

THE MINISTER OF
ECONOMIC AFFAIRS
House of Parliament
Cape Town

5th June 1974

Sir

*As required by Section 19
of the Electricity Act, 1958,
the Commission has the
honour to present its fifty
first Annual Report and
Accounts covering its work
for the financial year
ended 31st December 1973*

R. D. Dronjaku

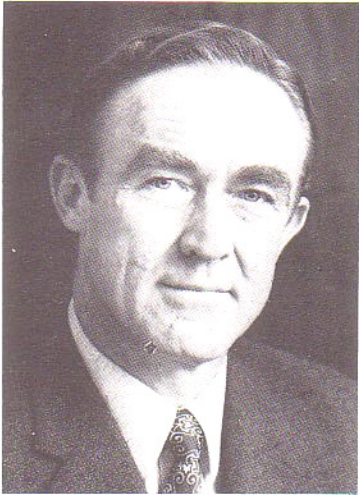
The Commission



W. H. Andrag



Dr. A. J. du Toit



D. J. Malan



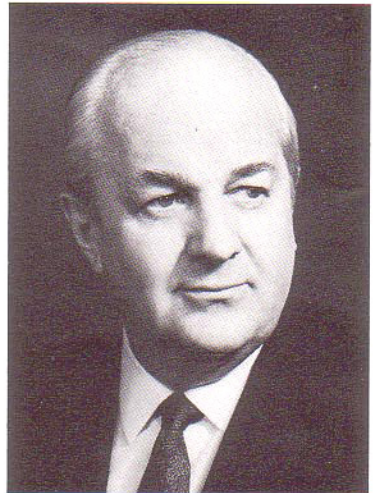
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H. H. L. Abrahamse



A. Anson Lloyd

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Members of the Electricity Supply Commission

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The year in brief

Sales

Sales of electricity surged ahead during 1973 to reach a total of 46 578 million units, reflecting an increase of 11,8 per cent over the 41 649 million units sold in 1972. This is the highest growth rate since 1955 and it also means that a rate of more than 9 per cent has been maintained for the fifth successive year. Two factors were largely responsible for this exceptional increase: a surge of growth in the mining industry, and the steadily increasing bulk supplies to municipalities. The units sold to the mining industry as a whole increased by 8,9 per cent in 1973 compared with an increase of only 2,0 per cent in 1972. The rates of growth of bulk sales to municipalities were 19,0 per cent in 1973 and 15,7 per cent in 1972.

National Grid

Towards the end of 1973 the transmission system linking the Border Undertaking and the Port Elizabeth Municipality with the national transmission network was completed. Port Elizabeth was supplied on the 1st November 1973, and the Border Undertaking in December 1973.

West Bank Power Station, previously controlled by the Border Undertaking, was formally transferred to the Central Generating Undertaking on 1st January 1974. It will in the future be found advantageous to integrate the small Cape Eastern Undertaking with the Orange River Undertaking. The Minister's approval to this change has already been obtained.

The second 400 kV transmission line to the Western Cape was taken into service in September 1973. As a result, the security of supply to that region has been greatly increased, and a further reduction of local generation is expected in 1974. The transmission links to the coastal regions will be strengthened as required, to provide for the growth in their demand for electricity. Further extensions are also planned to serve new areas where considerable development is envisaged.

Cabora Bassa

The construction of the Cabora Bassa hydro-electric power station in the Portuguese territory of Mozambique is proceeding according to plan. The two transmission lines to supply into Escom's system at its Apollo substation near Irene are expected to be completed early in 1974. The first supply from Cabora Bassa is expected by mid-1975.

Central Generating Undertaking

An improvement in the co-ordination of the interconnected power stations, as a result of the establishment of the Central Generating Undertaking, has allowed further reduction of the electricity sent out from the coal-fired power stations in the coastal provinces. During 1973, only 31,9 per cent of the electricity required by the Cape Western Undertaking was sent out from power stations situated in the Western Cape, the remainder being imported from the North via the 400 kV transmission lines. Similarly, some 53,8 per cent of the electricity required by the Natal Undertaking over the same period was imported via the 400 kV transmission lines from the North.

