	8,3	9,7	11,3	13,1	18,5
Central Generating Undertaking: own consumption	—	—	9,2	20,0	16,8	19,3
Total supplied	37 328,1	40 747,6	44 484,8	49 770,4	56 259,1	61 533,3

Table 10
Hourly maximum demand of Escom's Undertakings, megawatts

Undertaking	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Rand and O.F.S.	2 644,4	2 863,0	3 114,7	3 277,1	3 624,4	3 878,4	4 054,9	4 467,8	5 147,0	5 455,5
Natal	613,3	660,0	712,0	794,0	867,0	1 060,0	1 177,0	1 263,0	1 438,0	1 498,0
Eastern Transvaal	368,4	424,7	485,2	575,5	615,3	680,4	786,1	867,8	924,6	1 019,8
Cape Western	260,6	276,6	298,6	326,8	389,8	442,8	491,7	554,1	707,1	807,0
Cape Northern	79,2	102,2	117,5	127,3	139,8	157,1	170,1	201,9	231,0	249,5
Orange River	—	—	—	7,6	12,4	20,5	30,3	88,2	**117,5	**135,2
Border	54,6	58,9	64,9	67,7	70,2	80,3	88,3	100,8	114,0	127,0
Cape Eastern	1,1	1,5	1,7	2,0	2,0	2,3	2,5	2,3	*5,1	*5,2
Aggregate of non-simultaneous maximum demands	4 021,6	4 386,9	4 794,6	5 178,0	5 720,9	6 321,8	6 800,9	7 545,9	8 684,3	9 297,2

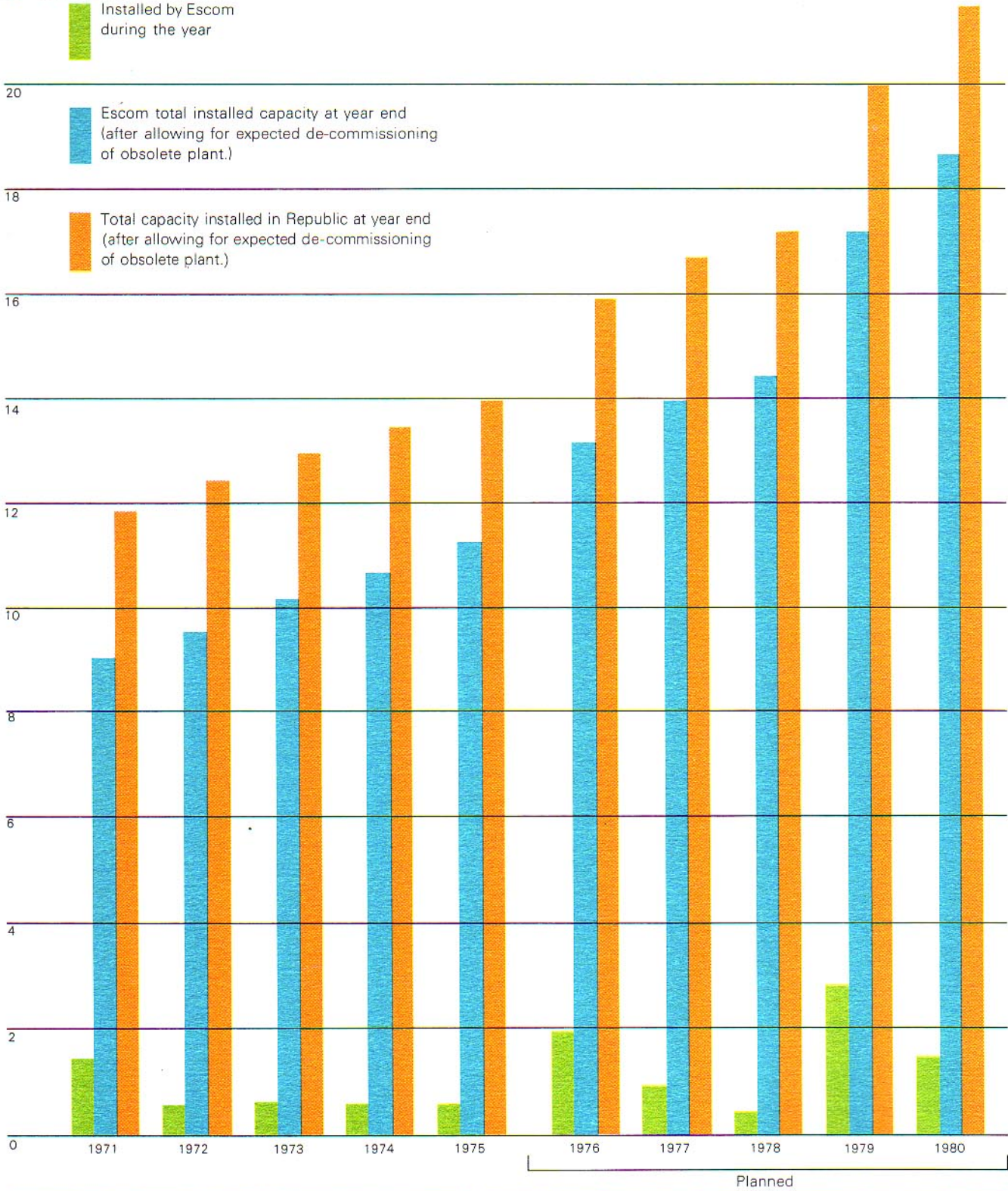
*Includes supply from Orange River Undertaking.

**The power supplied to Cape Eastern Undertaking by Orange River Undertaking is not included in this figure.

Capacity of the Republic's Power Stations, MW

1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1 430	538	590	550	550	1 921	837	393	2 800	1 450
9 013	9 551	10 141	10 691	11 241	13 162	13 999	14 392	17 192	18 642
11 880	12 410	12 950	13 470	13 990	15 900	16 700	17 160	20 000	21 500

22 Thousands of MW



Generation of electricity

As indicated in Statement No. 4 on page 56, a total of 65 479 million kWh of electricity were generated in Escom's power stations during 1975, which exceeds the corresponding figure for 1974 by 9,5 per cent. During 1974 the corresponding increase was 12,7 per cent. Table 9 shows the kWh of electricity distributed for consumption each year in all Escom's Undertakings for the six-year period 1970 to 1975 inclusive. The sources of this electricity – Escom's own generating stations, and outside purchases – are indicated.

It can be seen from Table 11 that the hourly maximum demand in 1975 on Escom's interconnected system was 9 185 MW. In comparison with the maximum of 8 552 MW reached in the preceding year, the increase in 1975 was 7,4 per cent (16,4 per cent in 1974). To cope with the increase of 7,4 per cent in demand, there was an increase of only 5,2 per cent in the sent-out rating of Escom's total power generating capacity, from 10 002 MW at 31 December 1974 to 10 522 MW at 31 December 1975.

The delay in the commencement of supply from Cabora Bassa, originally expected before the winter months of 1975, was due to unforeseen technical difficulties encountered at the site. By the end of the year, only two of the three 400 MW hydro-electric turbo-generators forming stage 1 of the contract were in operation. For test purposes, a small amount of electricity was fed into the Escom system from time to time at the Apollo distribution station near Pretoria. Bulk supplies on a contractual basis are now expected in the second half of 1976.

Plant performance and maintenance

The system load factor for 1975, calculated on the total energy sent out to all consumers and the one-hour simultaneous peak demand, was 76,5 per cent. Compared with electric utilities in other countries, this is a high yearly

system load factor, and is indicative of the sustained demand on Escom's power stations throughout the year. The absence of a pronounced "off-peak" season of system demand has the effect that the scheduling of plant shutdowns for planned maintenance and overhaul is difficult and expensive. This position was further aggravated during the year under review by the shortfall of reserve generating capacity, with the consequence that extensive revision of the planned maintenance programme was necessary.

Escom's national transmission network, started in the sixties with the ultimate objective of reducing the delivered cost of electricity in the coastal provinces, has now progressed to the stage where the supervision of the high-voltage transmission equipment entails the operation of sophisticated devices having intricate control features. There is a countrywide shortage of the specialist staff required to install, operate, and maintain equipment of this sophistication, and Escom like other similar organisations has experienced difficulties. There were a number of interruptions in the supplies transmitted to the coastal areas during the second half of the year. An analysis of these has indicated that they were in some cases caused by human error.

In addition to the difficulties arising from mal-operation, supplies were interrupted on some occasions by the effects of lightning. The lightning intensity on the Transvaal highveld is among the highest in the world, and Escom has contributed appreciably to the technology of protection against its effects. Atmospheric pollution also plays a role in the failure of overhead transmission lines, requiring highly specialised remedial action depending upon the source of the trouble. Examples taken at random are the protection of transmission equipment against the effects of sugar-cane fires, and the control of extensive fouling of insulators by birds.

Work was continued during the year on the extension and improvement of the two computerised power station data collecting systems installed at Arnot and Kriel power stations,

Table 11

Demand in each Undertaking at the time of maximum demand on total Escom system, megawatts

Undertaking	Year Time Date	1966 11h00 22/7/66	1967 11h00 14/7/67	1968 12h00 13/6/68	1969 09h00 25/7/69	1970 12h00 16/7/70	1971 09h00 17/6/71	1972 10h00 1/8/72	1973 19h00 13/7/73	1974 09h00 4/9/74	1975 09h00 24/7/75
Rand and O.F.S.		2 649,2	2 868,6	3 119,4	3 277,1	3 624,4	3 885,9	4 026,8	4 440	5 083	5 448
Natal		574,0	545,7	635,7	747,4	825,3	994,0	1 088,0	1 222	1 438	1 498
Eastern Transvaal		320,4	409,0	456,1	541,2	598,2	565,8	772,0	827	946	990
Cape Western		239,0	255,5	273,0	315,5	357,5	432,4	470,4	542	647	779
Cape Northern		75,4	95,8	110,3	114,5	136,8	144,8	163,0	197	218	241
Orange River		—	—	—	—	10,3	18,3	23,0	31	114	105
Border		47,5	52,6	63,1	59,0	69,0	74,0	87,0	91	106	124
Maximum simultaneous demand on total Escom system		3 905,5	4 227,2	4 657,6	5 054,7	5 621,5	6 115,2	6 630,2	7 350	8 552	9 185

namely the station thermal efficiency performance system, and the operating data monitoring system. The manufacture, calibration, delivery and installation of instruments required at these power stations for monitoring performance is in progress. The operating statistics system was extended to all power stations during the year.

Progress was made during the year with maintenance planning, using manual and computer-assisted techniques. Two power stations – Grootvlei and Hendrina – have been selected for the purpose of work studies, the objective being the development of work standards by comparative evaluation. By the end of the year about 75 per cent of the routine mechanical maintenance work in these two power stations had been measured.

Coal supplies

There was a continuation during the year of the upward trend of Escom's coal costs which first became evident in 1973, as

shown by the last row of Table 13. The rapid further increase in a single year of 37,7 per cent in Escom's overall average cost per ton of coal burnt overshadowed all attempts to minimise the national total coal cost by judicious load allocation among power stations. It is nevertheless significant that the cost of coal to Escom's Transvaal pithead stations averaged R3,51 per ton which is materially below the controlled price of R4,31 per ton. This is due to the large new units which have come into operation over the last few years, headed by the open-cast operation feeding Hendrina at R2,33 per ton, followed by Camden, Komati and Arnot. On the other hand the need to mechanise the older pithead collieries as a result of the changing labour pattern may place an additional cost burden on the older power station generation costs.

The report of the Petrick Commission which became available at the end of 1975 has not recommended any significant changes in the functioning of the coal industry. It has however emphasised the point that South Africa's coal

Table 12
Coal burnt per year in different areas, millions of metric tons

Geographic area	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Transvaal and O.F.S.	17,755	19,515	21,618	25,009	27,998	30,727	9,7	11,6
Natal	2,871	3,067	2,450	2,013	2,117	2,557	20,8	-1,0
Western Cape	0,797	0,604	0,622	0,591	0,627	0,770	22,8	0,5
Eastern Cape*	0,208	0,230	0,263	0,295	0,150	0,177	18,7	1,3
Total	21,631	23,416	24,953	27,908	30,892	34,231	10,8	9,6

*Incorporated in Central Generating Undertaking as from 1974.

Table 13
Yearly average cost of coal burnt in different areas
Rand per metric ton

Geographic area	1970	1971	1972	1973	1974	1975	Percentage increase 1975/74	Average yearly increase over 5 years per cent
Transvaal and O.F.S.	1,76	1,76	1,83	2,03	2,58	3,51	36,0	14,8
Natal	3,82	4,08	4,10	4,13	4,96	6,98	40,7	12,8
Western Cape	6,58	7,06	7,44	9,06	10,04	12,81	27,6	14,2
Eastern Cape*	6,13	6,31	6,83	8,17	8,87	11,33	27,7	13,1
Overall average	2,26	2,25	2,25	2,39	2,92	4,02	37,7	12,2
Percentage increase (+) compared with previous year	-5,0	-0,4	0,0	+6,2	+22,2	+37,7		

*Incorporated in Central Generating Undertaking as from 1974.

reserves are indeed limited, and that every effort should be made to conserve our coal resources. Escom has already taken steps to this end by sponsoring open-cast mining and pillar recovery and continues to burn coal of calorific value 22,2 MJ/kg, which is well below 25,5 MJ/kg – the lowest commercial grade. The conservation of coal resources by mining less selectively underground, and by taking all the coal from strip mining operations has however led to problems with the quality of coal being delivered which affects the generating capacity of certain power stations. Whilst it is possible to design for most qualities of coal, it is not practical to change the nature of power stations already commissioned. Hence some form of beneficiation of coal may become necessary and this will be the subject of investigations during the coming year.

The coal burnt each year in Escom power stations in different areas of the country is given in Table 12. The main features are the 10,8 per cent increase in the mass of coal burnt, which is in line with the increase in kWh generated, and the higher increases in the coal burnt in the Natal, Western Cape and Eastern Cape power stations which have had to carry a large share of the burden resulting from the non-availability of firm Cabora Bassa power, and the starting-up problems with the large new generating units. This economically adverse allocation of load among power stations is a reversal of the trend over the past few years, when the load on the stations in the coastal provinces was reduced. The consequence, in terms of the cost per ton burnt in different areas, is shown in Table 13. The two right-hand columns of this table reveal that the yearly percentage increase of Escom's overall cost per ton during the past five years could by judicious load allocation be kept below the corresponding percentage increase experienced in any single area of the country; and that this favourable situation did not continue through the year under review.

In addition to the factors already mentioned, there are other practical obstacles to optimum load allocation. These include mining difficulties, colliery labour problems, spares availability and raiing restrictions. Whilst steps are taken to correct adverse conditions wherever they arise, it is expected that the coal supply situation will continue to be difficult.

During the year trials with continuous mining methods have been successfully conducted, and it is expected that this method of coal recovery will gradually replace cutting and drilling with the advantages of safer mining conditions and higher labour productivity. Preparations for the introduction of longwall mining in 1976 are proceeding at the Coalbrook

Colliery. The second major dragline started operations at Arnot where the coal supply will be partly from strip mining and partly from underground operations.

Water supplies

The quantities and sources of water used in Escom power stations in the past two years are indicated in Table 14.

Escom's major power stations, situated in the Transvaal and the northern Orange Free State, are the principal raw water consuming stations. In 1975 these power stations sent out 54 341 million kWh of energy, which is some 88 per cent of the total for Escom and is an increase of 8,8 per cent on the corresponding output for 1974. The equivalent raw water consumption, excluding colliery and construction usage, was 157 231 megalitres, which is about 96 per cent of Escom's total fresh water consumption, and is an increase of 5,3 per cent on the corresponding consumption for 1974. Stated in terms of specific consumption, there was thus an improvement in performance, the figures for 1974 and 1975 being 2,99 and 2,88 litres per kWh of electricity sent out respectively. The latter figure would have been better had the exceptional rains, floods and silt-laden rivers not reduced the quality of the raw water received at the power stations.

To reduce environmental pollution, Escom is striving to minimise the effluent discharge from its power stations by recycling water to the extent this is acceptable. An indication of the progress made is the fact that the total water run to waste from Escom's power stations in the Transvaal and Orange Free State decreased from 14 101 megalitres in 1974 to 11 617 megalitres in 1975. This was a reduction of 17,6 per cent.

In the interests of water conservation and pollution control Escom is continuing its efforts to improve the use of water and reduce the controlled waste water discharge from these power stations.

Power stations employing non-evaporative or dry cooling use approximately 80 per cent less water than those with evaporative or wet cooling. Hence dry cooling is a great attraction as far as water conservation is concerned, but unfortunately the additional capital and operating costs involved discourage its general adoption, particularly in the present economic climate. However, the economics of alternative cooling methods are always re-considered whenever a new power station is added to the existing system. The Matla and Duvha power stations have been designed to use wet cooling.

Table 14
Water used in Escom coal-fired power stations megalitres
(Includes colliery and construction usage)

Area and source of water	Potable water		Crude river water		Water from other sources including boreholes, dams and sewage		Sea water circulated (estimated)	
	1974	1975	1974	1975	1974	1975	1974	1975
Western Cape								
Cape Town Municipality	280	432						
Worcester Municipality	484	505						
Hex River			*508	526				
Sea water (estimated)							296 400	334 957
Total Western Cape	764	937	*508	526			296 400	334 957
Eastern Cape								
East London Municipality	104	126						
Sea water (estimated)							73 312	86 965
Total Eastern Cape	104	126					73 312	86 965
Natal								
Durban Municipality	2 083	2 578						
Sea water (estimated)							102 913	132 161
Tugela River			1 575	2 154				
Ngagane River			10 709	10 168				
Total Natal	2 083	2 578	12 284	12 322			102 913	132 161
Transvaal and O.F.S.								
Vaal River	1 790	2 022	50 456	53 574				
Bronkhorstspuit			7 570	6 834				
Komati River			69 718	73 763				
Usutu complex			23 346	26 798				
Other	61	80			312	484		
Total Transvaal and O.F.S.	1 851	2 102	151 090	160 969	312	484		
Total all Escom	4 802	5 743	*163 882	173 817	312	484	472 625	554 083

*Amended

New works

Generating plant

The generating plant commissioned during 1975 as well as the plant under construction and on order at the end of 1975 is listed below.

Plant having a nominal power output capacity of 550 MW was taken into service during 1975, bringing Escom's total installed capacity to 11 241,5 MW.

Construction work on the following major power generation projects commenced or continued during the year:

Arnot power station

With the commissioning of the sixth 350 MW reheat turbo-generator set in August 1975, bringing the installed capacity of this station to 2 100 MW, Arnot became Escom's largest completed power station.

Hendrina power station

The eighth 200 MW non-reheat turbo-generator set in this power station was taken into service in June 1975, six months earlier than the commissioning date planned originally. This station now has an installed capacity of 1 600 MW. The commissioning dates of sets 9 and 10 have been advanced to March and December 1976 respectively.

Grootvlei power station

The steel building frame structure to accommodate the sixth and last 200 MW non-reheat turbo-generator set was substantially completed during the year. Work is proceeding with the construction of a dry cooling tower, the second, at

Grootvlei to serve this turbo-generator set. Grootvlei at present has an installed capacity of 1 000 MW made up of five 200 MW sets.

Kriel power station

The civil and structural works for the first three of six generating sets of 500 MW each were completed during the year. The construction of the foundations for the cooling towers, boiler houses and turbine houses for the remaining three sets proceeded.

Towards the end of the year the first set was approaching completion after a delay and commissioning was planned for early 1976. Erection of the second set commenced at the beginning of the year and proceeded satisfactorily towards planned commissioning by the end of 1976. The commissioning date planned for the third set is October 1977.

Coal for Kriel is supplied from the Kriel Colliery where both underground and strip mining will be employed.

Matla power station

Matla which is being erected about four kilometres from Kriel, will comprise six 600 MW generating sets.

Work on the site commenced in 1974 and the main civil construction work, although delayed by rains early in the year under review, is proceeding. In this power station, Escom has for the first time decided to employ concrete instead of the usual steel structures, to support the boilers.

The contract for the supply of coal and contracts for the first

Table 15
Power station plant taken into service during 1975 and on order at 31 December 1975

Name of power station	Plant taken into service in 1975		Plant under construction or on order at 31 December 1975	
	Boilers kg/s	Generators MW	Boilers kg/s	Generators MW
Coal-fired steam:				
Arnot	333	350	—	—
Hendrina	214	200	428	400
Grootvlei	—	—	215	200
Kriel	—	—	2 640	3 000
Matla	—	—	1 524	1 800
Duvha	—	—	1 524	1 800
Gas turbines:				
Acacia	—	—	—	171
Port Rex	—	—	—	171
Conventional storage:				
Hydro:				
Hendrik Verwoerd	—	—	—	160
Vanderkloof	—	—	—	220

three boilers and turbo-generators have been awarded. The first set is planned for commissioning in May 1979 and the second in September 1979.

Duvha power station

Duvha power station is being erected about 14 km south-east of Witbank and will also comprise six 600 MW generating sets.

The contracts for the supply of coal and for the first three sets have been placed. Work on the levelling of the site commenced during the year and progress is generally satisfactory. The first set is planned for commissioning in September 1979 and the second a year later.

Hendrik Verwoerd hydro-electric power station

This conventional storage hydro-electric power station will have an ultimate installed capacity of 320 MW made up of four 80 MW vertical-shaft Francis turbo-generators. The first two sets were commissioned in 1971 and work continued during the year under review on the final stages of the last two sets. The third set will be taken into service in January 1976 and the fourth is due for completion in March 1976.

This power station, the first large hydro-electric station built in the country, has rendered valuable service since its commissioning in 1971, incorporating attractive features such as quick starting and full automation with remote control from the national control centre near Germiston, a distance of 640 km from the site.

Vanderkloof power station

This hydro-electric power station will be underground and excavation of the machine hall and associated tunnels was completed early in the year. The installation of the two steel draft tubes and spiral casings was carried out in the first ten months of the year. Concreting of the machine and generator foundations is at present in progress.

Two 110 MW sets are planned for commissioning early in 1977. Like the Hendrik Verwoerd power station, Vanderkloof power station, which is situated at the P.K. le Roux Dam on the Orange River, will also be remote controlled from the national control centre, the start-up, synchronising and loading sequences of the sets being fully automatic.

Drakensberg pumped-storage scheme

This dual-purpose scheme, a joint venture with the Department of Water Affairs, to supplement the water resources of the Vaal River basin in addition to providing valuable peak-load generating capacity, will be Escom's first pumped-storage project and will house four pump/turbines each with a power generating capacity of 250 MW.

The borehole drilling and underground exploratory work has progressed satisfactorily and by the end of the year access to the vicinity of the underground caverns was available for comprehensive testing of the ground conditions and rock

properties. On the surface the works have been planned to minimise effects on the landscape and, following a wide-ranging assessment of economic, technical, operational and environmental factors, the overall design of the scheme has been finalised. Detailed design work is under way.