Coal-fired stations under construction

To benefit from our low cost coal resources in the Eastern Transvaal, it is to be expected that Escom's distribution undertakings must be supplied to an increasing extent from large coal-fired power stations sited at pitheads, via the national transmission system. During the year under review, a sixth 200 MW boiler-turbine set was commissioned at Hendrina Power Station. A fourth 350 MW set was commissioned at Arnot and a fifth 200 MW set at Grootvlei. The programme for 1974 provides for an additional 350 MW set at Arnot and a 200 MW set at Hendrina. Arnot will be completed to its ultimate capacity of six 350 MW sets by the end of 1975. The tenth and last 200 MW set at Hendrina will be completed by the end of 1975. A sixth and final set (dry-cooled) will be added at Grootvlei in late 1977.

Construction is proceeding of the large Kriel pithead power station which is planned for an ultimate installed capacity of 3 000 MW, made up of six 500 MW sets. The first set is to be

placed in service in 1975, with additional sets following at suitable intervals, to complete the power station by the winter of 1980.

Future plans

New coal-fired station

By the late seventies, the winter peak demand on the Escom interconnected system is expected to increase from year to year by at least 800 MW. To meet this growing demand, and to provide a margin of reserve, it will be necessary to commission more than one boiler-turbine set every year. Escom has consequently decided to commence construction of another large pithead power station in the Eastern Transvaal, having a total output of 3 600 MW, made up of six 600 MW sets. The first set will come into service late in 1978. This power station is to be named Matla Power Station.

Hydro-stations

Escom's studies of the alternative sources of primary energy available for conversion into electricity have revealed several interesting possible sources which have become feasible through the establishment of the national grid. At present the only Escom power station not using coal as its primary source of energy is the Hendrik Verwoerd hydro-electric power station with a capacity of 160 MW. During the second half of the seventies, Escom's hydro-electric generating capacity will be further increased by doubling the installed capacity at Hendrik Verwoerd and by installing 220 MW in the Vanderkloof hydro-electric power station at the P. K. le Roux Dam. In addition to the hydro-electric schemes of the Orange River Project, Escom is at present investigating a number of other hydro-electric proposals of both the conventional and pumped-storage varieties.

Pumped-storage schemes

A large pumped-storage scheme involving a co-operative effort with the Department of Water Affairs in its proposal for supplementing the resources of the Vaal River from the Tugela River is at present being studied. The feasibility of exploiting an attractive pumped-storage site in the Western Cape is also under consideration. Escom is also investigating the most economic sequence of developing several possible hydro-electric sites on the Tugela River. The potential of this river for hydro-electric power generation offers an opportunity for constructing several large power stations, not only of the conventional hydro-electric, but also of the pumped-storage type.

Nuclear power

Escom's long-term plans for generating electricity include the introduction of nuclear power. This source of energy for generating electricity has not yet been utilised by Escom, mainly because it has so far been uneconomic. One reason for this is its high capital cost compared with that of a pithead coal-fired power station – even if the capital cost of long transmission lines is added to the latter to obtain a sound basis for comparison. However, recent estimates of the capital cost of very large nuclear power stations, and severe escalation in the capital costs, not only of nuclear plant but also of conventional coal-fired plant, and of transmission equipment, have combined to improve the competitive position of nuclear generating plant. Escom has consequently recognised the need to re-examine its recent decision to postpone the construction of the proposed Koeberg nuclear power station to the north of Cape Town.

Koeberg

Another incentive to reconsider the economic feasibility of the Koeberg nuclear power project is the fact that the 400 kV transmission system from the Transvaal to the Western Cape will on the present indications be well loaded by the early eighties – even if the planned third 400 kV line via the north-western Cape and Saldanha is taken into account. Further studies have consequently been undertaken, and early in 1974 it was decided to commission the first nuclear unit, of capacity in the range 800 to 1 000 MWe, by late 1982. A second nuclear unit will come into operation either one or two years later. An outline enquiry, inviting tenders for the first nuclear unit, with an option on a second, was issued in February 1974.



Excavating the turbine hall at Vanderkloof Power Station.

Swawek	<p>Escom acts as an agent to the S.W.A. Water and Electricity Corporation (SWAWEK) in connection with, inter alia, the design and construction of power stations and transmission systems. The third 30 MW direct-condensing air-cooled turbo-generator set was completed in the Van Eck Power Station near Windhoek in March 1973, thus completing this coal-fired power station.</p>
Ruacana Power Station	<p>Escom is engaged, on behalf of SWAWEK, on construction of the Ruacana hydro-electric power station in northern South-West Africa. The civil contractor established himself at the site early in 1973. The turbine contract has been awarded and design and manufacture are progressing. The performance tests on a model of the turbine have been witnessed by Escom engineers. The power station is planned for a capacity of 320 MW, made up of four 80 MW sets. Three of these will be installed initially, the first for commissioning by the winter of 1977.</p> <p>The major 220 kV and 66 kV transmission system for SWAWEK was completed in 1973. This included the 220 kV line from Van Eck Power Station to Walmund distribution station, whence supplies will be given to Swakopmund and Walvis Bay. Towards the end of 1974, and early in 1975, supplies will be made available to the new mines at Ojihase and Rössing. The rights of way for two 330 kV lines from Ruacana Power Station to Omburu have been obtained.</p>
New head-office	<p>Further progress was made in 1973 with the plans to establish a new head-office complex for Escom to the north of Johannesburg. The various authorities concerned have granted their approval in principle for the use of the site in Sunninghill on the northern boundary of Sandton. The Escom head-office complex will occupy a portion only of the site; layout drawings have been prepared on the basis of utilising the remainder for a residential, recreational, and proposed office-park area. Proclamation is expected in the near future of the residential township, which is planned to include some 200 residential stands and 5 duplex flat stands. It is envisaged that this township will be in keeping with the overall planning of the area by Sandton Municipality and will be offered for sale to the public.</p> <p>Earthworks on the main site were virtually completed during the year. Construction of the main buildings is planned to commence by the middle of 1974, and occupation is planned by the middle of 1977.</p>
Capital expenditure	<p>Escom's capital expenditure for 1973 was R180 million. The latest estimate of capital expenditure for 1974 is R213 million. The estimated total capital expenditure for the years 1974 to 1977 inclusive is R915 million.</p>
Loans	<p>Long-term loans raised during the year totalled R118,3 million, comprising R85 million from local sources and R33,3 million on foreign capital markets. Short-term loans totalled R103,1 million, comprising R60 million from local sources and R43,1 million on foreign capital markets. Hardening in interest rates of foreign currencies caused Escom to repay revolving credit loans amounting to some R44,8 million. The credit facilities repaid to date, amounting to some R100 million, are available to Escom at any time.</p> <p>Of the R145 million raised locally during the year, Escom's internal funds contributed R51,7 million.</p>
Tariffs	<p>Escom's tariffs for the supply of electricity have in recent years been forced upwards, not only by the high current rates of interest on capital investment, but also by escalating costs of generation and distribution. The cost of machinery and equipment increased appreciably in 1973 as a result of the rising costs of basic materials and of wages. Although the interconnec-</p>

tion of its power stations enables Escom to moderate the effect of the rising cost of coal by reducing the burning rate of coastal coal-fired power stations, this is partly offset by the capital-related costs associated with the extension of the transmission system.

As a result of rising costs, Escom was obliged to increase the standard tariffs of four of its eight distribution undertakings from April 1974. Extension charges are not part of the standard tariffs; and consequently the overall effect is to increase total charges by amounts varying from 5,8 per cent in the case of the Eastern Transvaal Undertaking to 1,6 per cent in the case of the Cape Eastern Undertaking. The increase for the country as a whole averages about 1,1 per cent. Details of the tariff adjustments in the four undertakings affected are as follows:

Eastern Transvaal Undertaking: The surcharge is increased from the present 12,5 per cent to 20 per cent.

Natal Undertaking: The surcharge is increased from 12,5 per cent to 15 per cent.

Orange River Undertaking: The surcharge is increased from 12,5 per cent to 20 per cent

Cape Eastern Undertaking: The surcharge is increased from 17,5 per cent to 20 per cent.

As a result of the benefits of interconnection, it has been possible to keep the tariffs of the Cape Western, Cape Northern, and Border Undertakings at their existing levels.