The Drakensberg scheme will be connected to the main network by two 400 kV lines. Feasibility studies have indicated that it is economically and technically advantageous to install the high-voltage switchgear, which will be of the metal-clad sulphur hexafluoride-insulated type, alongside the generator transformers in an underground cavern.

During the year the enquiry for the pump-turbines was issued, tenders received and preliminary contracts placed for advanced design work and model testing of the machines by two selected tenderers. On completion of this work the main contractor will be selected for the supply of the pump-turbines. Enquiries for the motor-generators and main civil work will be issued in April 1976. Comprehensive testing of the complete hydraulic system using a physical and a mathematical model is in progress. Analysis and comparison of the measured and computed results will enable the optimum design of the waterways to be selected.

Elandsberg pumped-storage scheme

Early in 1975 it was decided to proceed with investigation of the site for the proposed Elandsberg pumped-storage station. This site is 13 km west of Wolseley and 14 km south-west of Tulbagh in the Western Cape and is located near the shore of the existing Voëlvlei Dam, which supplies water to the City of Cape Town. The station is to be built underground, making use of Voëlvlei Dam as the lower reservoir. A new dam at Zuurvlakte in the Elandskloofberg will be constructed to form the upper reservoir. Present indications are that approximately 1 000 MW of pumped-storage plant can be installed.

Geological drilling and excavation work is presently under way to provide information on the nature of the underground rock and to enable geophysical testing thereof to be undertaken.

Acacia and Port Rex gas-turbine power stations

These two gas-turbine power stations to be located in the Cape Town (Acacia) and East London (Port Rex) areas respectively will add further peak-load and emergency generating capacity to Escom's power system and will increase the reliability of electricity supplies to these coastal areas. Each of these power stations will house three 57 MW gas-turbine generating sets. All the plant has been ordered and work at both sites is in progress.

Erection is planned for the plant to be commissioned in the period May to June 1976 at Acacia and September to October 1976 at Port Rex.

Koeberg nuclear power station

During the year final tenders were invited from three international consortia for the supply and erection of South Africa's first nuclear power station to be called Koeberg. The tenders were for the supply of two light-water reactor-turbo-generator sets, each with a capacity of between 900 and 1 000 MWe, the first of which was scheduled for September 1982, and the second to follow one year later. The contract, which is to be awarded in 1976, includes the design and construction of the entire station, together with the fabrication of fuel for the initial loading and five reloads for each unit.

The design of the cooling water basin is nearing completion and the enquiry for this work will be issued in 1976.

Extensive investigations have been undertaken over the last four years at the Koeberg site. There has also been a regular exchange of information and views between Escom and the licensing branch of the Atomic Energy Board on the licensing and safety aspects of the project.

Transmission projects

The national transmission system was strengthened by the commissioning in June 1975 of a 400 kV series capacitor bank at Komsberg distribution station near Laingsburg in the Cape Province. Two 75 MVar synchronous condensers were commissioned at Muldersvlei distribution station in the Cape Town area. In the Eastern Transvaal, the second 400 kV transmission line between Arnot power station and Vulcan distribution station near Witbank was completed during the year, as was the first 400 kV transmission line between Vulcan distribution station, Kriel power station, and Atlas distribution station.

Planning and detailed design work reached an advanced stage in 1975 on the third 400 kV transmission line to the Western Cape. Apart from improving the reliability of supplies to the western Cape, this line will also serve the future needs of the north-western Cape and Saldanha Bay, including traction supplies for electrification of the Sishen-Saldanha railway. It will also provide an additional link with the future Koeberg nuclear power station. Contractors have already commenced work on the 400 kV transmission line running westwards from the existing north-south transmission system at De Aar. Construction work on the substations and other lines is planned to start in 1976.

To provide electricity for the continuing expansion of industry in Natal, planning and design work is in hand on a new 400 kV transmission line from Camden power station near Ermelo to Richards Bay, with intermediate substations for the South African Railways' electrification of the Ermelo-Richards Bay railway. A major 400/275 kV distribution station is being planned for the Richards Bay area. These projects are scheduled for completion by 1979.

Planning and design work is in progress also on the establishment of a 400 kV distribution station near Dundee which will initially connect the Drakensberg pumped-storage power station into the national transmission network via 400 kV lines and later (probably the mid-eighties) serve as a terminal point for a 765 kV transmission line from the future Ilanga power station in the eastern Transvaal.

Microwave radio network

Site work for this network is in progress, allowing the

installation of equipment to commence early in 1976. This network will give Escom's national control centre a means of direct communication with power stations and major distribution stations; it will also serve as a system of channels for Escom's integrated automatic telephone network. The channels made available for data transmission, supervisory control, back indication and remote operations will be required also for the establishment of Escom's system control and load despatch project, which is planned for completion in 1978.

Water supply systems for coal-fired power stations in the Eastern Transvaal

The first major water supply system for a large Escom coal-fired power station in the eastern Transvaal was the pumping station at Nooitgedacht Dam on the Komati River, and the associated pipeline, 64 km long, to supply the water requirements of Komati power station. This system was completed in the early sixties.

By the late sixties, the larger Camden power station near Ermelo was being completed, the water requirements for this station being supplied from the Jericho and Westoe Dams in the Usutu River system. In the meantime, Escom's expansion required the construction, also in the eastern Transvaal, of the Hendrina and Arnot power stations, which by the early seventies were obtaining water from the Komati River, partly from Nooitgedacht Dam, and partly from an additional dam, namely Kafferskraal, and a system of pumping stations, reservoirs and pipelines known as the Kafferskraal-Bosloop-Wintershoek system.

The good quality of the raw water delivered to Camden power station, and the implementation of water conservation measures at this station have resulted in a saving of water which is to be used to supply the first set at Kriel power station. For this purpose, an extension of the water supply system from the Usutu complex was necessary.

Escom was appointed in 1973 by the Department of Water Affairs to undertake the engineering of what has become known as the Usutu River Government Water Scheme, and has been actively engaged on the engineering and supervision of the construction of the reservoir and pumphouse at Camden power station and the pipeline between Camden and Kriel power stations since then.

The pipeline was commissioned in September 1975, supplying Usutu River water to Kriel power station in time for the start of power station commissioning. Escom is at present engaged on the engineering of the second phase in the development of the Usutu River Government Water Scheme.

A second pipeline is at present being installed between Kafferskraal Dam on the Komati River and Hendrina power station. Work is well advanced and completion is expected by mid-1976. Construction of the third pipeline from Wintershoek pumping station to Arnot power station, and of the second pipelines from Bosloop pumping station to Wintershoek, and from Kafferskraal Dam to Bosloop progressed well during the year and all this work is scheduled for completion during 1976. The pumping capacity at Wintershoek and Bosloop is being increased in stages, the installation of the final pumps being planned for completion early in 1977.

Total personnel employed on 31 December 1975:

Table 16

	Number	% increase during 1975
White salaried employees	7 115	13,1
White monthly-paid employees	5 279	8,1
Non-white employees	21 605	12,6
Totals	33 999	12,1

The overall percentage increase in Escom's employees during the year under review was 12,1 per cent and is attributed largely to the construction, commissioning and operation of further new plant for Kriel, Matla and Duvha power stations. The increase was also due to the establishment of an Education Department, and the development of computerised systems.

Recruitment campaigns were conducted in Europe during the year with a view to recruiting additional staff with special skills. As a result of these campaigns 78 immigrants were engaged and a further 24 immigrants joined Escom through the Department of Immigration. The corresponding figures for 1974 were 75 and 17 respectively.

Negotiations were concluded during the year with the trade unions to establish a scheme for the better utilisation of manpower. Among other things, this scheme provides for better promotional opportunities for employees and facilitates the employment of non-whites on more productive work in power stations.

Liaison committees have been established at all power stations and in the distribution undertakings to facilitate communication between management and non-white employees. Aptitude testing facilities for non-white employees have been introduced at several centres.

In view of the increasing participation by non-whites in sports, properly constituted clubs are being established at various work centres, thereby enabling employees to participate in provincial and national events.

Better housing conditions for non-white employees, of both a permanent and a mobile nature, are being introduced and are contributing to greater stability of the labour force.

Education and training

During 1975 the Education Department conducted courses in training centres at Klip, Henley and Meyerton for 1 118 employees in the technical fields of generation, distribution, construction, maintenance and operating services. Of the 110 apprentices who were prepared for the Government Trade Test, 91 or 83 per cent passed.

Academic and practical full-time formal training was provided for 293 pupil technicians in the various categories applicable to Escom.

On-job training programmes were undertaken by 34 graduate engineers-in-training towards obtaining professional status.

Under the Escom Bursary Loan Scheme, 29 new bursaries were granted to students during 1975, bringing the total number of bursars attending the various universities to 114. In addition to bursaries, 81 employees were assisted financially by Escom for further study on a part-time basis. During 1975, 51 scholarships were granted to dependants of employees under the Dr. H. J. van der Bijl Scholarship Scheme at a cost of R65 700 compared with 55 scholarships at a cost of R50 300 during 1974.

Fringe benefits, sport, recreation

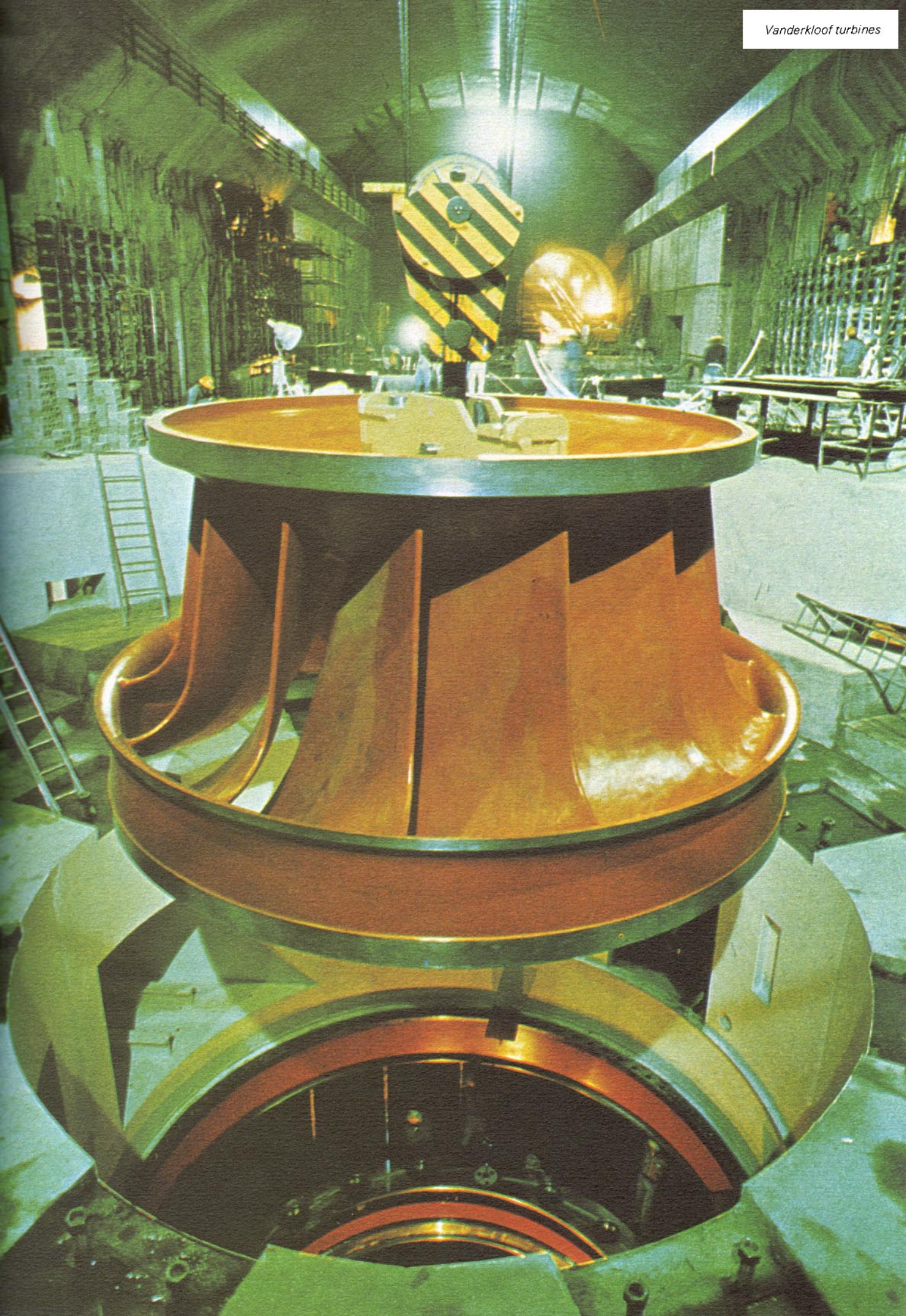
The trustees of the Pension and Provident Fund and the Commission approved an increase of 6 per cent in the amounts paid to pensioners on all pensions in force at 28 February 1975 and granted before 1 March 1974. The increase took effect from 1 March 1975 and was intended to give a measure of relief to pensioners particularly affected by the increase in the cost of living.

For the purpose of sport and recreation 23 Escom clubs, representing some 12 700 members throughout the Republic, are affiliated to the Federation of Escom Clubs. Membership increased by 1 700 and one new club was established, bringing the total number of clubs to 23.

Prevention of accidents

The rate of disabling injuries per million man-hours worked and also the fatality rate at the end of 1975 were the lowest recorded by Escom.

Because of Escom's improved record of injury experience, the Workmen's Compensation rate for Escom for 1975 has been reduced by a further 10 per cent as compared to the 1974 rate.



Capital expenditure

Expenditure on Capital Account during 1975 totalled a record R426 million.

A summary analysis of the movement on this account with comparative values for 1974 is given below:

Financial

	Rand million	
	1975	1974
Balance at beginning of year	2 176	1 943
Less:		
(i) Discount on loans issued in prior years transferred to deferred expenditure	32	
(ii) Assets decommissioned, sold or scrapped	—	2
	2 144	1 941
Add:		
Expenditure during the year	426	235
Balance at end of year	2 570	2 176

N.B. Prior to 1975 discount on loan issues which, in terms of the Electricity Act is a constituent of cost of raising loans, was charged to Capital Account. This item is now included as a component of deferred expenditure on the balance sheet.

During 1975 the value of assets earning revenue increased by R161 million (1974: R148 million) and totalled R2 009 million at the year end, the additional items earning revenue being inclusive of further commissioning of plant at Arnot and Hendrina power stations.

Expenditure on uncompleted works reached an unprecedented R561 million at the end of 1975. The main concentration of works under construction being at Kriel, Grootvlei, Matla and Duvha power stations.

The above mentioned expansion programme relating to capital works has resulted in a substantially increased working capital requirement and as a consequence the value of stores, materials, movable plant and equipment on hand at cost increased by R30 million to R147 million as at 31 December 1975.

Loans and the capital markets

Long-term loans totalling R157 million were raised during 1975 as follows:

	Rand million		
	Total	Public issues	Private placements
Local market	130	100	30
Foreign market	27	—	27
	157	100	57

Escom continues to experience considerable difficulty in raising long-term funds to finance its capital expansion programme, difficulties in this regard being aggravated by ever present rising costs.

As Escom is only one of many organisations competing for the relatively limited availability of long-term funds on the local market it is, in the circumstances becoming increasingly dependent on the foreign capital market to provide the necessary finance that cannot be obtained locally.

Unfortunately conditions on the foreign market are such that although it has been possible to "make up" capital financing requirements from that source it has necessitated heavy borrowing in the short term, and during 1975 this totalled R182 million.

In addition to the above:

- (i) The equivalent of R65 million by way of Revolving Credit Facilities was utilised; and
- (ii) the balance of monies outstanding for Import Financing Facilities increased to R61 million as at 31 December 1975 an increase of R31 million over outstandings as at the previous year end.

Capital Development Fund

Contributions amounting to R40,7 million (1974: R28,1 million) were made to the Capital Development Fund during 1975 and the amount standing to the credit of the Fund at 31 December 1975 totalled R112,9 million.

Reserve Fund

The Reserve Fund received contributions of R1,4 million during the year.

Replacement and betterment expenditure amounted to R2,0 million (1974: R3,2 million) and the balance in the fund at the end of the year was R183,8 million an increase of R12,3 million over the preceding year.

Revenue Account

The total revenue from sales of electricity in 1975 was R460,1 million which represented an increase of R101,3 million (28 per cent) above sales for the previous year. The accumulated deficit on Revenue Account increased from R12 million (1974) to R39 million by the end of 1975, which deficit will be partially made good by tariff increases already approved for the 1976 year.

Contributions to Funds, Total 8,65

Capital development	8,36
Reserve	0,29
Contributions to Funds, total	8,65

Electricity purchased 0,02

Distribution, total 9,69

Operation	1,30
Maintenance	2,49
Administration and general	5,90
Distribution, total	9,69

**Total costs
1975
R487 149 568**

Operation: Coal cost	24,99
Railage on Coal	3,27
Other costs	5,71
Operation, total	33,97
Maintenance	4,39
Administration and general	6,43

Generation, total 44,79

Corporate management 2,41

Loan charges, total 34,44

Interest:	
Generation	17,69
Distribution	10,35
Corporate Services	0,08
Interest, Total	28,12
Redemption:	
Generation	4,90
Distribution	1,42
Redemption, Total	6,32



Dragline at Arnot open-cast coalmine

The report of the auditors

The Chairman and Members
Electricity Supply Commission
Johannesburg

We have completed the audit of the financial statements and accounting records of the Commission for the year ended 31 December 1975.

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 and have reported thereon on Schedule 9.

Corporate Services

The net expenditure under this heading, after crediting amounts chargeable to electricity supply account under other headings, has been allocated to:

- (a) Capital and Reserve Fund expenditure.
- (b) Electricity supply account of Undertakings.

The amount allocated to electricity supply account has been apportioned by the Commission. We have no reason to disagree with the apportionment so made.

Electricity Supply Account

Operations during the year resulted in deficits at all the Undertakings.

Charges for electricity being supplied have been increased with effect from 1 April 1976 at all Undertakings and it is intended that further increases be made in September 1976.

General

In terms of Section 18(8) of the Electricity Act, 1958 we report that:

- (a) We have found the financial statements of the Commission to be in order.
- (b) The financial statements fairly present the financial position of the Commission and the results of its operations.
- (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) Land and rights, buildings and civil works, and machinery and plant are stated at cost.
- (e) Sums fixed by the Commission have been set aside to the Reserve Fund and Capital Development Fund under Section 13 as prescribed.
- (f) All our requirements as auditors have been complied with and carried out.

Halsey, Button & Perry
Alex Aiken & Carter
Chartered Accountants (S.A.), Auditors

Johannesburg
26 May 1976

Balance sheet

at 31 December 1975

		R000	R000
			1974
Capital expenditure, at cost	Notes 4.1	2 569 803	2 175 842
Land and rights		30 138	26 078
Buildings and civil works		118 756	106 776
Machinery and plant		1 860 023	1 714 630
Total in commission		2 008 917	1 847 484
Works under construction		560 886	328 358
Equipment and stores		128 420	102 049
Movable plant and equipment, at cost		40 016	33 051
less Accumulated depreciation		18 853	14 890
		21 163	18 161
Stores and materials	4.2	107 257	83 888
External investments	4.3	33 749	28 443
Deferred expenditure	4.4	57 790	14 221
		2 789 762	2 320 555
Financed by			
External borrowings		1 771 498	1 438 590
Loans outstanding (Schedule 1)	4.5	1 895 068	1 753 762
less Escom stock held internally	4.6	619 603	539 221
		1 275 465	1 214 541
Import financing facilities taken up		61 046	28 802
Other short-term loans and advances (Schedule 2)		434 987	195 247
Net current liabilities		103 100	52 238
Current liabilities and provisions		173 829	102 832
Accounts payable		125 602	63 479
Sundry provisions		6 436	4 884
Interest accrued		32 972	26 149
Bank overdrafts		8 819	8 320
Current assets		70 729	50 594
Accounts receivable		48 444	35 501
Payments in advance		1 701	2 588
Funds at call		17 554	9 599
Bank balances and cash		3 030	2 906
Total net debt		1 874 598	1 490 828
Statutory funds, reserves and provisions		915 164	829 727
Capital Development Fund (Schedule 7)		112 887	63 696
Reserve Fund (Schedule 8)		183 825	171 503
Redemption Fund (Schedule 9)		318 865	296 578
Unrealised surplus on Escom stock held internally	4.6	25 848	27 166
Provision for repayment of foreign loans		14 865	12 270
Capital reserve	4.7	297 951	270 651
		954 241	841 864
less Accumulated deficit	4.8	39 077	12 137
		2 789 762	2 320 555

Notes to the financial statements

31 December 1975

Note 1

Accounting system

A new management accounting system was implemented on 1 January 1975 which necessitated certain changes to cost collection methods and a reclassification of certain assets and liabilities, resulting in comparative figures for 1974 being re-grouped where necessary.

Note 2

Accounting policies

The principal accounting policies adopted by the Commission, which are consistent with previous years except where otherwise indicated, are as follows:

Capital expenditure and equipment

Interest is added to the cost of capital works under construction until such assets are taken into commercial operation.

Capital expenditure is not depreciated but is maintained at cost while the relevant assets are in commercial operation. Charges are made against working costs to provide for the repayment of loans. (See note on amortisation of borrowings.)

Movable plant and equipment is depreciated at rates considered appropriate to reduce cost to estimated residual value over the useful lives of the assets.

Foreign currencies

Foreign currency liabilities which are covered by forward exchange contracts are converted to Rand at the protected rates of exchange. Other foreign assets and liabilities are converted to Rand at the rates of exchange ruling at the

balance sheet date. The currencies most favourable to the bondholders are used to convert loans raised in European Units of Account.

Deferred expenditure

Discount on loans issued

With effect from the 1975 year, discount on loans issued, which was previously charged to capital expenditure as cost of raising loans, is being held in suspense as deferred expenditure and is charged to costs over the terms of the loans.

Exchange adjustment of foreign liabilities

Net losses arising from the conversion of foreign long term loan balances at the balance sheet date are written off over the periods of the loans.

Amortisation of borrowings

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

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

The redemption fund provisions are not applied to short-term loans and advances, as these are made under the provisions of paragraph 1(3) of the Schedule to the Act in anticipation of the raising of loans.