A new tariff has been calculated for the consumers of the Rand and O.F.S. Undertaking. The new tariff, with effect from April 1974, will change the present relationship between demand and unit-related charges, to reflect the changing trends in unit and demand related costs. Similar revisions are to be made in turn to the tariffs of all the distribution undertakings.

Sales of electricity

Escom's total sales of electricity during the year 1973 amounted to 46 578 million units, which reflected an increase of 11,8 per cent over the corresponding figure for the year 1972. The average cost per unit sold in 1973 was 0,657 3 cents (0,619 5 cents in 1972). The average price per unit sold increased from 0,610 8 cents in 1972 to 0,648 4 cents in 1973. The growth of Escom's sales over the ten-year period 1964 to 1973 is shown in the diagram on page 11, together with the yearly average price per unit sold and the yearly total quantity of coal burnt. The figures represented are the annual totals and averages for all undertakings taken together. Similar figures for the individual undertakings are given in later sections of this report.

The yearly sales of electricity in the main categories of supply are given in Table 1 below for the six-year period ending with the year 1973. The two columns on the right indicate the rate of increase during the year under review,

and the average yearly rate of growth over the last five years.

Sales to the mining sector

The mining industry was once again Escom's largest consumer, having purchased, as shown in statement No. 5 on page 74, 33,9 per cent of all units sold in 1973 (34,8 per cent in 1972). The renewed vigour of the mining industry is revealed by its purchases of electricity, which increased in 1973 by 8,9 per cent (2,0 per cent in 1972).

Sales of electricity to the different sectors of the mining industry for the period 1968 to 1973 are given in Tables 2 and 3.

The remarkable rates of growth experienced in 1973 by the platinum and copper sectors can be seen in Table 2. Table 3 shows the Far West Rand to be the most rapidly developing gold mining area over the past five-year period.

Table 1
Sales of electricity to categories of consumers, millions of units

Category of supply	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Bulk supplies:								
Municipalities	6 628	7 264	8 108	9 265	10 716	12 751	19,0	14,0
Direct Supplies:								
Traction	2 181	2 307	2 410	2 616	2 782	2 895	4,1	5,8
Mining	11 995	12 642	13 948	14 227	14 509	15 800	8,9	5,7
Industrial	7 439	8 574	9 608	11 014	12 641	14 026	11,0	13,5
Domestic	632	708	805	906	988	1 092	10,5	11,5
Street Lighting	10	11	12	12	13	14	7,7	5,9
Total	28 885	31 506	34 891	38 040	41 649	46 578	11,8	10,0

Table 2
Sales of electricity to sectors of the mining industry, millions of units

Sector of mining industry	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Gold and uranium	10 339	10 647	11 504	11 662	11 773	12 263	4,2	3,5
Diamonds	281	282	288	297	325	334	2,8	3,6
Coal	480	495	535	563	589	620	5,3	5,3
Platinum	378	653	941	962	990	1 581	59,7	36,3
Copper	256	282	343	374	422	565	33,9	17,5
Iron and manganese	81	80	88	92	101	113	11,9	7,0
Chrome	14	17	20	25	31	33	6,5	18,9
Asbestos	107	118	137	152	161	168	4,3	9,5
Other	59	68	91	100	117	123	5,1	16,2
Total	11 995	12 642	13 947	14 227	14 509	15 800	8,9	5,7