Note 3

Electricity Supply Account

		R000							
1974		1975							
		Total	Corporate Services	Central Generating	Distribution				
					Total	Cape Western	Cape Northern	Cape Eastern	Border
358 768	Note 3.1	Electricity sold	Increase % 28,24	460 073		55 860	15 479	483	9 956
113 651		Industrial	30,53	148 347		19 050	1 691	284	1 028
109 218		Bulk	33,55	145 864		22 027	3 273	54	8 107
94 390		Mining	21,78	114 952		—	6 923	—	—
27 436		Traction	22,50	33 608		6 651	3 094	—	—
14 073		Domestic and lighting	22,94	17 302		8 132	498	145	821
194 416	3.2	Operating expenditure		277 242	11 719	218 210	47 313	9 487	2 969
—		Operations		171 832	—	165 498	6 334	535	254
—		Maintenance		33 538	—	21 395	12 143	2 623	388
—		Electricity purchased		114	—	26	88	—	88
—		Administration and general expenses		71 758	11 719	31 291	28 748	6 329	2 327
141 459	3.3	Loan charges		167 777	387	110 055	57 335	6 153	3 358
114 308		Interest and finance charges		136 963	387	86 147	50 429	5 394	2 963
16 253		Redemption of local loans		18 082	—	11 326	6 756	759	395
10 898		Repayment of foreign loans		12 732	—	12 582	150	—	—
28 180	3.4	Contributions to funds		42 130	—	31 750	10 380	1 080	430
66		Reserve Fund		1 400	—	—	1 400	—	200
28 114		Capital Development Fund		40 730	—	31 750	8 980	1 080	430
—	3.5	Distribution of costs		—	(12 106)	(360 015)	372 121	43 262	9 782
—		Corporate burden		—	(12 106)	7 709	4 397	518	244
—		Interconnectors		—	—	1 319	(1 319)	—	—
—		Use of circuits		—	—	425	(425)	—	342
—		Transmission costs		—	—	(10 170)	10 170	5 782	526
—		Electricity supplied		—	—	—	—	—	—
—		Excess local generating costs		—	—	(23 062)	23 062	8 528	—
—		Pooled generation		—	—	(336 236)	336 236	28 434	8 670

		R000												
		1974												
		Undertakings		Corporate Services		Central Generating		Distribution undertakings						
		Orange River	Natal	Eastern Transvaal	Rand and O.F.S.	Total	Cape Western	Cape Northern	Cape Eastern	Border	Orange River	Natal	Eastern Transvaal	Rand and O.F.S.
		7 000	83 707	55 382	232 206									
		947	25 587	31 865	67 895									
		6 020	42 357	6 216	57 810									
		—	1 947	13 022	93 060									
		—	10 675	3 738	9 450									
		33	3 141	541	3 991									
		661	8 575	5 854	17 453									
		90	1 510	932	2 891									
		136	2 260	2 353	3 908									
		—	—	—	—									
		435	4 805	2 569	10 654									
		1 910	9 978	8 573	25 881									
		1 649	8 662	7 609	22 807									
		261	1 166	964	3 074									
		—	150	—	—									
		417	2 460	1 270	4 280									
		200	1 000	—	—									
		217	1 460	1 270	4 280									
		5 182	69 200	39 868	197 117									
		95	737	621	2 084									
		(248)	—	(181)	(890)									
		(256)	—	(314)	(326)									
		949	1 990	—	222									
		—	—	665	(665)									
		—	11 880	—	—									
		4 642	54 593	39 077	196 692									

Note 4

Balance sheet

4.1 Capital expenditure

	R000	1974 R000
Balance at beginning of year	2 175 842	1 942 949
Discount on loans issued in prior years transferred to deferred expenditure (Note 4.4)	31 548	
Assets decommissioned, sold or scrapped	39	1 778
	31 587	
	2 144 255	1 941 171
Expenditure during the year	425 548	234 671
	2 569 803	2 175 842
Commitments in respect of capital expenditure contracted for amount to approximately	811 500	610 000

This expenditure will be financed from external borrowings and from cash generated by means of the Capital Development Fund.

4.2 Stores and materials

Consists of		
Coal	8 013	7 113
Construction material	50 705	37 463
Maintenance and consumable stores	48 539	39 312
	107 257	83 888

4.3 External investments

Held for		
Reserve Fund (Schedule 4)	9 334	9 406
Redemption Fund (Schedule 5)	2 399	2 437
	11 733	11 843
Housing loans to employees secured by first mortgage	22 015	16 599
Entire share capital of Rand Mines Power Supply Company Limited	1	1
	33 749	28 443

4.4 Deferred expenditure

Discount on loans issued		32 666	—
Incurred during this year	2 418		
Transferred from capital expenditure (Note 4.1)	31 548		
	33 966		
less Discount on loans repaid in prior years	1 300		
	17 065	12 654	
Exchange adjustment of foreign liabilities	8 059	1 567	
Expenditure on future fuel supplies	57 790	14 221	

4.5 Loans outstanding

Loans and instalments repayable during next year amount to	58 240	27 338
These repayments will be made out of the Redemption Fund and the Provision for repayment of Foreign Loans.		

	R000		1974 R000	
	Book value	Nominal value	Book value	Nominal value
4.6 Escom stock held for				
Capital Development Fund (Schedule 3)	109 518	110 966	62 243	63 220
Reserve Fund (Schedule 4)	169 315	177 870	155 359	163 893
Redemption Fund (Schedule 5)	309 911	325 029	288 447	305 013
Repayment of foreign loans (Schedule 6)	5 011	5 738	6 006	7 095
	<u>593 755</u>	<u>619 603</u>	<u>512 055</u>	<u>539 221</u>
Unrealised surplus being excess of nominal over book values	<u>25 848</u>		<u>27 166</u>	
4.7 Capital reserve				
Loans repaid		347 276		319 938
Machinery and plant financed out of Reserve Fund		10 360		10 360
		<u>357 636</u>		<u>330 298</u>
less Cost of land and rights, buildings and civil works and machinery and plant sold and scrapped		<u>59 685</u>		<u>59 647</u>
		<u>297 951</u>		<u>270 651</u>

4.8 Accumulated deficit

In terms of the Electricity Act, 1958, the undertakings of the Commission are, as far as practicable, carried on neither at a profit nor at a loss, and its charges are adjusted accordingly from time to time.

Note 5

Commitments

In addition to the commitment for capital expenditure referred to in Note 4.1, the Commission is committed to:

1. The payment of approximately R2 279 000 (R1 821 000 in 1974) in respect of loans granted to employees under the Commission's Home Ownership Scheme and not yet paid out.
2. The payment to the Electricity Supply Commission Pension and Provident Fund, in addition to the normal contributions, of R191 000 per annum for the period ending 31 December 1985.
3. The purchase from certain stockholders of Electricity Supply Commission Local Registered Stock as follows:
R4 500 000 – 6,75 per cent 1991 not later than September 1976 at R97 per cent.
R2 000 000 – 6,75 per cent 1991 at the option of the stockholders at R97 per cent.

Note 6

Contingent liabilities

The Commission has indemnified the Electricity Supply Commission Pension and Provident Fund against any loss resulting from the negligence, dishonesty or fraud of the Fund's officers or of the Trustees.

Loans outstanding

at 31 December 1975

Schedule 1

ROOO						ROOO										
Loan No.	Per cent	Out-standing	1974	Loan No.	Per cent	Out-standing	1974									
Internal registered stock				Brought forward				1 047 500	1 067 500							
32	20 000	5,000	1971/75	—	20 000	92	20 000	9,250	1997	20 000	20 000					
33	16 000	4,625	1975/80	16 000	16 000	93	22 000	9,125	1997	22 000	22 000					
34	16 000	4,875	1975/80	16 000	16 000	94	5 000	8,750	1997	5 000	5 000					
35	16 500	5,125	1976/81	16 500	16 500	95	25 000	8,500	1997	25 000	25 000					
36	20 000	5,125	1977/82	20 000	20 000	96	28 000	8,250	1997	28 000	28 000					
37	22 000	5,125	1976/82	22 000	22 000	97	7 000	8,000	1997	7 000	7 000					
38	24 000	5,125	1977/83	24 000	24 000	98	45 000	8,250	1997	45 000	45 000					
39	24 000	5,375	1978/83	24 000	24 000	99	30 000	8,250	1998	30 000	30 000					
40	22 000	5,625	1979/84	22 000	22 000	100	20 000	8,375	1998	20 000	20 000					
42	20 000	5,375	1979/84	20 000	20 000	101	5 000	8,000	1998	5 000	5 000					
43	16 000	5,375	1979/85	16 000	16 000	102	30 000	6,250	1976	30 000	30 000					
44	16 000	5,375	1980/85	16 000	16 000	103	24 000	8,000	1998	24 000	24 000					
45	17 000	5,500	1980/86	17 000	17 000	104	6 000	7,625	1998	6 000	6 000					
46	16 000	5,875	1981/86	16 000	16 000	105	30 000	7,250	1979	30 000	30 000					
47	18 000	6,250	1981/86	18 000	18 000	106	45 000	8,000	1998	45 000	45 000					
49	18 000	6,125	1982/87	18 000	18 000	107	27 000	9,000	1999	27 000	27 000					
50	22 000	5,250	1982/87	22 000	22 000	108	3 000	8,500	1999	3 000	3 000					
51	29 000	5,000	1983/88	29 000	29 000	109	12 000	8,000	1976	12 000	12 000					
52	40 000	5,000	1980/83	40 000	40 000	110	30 000	9,500	1999	30 000	30 000					
53	20 000	5,000	1982/84	20 000	20 000	111	11 000	10,750	2000	11 000	(a) 11 000					
54	20 000	5,500	1982/84	20 000	20 000	112	29 000	10,750	2000	29 000	(b) 29 000					
55	32 000	5,875	1983/85	32 000	32 000	113	40 000	10,750	2000	40 000	40 000					
56	38 000	6,500	1983/85	38 000	38 000	114	25 000	10,750	2000	25 000	—					
58	30 000	6,500	1989/91	30 000	30 000	115	5 000	10,250	2000	5 000	—					
60	35 000	6,750	1991	35 000	35 000	116	30 000	10,750	2000	30 000	—					
61	35 000	6,875	1992	35 000	35 000	117	5 000	10,875	1985	(a) 5 000	—					
64	12 000	6,500	1992	12 000	12 000	118	55 000	11,000	2000	(b) 55 000	—					
65	37 000	6,875	1992	37 000	37 000	119	10 000	10,750	1980/95	(c) 10 000	—					
70	10 000	6,500	1993	10 000	10 000											
71	70 000	6,875	1993	70 000	70 000											
75	22 000	6,500	1993	22 000	22 000											
76	48 000	6,875	1993	48 000	48 000											
78	20 000	6,500	1994	20 000	20 000											
79	30 000	6,875	1994	30 000	30 000											
81	10 000	6,500	1994	10 000	10 000											
82	25 000	6,875	1994	25 000	25 000											
83	18 000	7,500	1995	18 000	18 000											
84	3 000	7,000	1995	3 000	3 000											
85	35 000	8,750	1995	35 000	35 000											
86	10 000	8,500	1995	10 000	10 000											
87	45 000	9,250	1996	45 000	45 000											
88	10 000	8,750	1996	10 000	10 000											
89	20 000	9,250	1996	20 000	20 000											
90	30 000	9,250	1996	30 000	30 000											
91	10 000	8,750	1996	10 000	10 000											
Carried forward				1 047 500	1 067 500											

											ROOO	
Loan No.					Per cent	Out-standing					1974	
Brought forward											1 671 500	1 561 500
Foreign bond issues												
557	DM	50 000 000	(8 921)	6,500	1965/80	4 461	5 353					
562	US\$	15 000 000	(10 776)	7,000	1967/77	2 155	3 233					
574	UA	15 000 000	(10 906)	7,000	1968/78	7 809	8 562					
577	DM	100 000 000	(18 034)	6,500	1968/83	14 596	16 452					
578	DM	100 000 000	(19 583)	8,500	1970/85	19 583	19 583					
580	UA	12 000 000	(8 627)	9,250	1970/80	8 149	8 219					
584	DM	100 000 000	(19 556)	8,000	1971/86	19 556	19 556					
592	UA	20 000 000	(14 210)	8,250	1971/86	19 938	18 276					
598	US\$	20 000 000	(14 304)	8,500	1971/86	12 158	13 231					
604	DM	100 000 000	(25 132)	6,250	1972/87	25 132	25 132					
607	SF	50 000 000	(8 293)	6,500	1973/88	8 293	8 293					
610	DM	100 000 000	(24 975)	7,000	1973/88	24 975	24 975					
614	US\$	15 000 000	(10 080)	9,250	1974/89	9 744	10 080					
Direct placings												
559	US\$	20 000 000	(14 357)	6,250	1966/76	2 108	3 513					
589	DM	10 000 000	(2 054)	8,000	1971/86	2 054	2 054					
593	DM	20 000 000	(3 644)	8,500	1971/86	3 644	3 644					
596	DM	20 000 000	(4 016)	8,500	1971/86	4 016	4 016					
597	DM	40 000 000	(9 437)	8,500	1971/83	9 437	9 437					
620	US\$	40 000 000	(27 244)	9,375	1975/90	27 244	—					
											1 896 552	1 765 109
less Payable by stockholders in respect of internal registered stock											1 484	11 347
111	Not later than 27 March 1975										(a) 3 780	
112	Not later than 27 March 1975										(b) 7 567	
117	Not later than 27 February 1976										(a) 1	
118	Not later than 27 February 1976										(b) 785	
119	Not later than 27 February 1976										(c) 698	
											1 895 068	1 753 762

Short-term loans and advances

at 31 December 1975

Schedule 2

						R000	
Loan No.				Per cent		Out-standing	1974
Foreign bond issues							
621	US\$	25 000 000	(17 028)	10,0000	1975/80	17 028	—
622	DM.	100 000 000	(27 851)	9,2500	1975/80	27 851	—
625	US\$	30 000 000	(26 119)	10,2500	1975/83	26 119	—
Direct placings							
587	SF.	50 000 000	(8 355)	8,5000	1971/76	8 355	8 355
591	SF.	40 000 000	(6 892)	8,5000	1971/76	6 892	6 892
595	SF.	40 000 000	(7 176)	7,5000	1971/76	7 176	7 176
600	SF.	9 000 000	(1 585)	6,5000	1972/77	1 585	1 585
601	D.FL.	50 000 000	(11 740)	6,5000	1972/79	11 740	11 740
608	SF.	50 000 000	(8 324)	6,7500	1973/80	8 324	8 324
609	SF.	35 000 000	(7 647)	6,7500	1973/78	7 647	7 647
611	SF.	75 000 000	(16 304)	6,5000	1973/80	16 304	16 304
613	SF.	50 000 000	(10 850)	7,2500	1973/78	10 850	10 850
615	SF.	20 000 000	(4 318)	8,5000	1974/79	4 318	4 318
616	US\$	35 000 000	(23 839)	9,1250	1974/82	22 647	23 839
618	DM.	70 000 000	(20 138)	10,5000	1975/79	20 138	—
619	SF.	30 000 000	(8 003)	9,0000	1975/82	8 003	—
624	SF.	50 000 000	(13 298)	9,0000	1975/80	13 298	—
626	US\$	30 000 000	(25 832)	7,0000	1975/76	25 832	—
627	SF.	50 000 000	(16 226)	8,5000	1975/78	16 226	—
628A	US\$	30 000 000	(26 119)	8,3125	1975/76	26 119	—
Short-term loans						286 452	107 030
Other short-term advances						148 535	88 217
						434 987	195 247

Investments of the Capital Development Fund

at 31 December 1975

Schedule 3

R000

Description	Loan No.	Nominal value	Book value
Escom internal registered stock			
8,500 per cent	1997 95	7 000	6 750
8,250 per cent	1997 98	7 400	7 315
8,375 per cent	1998 100	2 000	1 991
8,000 per cent	1998 103	2 000	2 000
8,000 per cent	1998 106	13 000	13 000
9,500 per cent	1999 110	12 000	11 911
10,750 per cent	2000 112	8 766	8 583
10,750 per cent	2000 113	20 000	19 583
10,750 per cent	2000 114	800	795
10,750 per cent	2000 116	10 000	9 940
11,000 per cent	2000 118	28 000	27 650
Total (Note 4.6)		110 966	109 518
Interest accrued			2 533
			112 051
Market value	103 419		

Investments of the Reserve Fund

at 31 December 1975

Schedule 4

Description	R000			
	Loan No.	Nominal value	Book value	
Escom internal registered stock				
4,625 per cent	1975/80	33	1 015	854
4,875 per cent	1975/80	34	2 152	1 883
5,125 per cent	1976/81	35	1 845	1 666
5,125 per cent	1977/82	36	952	831
5,125 per cent	1976/82	37	1 689	1 516
5,125 per cent	1977/83	38	2 349	2 111
5,375 per cent	1978/83	39	172	135
5,625 per cent	1979/84	40	2 128	1 827
5,375 per cent	1979/84	42	1 441	1 294
5,375 per cent	1979/85	43	346	293
5,375 per cent	1980/85	44	1 110	965
5,500 per cent	1980/86	45	1 867	1 657
5,875 per cent	1981/86	46	2 618	2 403
6,250 per cent	1981/86	47	3 379	3 039
6,125 per cent	1982/87	49	2 048	1 909
5,250 per cent	1982/87	50	3 569	3 059
5,000 per cent	1983/88	51	5 140	4 263
5,000 per cent	1980/83	52	3 001	2 631
5,000 per cent	1982/84	53	2 497	2 176
5,500 per cent	1982/84	54	2 241	2 025
5,875 per cent	1983/85	55	4 308	3 909
6,500 per cent	1983/85	56	5 070	4 441
6,500 per cent	1989/91	58	3 977	3 790
6,750 per cent	1991	60	4 490	4 387
6,875 per cent	1992	61	5 000	4 936
6,875 per cent	1992	65	8 907	8 761
6,875 per cent	1993	71	7 226	6 868
6,500 per cent	1993	75	1 544	1 433
6,875 per cent	1993	76	8 746	8 452
6,500 per cent	1994	78	1 989	1 873
6,875 per cent	1994	79	6 966	6 834
6,500 per cent	1994	81	1 982	1 826
6,875 per cent	1994	82	3 484	3 347
7,500 per cent	1995	83	1 730	1 730
7,000 per cent	1995	84	1 605	1 522
8,750 per cent	1995	85	8 950	8 950
8,500 per cent	1995	86	1 845	1 801
9,250 per cent	1996	87	1 386	1 386
9,250 per cent	1996	89	1	1
9,250 per cent	1996	90	129	128
8,750 per cent	1996	91	232	231
9,125 per cent	1997	93	321	321
8,750 per cent	1997	94	98	98
8,500 per cent	1997	95	3 983	3 841
8,250 per cent	1997	96	358	348
8,250 per cent	1997	98	6 480	6 406
8,250 per cent	1998	99	7 455	7 231
8,375 per cent	1998	100	2 817	2 805
6,250 per cent	1976	102	9 649	9 639
7,250 per cent	1979	105	5 255	5 201
8,000 per cent	1998	106	1 870	1 870
8,000 per cent	1976	109	4 040	4 036
Carried forward			163 452	154 939

Description	R000			
	Loan No.	Nominal value	Book value	
Brought forward		163 452	154 939	
10,750 per cent	2000	111	701	701
10,750 per cent	2000	114	106	105
10,250 per cent	2000	115	1	1
10,750 per cent	2000	116	4 679	4 651
10,875 per cent	1985	117	3 000	2 987
10,750 per cent	1980/95	119	5 931	5 931
Total (Note 4.6)		177 870	169 315	
Republic of South Africa				
5,250 per cent	1979		700	682
Municipal stock				
Bloemfontein				
5,375 per cent	1975/80		100	91
Cape Town				
5,375 per cent	1980/85	203	600	526
5,500 per cent	1981/86	208	850	737
5,500 per cent	1983/88	219	610	519
5,500 per cent	1980	227	100	93
6,500 per cent	1981	240	210	203
Durban				
3,000 per cent	1967/77	50	1	1
5,375 per cent	1974/79	68	600	563
5,375 per cent	1976/80	70	800	739
6,000 per cent	1972/77	74	334	328
5,000 per cent	1984	84	500	425
5,500 per cent	1982	87	450	407
6,000 per cent	1980	88	500	474
6,000 per cent	1981	91	1 000	939
6,500 per cent	1981	93	1 000	963
Germiston				
5,375 per cent	1985	16	150	128
Johannesburg				
5,375 per cent	1974/79	36	120	113
Pretoria				
5,000 per cent	1961/81	7	246	221
5,375 per cent	1975/78	44	100	96
5,375 per cent	1975/78	47	100	95
6,250 per cent	1977/82	49	200	189
5,500 per cent	1980/83	56	200	179
6,500 per cent	1981/84	59	200	190
Rand Water Board				
6,500 per cent	1984	33	250	237
7,000 per cent	1987	35	200	196
External investments (Note 4.3)			10 121	9 334
			187 991	178 649
Interest accrued				2 336
				180 985
Market value		145 512		

Investments of the Redemption Fund

at 31 December 1975

Schedule 5

Description	Loan No.	R000	
		Nominal value	Book value
Escom internal registered stock			
5,125 per cent	1976/81	35	1 419
5,125 per cent	1977/82	36	1 063
5,125 per cent	1976/82	37	3 509
5,125 per cent	1977/83	38	8 428
5,375 per cent	1978/83	39	120
5,625 per cent	1979/84	40	1 915
5,375 per cent	1979/84	42	6 096
5,375 per cent	1979/85	43	6 130
5,375 per cent	1980/85	44	7 367
5,500 per cent	1980/86	45	4 853
5,875 per cent	1981/86	46	7 575
6,250 per cent	1981/86	47	4 154
6,125 per cent	1982/87	49	6 338
5,250 per cent	1982/87	50	6 544
5,000 per cent	1983/88	51	9 705
5,000 per cent	1982/84	53	3 373
5,500 per cent	1982/84	54	3 523
5,875 per cent	1983/85	55	10 221
6,500 per cent	1983/85	56	3 685
6,500 per cent	1989/91	58	9 424
6,750 per cent	1991	60	4 164
6,875 per cent	1992	61	6 247
6,500 per cent	1992	64	2 056
6,875 per cent	1992	65	4 044
6,500 per cent	1993	70	2 259
6,875 per cent	1993	71	5 551
6,500 per cent	1993	75	1 799
6,875 per cent	1993	76	169
6,500 per cent	1994	78	3 628
6,875 per cent	1994	79	11 025
6,500 per cent	1994	81	3 560
6,875 per cent	1994	82	9 226
7,500 per cent	1995	83	540
7,000 per cent	1995	84	122
8,750 per cent	1995	85	8 557
8,500 per cent	1995	86	1 450
9,250 per cent	1996	87	3 821
8,750 per cent	1996	88	108
9,250 per cent	1996	89	4 492
9,250 per cent	1996	90	10 924
8,750 per cent	1996	91	7 742
9,250 per cent	1997	92	2 140
9,125 per cent	1997	93	938
8,750 per cent	1997	94	933
8,500 per cent	1997	95	13 149
8,250 per cent	1997	96	7 065
8,000 per cent	1997	97	203
8,250 per cent	1997	98	10 728
8,250 per cent	1998	99	7 500
8,375 per cent	1998	100	2 361
Carried forward		241 943	227 439