Millions of units sold Price per unit sold, cents

Coal burnt, millions of metric tons

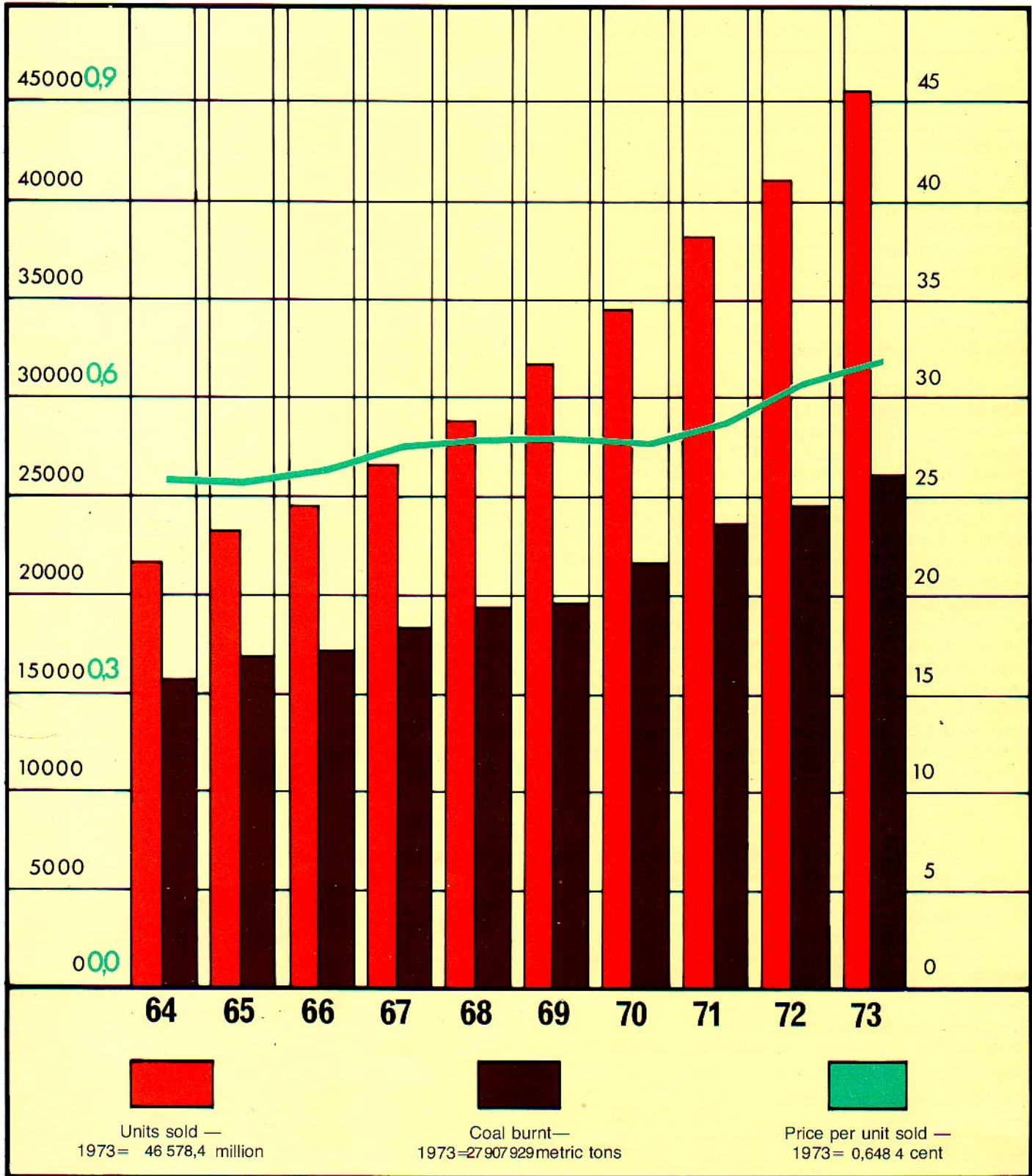


Table 3
Sales of electricity to the various gold mining areas, millions of units

Gold mining area	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent
Witwatersrand	2 329	2 186	2 144	1 974	1 801	1 813	0,7	—4,8
Klerksdorp	1 987	2 178	2 283	2 355	2 561	2 771	8,2	6,9
Far West Rand	2 639	2 759	3 439	3 602	3 622	3 790	4,6	7,8
Orange Free State	2 804	2 913	3 002	3 095	3 144	3 222	2,5	2,8
Eastern Transvaal	580	611	636	636	645	667	3,4	2,9
Total	10 339	10 647	11 504	11 662	11 773	12 263	4,2	3,5

Sales to the industrial sector

Industrial consumers, as shown in Statement No. 5 on page 75 accounted for 30,1 per cent of Escom's total sales of electricity in 1973 (30,4 per cent in 1972). Sales to the industrial sector increased in 1973 by 11,0 per cent – a somewhat lower rate than the yearly average of 13,5 per cent experienced over the past five years. The remarkable rate of growth during the years preceding 1973 was due mainly to the initial phase of establishment of large new ventures such as those of Alusaf, Highveld Development Corporation, Amcor and Iscor. Sustained growth at a somewhat reduced rate may be expected from these new industries in the future. This trend is revealed in Table 4 below, showing that sales to the engineering sector of industry increased by 12,0 per cent in 1973 as against an average yearly rate of 16,9 per cent during the five preceding years. The engineering sector, including iron, steel and base metals, is still the largest sector among Escom's industrial consumers, accounting for 54,8 per cent of total sales to industry in 1973 (54,3 per cent in 1972). In the

building, chemical, and paper sectors of industry, electricity sales grew in 1973 at a much higher rate than the yearly average experienced over the past five years.

The breakdown in Table 4 of electricity sales to the various sectors of industry does not include supplies of electricity furnished to industrial consumers by municipalities. This is partly the explanation for the apparently anomalous rates of growth shown in Table 4 for the foodstuffs sector. Another limitation of Table 4 is the fact that the method of classification into sectors has unavoidably suffered changes over the years.

Bulk supplies to municipalities

As shown in Statement No. 5 on page 74, the sales of electricity under the heading "bulk" supplies to municipalities comprised 27,4 per cent of Escom's total electricity sales in 1973 (25,7 per cent in 1972). Table 1 reveals that bulk sales to municipalities increased during 1973 at the remarkable rate of 19,0 per cent, which is considerably more than the yearly rate of 14,0 per cent

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

Sector of industry	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Building, cement and quarrying .	646	716	782	824	878	1 096	24,8	11,4
Chemical	1 241	1 272	1 376	1 444	1 639	1 921	17,2	9,3
Engineering, iron, steel and base metals	3 529	4 207	4 683	5 652	6 863	7 687	12,0	16,9
Paper and paper products	493	542	485	494	520	575	10,6	3,4
Foodstuffs, consumer goods, commercial, and other	1 530	1 837	2 282	2 600	2 741	2 747	0,2	12,8
Total	7 439	8 574	9 608	11 014	12 641	14 026	11,0	13,5

experienced on average over the past five years. The high rate of growth achieved in 1973 is due primarily to substantial new partial bulk supplies to the municipalities of Johannesburg and Pretoria, and to rapid growth of the supplies to the Cities of Cape Town and Bloemfontein. The City of Port Elizabeth received a partial bulk supply from November 1973 onwards.

If the new bulk supplies to the Cities of Johannesburg, Pretoria, and Port Elizabeth, and the bulk supplies to Cape Town and Bloemfontein are excluded, the remaining bulk sales showed an increase during 1973 of 13,3 per cent (11,8 per cent in 1972). Included in this category were new bulk supplies to the Municipalities of Upington and Prieska.

Sales to neighbouring territories

Sales of electricity in the category of bulk supplies include electricity sold to neighbouring territories. Table 5 below shows the increase in these sales in recent years.

Supplies to the territory of Mozambique increased sharply in 1972, and again in 1973, following the creation of a second point of supply in November 1972. Swaziland received its first supplies in April 1973.

Traction sales

Electricity sold to the South African Railways for traction increased by 4,1 per cent to 2 895 million units in 1973.

This rate of increase is somewhat less than the yearly average of 5,8 per cent experienced over the past five years, as shown in Table 1. Details of the development which took place in 1973 in the field of railway electrification are given in a later section of this report dealing with developments in each of the separate undertakings. The 1973 sales of electricity for railway traction in each of the undertakings concerned are given in Table 6 below, together with the corresponding figures for the five years prior to 1973.

Table 6 shows that the retarded growth of Escom's total traction sales in 1973, as compared with the five preceding years, is due to the reduced pace of electrification by the South African Railways in Natal and in the area of supply of the Rand and O.F.S. Undertaking.