Description	Loan No.	R000	
		Nominal value	Book value
Brought forward		241 943	227 439
8,000 per cent	1998	101	2 098
6,250 per cent	1976	102	3 000
8,000 per cent	1998	103	580
7,625 per cent	1998	104	2 078
7,250 per cent	1979	105	7 189
8,000 per cent	1998	106	29 990
9,000 per cent	1999	107	36
8,500 per cent	1999	108	485
8,000 per cent	1976	109	660
9,500 per cent	1999	110	8 888
10,750 per cent	2000	111	40
10,750 per cent	2000	112	2
10,250 per cent	2000	115	1 034
10,750 per cent	2000	116	15 000
10,875 per cent	1985	117	1 786
11,000 per cent	2000	118	9 245
10,750 per cent	1980/95	119	975
Total (Note 4.6)		325 029	309 911
Republic of South Africa			
5,250 per cent	1979		300
6,000 per cent	1985		500
Municipal stocks			
Bloemfontein			
5,375 per cent	1975/80		80
Cape Town			
3,000 per cent	1976	167	200
5,375 per cent	1980/85	203	300
Durban			
3,250 per cent	1966/76	49	100
3,000 per cent	1967/77	50	668
5,375 per cent	1974/79	68	120
Germiston			
5,375 per cent	1985	16	20
Johannesburg			
3,000 per cent	1967/77	21	60
5,375 per cent	1974/79	36	194
External investments (Note 4.3)		2 542	2 399
		327 571	312 310
Interest accrued			3 548
			315 858
Market value		251 955	

Investments in Escom foreign loan bonds

at 31 December 1975

Schedule 6

R000

Description		Loan No.	Foreign currency	Nominal value	Book value	
German	6,5 per cent 1965/80	557	DM	757 000	135	124
Euro-dollar	7 per cent 1967/77	562	\$	53 000	38	37
Units of Account	7 per cent 1968/78	574	UA	443 000	602	545
German	6,5 per cent 1968/83	577	DM	3 562 000	642	583
German	8,5 per cent 1970/85	578	DM	469 000	92	83
Units of Account	9,25 per cent 1970/80	580	UA	344 000	467	430
German	8 per cent 1971/86	584	DM	1 506 000	295	262
Units of Account	8,25 per cent 1971/86	592	UA	609 000	827	740
Euro-Dollar	8,5 per cent 1971/86	598	\$	417 000	298	258
German	6,25 per cent 1972/86	604	DM	6 271 000	1 576	1 283
German	7 per cent 1973/88	610	DM	920 000	230	183
Euro-Dollar	9,25 per cent 1974/89	614	\$	798 000	536	483
Total (Note 4.6)					5 738	5 011
Interest accrued						231
						5 242
Market value				5 040		

Capital Development Fund Account

for the year ended 31 December 1975

Schedule 7

	R000	R000
		1974
Amounts set aside	40 730	28 114
Cape Western Undertaking	1 080	670
Cape Eastern Undertaking	33	17
Cape Northern Undertaking	430	356
Border Undertaking	210	136
Natal Undertaking	1 460	1 016
Eastern Transvaal Undertaking	1 270	1 036
Rand and Orange Free State Undertaking	4 280	2 768
Central Generating Undertaking	31 750	22 000
Orange River Undertaking	217	115
Income from investments	8 461	4 215
Interest earned	8 449	4 206
Adjustment of investment values	12	9
Accumulated balance at beginning of year	63 696	31 367
Balance at end of year	112 887	63 696

Reserve Fund Account

for the year ended 31 December 1975

Schedule 8

	R000	R000	
		1974	
Amounts set aside	1 400		66
Cape Eastern Undertaking	—	9	
Border Undertaking	200	—	
Natal Undertaking	1 000	—	
Orange River Undertaking	200	57	
	<hr/>	<hr/>	
Income from investments	12 903		11 637
Interest earned	12 849	11 591	
Adjustment of investment values	54	46	
	<hr/>	<hr/>	
	14 303		11 703
Expenditure during the year	1 981		3 216
Cape Western Undertaking	9	244	
Cape Eastern Undertaking	1	—	
Cape Northern Undertaking	38	29	
Border Undertaking	2	5	
Natal Undertaking	413	385	
Eastern Transvaal Undertaking	5	157	
Rand and Orange Free State Undertaking	315	130	
Central Generating Undertaking	1 197	2 237	
Orange River Undertaking	1	29	
	<hr/>	<hr/>	
	12 322		8 487
Accumulated balance at beginning of year	171 503		163 016
	<hr/>	<hr/>	
Balance at end of year	183 825		171 503

Redemption Fund Account

for the year ended 31 December 1975

Schedule 9

	R000	R000
		1974
Balance at beginning of year	296 578	312 369
Amounts contributed during year	18 082	16 252
Cape Western Undertaking	759	681
Cape Eastern Undertaking	16	14
Cape Northern Undertaking	395	349
Border Undertaking	121	87
Natal Undertaking	1 166	1 001
Eastern Transvaal Undertaking	964	765
Rand and Orange Free State Undertaking	3 074	2 863
Central Generating Undertaking	11 326	10 301
Orange River Undertaking	261	191
Other contributions	36	42
Proceeds of sales of fixed property	111	718
Income from investments	24 058	21 197
Interest earned	25 750	22 387
Adjustment of investment values	(1 692)	(1 190)
	338 865	350 578
Repayment of internal registered stock	20 000	54 000
3 per cent 1968/74 (Loan 14)	—	6 000
3,5 per cent 1969/74 (Loan 16)	—	6 000
3,75 per cent 1969/74 (Loan 17)	—	6 000
5 per cent 1971/74 (Loan 31)	—	16 000
5 per cent 1974 (Loan 80)	—	20 000
5 per cent 1971/75 (Loan 32)	20 000	—
Balance at end of year	318 865	296 578

We report that we have examined the accounting records of the Redemption Fund and are satisfied as to the correctness thereof and as to the maintenance of the Fund at the amount required by the schedule to the Electricity Act 1958.

In reviewing the valuation of the Fund at 31 December 1975 we have taken into account the market value of the investments at that date.

Halsey, Button & Perry
 Alex. Aiken & Carter
 Chartered Accountants (S.A.)
 Auditors

Johannesburg
 26 May 1976

Power stations: principal equipment installed

at 31 December 1975

Statement No. 1

Power station	Station capacity			Boilers		Main turbo-generators				
	Type	Boilers kg/s	Generators MW	Assigned sent out rating MW	Continuous maximum rating each kg/s	No.	Normal rating each MW	Steam conditions at turbine inlet		
								Pressure MPa (abs)	Temperature °C	
Coal-fired stations, Transvaal and O.F.S.										
Arnot	Steam	1 998,6	2 100,0	1 980	6	333,1	6	350,0	15,9	510/510
Hendrina	Steam	1 713,6	1 600,0	1 520	8	214,2	8	200,0	10,3	538
Camden	Steam	1 814,4	1 600,0	1 520	8	226,8	8	200,0	10,3	538
Grootvlei	Steam	856,8 230,6 1 087,4	1 000,0 1 000,0	950	4 1 5	214,2 230,6	5 5	200,0	10,3	538
Komati	Steam	567,0 566,8 1 133,8	500,0 500,0 1 000,0	925	5 4 9	113,4 141,7	5 4 9	100,0 125,0	8,4 8,4	510 510
Highveld	Steam	554,4	480,0	440	8	69,3	8	60,0	6,3	482
Taaibos	Steam	584,8	480,0	440	8	73,1	8	60,0	4,2	441
Klip	Steam	567,5 567,5	396,0 *28,0 424,0	380	25 25	22,7	12 12	33,0	2,5	390
Vierfontein	Steam	503,5	360,0	335	19	26,5	12	30,0	4,2	441
Vaal	Steam	430,2 430,2	297,0 †21,0 318,0	280	18 18	23,9	9 9	33,0	2,5	427
Wilge	Steam	62,8 201,6 73,1 337,5	60,0 180,0 240,0	220	4 4 1 9	15,7 50,4 73,1	2 3 5	30,0 60,0	4,2 4,2	454 454
Sub-total		10 725,7	9 602,0	8 990	123		90			
Coal-fired stations, Western Cape										
Salt River No. 1	Steam	75,6	60,0		6	12,6	3	20,0	2,9	385
Salt River No. 2	Steam	328,0	120,0 120,0		10	32,8	4 2	30,0 60,0	4,2 4,2	482 482
Salt River 1 and 2		403,6	240,0 300,0	285	10 16		6 9			
Hex River	Steam	100,8 69,2 170,0	60,0 60,0 120,0	110	4 2 6	25,2 34,6	3 2 5	20,0 30,0	4,2 4,2	427 482
Sub-total		573,6	420,0	395	22		14			

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

Power station	Station capacity			Boilers		Main turbo-generators				
	Type	Boilers kg/s	Generators MW	Assigned sent out rating MW	Continuous maximum rating each kg/s	No.	Normal rating each MW	Steam conditions at turbine inlet		
								Pressure MPa (abs)	Temperature °C	
Coal-fired stations, Natal										
Ingagane	Steam	567,0	500,0	465	5	113,4	5	100,0	8,4	510
Umgeni	Steam	181,6 164,0 345,6	120,0 120,0 240,0	225	8 5 13	22,7 32,8	4 2 6	30,0 60,0	4,2 4,2	454 454
Congella	Steam	201,6 201,6	70,0 37,0 107,0	97	8 8	25,2	2 1 3	35,0 37,0	4,3 4,3	435 435
Colenso	Steam	113,5 50,4 163,9	75,0 30,0 105,0	89	5 2 7	22,7 25,2	3 1 4	25,0 30,0	2,0 2,0	385 385
Sub-total		1 278,1	952,0	876	33		18			
Coal-fired station, Eastern Cape										
West Bank No. 1	Steam	27,6	22,5		4	6,9	3	7,5	1,6	371
West Bank No. 2	Steam	85,6 53,0 138,6 166,2	45,0 40,0 85,0		4 2 6 10	21,4 26,5	3 2 5 8	15,0 20,0	2,9 2,9	427 427
West Bank 1 and 2		166,2	107,5	101	10		8			
Sub-total		166,2	107,5	101	10		8			
Total, coal-fired stations		12 743,6	11 081,5	10 362	188		130			
Hydro-electric stations, conventional storage										
Hendrik Verwoerd	Hydro		160,0	160			2	80,0		
Total, hydro stations			160,0	160			2			
Total all Escom		12 743,6	11 241,5	10 522	188		132			

Transmission lines and cables:

Circuit kilometres (excluding service connections on reticulation systems)

at 31 December 1975

Statement No. 1
(continued)

(a) Transmission lines

Undertaking	533 kV D.C.	400 kV	275 kV	220 kV	132 kV	88 kV	66 kV
Border				159,85			532,51
Cape Eastern							
Cape Northern			206,60		2 262,87		604,96
Cape Western					1 121,19		1 831,21
Eastern Transvaal			807,63		1 514,36	1 015,48	291,38
Natal			1 171,01		1 280,38	2 269,30	
Orange River				478,94	100,83		679,13
Rand and O.F.S.		430,49	2 516,35		3 554,39	5 927,68	126,5
Central Generating	1 029,70	4 668,36			5,15		
Totals A	1 029,70	5 098,85	4 701,59	638,79	9 839,17	9 212,46	4 065,76

(b) Underground cables

Border							
Cape Eastern							0,32
Cape Northern							47,30
Cape Western					15,75		
Eastern Transvaal							
Natal						1,89	
Orange River							
Rand and O.F.S.						39,86	
Totals B					15,75	41,75	47,62

(c) Total lines and cables

1975=A+B=C	1 029,70	5 098,85	5 340,38		9 854,92		
Year 1974=D		5 039,54	5 055,82		9 428,75		
Additions in 1975=C-D=E	1 029,70	59,31	284,56		426,17		

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
	57,48	522,03	1 408,41		5,78		177,17	2 863,23
		242,53	223,83				16,82	483,18
		1 479,26	1 756,28				113,26	6 423,23
	163,66	1 103,07	5 756,26	549,02			2 270,44	12 794,85
		4 365,70	4 403,97	101,70	13,52	79,96	341,91	12 935,61
	871,02	624,00	7 643,45	8,15		1,53	805,09	14 673,93
		1 064,93	108,83				2,81	2 435,47
2 390,45	14,80	1 989,66	11 351,68	553,41		1,62	1 296,45	30 153,55
								5 703,21
2 390,45	1 106,96	11 391,18	32 652,71	1 212,28	19,30	83,11	5 023,95	
16 775,63					50 382,53			88 466,26

		0,02	29,71		2,55		39,11	71,39
							2,53	2,53
			2,00	0,75			29,59	32,66
	72,20	5,77	1 037,91	15,46	0,17		1 407,39	2 602,49
		40,77	68,15	3,15	1,67	4,78	141,05	259,57
	4,45	4,68	369,51	6,84	0,47	0,02	214,18	602,04
152,84	0,33	178,97	402,71	655,17	0,21		442,74	1 872,83
152,84	76,98	230,21	1 909,99	681,37		4,80	2 276,59	
319,19								5 443,51
2 543,29	1 183,94	11 621,39	34 562,70	1 893,65	24,91	87,91	7 300,54	
17 094,82								93 909,77
16 660,06								88 224,74
434,76								5 685,03

Capacity of transformers in service

at 31 December 1975

Statement No. 1
(continued)

Undertaking	Number		MVA	
	1974	1975	1974	1975
Border	1 137	1 215	656,880	672,641
Cape Eastern	558	594	15,610	16,680
Cape Northern	2 818	3 048	1 298,906	1 375,184
Cape Western	9 328	10 658	4 043,442	4 271,180
Eastern Transvaal	5 536	6 141	5 296,924	7 037,891
Natal	7 720	8 464	8 596,393	8 857,162
Orange River	255	285	2 366,950	2 370,505
Rand and Orange Free State	16 015	17 557	28 602,502	31 346,241
Central Generating	1 100	1 157	15 022,602	16 497,104
Totals	44 367	49 119	65 900,209	72 444,588

Power purchased from outside sources

Statement No. 2

Purchased from	kWh					1975
	1970	1971	1972	1973	1974	
Water Affairs Department	46 283	1 886 712	2 986 020	3 506 570	4 518 726	8 451 200
Port Elizabeth Municipality (Aloes) . . .	4 559 484	5 058 867	5 706 956	6 426 031	1 375 020	—
Port Elizabeth Municipality (Summit)	2 510 960	1 375 320	958 440	1 337 160	1 977 465	1 264 860
Transvaal Sugar Corporation	144 000	6 000	—	—	—	—
Cabora Bassa	—	—	—	—	—	25 152 400
Pretoria Municipality . . .	—	—	2 160	—	—	—
Total kWh purchased	7 260 727	8 326 899	9 653 576	11 269 761	7 871 211	34 868 460
Total kWh sold	34 890 575 085	38 040 020 852	41 648 918 788	46 578 458 899	52 585 098 245	57 869 160 163
Purchased as percentage of sales	0,021%	0,022%	0,023%	0,024%	0,015%	0,060%

kWh sold and number of consumers, 1975

Statement No. 3

In licensed areas of Undertakings

Undertakings	Traction			Bulk			Mining	
	kWh	Per cent	Number of consumers	kWh	Per cent	Number of consumers	kWh	Per cent
Border				523 852 797	2,90	18		
Cape Eastern				2 320 440	0,01	1		
Cape Northern	273 898 436	8,28	3	298 703 500	1,66	30	622 392 551	3,57
Cape Western	505 894 900	15,30	6	2 383 297 159	13,20	56		
Eastern Transvaal	373 301 452	11,29	7	768 066 090	4,25	31	1 728 481 179	9,91
Natal	1 034 944 416	31,29	14	4 984 675 849	27,61	35	185 941 570	1,06
Orange River				863 359 380	4,78	32		
Rand and O.F.S.	1 119 137 608	33,84	2	8 230 666 294	45,59	150	14 907 526 596	85,46
Total electricity	3 307 176 812	100,00	32	18 054 941 509	100,00	353	17 444 341 896	100,00
Per cent of total		5,71			31,20			30,14

In provinces of South Africa and neighbouring territories

Cape	688 905 000	20,83	8	4 105 510 237	22,74	125	574 869 081	3,30
Lesotho				31 429 613	0,17	2		
Swaziland				38 601 279	0,21	1		
Natal	887 193 066	26,83	12	4 852 278 129	26,88	25	185 941 570	1,06
O.F.S.	230 602 959	6,97	2	909 317 861	5,04	69		
Mozambique				203 148 800	1,13	2	3 598 242 256	20,63
Transvaal	1 500 475 787	45,37	10	7 905 049 230	43,78	128	13 085 288 989	75,01
Rhodesia				9 606 360	0,05	1		
Total electricity	3 307 176 812	100,00	32	18 054 941 509	100,00	353	17 444 341 896	100,00

Number of consumers	Industrial			Domestic and street lighting			Total kWh sold		
	kWh	Per cent	Number of consumers	kWh	Per cent	Number of consumers	kWh	Per cent	Total number of consumers
	42 568 213	0,24	472	31 230 071	3,08	3 964	597 651 081	1,03	4 454
	7 314 200	0,04	248	3 847 128	0,38	628	13 481 768	0,02	877
76	119 173 894	0,66	873	26 195 825	2,59	2 867	1 340 364 206	2,32	3 849
	1 314 126 367	7,28	8 780	452 237 205	44,64	59 291	4 655 555 631	8,05	68 133
110	4 367 202 972	24,20	5 848	29 794 796	2,94	2 922	7 266 846 489	12,56	8 918
36	2 786 878 593	15,44	5 937	173 353 253	17,11	22 287	9 165 793 681	15,84	28 309
	51 171 866	0,28	111	866 891	0,09	109	915 398 137	1,58	252
103	9 361 189 424	51,86	21 329	295 549 248	29,17	16 961	33 914 069 170	58,60	38 545
325	18 049 625 529	100,00	43 598	1 013 074 417	100,00	109 029	57 869 160 163	100,00	153 337
		31,20			1,75			100,00	

66	1 529 174 268	8,47	10 496	511 700 583	50,51	66 535	7 410 159 169	12,81	77 230
							31 429 613	0,05	2
							38 601 279	0,07	1
36	2 752 708 157	15,25	5 142	159 764 446	15,77	20 296	8 837 885 368	15,27	25 511
25	740 064 110	4,10	538	12 222 014	1,21	1 680	5 490 449 200	9,49	2 314
							203 148 800	0,35	2
198	13 027 678 994	72,18	27 422	329 387 374	32,51	20 518	35 847 880 374	61,94	48 276
							9 606 360	0,02	1
325	18 049 625 529	100,00	43 598	1 013 074 417	100,00	109 029	57 869 160 163	100,00	153 337

Power station operating statistics, 1975

Statement No. 4

Power station	GWh generated	GWh sent out	Maximum demands 1 hour sent out MW	Station load factors per cent		Overall thermal efficiency per cent	
				A	B	Generated	Sent out
Stations under construction							
Arnot†	12 202,2	11 331,8	1 902	72,3	68,0	36,6	34,0
Grootvlei	6 030,9	5 750,1	994	69,1	66,0	33,1	31,6
Hendrina	10 103,5	9 588,5	1 504	76,8	72,8	34,0	32,3
Sub-total, steam stations	28 336,6	28 670,4	—	73,1	—	34,9	32,8
Hendrik Verwoerd Hydro	1 100,4	1 098,7	269	78,4	46,6	—	—
Group total	29 437,0	27 769,1	—	—	—	—	—
Completed stations: Transvaal and O.F.S.							
Camden	10 477,1	9 999,5	1 502	75,1	76,0	32,3	30,8
Highveld	2 510,2	2 329,0	490	60,4	54,3	29,0	26,9
Klip	1 601,2	1 462,1	384	43,9	43,5	20,1	18,4
Komati	6 895,9	6 405,6	932	79,1	78,5	29,5	27,4
Taaibos	2 406,8	2 206,5	466	57,2	54,1	26,9	24,6
Vaal	1 929,2	1 792,6	289	73,1	70,8	21,3	19,8
Vierfontein	2 055,3	1 908,4	343	65,0	63,5	23,8	22,1
Wilge	1 695,5	1 567,1	238	81,3	75,2	26,1	24,2
Group total	29 571,2	27 670,8	—	69,6	—	28,0	26,2
Western Cape							
Hex River	298,4	279,9	117	29,0	27,3	24,1	22,6
Salt River Nos. 1 and 2	1 171,2	1 107,9	284	44,4	44,5	26,3	24,9
Group total	1 469,6	1 387,8	—	40,1	—	25,8	24,4
Natal							
Colenso	293,5	270,5	130	34,7	23,8	17,6	16,2
Congella	384,8	350,4	116	41,2	34,5	21,3	19,4
Ingagane	3 452,5	3 240,3	490	79,5	75,5	30,5	23,6
Umgeni	581,7	537,2	226	27,3	27,1	22,0	20,3
Group total	4 712,5	4 398,4	—	57,3	—	27,0	25,2
Eastern Cape							
West Bank Nos. 1 and 2	288,9	272,3	107	30,8	29,1	21,8	20,6
Group total	288,9	272,3	107	30,8	29,1	21,8	20,6
Total Escom power stations	65 479,2	61 498,4	9 185	68,6	76,4	31,0*	29,1*

†Completed in August 1975

Availability %	Water used Litre/kWh S.O. (excludes colliery and construction usage)	Coal burnt metric ton	Kg of coal per kWh sent out	Calorific value of coal MJ per kg as received (weighted average)	Station heat rate MJ per kWh sent out	Coal cost		
						Total Rand	Per metric ton Rand	Per kWh sent out Cents
80,8	2,65	5 308 226	0,468	22,59	10,57	17 199 780	3,24	0,151 8
83,6	2,04	3 133 025	0,545	20,94	11,41	18 009 820	5,75	0,313 2
80,8	2,42	4 534 012	0,473	23,59	11,16	10 577 932	2,33	0,110 3
—	2,44	12 975 263	0,487	22,54	10,98	45 787 532	3,53	0,171 7
94,7	—	—	—	—	—	—	—	—
—	—	12 975 263	—	—	—	45 787 532	3,53	0,171 7
80,9	2,46	5 086 453	0,509	22,95	11,64	15 046 625	2,96	0,150 5
94,0	3,31	1 571 726	0,675	19,84	13,39	7 026 674	4,47	0,301 7
92,1	5,16	1 376 613	0,942	20,80	19,59	7 770 493	5,64	0,531 5
84,4	3,02	3 568 575	0,557	23,55	13,12	9 771 594	2,74	0,152 5
91,2	4,02	1 809 688	0,820	17,81	14,60	8 174 481	4,52	0,370 5
88,4	4,72	1 712 010	0,955	19,08	18,22	5 511 530	3,22	0,307 5
89,5	4,34	1 555 422	0,815	19,95	16,26	5 611 963	3,61	0,294 1
89,2	4,50	1 071 744	0,684	21,79	14,90	3 270 713	3,05	0,208 7
85,3	3,32	17 752 231	0,642	21,40	13,74	62 184 073	3,50	0,224 7
92,4	3,68	164 570	0,588	27,14	15,96	2 040 790	12,40	0,729 1
84,6	0,39	605 522	0,547	26,43	14,46	7 822 277	12,92	0,706 0
86,8	1,05	770 092	0,555	26,58	14,75	9 863 067	12,81	0,710 7
81,8	5,38	235 138	0,869	25,53	22,19	2 178 549	9,26	0,805 4
86,1	0,97	266 815	0,761	24,39	18,56	2 969 800	11,17	0,847 5
94,7	2,98	1 671 268	0,516	24,39	12,59	8 389 875	5,02	0,258 9
93,8	4,16	383 828	0,714	24,78	17,69	4 311 895	11,23	0,802 7
92,2	3,11	2 557 049	0,581	24,55	14,26	17 850 119	6,98	0,405 8
87,3	0,46	177 100	0,650	26,88	17,47	2 006 918	11,33	0,737 0
87,3	0,46	177 100	0,650	26,88	17,47	2 006 918	11,33	0,737 0
85,0	2,85*	34 231 735*	0,567*	22,21*	12,59	137 691 709	4,02	0,223 9

$$\text{Station Load factors A} = \frac{\text{U.S.O.} \times 100}{(\text{Assigned S.O. rating}) \times \text{hours in year}}$$

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

$$\text{Station Load factors B} = \frac{\text{U.S.O.} \times 100}{(\text{Station M.D. S.O.}) \times \text{hours in year}}$$

*Coal-fired stations only

Cost of fuel burnt at Escom power stations in 1975, cent per kWh sent out

Statement No. 5

Power station and region	Coal cost excluding handling and transport	Railage	Coal delivered to station	Furnace oil delivered to station	Total fuel cost
Transvaal and O.F.S.:					
Arnot	0,151 8	—	0,151 8	0,012 6	0,164 4
Hendrina	0,110 3	—	0,110 3	0,004 1	0,114 4
Camden	0,150 5	—	0,150 5	0,004 0	0,154 5
Grootvlei	0,312 1	0,001 1	0,313 2	0,006 8	0,320 0
Komati	0,152 5	—	0,152 5	0,008 3	0,160 8
Highveld	0,294 6	0,007 1	0,301 7	0,010 7	0,312 4
Taaibos	0,345 3	0,025 2	0,370 5	0,011 1	0,381 6
Klip	0,403 2	0,128 3*	0,531 5	—	0,531 5
Vierfontein	0,294 1	—	0,294 1	—	0,294 1
Vaal	0,307 5	—	0,307 5	—	0,307 5
Wilge	0,208 7	—	0,208 7	0,004 9	0,213 6
Sub-total	0,193 8	0,004 9	0,198 7	0,006 8	0,205 5
Western Cape:					
Salt River	0,228 3	0,477 8	0,706 1	—	0,706 1
Hex River	0,229 1	0,500 0	0,729 1	—	0,729 1
Sub-total	0,228 4	0,482 3	0,710 7	—	0,710 7
Natal:					
Ingagane	0,256 4	0,002 5	0,258 9	0,009 3	0,268 2
Umgeni	0,308 4	0,494 2	0,802 6	—	0,802 6
Congella	0,397 0	0,450 5	0,847 5	0,059 5	0,907 0
Colenso	0,441 2	0,364 2	0,805 4	—	0,805 4
Sub-total	0,285 3	0,120 5	0,405 8	0,011 6	0,417 4
Eastern Cape:					
West Bank	0,263 4	0,473 6	0,737 0	—	0,737 0
Sub-total	0,263 4	0,473 6	0,737 0	—	0,737 0
Overall total	0,201 6	0,026 4	0,228 0	0,007 0	0,235 0

*Road haulage levy 0,007 4 cent/kWh s.o. included.

Statement showing the price or rent of land or rights or interests in or over land or any other property acquired or hired by the Commission during the year ending 31 December 1975

Statement No. 6

Rand and O.F.S. Undertaking

Immovable property acquired for considerations amounting to	R472 594,00
Servitudes and other interest in or over land or other property acquired or hired	R697 292,91

Eastern Transvaal Undertaking

Immovable property acquired for considerations amounting to	R19 000,00
Servitudes and other interest in or over land or other property acquired or hired	R180 713,19

Cape Northern Undertaking

Immovable property acquired for considerations amounting to	R364 031,00
Servitudes and other interest in or over land or other property acquired or hired	R99 760,73

Cape Western Undertaking

Immovable property acquired for considerations amounting to	R57 566,00
Servitudes and other interest in or over land or other property acquired or hired	R165 457,20

Cape Eastern Undertaking

Immovable property acquired for considerations amounting to	R1,00
Servitudes and other interest in or over land or other property acquired or hired	R7 654,71

Border Undertaking

Immovable property acquired for considerations amounting to	R71 149,83
Servitudes and other interest in or over land or other property acquired or hired	R214 814,82

Natal Undertaking

Immovable property acquired for considerations amounting to	R149 550,00
Servitudes and other interest in or over land or other property acquired or hired	R282 355,00

Orange River Undertaking

Immovable property acquired for considerations amounting to	R193 000,00
Servitudes and other interest in or over land or other property acquired or hired	R63 715,24

Central Generating Undertaking

Immovable property acquired for considerations amounting to	R4 105 176,06
Servitudes and other interest in or over land or other property acquired or hired	R740 357,40

Education Department

Immovable property acquired for considerations amounting to	R304 200,00
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Average cost of coal burnt at Escom power stations

Statement No. 7

Rand per metric ton

Power station and region	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
	R	R	R	R	R	R	R	R	R	R	R	R
Transvaal and O.F.S.												
Arnot	—	—	—	—	—	—	—	1,67	1,97	2,12	2,61	3,24
Hendrina	—	—	—	—	—	—	1,95	1,72	1,89	2,13	2,14	2,33
Camden	—	—	—	2,00	1,55	1,79	1,82	1,69	1,69	1,84	2,15	2,96
Grootvlei	—	—	—	—	—	1,84	1,67	1,83	2,09	2,16	4,10	5,75
Komati	1,48	1,29	1,37	1,27	1,40	1,41	1,33	1,37	1,50	1,60	1,92	2,74
Highveld	1,83	1,79	1,81	1,95	2,07	2,23	2,23	2,19	2,15	2,20	2,84	4,47
Taaibos	1,74	1,72	1,82	1,96	2,05	2,11	2,04	1,92	2,06	2,14	2,76	4,52
Klip	2,23	2,39	2,74	2,91	3,12	2,93	2,74	2,86	2,89	3,23	3,86	5,64
Vierfontein	1,57	1,70	1,85	1,82	1,87	1,72	1,76	1,85	1,85	2,34	2,79	3,61
Vaal	1,15	1,15	1,20	1,28	1,27	1,22	1,17	1,32	1,25	1,64	2,34	3,22
Wilge	1,06	1,09	1,20	1,44	1,47	1,36	1,38	1,58	1,66	1,79	2,20	3,05
Western Cape												
Salt River	5,86	5,97	6,23	6,56	6,48	6,64	6,61	7,01	7,46	9,13	10,12	12,92
Hex River	5,70	5,88	6,14	6,38	6,22	6,36	6,43	7,35	7,30	8,60	9,51	12,40
Natal												
Ingagane	2,49	2,71	2,78	2,78	2,77	2,53	2,51	2,75	3,02	3,34	4,00	5,02
Umgeni	4,76	5,00	5,31	5,61	5,58	5,45	5,57	5,84	6,08	6,82	7,78	11,23
Congella	3,58	3,77	3,92	4,01	4,19	5,24	5,26	5,44	5,82	6,41	7,34	11,17
Colenso	3,71	4,16	4,31	4,30	4,20	4,39	4,39	4,51	4,68	5,26	6,12	9,26
Eastern Cape												
West Bank	5,52	5,62	5,75	5,85	5,84	6,04	6,13	6,31	6,83	8,17	8,87	11,33

GWh sold by undertakings to all consumers

Statement No. 8

Year	Border	Cape Eastern	Cape Northern	Cape Western	Eastern Transvaal	Natal	Orange River	Rand and O.F.S.	Total	Per cent growth for the year
1950	79,9	—	53,9	271,9	384,8	968,3	—	5 151,8	6 910,6	
1951	88,1	—	58,5	303,5	392,9	1 050,4	—	5 563,2	7 456,5	7,9
1952	97,7	—	61,3	341,2	431,1	1 109,6	—	6 039,6	8 080,6	8,4
1953	107,8	—	67,1	375,5	416,3	1 205,5	—	6 559,9	8 732,2	8,1
1954	118,2	—	70,7	436,2	276,1	1 310,2	—	7 465,2	9 676,6	10,8
1955	130,8	—	73,2	527,1	400,3	1 417,2	—	8 416,3	10 964,0	13,3
1956	139,1	—	78,7	585,1	511,9	1 553,1	—	9 151,6	12 019,5	9,6
1957	143,1	—	86,1	698,6	542,5	1 640,4	—	9 652,5	12 763,1	6,2
1958	152,9	—	115,2	826,0	587,1	1 720,2	—	10 200,6	13 602,2	6,6
1959	165,0	—	171,4	861,8	633,3	1 858,0	—	11 034,8	14 724,5	8,3
1960	172,3	—	185,2	871,6	762,0	2 058,3	—	12 044,8	16 094,1	9,3
1961	178,8	—	191,3	860,0	901,5	2 181,5	—	12 700,0	17 013,2	5,7
1962	188,6	—	224,9	945,0	1 012,2	2 320,5	—	13 429,8	18 121,0	6,5
1963	204,9	—	264,9	1 051,4	1 212,1	2 543,6	—	14 223,1	19 500,0	7,6
1964	228,8	0,4	311,4	1 163,9	1 553,6	2 922,1	—	15 067,3	21 247,5	9,0
1965	250,5	1,6	393,2	1 267,4	1 936,8	3 182,5	—	16 111,3	23 143,3	8,9
1966	272,4	2,5	442,4	1 367,0	2 408,2	3 498,5	—	16 563,4	24 554,3	6,1
1967	294,2	3,2	519,9	1 533,1	2 829,6	3 720,6	1,1	17 755,4	26 657,1	8,6
1968	310,5	4,1	609,6	1 666,2	3 191,4	4 121,5	2,4	18 979,3	28 885,0	8,4
1969	330,5	5,7	657,9	1 824,3	3 824,4	4 636,7	8,0	20 218,1	31 505,6	9,1
1970	360,4	6,1	714,9	2 101,0	4 294,1	5 073,5	47,3	22 293,4	34 890,6	10,7
1971	399,9	7,1	789,7	2 494,5	4 551,5	6 072,3	95,0	23 620,0	38 040,0	9,0
1972	448,1	8,4	895,8	2 771,3	5 234,6	6 938,0	144,5	25 208,2	41 648,9	9,5
1973	504,6	9,6	1 060,1	3 148,8	6 097,5	7 581,3	238,8	27 937,7	46 578,4	11,8
1974	551,5	11,5	1 210,5	3 851,6	6 527,4	8 499,9	786,2	31 146,5	52 585,1	12,9
1975	597,7	13,5	1 340,4	4 655,5	7 266,8	9 165,8	915,4	33 914,1	57 869,2	10,0

Note:

Sabie Undertaking incorporated in Eastern Transvaal Undertaking since 1 July 1958, in terms of the Amended Licence.

De-commissioned November 1964. GWh sold in Sabie prior to incorporation included in Eastern Transvaal Undertaking.

Escom – Total GWh sold

Statement No. 9

Year	GWh sold							
	Traction	Bulk S.A. municipalities	Bulk neighbouring territories	Mining	Air and steam	Industrial and commercial	Domestic and street lighting	Total sold
1950	524,0	1 106,5	—	3 898,6	276,9	990,7	113,9	6 910,6
1951	539,4	1 260,7	—	4 104,6	267,5	1 149,9	134,4	7 456,5
1952	554,8	1 459,5	—	4 332,9	264,7	1 337,7	131,0	8 080,6
1953	584,5	1 640,0	—	4 736,5	234,2	1 402,1	134,9	8 732,2
1954	619,2	1 839,0	—	5 316,8	219,5	1 539,9	142,2	9 676,6
1955	689,7	2 047,6	—	5 977,4	212,2	1 880,5	156,6	10 964,0
1956	739,7	2 282,2	—	6 445,3	191,2	2 187,1	174,0	12 019,5
1957	752,7	2 540,1	—	6 789,7	159,7	2 331,2	189,7	12 763,1
1958	789,0	2 837,8	—	7 136,2	153,6	2 479,8	205,8	13 602,1
1959	887,4	3 057,7	—	7 676,4	138,2	2 736,5	228,3	14 724,5
1960	1 045,2	3 242,8	—	8 258,7	125,6	3 168,7	253,1	16 094,1
1961	1 178,3	3 368,2	—	8 625,9	123,8	3 437,5	279,5	17 013,2
1962	1 296,4	3 570,4	—	9 143,4	115,7	3 691,8	303,3	18 121,0
1963	1 389,0	3 997,5	—	9 416,3	115,1	4 253,0	329,1	19 500,0
1964	1 558,6	4 494,0	—	9 847,2	93,9	4 873,1	380,7	21 247,5
1965	1 762,7	4 920,5	—	10 270,8	87,2	5 663,1	439,0	23 143,3
1966	1 835,8	5 343,6	—	10 775,1	39,5	6 068,6	491,7	24 554,3
1967	1 958,0	5 965,7	—	11 441,5	Terminated	6 729,1	562,8	26 657,1
1968	2 180,7	6 628,1	—	11 995,5	—	7 438,8	641,9	28 885,0
1969	2 307,0	7 263,4	0,1	12 641,9	—	8 573,8	719,4	31 505,6
1970	2 409,7	8 098,7	9,4	13 947,9	—	9 607,7	817,2	34 890,6
1971	2 616,3	9 251,4	13,1	14 227,1	—	11 013,8	918,3	38 040,0
1972	2 782,2	10 684,0	32,1	14 508,6	—	12 641,5	1 000,5	41 648,9
1973	2 895,5	12 572,4	179,3	15 800,0	—	14 026,0	1 105,2	46 578,4
1974	3 107,9	15 256,3	265,7	16 940,5	—	15 936,7	1 078,0	52 585,1
1975	3 307,2	17 772,1	282,8	17 444,3	—	18 049,6	1 013,2	57 869,2

Overall average selling price cents/kWh	Escom employees		Capital expenditure at cost		GWh sent out*	Ratio: GWh sold / GWh sent out
	Total number as at 31 December	Number/GWh sold	R000 Total as at 31 December	R000 per GWh sold		
0,274 1	9 352	1,353	115 129	16,66	7 417,8	0,932
0,292 2	10 336	1,386	137 283	18,41	8 001,3	0,932
0,311 5	10 889	1,348	176 559	21,85	8 651,3	0,934
0,354 2	11 518	1,319	218 739	25,05	9 395,8	0,929
0,380 8	12 317	1,273	270 621	27,97	10 414,7	0,929
0,413 9	12 490	1,139	304 342	26,76	11 764,4	0,932
0,428 5	12 977	1,080	342 068	28,46	12 927,0	0,930
0,447 8	13 421	1,052	377 265	29,56	13 802,9	0,925
0,473 3	14 312	1,052	417 701	30,71	14 679,9	0,927
0,495 1	13 947	0,947	453 130	30,77	15 870,7	0,928
0,507 9	14 654	0,911	491 471	30,54	17 376,4	0,926
0,515 5	15 441	0,908	529 565	31,13	18 292,4	0,930
0,516 4	16 467	0,909	581 579	32,09	19 416,5	0,933
0,517 7	16 804	0,862	637 076	32,67	20 793,5	0,938
0,510 1	17 172	0,808	679 193	31,97	22 736,4	0,935
0,507 6	17 851	0,771	741 109	32,02	24 761,6	0,935
0,525 4	18 579	0,757	840 782	34,24	26 158,0	0,939
0,546 7	19 817	0,743	950 863	35,67	28 440,5	0,937
0,555 0	20 893	0,723	1 114 390	38,58	30 851,4	0,936
0,556 5	21 644	0,687	1 271 785	40,37	33 606,2	0,937
0,554 5	22 700	0,651	1 429 862	40,98	37 328,1	0,935
0,577 2	25 050	0,659	1 604 755	42,19	40 747,7	0,934
0,610 8	26 937	0,647	1 774 350	42,60	44 484,7	0,936
0,648 4	28 559	0,613	1 942 949	41,71	49 770,4	0,936
0,682 2	29 891	0,568	2 175 842	41,38	56 259,1	0,935
0,795 0	33 999	0,588	2 569 803	44,41	61 533,3	0,940

*Including purchased GWh.

Summary of consolidated Escom revenue and expenditure account

Statement No. 10

Year	Total Escom GWh sold	Total Escom costs					Total Escom costs							Total revenue
		Interest	Redemption and other provision for loan repayment	Reserve Fund	Capital Development Fund		Sub-total capital related costs	Purchase of electricity	Fuel	Other power station operating and maintenance costs	Distribution operation and maintenance costs	General expenses	Total costs	
1967	26 657,1	R(000)	37 312	24 536	9 912	—	71 760	313	42 488	14 618	7 146	10 603	146 928	146 783
		C/kWh sold	0,140 0	0,092 0	0,037 2	—	0,269 2	0,001 2	0,159 4	0,054 8	0,026 8	0,039 8	0,551 2	0,550 6
		% of total cost	25,39	16,70	6,75	—	48,84	0,21	28,92	9,95	4,86	7,22	100,00	99,90
1968	28 885,0	R(000)	43 282	23 884	12 300	—	79 466	121	45 117	17 016	8 097	12 176	161 993	161 475
		C/kWh sold	0,149 8	0,082 7	0,042 6	—	0,275 1	0,000 4	0,156 2	0,058 9	0,028 0	0,042 2	0,560 8	0,559 0
		% of total cost	26,72	14,74	7,59	—	49,06	0,07	27,85	10,50	5,00	7,52	100,00	99,68
1969	31 505,6	R(000)	50 943	20 809	13 605	—	85 357	102	48 035	19 038	9 264	13 578	175 374	176 106
		C/kWh sold	0,161 7	0,066 0	0,043 2	—	0,270 9	0,000 3	0,152 5	0,060 4	0,029 4	0,043 1	0,556 6	0,559 0
		% of total cost	29,05	11,87	7,76	—	48,67	0,06	27,39	10,86	5,28	7,74	100,00	100,42
1970	34 890,6	R(000)	59 484	23 654	15 202	—	98 340	89	49 440	21 955	10 594	15 448	195 866	193 475
		C/kWh sold	0,170 5	0,067 8	0,043 6	—	0,281 9	0,000 3	0,141 7	0,062 9	0,030 4	0,044 3	0,561 4	0,554 5
		% of total cost	30,37	12,08	7,76	—	50,21	0,05	25,24	11,21	5,41	7,89	100,00	98,78
1971	38 040,0	R(000)	70 266	30 928	8 568	—	109 762	82	53 587	26 276	11 492	18 440	219 639	219 584
		C/kWh sold	0,184 7	0,081 3	0,022 5	—	0,288 5	0,000 2	0,140 9	0,069 1	0,030 2	0,048 5	0,577 4	0,577 2
		% of total cost	31,99	14,08	3,90	—	49,97	0,04	24,40	11,96	5,23	8,40	100,00	99,97
1972	41 648,9	R(000)	86 631	30 575	3 056	13 596	133 858	95	57 259	31 586	13 486	21 737	258 021	254 394
		C/kWh sold	0,208 0	0,073 4	0,007 3	0,032 6	0,321 4	0,000 2	0,137 5	0,075 8	0,032 4	0,052 2	0,619 5	0,610 8
		% of total cost	33,58	11,85	1,18	5,27	51,88	0,04	22,19	12,24	5,23	8,42	100,00	98,59
1973	46 578,4	R(000)	101 858	34 200	3 760	15 366	155 184	117	68 634	38 685	17 082	26 460	306 162	302 034
		C/kWh sold	0,218 7	0,073 4	0,008 1	0,033 0	0,333 2	0,000 3	0,147 4	0,083 1	0,036 7	0,056 8	0,657 3	0,648 4
		% of total cost	33,27	11,17	1,23	5,02	50,69	0,04	22,42	12,64	5,58	8,64	100,00	98,65
1974	52 585,1	R(000)	114 308	27 151	66	28 114	169 639	86	92 530	48 572	20 617	32 611	364 055	358 768
		C/kWh sold	0,217 4	0,051 6	0,000 1	0,053 5	0,322 6	0,000 2	0,176 0	0,092 4	0,039 2	0,062 0	0,692 3	0,682 2
		% of total cost	31,40	7,46	0,02	7,72	46,60	0,02	25,42	13,34	5,66	8,96	100,00	98,55
1975	57 869,2	R(000)	136 963	30 814	1 400	40 730	209 907	114	141 913	44 980*	18 477*	71 758*	487 149	460 073
		C/kWh sold	0,236 7	0,053 2	0,002 4	0,070 4	0,362 7	0,000 2	0,245 2	0,077 7	0,031 9	0,124 0	0,841 8	0,795 0
		% of total cost	28,12	6,33	0,29	8,36	43,09	0,02	29,13	9,23	3,79	14,73	100,00	94,44

*Basis of allocation changed in 1975

Generation of electricity

Statement No. 11

Year	Total GWh generated in Escom power stations	Escom GWh generated as % of national total generated %	GWh sent out from Escom stations			GWh purchased by Escom
			Sent out from coal-fired power stations	Sent out from other Escom power stations	Total sent out from Escom power stations	
1950	7 773,6	69,5	7 276,3	10,1	7 286,4	131,4
1951	8 326,6	70,0	7 797,1	9,6	7 806,7	194,6
1952	8 778,0	70,1	8 219,8	7,6	8 227,4	423,9
1953	9 442,0	68,7	8 838,2	7,2	8 845,4	550,4
1954	10 651,9	70,2	9 971,6	5,9	9 977,5	437,3
1955	12 214,5	71,1	11 419,1	6,1	11 425,2	339,3
1956	13 578,4	73,3	12 663,2	6,4	12 669,6	257,7
1957	14 638,8	72,7	13 633,6	6,5	13 640,1	162,8
1958	15 582,6	73,6	14 510,5	5,3	14 515,8	164,1
1959	16 926,5	75,0	15 774,6	2,6	15 777,2	93,6
1960	18 543,3	76,1	17 305,5	2,1	17 307,6	15,3
1961	19 575,4	76,2	18 282,2	1,8	18 284,0	8,4
1962	20 805,5	77,1	19 401,1	2,8	19 403,9	12,6
1963	22 312,4	75,9	20 789,2	4,4	20 793,6	18,6
1964	24 355,3	76,1	22 634,1	4,5	22 638,6	41,0
1965	26 440,4	76,7	24 582,6	0,1	24 582,7	126,6
1966	27 395,5	75,1	25 504,1	—	25 504,1	629,9
1967	30 421,7	76,8	28 370,9	—	28 370,9	69,6
1968	33 061,2	76,9	30 843,5	—	30 843,5	7,9
1969	35 967,0	78,2	33 598,2	—	33 598,2	8,0
1970	39 796,2	78,4	37 320,8	—	37 320,8	7,3
1971	43 472,5	79,0	40 645,8	93,6	40 739,4	8,3
1972	47 411,1	80,2	43 662,2	812,9	44 475,1	9,7
1973	53 039,9	81,8	49 569,9	189,3	49 759,2	11,3
1974	59 797,5	84,4	55 140,9	1 110,3	56 251,1	7,9
1975	65 479,2	87,4	60 399,7	1 098,7	61 498,4	34,9