Sales by distribution undertakings

In Table 7 on page 15, the total sales of electricity in each of Escom's distribution undertakings are given for the six years 1968 to 1973. The table shows that Escom's high rate of overall growth in 1973 can be attributed largely to the 10,8 per cent increase (6,7 per cent in 1972) of electricity sales in its major distribution undertaking, the Rand and O.F.S. Undertaking. The 10,8 per cent increase of sales in this large undertaking during 1973 is well above the yearly average rate of 8,0 per cent attained over the past five years. This is due mainly to increased sales to the mining

Table 5
Sales of electricity to neighbouring territories, millions of units

Neighbouring territory	1968	1969	1970	1971	1972	1973
Lesotho	4,1	7,3	8,8	12,2	16,6	19,7
Mozambique	*	0,1	0,6	0,8	15,5	151,2
Swaziland	*	*	*	*	*	8,4
Total	4,1	7,4	9,4	13,0	32,1	179,3

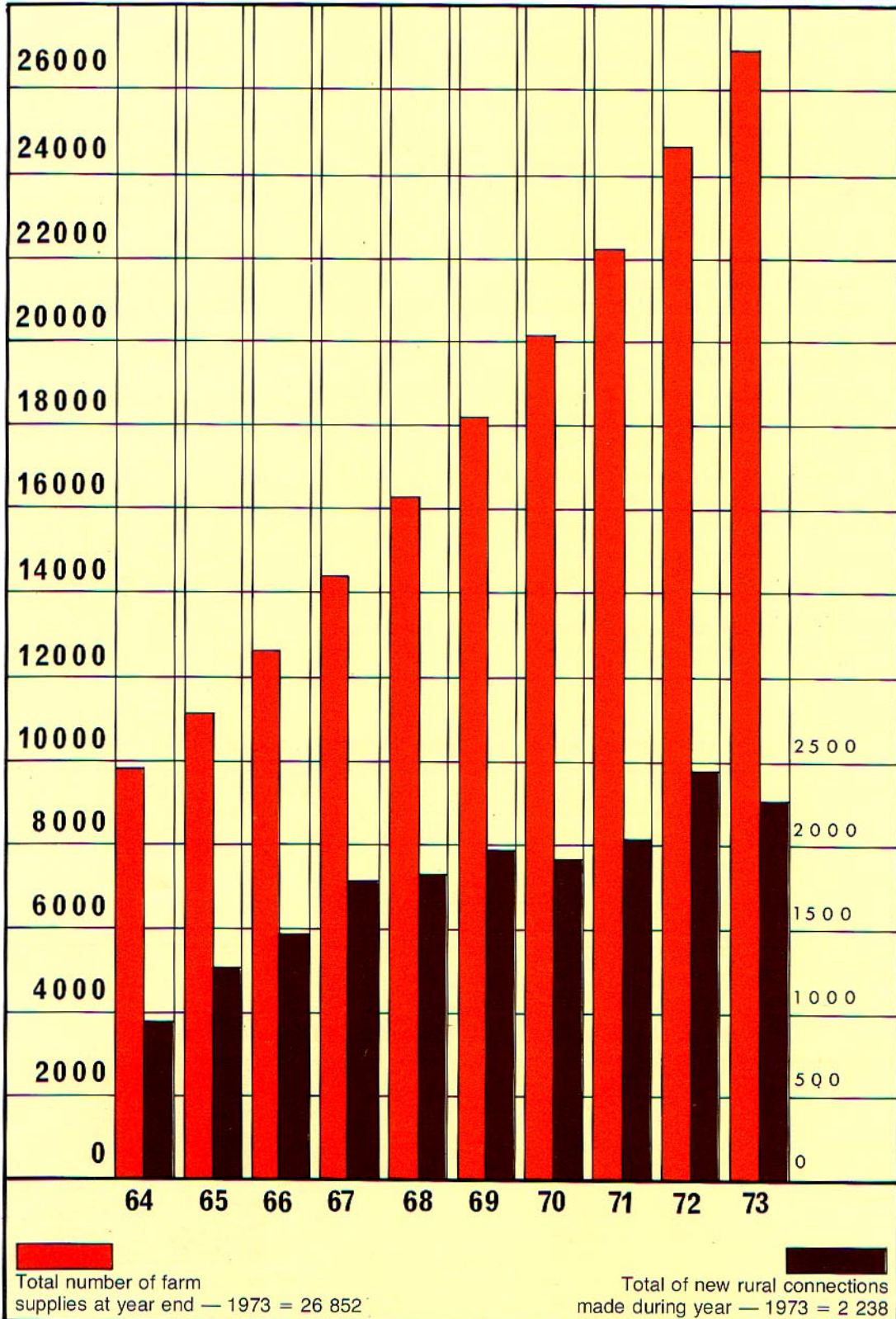
*Supplies not yet furnished.