Power station plant load factor = $\frac{\text{GWh sent out from all Escom stations}}{\text{Aggregate of assigned sent out capacity hours in year}}$

System load factor = $\frac{\text{GWh sent out on all Escom systems}}{(\text{Peak demand on integrated Escom systems}) \times \text{hours in year}}$

Total GWh sent out on Escom systems (including purchased GWh)	Escom generating capacity as at 31 December		Power station plant load factor (sent out) %	Peak demand on integrated Escom system MW	Integrated Escom system sent out load factor %
	Installed rating MW	Assigned sent out rating MW			
7 417,8	1 440,0	1 290	64,7	*1 182	71,6
8 001,3	1 520,6	1 361	66,1	*1 212	75,4
8 651,3	1 624,6	1 454	66,9	*1 265	77,9
9 395,8	1 825,1	1 635	65,5	*1 394	76,9
10 414,8	2 052,0	1 846	66,4	*1 570	75,7
11 764,5	2 378,6	2 145	65,9	*1 806	74,4
12 926,8	2 764,9	2 498	61,2	*2 001	73,5
13 802,9	2 826,9	2 555	61,1	*2 151	73,3
14 679,9	3 036,6	2 748	62,0	*2 249	74,5
15 870,8	3 297,0	2 983	62,6	*2 429	74,6
17 322,9	3 416,5	3 091	65,2	*2 605	75,7
18 292,4	3 659,0	3 226	66,2	*2 733	76,4
19 416,5	3 759,0	3 406	65,8	*2 925	75,3
20 812,2	4 176,0	3 788	65,7	*3 183	74,6
22 679,6	4 501,0	4 077	65,2	*3 460	74,6
24 709,3	4 624,8	4 181	67,4	3 669	76,9
26 134,0	4 836,4	4 377	67,1	3 906	76,4
28 440,5	5 845,4	5 328	66,8	4 227	76,8
30 851,4	6 344,7	5 800	62,9	4 658	75,4
33 606,2	6 984,7	6 441	62,1	5 055	75,9
37 328,1	7 583,3	7 060	62,9	5 622	75,8
40 747,7	9 013,3	8 373	61,3	6 115	76,1
44 484,8	9 551,3	8 849	59,6	6 630	76,4
49 770,5	10 141,5	9 482	62,5	7 350	77,3
56 259,1	10 691,5	10 002	66,3	8 552	75,1
61 533,3	11 241,5	10 522	68,6	9 185	76,5

*Estimates based on limited information

Operation of Escom's coal-fired power stations

Statement No. 12

Year	Generated in coal-fired stations GWh	Sent out from coal-fired stations GWh	Ratio sent out generated in coal-fired stations	Coal used, thousands of tons	Coal used, kg per kWh sent out	Calorific value of coal, MJ/kg
1950	7 763,2	7 276,3	0,937	6 323,4	0,869	22,72
1951	8 316,7	7 797,1	0,938	6 662,9	0,855	22,72
1952	8 770,0	8 219,8	0,937	7 113,4	0,865	22,75
1953	9 434,6	8 838,2	0,937	7 393,9	0,837	23,08
1954	10 645,9	9 971,6	0,937	8 024,9	0,805	23,06
1955	12 208,2	11 419,1	0,935	8 999,7	0,788	22,89
1956	13 571,6	12 663,2	0,933	9 688,5	0,765	22,96
1957	14 632,1	13 633,6	0,932	10 220,6	0,750	22,79
1958	15 577,1	14 510,5	0,932	10 784,1	0,743	22,73
1959	16 923,7	15 774,6	0,932	11 548,7	0,732	22,44
1960	18 541,1	17 305,5	0,933	12 512,6	0,723	22,52
1961	19 573,4	18 282,2	0,934	13 194,9	0,722	22,39
1962	20 802,5	19 401,1	0,933	13 955,5	0,719	22,22
1963	22 307,9	20 789,2	0,932	14 721,1	0,708	22,15
1964	24 293,8	22 634,1	0,932	15 654,7	0,692	22,15
1965	26 388,1	24 582,6	0,932	16 726,7	0,680	22,39
1966	27 371,5	25 504,1	0,932	16 982,3	0,666	22,20
1967	30 421,7	28 370,9	0,933	18 307,7	0,645	22,44
1968	33 061,2	30 843,5	0,933	19 133,9	0,620	22,63
1969	35 966,9	33 598,2	0,934	19 982,9	0,595	22,73
1970	39 796,2	37 320,8	0,938	21 630,6	0,580	22,97
1971	43 378,8	40 645,8	0,937	23 416,2	0,576	23,30
1972	46 597,3	43 662,2	0,937	24 952,8	0,571	22,89
1973	52 849,3	49 569,9	0,938	27 907,9	0,563	22,47
1974	58 685,5	55 140,9	0,940	30 891,4	0,560	22,42
1975	64 378,8	60 399,7	0,938	34 231,7	0,568	22,21

Station heat rate MJ/kWh sent out	Overall thermal efficiency sent out basis, per cent	Coal cost			Water used by coal-fired power stations Litre/kWhS.O.*
		Total R000	Rand per metric ton	Cents per kWh sent out	
19,74	18,2	5 302,0	0,84	0,072 9	na
19,43	18,5	6 553,0	0,98	0,084 0	na
19,68	18,3	8 520,0	1,20	0,103 7	na
19,32	18,6	9 862,0	1,33	0,111 6	na
18,56	19,4	11 329,0	1,41	0,113 6	na
18,04	20,0	13 709,0	1,52	0,120 1	na
17,56	20,5	13 653,0	1,62	0,123 6	na
17,09	21,1	17 256,0	1,69	0,126 6	na
16,89	21,3	19 039,0	1,77	0,131 2	na
16,43	21,9	20 970,0	1,82	0,132 9	na
16,28	22,1	25 373,0	2,03	0,146 6	na
16,17	22,3	27 713,0	2,10	0,151 6	na
15,98	22,5	29 230,0	2,09	0,150 7	na
15,68	23,0	31 009,0	2,11	0,149 2	na
15,33	23,5	32 367,0	2,07	0,143 0	na
15,23	23,6	34 986,0	2,09	0,142 3	na
14,79	24,4	37 901,0	2,23	0,148 6	na
14,47	24,9	42 053,0	2,30	0,148 2	na
14,03	25,6	44 604,0	2,33	0,144 6	na
13,52	26,6	47 453,0	2,37	0,141 2	3,49
13,32	27,0	48 807,0	2,26	0,130 8	3,25
13,42	26,8	52 705,0	2,25	0,129 7	3,13
13,07	27,5	56 113,0	2,25	0,128 5	2,97
12,65	28,5	66 837,4	2,39	0,134 8	2,86
12,56	28,7	90 268,8	2,92	0,163 7	2,91
12,59	29,1	137 691,7	4,02	0,223 9	2,85

*Excludes colliery and construction usage

na=not available

Expansion of Escom's transmission and distribution system

Statement No. 13

Year	Transmission/Distribution lines: circuit kilometres (excluding service connections on reticulation systems)							Transformers, capacity in service, MVA
	533 kV D.C.	400 kV	275 kV	220 kV	132 kV (including underground cables)	88 kV and below (including underground cables)	Total	
1950		—	—	—	203	10 414	10 617	6 137
1951		—	—	—	203	11 658	11 861	6 613
1952		—	—	—	427	11 880	12 307	7 023
1953		—	—	—	734	12 821	13 555	8 374
1954		—	—	—	1 051	13 085	14 136	9 663
1955		—	—	—	1 437	14 236	15 673	10 931
1956		—	—	—	1 727	15 234	16 961	11 997
1957		—	—	—	1 838	16 539	18 377	12 104
1958		—	—	—	2 274	18 393	20 667	14 346
1959		—	315	—	2 689	20 114	23 118	15 665
1960		—	315	—	2 778	21 926	25 019	15 987
1961		—	315	—	3 782	23 840	27 937	18 730
1962		—	648	—	3 853	26 114	30 615	19 265
1963		—	875	—	4 052	28 911	33 838	20 059
1964		—	1 490	—	4 375	31 898	37 763	22 981
1965		—	2 049	—	4 886	34 692	41 627	26 651
1966		—	2 194	—	5 387	37 592	45 173	26 814
1967		597	2 194	—	5 486	41 258	49 535	28 928
1968		597	2 412	—	6 080	44 928	54 017	32 191
1969		1 480	2 552	—	6 898	48 922	59 852	39 400
1970		1 916	2 599	—	7 063	52 318	63 896	43 007
1971		2 503	3 176	—	7 601	55 850	69 130	47 811
1972		3 275	3 826	—	8 352	59 860	75 313	52 025
1973		4 197	4 255	639	8 942	64 628	82 661	60 581
1974		5 040	4 417	639	9 429	68 700	88 225	65 900
1975	1 030	5 099	4 701	639	9 855	72 586	93 910	72 445

Escom's Distribution Undertakings

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

Cape Western Undertaking

The map shows the licensed area of supply of this Undertaking at 31 December 1975.

Sales of electricity

During the year, 5 099 million kWh of electricity were supplied to this Undertaking by the Central Generating Undertaking. Of the total 1 388 million kWh or 27.2 per cent (26.2 per cent in 1974) were sent out from the Salt River and Hex River power stations in the Western Cape, the remainder having been imported from the north.

Total sales in the Undertaking increased by 20.9 per cent from 3 852 million kWh in 1974 to 4 656 million kWh in 1975. This increase was somewhat less than the high rate of 22.3 per cent attained in 1974 which was due to the extraordinary increase in bulk sales to the Municipality of Cape Town. Bulk sales to Cape Town increased during the year by 53 per cent; although this is a high rate of growth, it is considerably less than the figure of 80 per cent attained in 1974. Cape Town is now responsible for 34.8 per cent of all sales in the Undertaking.

Bulk sales to municipalities continued to dominate total sales in the Undertaking. Bulk sales, excluding sales to Cape Town, reached 763 million kWh in 1975, 12.5 per cent more than the sales in the preceding year (12.2 per cent in 1974).

Sales to the industrial sector showed a bigger increase in 1975 than in 1974. Nevertheless, the total contribution of this sector to total sales in the Undertaking decreased from the 31.6 per cent recorded in 1974 to 28.2 per cent in 1975.

Development of the Undertaking

During the year under review design work was completed and material ordered for the construction of the necessary 132 kV lines, the substations, and the 66 kV lines to supply the Iscor ore loading facility at Saldanha. Construction of the 132 kV line was commenced and substation civil work was well advanced by the end of the year.

At Muldersvlei distribution station two 75 MVA synchronous condensers, connected to the tertiary windings of two of the 240 MVA 400/132 kV transformers, were assembled and erected by contractors. Completion of this project was delayed by various problems, but commissioning of the machines is now anticipated early in 1976.

400 kV series capacitors and associated equipment were installed and commissioned at Komsberg at the mid-point of each of the two Droërivier-Muldersvlei lines. The completion of this work enabled major construction to be commenced at Acacia substation in the Cape Town area. Difficulty was still experienced in obtaining servitudes for the 2 x 400 kV transmission lines from Muldersvlei to Acacia, but it is expected that these lines will be completed by the third quarter of 1976.

A double circuit 132 kV line, 7 km in length, from Firgrove to Lourens River was constructed, as well as a new 132/66 kV substation at Stellenbosch and a 132 kV section for the existing Lourens River substation near Somerset West. 132 kV installations at Muldersvlei were carried out so that the existing 26.3 km double circuit 132 kV Muldersvlei line – operated at 66 kV for years – could be operated at 132 kV and supply the new Stellenbosch substation and bypass Firgrove substation to supply Lourens River at 132 kV. Two 45 MVA transformers and two 120 MVA transformers were commissioned at Stellenbosch and Lourens River respectively during completion of this project.

A 100 MVA 132 kV shunt capacitor bank at Muldersvlei was installed and will be commissioned early in 1976.

New 66/11 kV substations were completed and commissioned at Bellville South, Kraaifontein, Riversdale and Brackenfell.

A 66 kV 60 MVA cable, 3.3 km long, was laid and commissioned between the terminal at Stikland Hospital and Bellville South substation.

The Boston substation in Bellville was commissioned at 33 kV, but due to complaints from the public regarding the noise, it had to be de-energised. Acoustic barriers were fitted and the transformers were re-energised before the end of the year. Three 33 kV cables, each 3.1 km long, were laid from Oakdale substation to Boston substation.

The transformer capacity was stepped up at Mōrewag substation near Malmesbury, to enable an initial supply to be given to the new Atlantis Coloured township.

Good progress was made with the construction of 22 and 11 kV lines from Vredendal substation to enable supplies to be given to Vredendal, Lutzville, Vanrhynsdorp and Doringbaai.

Increasing resistance was experienced in obtaining servitudes for power lines in the Cape. Future development of land, higher land prices, crop spraying, and general interference with agricultural pursuits appeared to be the main difficulties.

Three new traction substations were commissioned for the South African Railways during the year. These were: Bantams – a 132 kV substation on the Worcester-Laingsburg line; Botha – a 66 kV substation on the Wolseley-Worcester line; and Tunnel – a 66 kV substation beyond De Doorns on the Worcester-Laingsburg line.

Work on the Juno substation near Olifantsrivier will commence in the second quarter of 1976 for completion in the fourth quarter of 1977. Progress was made with the route survey of the 400 kV transmission line from Muldersvlei through Aurora and Juno substations to link with the 400 kV transmission line through the north west Cape

A total of 761 new farming supplies were connected during the year, requiring the erection of 327 km of new transmission lines. The large number of new supplies, almost

double that for the preceding year, is largely attributable to the development of the big rural scheme in the Vredendal district. This scheme alone accounted for 225 new supplies and 120 km of transmission lines. The Caledon-Shaw's Pass scheme completed during the year involved 44 new supplies. The remaining new supplies were provided by extensions from existing schemes, and it is significant that farmers with established supplies decided to take 270 additional supplies.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 1,199 9 cents per kWh sold during 1975 is 4,0 per cent higher than the figure for the preceding year (2,2 per cent lower in 1974). Total sales revenue for the year amounted to R55 859 860 and exceeded the corresponding figure for the preceding year by 25,7 per cent (19,6 per cent in 1974).

Class	Consumer		Sales of electricity						Revenue from sales		Average price per kWh sold	
	Number		Proportion %		kWh sold		% Change		Rand		Cents	
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975
Traction	6	6	12,75	10,87	491 153 481	505 894 900	+8,95	+3,00	6 012 989	6 650 599	1,224 3	1,314 6
Bulk municipal	54	56	45,08	51,19	1 736 216 600	2 383 297 159	+45,44	+2,38	15 328 918	22 027 476	0,882 9	0,924 2
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	9 636	8 780	31,55	28,23	1 215 159 909	1 314 126 367	+7,04	+8,14	16 186 293	19 049 849	1,332 0	1,449 6
Domestic and street lighting	60 177	59 291	10,62	9,71	409 041 684	452 237 205	+10,88	+10,56	6 903 646	8 131 936	1,687 8	1,798 2
Total	69 873	68 133	100,00	100,00	3 851 571 674	4 655 555 631	+22,32	+20,87	44 431 846	55 859 860	1,153 6	1,199 9
									1974	1975		
									R	R		
Total revenue									44 431 846	55 859 860		
Expenditure charged									44 487 813	59 982 583		
Surplus									—	—		
Deficit									55 967	4 122 723		
Accumulated to 31 December:												
Surplus									—	—		
Deficit									1 505 313	5 628 036		

Cape Northern Undertaking

During the year under review, the licensed area of supply of this Undertaking was increased by the incorporation of an area surrounding Hopetown in the Cape Province. The map shows the licensed area of supply at 31 December 1975.

Sales of electricity

During the year, 1 340 million kWh of electricity were sold in this Undertaking, 10,7 per cent more than the 1 210 million kWh sold in 1974, when the corresponding increase was 14,2 per cent. The three major sales categories – traction, bulk and mining – all recorded lower rates of growth than in 1974. The increase in traction sales dropped to less than half the percentage increase attained in 1974 and in this regard it should be borne in mind that rail traction development in this Undertaking is closely linked to mining development and the need for ore transport. Consequently, short-term peaks and valleys in the electricity sales to both mining and traction can be expected to coincide with the expansion programmes of the various mining concerns.

Sales to the mining sector increased its dominance of the total sales in this Undertaking and the biggest share in this sector went to diamond mining (30,5 per cent), followed by copper (26,1 per cent), iron (13,8 per cent), asbestos (16,6 per cent), gypsum and lime (7,0 per cent), and manganese (6,0 per cent).

In 1975 some 18 per cent of all electricity sold in this Undertaking was accounted for by Iscor and Prieska copper alone. The expansion programmes of these concerns thus have an important influence, not only on mining sales, but also on the Undertaking's total sales. During the year, the sales to Iscor and Prieska copper were 7,1 per cent more than in the preceding year, as against an increase of 45,1 per cent recorded in 1974. In 1975, electricity sales to the mining sector, excluding Iscor and Prieska copper, were 17,5 per cent more than in the preceding year, as against an increase of only 7,7 per cent in 1974.

Bulk sales to municipalities increased at a slightly diminished rate in 1975 compared with 1974. The bulk supplies to Kimberley Municipality comprised some 61 per cent of the total bulk supplies in 1975; consequently the yearly growth of the Kimberley supply has an appreciable effect on total sales to this sector. In 1975, Kimberley took only 6,2 per cent more from Escom as against 10,3 per cent in 1974.

Development of the Undertaking

Strengthening of the supply to the Sishen and Danielskuil areas was commenced during 1975 and work on three new 275 kV substations near Kimberley, Silverstreams and Sishen is now well under way. Work has also begun on the 275 kV transmission line, 226 km long, interconnecting these new substations. All this work is scheduled for completion during 1976.

A second 40 MVA 132/66 kV transformer was commissioned in May 1975 at Sishen substation for Iscor's export plant. Four 15 MVA 66 kV shunt capacitor banks were also installed and commissioned at this substation. A 66 kV transmission line, 3 km long, was erected to provide a supply to the Iscor plant.

To provide a supply to Union Lime Company's new cement works near Danielskuil, Ouplaas substation was constructed with one 10 MVA 132/22 kV transformer, and a 17 km 132 kV transmission line is being erected between Olien substation near Limeacres and Ouplaas substation.

At Kleinbegin a 132/22 kV substation with one 10 MVA transformer was constructed and commissioned to provide power to the local 22 kV system. From the Kleinbegin substation a 22 kV line, approximately 50 km in length, was built to furnish supplies to the SABC near Kleinbegin, the SAR station, the Department of Posts and Telecommunications for a microwave station at Rooisand, and the town of Groblershoop.

To comply with statutory regulations applicable to deep-level mining, De Beers requested a second 132 kV line between Kimberley distribution station and their diamond mine at Koffiefontein. This line of approximately 90 km was completed and is due for commissioning in May 1976.

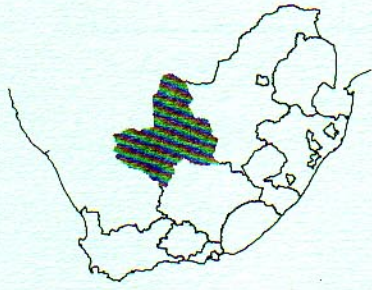
To provide a ring feed on the 66 kV system between Asbes substation near Kuruman and Silverstreams substation near Limeacres a section of 66 kV line, 29 km in length, was constructed between Valley substation and Moffat substation in the Kuruman area. This also necessitated the uprating of Valley substation to operate at 66 kV. Two transformers were installed to provide 22 kV power to the local asbestos mines. The supply point for De Beer's diamond mines at Kimberley was moved from within the security area to the outside of the security fence. This entailed the construction of the Koekepan 66 kV substation at a point adjacent to De Beer's security fence near Kimberley distribution station.

Excavations are in progress for the construction of about 40 km of 132 kV line from Ganspan to a new substation between Warrenton and Christiana named Bloemheuwel. This line will feed into the Kimberley-Wildhoen traction line section, and will also serve as an alternative feed-back via Ganspan to Ulco.

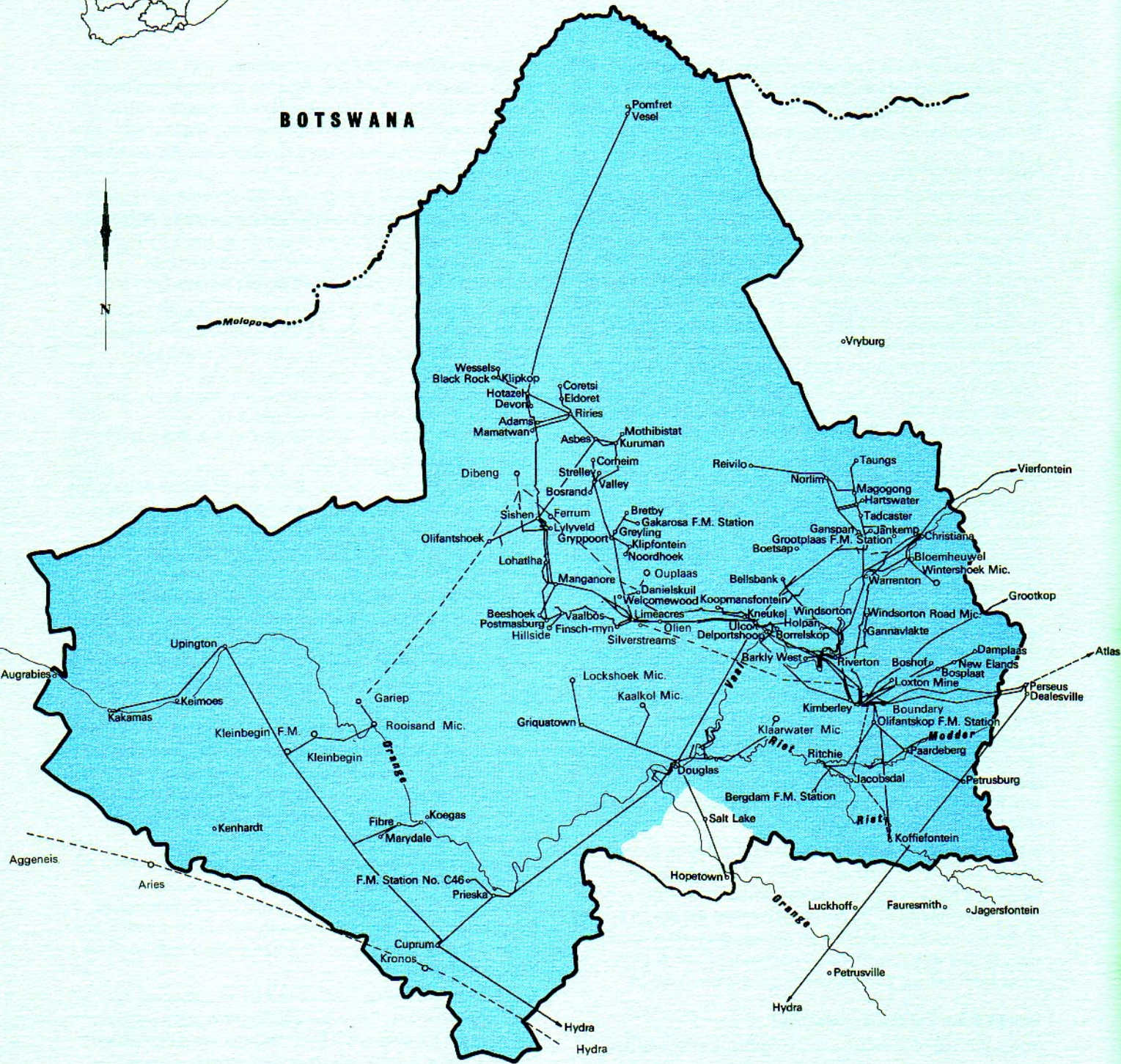
Approximately 50 km of 132 kV line for an additional 16 traction substations, 12 on the Kimberley-Hotazel section and 4 on the Kimberley-Wildhoen section, were completed. The 16 traction substations have been completed and commissioned.

The Department of Posts and Telecommunications requested supplies to their new microwave link between Kimberley and Upington. During 1975 approximately 57 km of 22 kV line

CAPE NORTHERN UNDERTAKING

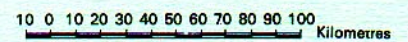


BOTSWANA



REFERENCE

- Area of supply
- Transmission lines
- Transmission lines under construction



Area of supply 147 400 square kilometres

was built to supply four of the proposed 6 microwave stations which will form this link.

During the year this Undertaking provided a total of 96 new farming supplies, requiring the construction of 277 km of additional transmission lines. Most of these new supplies were provided from established rural schemes. The new rural schemes in the Plooyburg and Strausburg districts together accounted for 73 of the new supplies connected in 1975.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 1,154 8 cents per kWh sold during 1975 is 17,0 per cent higher than the figure for the preceding year (3,5 per cent in 1974). Total sales revenue for the year amounted to R15 478 930 and exceeded the corresponding figure for the preceding year by 29,6 per cent (18,1 per cent in 1974).

Class	Consumer		Proportion %		Sales of electricity				Revenue from sales		Average price per kWh sold	
	Number				kWh sold		% Change		Rand	Rand	Cents	Cents
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975
Traction	3	3	21,58	20,43	261 213 972	273 898 436	+12,73	+4,86	2 491 794	3 094 046	0,953 9	1,129 6
Bulk municipal	21	30	21,92	22,29	265 268 500	298 703 500	+15,23	+12,30	2 502 841	3 273 031	0,943 4	1,095 7
Mining	77	76	45,38	46,44	549 276 640	622 392 551	+20,24	+13,31	5 161 253	6 922 684	0,939 6	1,112 3
Industrial	746	873	8,94	8,89	108 275 836	119 173 894	-5,24	+10,06	1 344 954	1 691 222	1,242 2	1,419 1
Domestic and street lighting	2 884	2 867	2,18	1,95	26 417 955	26 195 825	-2,36	-1,21	445 796	497 947	1,687 5	1,900 9
Total	3 731	3 849	100,00	100,00	1 210 472 903	1 340 364 206	+14,18	+10,73	11 946 638	15 478 930	0,986 9	1,154 8
									1974	1975		
									R	R		
Total revenue									11 946 638	15 478 930		
Expenditure charged									12 266 726	16 538 834		
Surplus									—	—		
Deficit									320 088	1 059 904		
Accumulated to 31 December:												
Surplus									—	—		
Deficit									213 697	1 273 501		

Cape Eastern Undertaking

The map shows the licensed area of supply of this Undertaking at 31 December 1975.

Sales of electricity

Electricity sales in this Undertaking amounted to 13 million kWh in 1975, 17,5 per cent more than in 1974. This increase was only slightly lower than the 18,9 per cent recorded in 1974. The reduced rate of growth was mainly due to a much lower increase in the bulk sales to municipalities and the supplies to the industrial sector. The yearly growth of sales for domestic and street lighting, however, increased considerably from 0,39 per cent in 1974 to 12,8 per cent in 1975.

Development of the Undertaking

During the year work was carried out on extensions to a 132 kV yard at Grassridge substation near Coega with a target

completion date of early 1976, to supply a new 132 kV line and substation for Despatch Municipality. Humansdorp Municipality has agreed to take a supply from Escom and for this purpose a 24 km 132 kV line will be constructed from Apex substation in the Port Elizabeth area to a substation near Jeffrey's Bay.

Approximately 8 km of 22 kV and 4 km of 11 kV transmission lines were erected to provide new supplies to a total of 36 farming consumers and 4 other rural consumers.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 3,584 4 cents per kWh sold during 1975 is 5,2 per cent higher than the figure for the preceding year (1,0 per cent in 1974). Total sales revenue for the year amounted to R483 236 and exceeded the corresponding figure for the preceding year by 23,5 per cent (20,1 per cent in 1974).

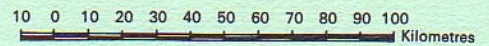
Class	Consumer		Sales of electricity				Revenue from sales		Average price per kWh sold			
	Number		Proportion %		kWh sold		% Change		Rand	Rand	Cents	Cents
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk municipal	1	1	19,80	17,21	2 272 200	2 320 440	+14,78	+2,12	47 439	53 999	2,087 8	2,327 1
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	216	248	50,49	54,25	5 794 065	7 314 200	+35,50	+26,24	220 451	284 334	3,804 8	3,887 4
Domestic and street lighting	615	628	29,71	28,54	3 410 304	3 847 128	+0,38	+12,81	123 316	144 903	3,618 0	3,766 5
Total	832	877	100,00	100,00	11 476 569	13 481 768	+18,89	+17,47	391 206	483 236	3,408 7	3,584 4
									1974	1975		
									R	R		
Total revenue									391 206	483 236		
Expenditure charged									448 704	517 755		
Surplus									—	—		
Deficit									57 498	34 519		
Accumulated to 31 December:												
Surplus									—	—		
Deficit									306 685	341 204		

BORDER UNDERTAKING



REFERENCE

- Area of supply
- Escom power stations West Bank Port Rex (under construction)
- Transmission lines
- Transmission lines under construction
- Ducat's Outspan substation



Area of supply 55 400 square kilometres

Border Undertaking

The map shows the licensed area of supply of this Undertaking at 31 December 1975.

Sales of electricity

During the year, 648 million kWh of electricity were supplied to this Undertaking by the Central Generating Undertaking. Of the total, 272 million kWh or 42 per cent (40,4 per cent in 1974) were sent out from the West Bank power station in East London, the remainder having been imported from the north. Sales increased by 8,4 per cent from 551 million kWh in 1974 to 598 million kWh in 1975. Bulk supplies to municipalities continued to dominate the overall sales, with East London as the Undertaking's largest single consumer. During 1975, 65,9 per cent of the total sales (69 per cent in 1974) were supplied to East London, an increase of 3,7 per cent compared with 1974 when the corresponding increase was 7,7 per cent. Excluding the supply to East London, electricity sales to the remaining consumers during 1975 were 18,8 per cent more than during the preceding year (13 per cent in 1974).

Development of the Undertaking

A 132 kV line (temporarily operating at 66 kV) was erected to a new substation near Queenstown to supply Queenstown Municipality. The 132 kV line from Lamplough substation near Butterworth to Zimbane substation near Umtata was completed. Zimbane substation was commissioned, and a partial bulk supply was given to Umtata from April 1975. The line is approximately 115 km long and is being operated at 66 kV initially.

The Grahamstown substation 66 kV busbars were extended and a line bay on the King William's Town line was installed in addition to a further 66/11 kV 6 MVA transformer.

A 66/11 kV transformer was commissioned in a temporary substation at Dimbaza near King William's Town, and a 66 kV transmission line, 2 km long, was erected. This provided an initial supply for the early development of a new industrial complex.

Work on the 22 kV transmission line (20 km long) between Buffalo substation near East London and Prospect substation near Kidd's Beach was completed and Prospect substation was commissioned in January 1975. This substation is required to provide reinforcement to the South Coast system. A 22 kV transmission line (10 km long) was erected from Buffalo substation to Fort Jackson, giving a 22 kV supply to the area.

The 66 kV circuit breaker at King William's Town controlling the Grahamstown line has been replaced with a unit of higher rupturing capacity. The construction of 20 km of 22 kV line (operated at 11 kV initially) from Alicedale to Paterson was completed in December 1975 and this will enable supplies to be given to Paterson and its environs.

Erection of the 132 kV line from Pembroke substation near Berlin to Buffalo substation has commenced to reinforce supplies to the East London area.

The erection of a 66/11 kV substation at Greenacres near Gonubie has started, and a 66 kV line will be erected from Aloe Glen switching station to this substation to reinforce supplies to Gonubie and the environs.

Two 5 MVA capacitor banks for the Lamplough substation near Butterworth have been delivered and their installation is now expected to be completed in the second quarter of 1976.

The erection of Kariega substation near Kenton on Sea and 32 km of 66 kV line from Albany substation near Grahamstown was completed. The construction of the 22 kV line from Kariega to Station Hill substation near Port Alfred has been completed and supply to this area will be made available in May 1976.

The construction of 132 kV busbars, and the installation of two 5 MVA 66/22 kV transformers at Kubusie substation near Stutterheim are progressing well and are due for completion early in 1976.

A supply was provided during the year to the Department of Posts and Telecommunications at Buyskloof microwave station near Alexandria by extending the Zuney 11 kV line by approximately 11 km.

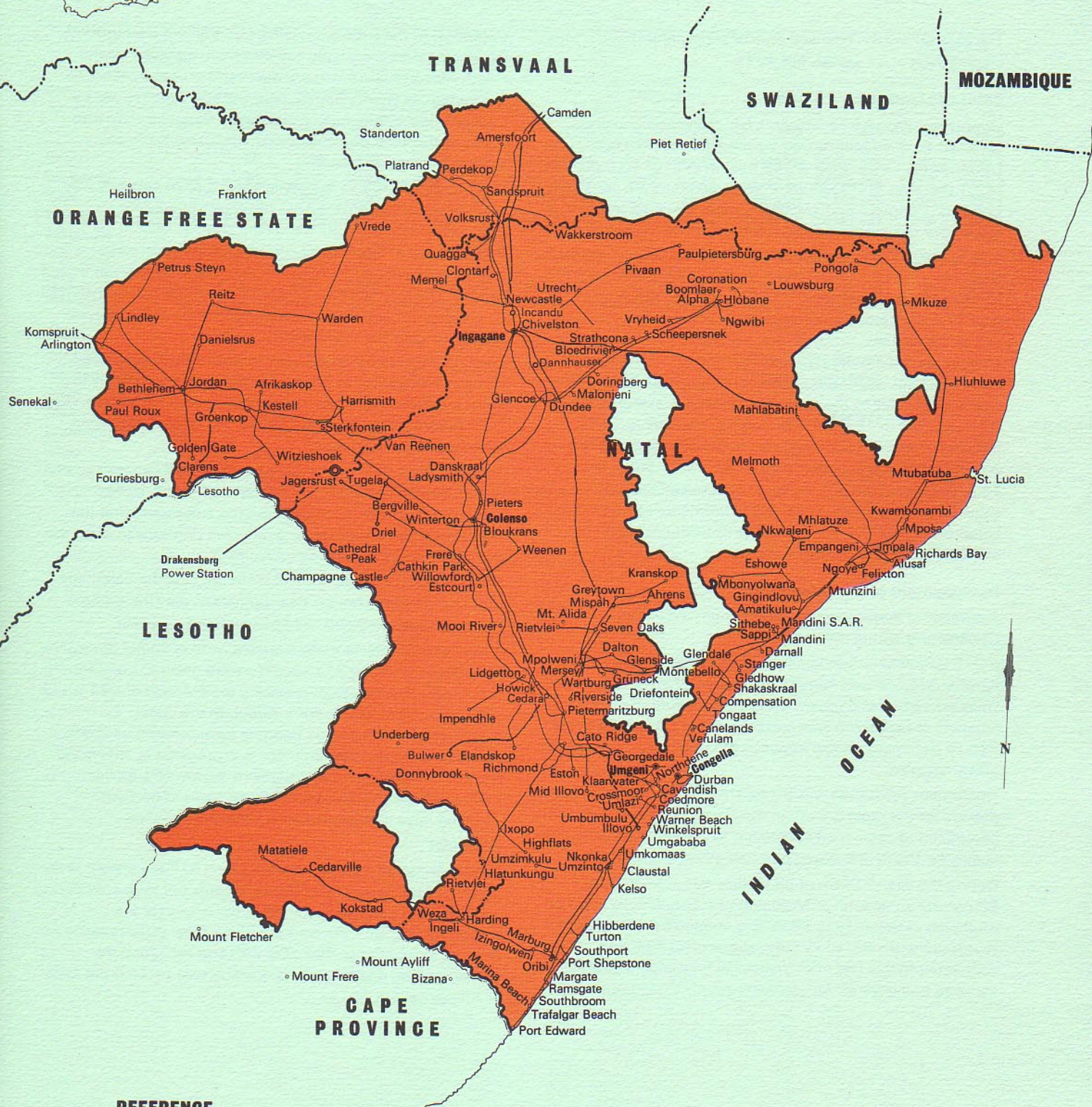
A total of 32 new farming supplies were connected during the year, requiring the erection of 74 km of new transmission lines. Three of the new supplies were to farmers with previously established supplies. Supplies were also provided to 20 non-farming consumers in rural areas.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 1,665 8 cents per kWh sold during 1975 is 13,8 per cent higher than the figure for the preceding year (4,3 per cent in 1974). Total sales revenue for the year amounted to R9 955 464 and exceeded the corresponding figure for the preceding year by 23,3 per cent (14 per cent in 1974).

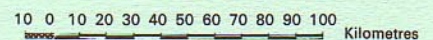
Class	Consumer		Sales of electricity				Revenue from sales		Average price per kWh sold			
	Number		Proportion %		kWh sold		% Change		Rand	Rand	Cents	Cents
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk municipal	16	18	87,63	87,65	483 292 430	523 852 797	+9,70	+8,39	6 540 977	8 107 078	1,353 4	1,547 6
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	432	472	7,33	7,12	40 406 463	42 568 213	+2,00	+5,35	872 587	1 027 985	2,159 5	2,414 9
Domestic and street lighting	3 746	3 964	5,04	5,23	27 785 537	31 230 071	+13,59	+12,40	661 334	820 401	2,380 1	2,627 0
Total	4 194	4 454	100,00	100,00	551 484 430	597 651 081	+9,28	+8,37	8 074 898	9 955 464	1,464 2	1,665 8
									1974	1975		
									R	R		
Total revenue									8 074 898	9 955 464		
Expenditure charged									8 329 974	11 431 753		
Surplus									—	—		
Deficit									255 076	1 476 289		
Accumulated to 31 December:												
Surplus									13 340	—		
Deficit									—	1 462 949		

NATAL UNDERTAKING



REFERENCE

- Area of supply
- Escom power stations Congella Drakensberg
(under construction)
- Transmission lines (under construction)
- Provincial boundaries
- International boundaries



Area of supply 106 700 square kilometres

Natal Undertaking

The map shows the licensed area of supply of this Undertaking at 31 December 1975.

Sales of electricity

During the year 9 672 million kWh of electricity were supplied to this Undertaking by the Central Generating Undertaking. Of the total 4 399 million kWh or 45,5 per cent (42,5 per cent in 1974) were sent out from the Ingagane, Colenso, Congella and Umgeni power stations situated in Natal, the remainder having been imported from the north.

Total sales in the Undertaking increased by 7,8 per cent from 8 500 million kWh in 1974 to 9 166 million kWh in 1975. In 1974 the corresponding increase over the preceding year was 12,1 per cent. The lower growth rate in 1975 is mainly due to the fact that no large new expansion programmes were undertaken during the year by the big industrial users such as Alusaf, Iscor, Sappi and Feralloys. Thus the growth rate in total sales to the industrial sector in Natal fell from 27,2 per cent in 1974 to less than half this rate in 1975, although the corresponding rates of growth applicable to industrial consumers other than Alusaf, Iscor, Sappi and Feralloys were 18,9 and 17,8 per cent respectively. Bulk sales to municipalities continued to dominate sales in this Undertaking but there is a trend for this dominance to be relinquished to the industrial sector.

Development of the Undertaking

A number of major projects were completed in this Undertaking during the year.

A 275 kV transmission line from Georgedale substation to Illovo substation was completed to strengthen supplies to the southern region of Durban. Danskraal substation on the outskirts of Ladysmith was completed and connected to the 275 kV transmission line between the Ingagane and Colenso power stations.

Driefontein substation was established near Tongaat to provide for the rapid growth in the area. Extensions were also completed at Jagersrust substation to provide a construction supply for the Drakensberg pumped-storage scheme.

During the year 103 km of 88 kV line was erected from Bloedrivier substation to Mahlabatini substation, forming an extension of the existing 88 kV line erected from Empangeni to this point. Six 88/11 kV substations were built and connected to this line from Vryheid to Empangeni to provide supplies to the South African Railways for signalling

purposes. At the substation closest to Vryheid a temporary 25 kV single-phase supply has also been installed for the South African Railways to conduct tests on a.c. traction. In the Vryheid/Richards Bay section, traction supplies will be incorporated within these substations. Supplies were also made available at Beechwick and Vooruitsig north of Volksrust for d.c. traction.

The Mkuze 132/22 kV substation of 7,5 MVA capacity was completed to reinforce the rapidly expanding 22 kV reticulation system in Zululand. The two 7,5 MVA transformers at Empangeni 88/11 kV substation were replaced by two 20 MVA units to provide for the rapid load growth. The last remaining rural 11 kV supply was transferred to another substation and Empangeni substation is now supplying only the municipality.

The first stage of the extensions to Ballengeich substation, south of Newcastle, to provide for the increased supply to a carbide factory, has been completed. Ruston substation, near Dannhauser, to increase the output of a colliery supplying Iscor, was also completed.

The Kingsdale 88/11 kV substation of 5 MVA capacity south of Umzinto on the Natal South Coast is nearing completion. Existing 11 kV lines are being uprated and turned into the new substation which is being provided primarily to meet the increasing loads of existing consumers.

The provision of a supply at 88 kV to the Lesotho Electricity Corporation at the border near Clarens in the Orange Free State is proceeding and will be completed next year.

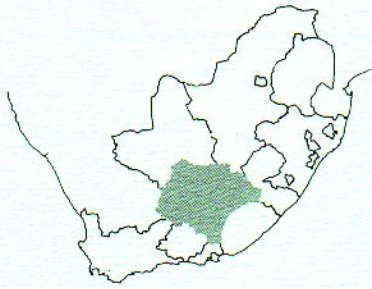
A total of 572 new farming supplies were provided during the year, and in addition 371 supplies were given to non-farming consumers in rural areas, requiring the erection of 534 km of additional transmission lines. Although the initial establishment of the large Pongola rural scheme has been completed, further development is in progress to satisfy the requests of farmers for additional or increased supplies. Farmers in the Hluhluwe and Mkuze areas of northern Zululand have also requested substantial supplies.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 0,913 3 cents per kWh sold during 1975 is 15,0 per cent higher than the figure for the preceding year (5,1 per cent in 1974). Total sales revenue for the year amounted to R83 706 763 and exceeded the corresponding figure for the preceding year by 24,0 per cent (17,8 per cent in 1974).

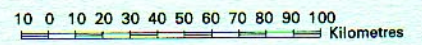
Class	Consumer		Sales of electricity						Revenue from sales		Average price per kWh sold		
	Number		Proportion %		kWh sold		% Change		Rand	Rand	Cents	Cents	
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975	
Traction	14	14	11,55	11,29	981 604 416	1 034 944 416	+9,56	+5,43	8 840 204	10 674 632	0,900 5	1,031 4	
Bulk municipal	35	35	55,26	54,38	4 696 638 860	4 984 675 849	+6,32	+6,13	34 542 336	42 356 949	0,735 5	0,849 7	
Mining	33	36	2,07	2,03	175 921 806	185 941 570	+4,75	+5,70	1 619 643	1 947 045	0,920 7	1,047 1	
Industrial	5 485	5 937	29,30	30,41	2 490 822 182	2 786 878 593	+27,17	+11,88	19 887 560	25 587 487	0,798 4	0,918 1	
Domestic and street lighting	20 778	22 287	1,82	1,89	154 969 993	173 353 253	+9,60	+11,86	2 607 401	3 140 650	1,682 5	1,811 7	
Total	26 345	28 309	100,00	100,00	8 499 957 257	9 165 793 681	+12,12	+7,83	67 497 144	83 706 763	0,794 1	0,913 3	
									1974	1975			
									R	R			
Total revenue										67 497 144	83 706 763		
Expenditure charged										67 713 111	90 212 584		
Surplus										—	—		
Deficit										215 967	6 505 821		
Accumulated to 31 December:													
Surplus										—	—		
Deficit										1 444 760	7 950 581		

ORANGE RIVER UNDERTAKING



REFERENCE

- Area of supply
- Transmission lines
- Transmission lines under construction
- Escom power stations Hendrik Verwoerd Vanderkloof
(under construction)



Area of supply 137 000 square kilometres

Orange River Undertaking

The licensed area of supply of this Undertaking was amended during the year under review by the excision of an area surrounding Hopetown in the Cape Province. The map shows the licensed area of supply at 31 December 1975.

Sales of electricity

The surge of growth experienced in 1974 since the start of a bulk supply to Port Elizabeth in November 1973, settled down during the year under review to an increase of 16,4 per cent in sales. Sales to Port Elizabeth accounted for 90,1 per cent of the Undertaking's total bulk sales to municipalities which were 25,7 per cent more than in 1974. In the industrial sector there was a sharp decrease in electricity sales in 1975 due to the cessation of the substantial temporary supplies for construction work under the Orange River Project. In 1974, 91,3 per cent of the total sales to the industrial sector were temporary supplies; the corresponding percentage for 1975 was 78,2 per cent.

Development of the Undertaking

The Luckhoff capacitor station on the 400 kV transmission system between Perseus distribution station near Dealesville and Hydra distribution station near De Aar was completed and commissioned in November.

At Hydra distribution station, certain 400 kV line bays were rearranged and the associated 400 kV lines swung over to cater for new yard extensions. A new 400 kV reactor bay was erected and a repaired reactor was installed and commissioned in March.

At Ruigtevallei substation, near Hendrik Verwoerd Dam, the two additional feeder bays were erected for the Hendrik Verwoerd power station generators 3 and 4. The erection of two additional 132 kV lines from Hendrik Verwoerd power station to Ruigtevallei has also been completed. The 132 kV busbars at Ruigtevallei were reconducted to cater for the larger loads associated with the additional generating capacity at Hendrik Verwoerd.

A start has been made on the extensions to the 400 kV switching yard at Hydra distribution station to cater for the third 400 kV line from Perseus, to be completed in 1978, and for the 400 kV line to the north-western Cape, from Hydra to Kronos distribution station near Copperton. This line is expected to be completed in 1976.

The erection of the 400 kV capacitor station near Victoria West is proceeding satisfactorily and is due for completion in

the first quarter of 1976.

Work is well advanced on the 220 kV switching yard at Hydra for the installation of two 315 MVA 400/220 kV transformers and the uprating of the two 132 kV lines to Ruigtevallei to 220 kV operation. The 220 kV feed from Roodekuil near the P. K. le Roux Dam will also be brought into the yard towards the end of 1976.

At Ruigtevallei substation a 132/220 kV step-up switching yard is nearing completion and in May 1976 two 250 MVA 132/220 kV transformers will be commissioned. These will enable the Ruigtevallei-Hydra lines to be uprated to 220 kV operation.

Servitudes have been obtained for the 132 kV transmission lines from the Vanderkloof power station to Roodekuil and the 220 kV transmission lines from Roodekuil to Hydra.

Work is well advanced on the erection of a 66 kV switching yard at Poseidon distribution station, near Cookhouse, and the installation of two 40 MVA 220/66 kV transformers. This yard is required to give supplies to Somerset East, Cradock and Graaff Reinet.

The erection of 74 km of 66 kV line from Poseidon to Cradock and 36 km from Poseidon to Somerset East has been completed. 110 km of line to Graaff Reinet is at present under construction together with the substations at these three towns.

As a consequence of the high extension charges which Escom must impose to recover its costs in the case of some potential farming supplies, the additional supplies provided in 1975 were less than in the preceding year. A total of 36 new farming supplies were provided, 4 of these being additional supplies to established consumers. In addition, 10 supplies were provided to non-farming consumers in rural areas. Additional transmission lines, 37 km long, were required for all these supplies.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 0,764 7 cents per kWh sold during 1975 is 9,8 per cent higher than the figure for the preceding year. In 1974, a reduction was achieved in the price per kWh sold, compared with the preceding year, because of a substantial increase in the sales to the City of Port Elizabeth. Total sales revenue for the year amounted to R6 999 940 and exceeded the corresponding figure for the preceding year by 27,8 per cent (137,7 per cent in 1974).

Class	Consumer		Sales of electricity						Revenue from sales		Average price per kWh sold		
	Number		Proportion %		kWh sold		% Change		Rand	Rand	Cents	Cents	
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975	
Traction	—	—	—	—	—	—	—	—	—	—	—	—	
Bulk municipal	31	32	87,35	94,32	686 761 881	863 359 380	+400,14	+25,71	4 220 213	6 019 911	0,614 5	0,697 3	
Mining	—	—	—	—	—	—	—	—	—	—	—	—	
Industrial	91	111	12,59	5,59	98 969 806	51 171 866	+97,74	-48,30	1 235 040	946 497	1,247 9	1,849 6	
Domestic and street lighting	103	109	0,06	0,09	510 225	866 891	+139,06	+69,90	20 607	33 532	4,038 8	3,868 0	
Total	225	252	100,00	100,00	786 241 912	915 398 137	+229,26	+16,43	5 475 860	6 999 940	0,696 5	0,764 7	
									1974	1975			
									R	R			
Total revenue										5 475 860	6 999 940		
Expenditure charged										5 349 990	8 169 703		
Surplus										125 870	—		
Deficit										—	1 169 763		
Surplus on network taken over										—	136 486		
Accumulated to 31 December:													
Surplus										—	—		
Deficit										156 695	1 189 972		

The map shows the licensed area of supply of this Undertaking at 31 December 1975.

Sales of electricity

Sales of electricity in this Undertaking increased by 11,3 per cent in 1975 which is well above the 7,0 per cent attained in 1974. As explained in previous reports the growth rate of sales in this Undertaking is determined largely by the expansion programmes of a relatively small number of large industrial concerns. The industrial sector is still increasing its dominance of overall sales at the expense of the mining sector. The slight reduction in the growth rate of sales to the mining sector in 1975 was mainly due to a slow-down of activity in the gold and copper mining sectors. The sales to gold mining showed a negative growth rate of -1,2 per cent in 1975 compared with the preceding year. (Positive growth rate of 2,2 per cent in 1974). The sales to copper mining in 1975 were 5,8 per cent more than in the preceding year (9,3 per cent in 1974). The gold and copper mining sectors in 1975 accounted for 38,9 per cent and 26,3 per cent respectively of the total mining sales. On the other hand, sales to the coal mines, which in 1975 accounted for 22,3 per cent of the total mining sales, increased in 1975 by 12,5 per cent, compared with an increase in 1974 of only 3,8 per cent.

The rate of growth of bulk sales to municipalities decreased slightly from 14,5 per cent in 1974 to 12,1 per cent in 1975. This was due to the fact that municipalities such as Lydenburg and Kinross recorded a more moderate increase in consumption in 1975 than in earlier years; furthermore, other municipalities such as Ogies which received their first bulk supplies a short time ago did not find it necessary to increase their supplies substantially in 1975.

Escom's bulk supplies to foreign territories comprise, in the case of this Undertaking, the supplies to the neighbouring territories of Mozambique and Swaziland. The 47 per cent surge of growth experienced in this category in 1974 decreased to the very moderate rate of 3 per cent in 1975. The explanation for this is the reversal experienced in the rate of growth of supplies to Mozambique: a 42,5 per cent surge in 1974 was reversed to a negative growth rate of -5,8 per cent in 1975. In 1975, bulk supplies to Mozambique nevertheless still accounted for 84 per cent of the total foreign bulk supplies.

Development of the Undertaking

The second 400 kV line, 80 km long, from Arnot power station to Vulcan distribution station, near Witbank, and the first 400 kV line, 55 km long, from Kriel power station to Vulcan distribution station were completed during 1975 and placed in service. The 400 kV line from Kriel power station to Atlas distribution station near Vereeniging in the Rand and

O.F.S. Undertaking was also placed in service during the year.

A 275/132 kV substation was placed in service at Komatipoort to reinforce the local traction and 132 kV distribution systems.

The Turbo substation, which will supply the residential township for Kriel and Matla power stations, was placed in service, with two 10 MVA 132/11 kV transformers installed. Karino substation near Nelspruit was commissioned, with an installed capacity of 2 x 5 MVA 132/11 kV transformers. This substation will reinforce the rural reticulation in the Karino and White River areas.

Churchill substation near Witbank has been reinforced by an additional 3 x 30 MVA 132/21 kV transformers. This substation supplies Ferrometals, Rand Carbide, Witbank Municipality, coal mines and other consumers in the vicinity of Witbank.

Middelpunt substation, about 52 km from Steelpoort, was placed in service with two 20 MVA 132/22 kV transformers installed, for supplying mining and rural consumers. The 132 kV transmission line from Steelpoort to Middelpunt substation was also completed during the year.

Vandykcol substation near Vandyksdrif was established and commissioned during the year. The substation has an installed transformer capacity of 2 x 10 MVA 88/11 kV transformers and will supply the coal mine.

Rosco substation near Leslie was commissioned with an installed capacity of 3 x 5 MVA 88/6,6 kV transformers.

Makriel substation, adjacent to Camden power station, in the Ermelo district has been completed, and is providing electricity for pumping the water required for Kriel power station.

An 88 kV transmission line, 14 km long, from Middalburg to Rockdale substation was completed and placed in service. Lomati substation and the 66 kV transmission line from Malelane, 32 km long, were completed and placed in service, to supply rural schemes in the Lomati River and Komatipoort areas. Extension of the 88 kV transmission system is continuing, particularly in the Ermelo, Davel and Dullstroom areas.

Progress is continuing with the provision of traction supplies to the South African Railways. The Witbank-Bronkhorstspuit section is being provided with 50 km of 88 kV line and four substations. One of these, the Mynhoop substation at Witbank, operates at 132 kV and received a supply in mid-1975.

The 132 kV traction section between Marathon distribution station near Nelspruit and Komatipoort, which has 5 substations, was placed in service during the year.

During the year, 394 new farming supplies were provided, 8 of these being additional supplies to previously established

farming consumers. In addition, 61 non-farming consumers were connected in rural areas. A total of 461 km of additional transmission lines were required.

The provision of new supplies in the vicinity of existing rural schemes, and the many requests for an increase of existing supplies, have resulted in a high level of loading of some rural networks. A strengthening programme is in hand to provide the increased transmission capacity required.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 0.762 1 cents per kWh sold during 1975 is 16,7 per cent higher than the figure for the preceding year (16,3 per cent in 1974). Total sales revenue for the year amounted to R55 382 697 and exceeded the corresponding figure for the preceding year by 30,0 per cent (24,5 per cent in 1974).

Class	Consumer		Sales of electricity						Revenue from sales		Average price per kWh sold		
	Number	Proportion %	kWh sold		% Change		Rand	Rand	Cents	Cents			
			1974	1975	74/73	75/74	1974	1975	1974	1975			
Traction	7	7	5,42	5,13	353 629 355	373 301 452	+0,68	+5,56	2 931 111	3 737 559	0,828 9	1,001 2	
Bulk municipal	29	28	7,19	7,24	469 438 547	526 316 011	+14,54	+12,12	3 266 539	4 300 959	0,695 8	0,817 2	
Bulk foreign	3	3	3,60	3,33	234 662 176	241 750 079	+46,98	+3,02	1 602 646	1 915 140	0,682 9	0,792 2	
Mining	105	110	25,32	23,79	1 652 869 944	1 728 481 179	+6,13	+4,57	10 550 678	13 022 298	0,638 3	0,753 4	
Industrial	5 296*	5 848	58,00	60,10	3 792 090 245	4 367 202 972	+5,43	+15,17	23 881 859	31 865 309	0,629 8	0,729 7	
Domestic and street lighting	2 776*	2 922	0,47	0,41	24 677 194	29 794 796	+10,32	+20,74	379 694	541 432	1,538 6	1,817 2	
Total	8 216	8 918	100,00	100,00	6 527 367 461	7 266 846 489	+7,05	+11,33	42 612 527	55 382 697	0,652 8	0,762 1	
									1974	1975			
									R	R			
Total revenue										42 612 527	55 382 697		
Expenditure charged										42 517 583	55 565 863		
Surplus										94 944	—		
Deficit										—	183 166		
Accumulated to 31 December:													
Surplus										—	—		
Deficit										1 780 419	1 963 585		

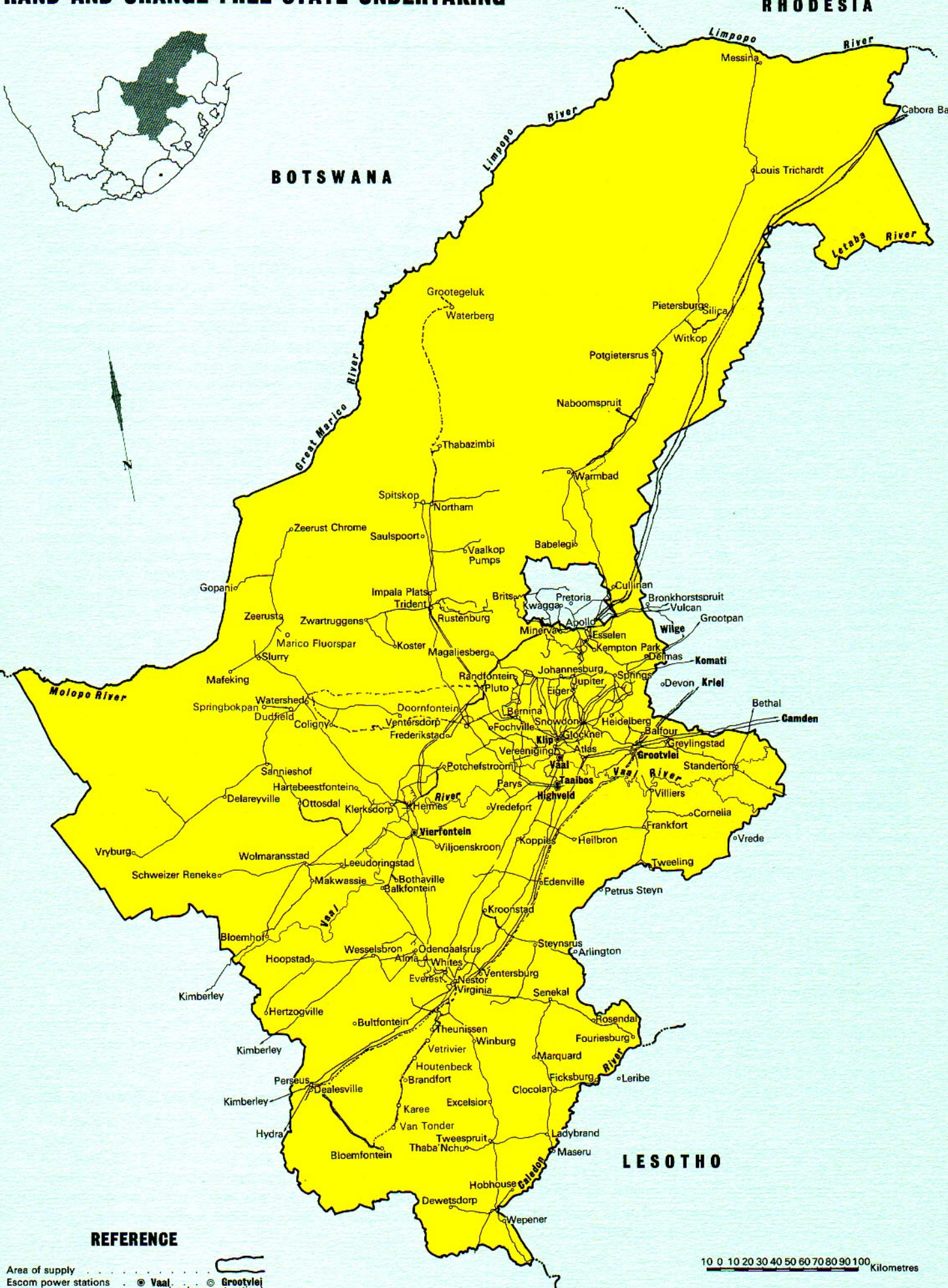
*Reclassification of rural industrial and rural domestic.

RAND AND ORANGE FREE STATE UNDERTAKING

RHODESIA

BOTSWANA

LESOTHO



REFERENCE

- Area of supply
- Escom power stations
- Transmission lines
- Transmission lines under construction

10 0 10 20 30 40 50 60 70 80 90 100 Kilometres

Area of supply 261 900 square kilometres

Rand and O.F.S. Undertaking

The map shows the licensed area of supply of this Undertaking at 31 December 1975.

Sales of electricity

Total sales for 1975 were 33 914 million kWh, reflecting an increase of 8,9 per cent over the sales for the preceding year. The corresponding growth rate recorded in 1974 was 11,5 per cent. The table shows that the three major categories of consumers were responsible for the reduced rate of growth, and that the retardation was proportionately more noticeable in the mining supplies than in the supplies to industry and the municipalities.

The sales to the gold mining industry in 1975, amounting to some 83 per cent of the total mining sales, were only 2,6 per cent higher than in the preceding year; in 1974 the corresponding rate of growth was 4,5 per cent.

The yearly growth of bulk supplies to the municipalities dropped in 1975 to a level of 18,4 per cent from the high rates in excess of 20 per cent which were maintained during the two preceding years. The retardation in 1975 was general, and cannot be attributed to particular municipalities.

The sectoral breakdown of percentages tabulated for the two years 1974 and 1975 reveals a continuing trend for the mining sector to relinquish its dominance in the pattern of sales to the industrial and bulk municipal sectors.

Development of the Undertaking

A 275 kV transmission line, 167 km long, between the existing 275 kV Warmbad distribution station and Witkop, a new 275/132 kV distribution station near Pietersburg, was completed. Two 250 MVA transformers were installed at Witkop to reinforce the supply to the Pietersburg and Potgietersrus areas.

Two 315 MVA transformers were installed at Kookfontein distribution station for a supply to the Metalloys complex near Meyerton, replacing the one 180 MVA transformer previously installed. The second 275 kV transmission line from Kookfontein distribution station to Glockner distribution station near Meyerton was commissioned.

The Spitskop distribution station near Northam, equipped with one 180 MVA 275/88 kV transformer and associated equipment was commissioned during the year to provide for increased supplies to the platinum mines in the Northam area, and the transmission line from Trident distribution station near Rustenburg to Spitskop distribution station, which was previously constructed and operated at 88 kV, was converted to 275 kV operation.

Several 275 kV transmission lines were completed during the year: a 36,6 km line between Jupiter distribution station and Snowdon distribution station in the central Reef area, a 10,1 km line between Jupiter distribution station near Germiston and Eiger distribution station in the Alberton district, a second 68,4 km line from Perseus distribution station near Dealesville and Harvard distribution station at Bloemfontein, and two 1,9 km lines between the Jupiter and Prospect distribution stations in the Germiston area.

An 88 kV supply previously furnished to Johannesburg Municipality at Fordsburg substation was converted to 275 kV during the year. A fourth 90 MVA 132/42 kV transformer was installed and commissioned at North Rand distribution station. A substation with one 40 MVA 132/66 kV transformer and 18 km of line from Kroonstad switching station were commissioned to provide a partial supply to Kroonstad Municipality. To supply Iscor's increased requirements at their Vanderbijl works, a second 90 MVA 132/33 kV transformer was placed in service at one substation and a further 132/11 kV substation equipped with two 20 MVA transformers was provided. A substation comprising two 132/6,6 kV transformers of 10 MVA capacity was established to provide a 6,6 kV supply to No. 3 shaft at Kloof Gold Mine, and a 132/6,6 kV substation of 20 MVA capacity was provided to make a 6,6 kV supply available to the new Deelkraal Gold Mine. To provide for additional loads notified by President Steyn, President Brand and St. Helena Gold Mines, and to enable the Alma and Everest distribution stations to supply additional load to Free State Saaiplaas Gold Mine, the 132/42 kV Witpan distribution station and approximately 40 km of heavy conductor 42 kV lines are under construction.

Two 88/33 kV transformers of 40 MVA capacity were installed for a 33 kV supply to Scaw Metals at their Arcscaw substation. Two lines between Jupiter distribution station and Union substation are at present being constructed to reinforce this furnace supply. A substation comprising three 88/11 kV transformers of 20 MVA capacity and associated equipment was established for the Amandel platinum mine north of Rustenburg. The construction of 38 km of transmission line between Atlas distribution station and Makalu substation near Sasolburg, is in progress, and the transmission line between Atlas and Highveld power station will be looped in to Makalu which will comprise three 160 MVA 275/88 kV transformers. This project will reinforce the 88 kV network in the Sasolburg complex. At Anglo Alpha, Dudfield, a new substation with six 10 MVA transformers was equipped to furnish increased supply to this cement factory. An 88 kV line, 27 km in length, was constructed from Anglo Alpha's Dudfield factory to the Springbokpan quarry. A new substation was equipped for supplies to the Impala platinum refinery at Springs.

To provide increased supplies to Lesotho, the capacity of the Maseru substation was stepped up by replacing two 5 MVA transformers with others of 10 MVA capacity.

Additional supplies were provided to the South African Railways for traction purposes. A 132 kV line, 110 km long, was constructed between Virginia distribution station and the Railways' Van Tonder substation for the Gunhill-Hamilton section, supplies having been provided at Welkom, Houtenbeck, Vetrivier, Theron and Welgeleë. Supplies on the Union-Volksrust line were provided at Rusthof, Kromdraai, Standerton and Holmdene. Supplies on the Klerksdorp-Beaconsfield section were provided at Regina and Leeubos. Other supplies given were at Verwoerdburg on the Germiston-Pretoria section, Lawley on the Langlaagte-

Vereeniging section, and Nigel on the Springs-Kaydale section.

Four supplies were provided to the Department of Posts and Telecommunications microwave stations at Rhenosterhoek (district Klerksdorp), Kareepan (district Bloemhof), Hartebeesthoek (near Pretoria), and Middelbult (district Lichtenburg). At Rhenosterhoek a supply was also given to the earth satellite station.

The total of 817 new farming supplies provided in this Undertaking during the year was slightly below the total for the preceding year. A total of 817 km of additional transmission lines were required. Most of the new supplies were provided by extending established schemes. However, 69 new supplies were given in the new rural schemes in the

Rayton area (near Pretoria) at Sannieshof, and at Sybrandskraal (north-east of Pretoria), requiring 56 km of transmission lines. About 80 km of new transmission lines were erected for the new Bultfontein scheme, but as yet no new consumers have been connected.

Financial

The Undertaking's financial results for 1975 are shown in the table. The average price of 0,684 7 cents per kWh sold during 1975 is 19,6 per cent higher than the figure for the preceding year (4,2 per cent in 1974). Total sales revenue for the year amounted to R232 205 878 and exceeded the corresponding figure for the preceding year by 30,2 per cent (16,1 per cent in 1974).

Class	Consumer		Sales of electricity				Revenue from sales		Average price per kWh sold			
	Number		Proportion %		kWh sold		% Change		Rand	Rand	Cents	Cents
	1974	1975	1974	1975	1974	1975	74/73	75/74	1974	1975	1974	1975
Traction	2	2	3,52	3,30	1 020 294 460	1 119 137 608	+5,65	+9,69	7 160 062	9 450 332	0,701 8	0,844 4
Bulk municipal	139*	147	22,15	24,15	6 916 404 319	8 189 630 321	+20,48	+18,41	40 975 125	57 444 756	0,592 4	0,701 4
Bulk foreign	3	3	0,09	0,12	30 929 404	41 035 973	+56,76	+32,68	191 296	365 131	0,618 5	0,889 8
Mining	99	103	46,64	43,96	14 562 473 119	14 907 526 596	+6,94	+2,37	77 058 469	93 059 562	0,529 2	0,624 2
Industrial	19 745†	21 329	26,23	27,60	8 354 120 962	9 361 189 424	+13,42	+12,05	50 021 911	67 895 494	0,598 7	0,725 3
Domestic and street lighting	15 778†	16 961	1,36	0,87	282 303 775	295 549 248	+14,96	+12,67	2 930 909	3 990 603	1,117 3	1,350 5
Total	35 766	38 545	100,00	100,00	31 146 526 039	33 914 069 170	+11,49	+8,89	178 337 772	232 205 878	0,572 6	0,684 7
									1974	1975		
									R	R		
Total revenue									178 337 772	232 205 878		
Expenditure charged									182 941 135	244 730 493		
Surplus									—	—		
Deficit									4 603 363	12 524 615		
Accumulated to 31 December:												
Surplus									—	—		
Deficit									6 742 792	19 267 407		

*Multiple supplies to a single consumer in some cases reclassified as one consumer.

†Reclassification of rural industrial and rural domestic.