Table 6
Sales of electricity to S.A.R. traction, millions of units

Undertaking	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Cape Northern	161,8	179,5	178,3	203,6	203,0	231,7	14,1	7,7
Cape Western	391,3	397,0	412,6	420,2	424,3	450,8	6,2	2,9
Eastern Transvaal	269,9	270,2	270,3	299,2	327,1	351,3	7,4	5,5
Natal	580,1	667,9	751,5	819,7	893,5	896,0	0,3	9,2
Rand and O.F.S.	777,5	792,4	796,9	873,7	934,4	965,8	3,4	4,5
Total	2 180,6	2 307,0	2 409,6	2 616,4	2 782,3	2 895,6	4,1	5,8

Supplies to farmers

New rural connections



industry and increased bulk supplies to municipalities. Electricity sales in the Natal Undertaking increased in 1973 by 9,3 per cent. While this is a high rate of yearly growth, it is appreciably less than the remarkable rate of 12,9 per cent per year achieved on average over the past five years by this undertaking. The reduced rate of growth in 1973 is seen as a transient phase, in which a period of consolidation has followed the vigorous establishment of large new industrial ventures such as Alusaf. It is interesting to note in Table 7 that all the other undertakings experienced growth rates above 12 per cent in their sales of electricity during 1973. Electricity sales in the Orange River Undertaking have been dominated, to the end of 1973, by substantial supplies for construction purposes connected with the Orange-Fish River Project. These supplies are of a temporary nature, and will from 1974 onwards be secondary to

the bulk supplies to the City of Port Elizabeth. Disregarding the special case of the recently established Orange River Undertaking, the highest percentage increase of electricity sales in 1973 was achieved by Cape Northern Undertaking, with a figure of 18,4 per cent – considerably more than the yearly average of 11,7 per cent over the past five years. This high rate of growth in 1973 in the Cape Northern Undertaking was due to the further development of the copper mining industry within its area of supply and due to new bulk supplies to the municipality of Upington and increased bulk supplies to the Municipality of Kimberley and to other municipalities. Of more significance to Escom's overall rate of growth in 1973 was the increase of 16,5 per cent achieved by the Eastern Transvaal Undertaking, which ranks third among Escom's distribution undertakings in respect of electricity sold. The increased sales in

Table 7
Total sales of electricity in Escom distribution undertakings, millions of units

Undertaking	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Rand and O.F.S.	18 979	20 218	22 294	23 620	25 209	27 938	10,8	8,0
Natal	4 122	4 637	5 074	6 072	6 938	7 581	9,3	12,9
Eastern Transvaal	3 191	3 824	4 294	4 562	5 235	6 098	16,5	13,9
Cape Western	1 666	1 824	2 101	2 494	2 771	3 149	13,6	13,6
Cape Northern	610	658	715	790	896	1 060	18,4	11,7
Border	311	331	360	400	448	504	12,6	10,3
Orange River	2	8	47	95	144	239	65,3	150,3
Cape Eastern	4	6	6	7	8	9	14,8	18,7
Total	28 885	31 506	34 891	38 040	41 649	46 578	11,8	10,0

Table 8
Total number of farming supplies at the year end

Undertaking	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Rand and O.F.S.	4 221	5 147	5 862	6 719	7 570	8 398	10,9	14,8
Cape Western	5 155	5 269	5 527	5 805	6 071	6 389	5,2	4,4
Natal	2 936	3 347	3 787	4 140	4 652	5 080	9,2	11,6
Eastern Transvaal	1 735	2 057	2 411	2 717	3 187	3 634	14,0	16,0
Cape Northern	1 387	1 531	1 653	1 777	2 033	2 130	4,8	9,0
Border	458	501	571	642	688	716	4,1	9,4
Cape Eastern	330	368	378	387	388	432	11,3	5,6
Orange River	*	*	*	4	25	73	**	**
Total	16 222	18 220	20 189	22 191	24 614	26 852	9,1	10,6

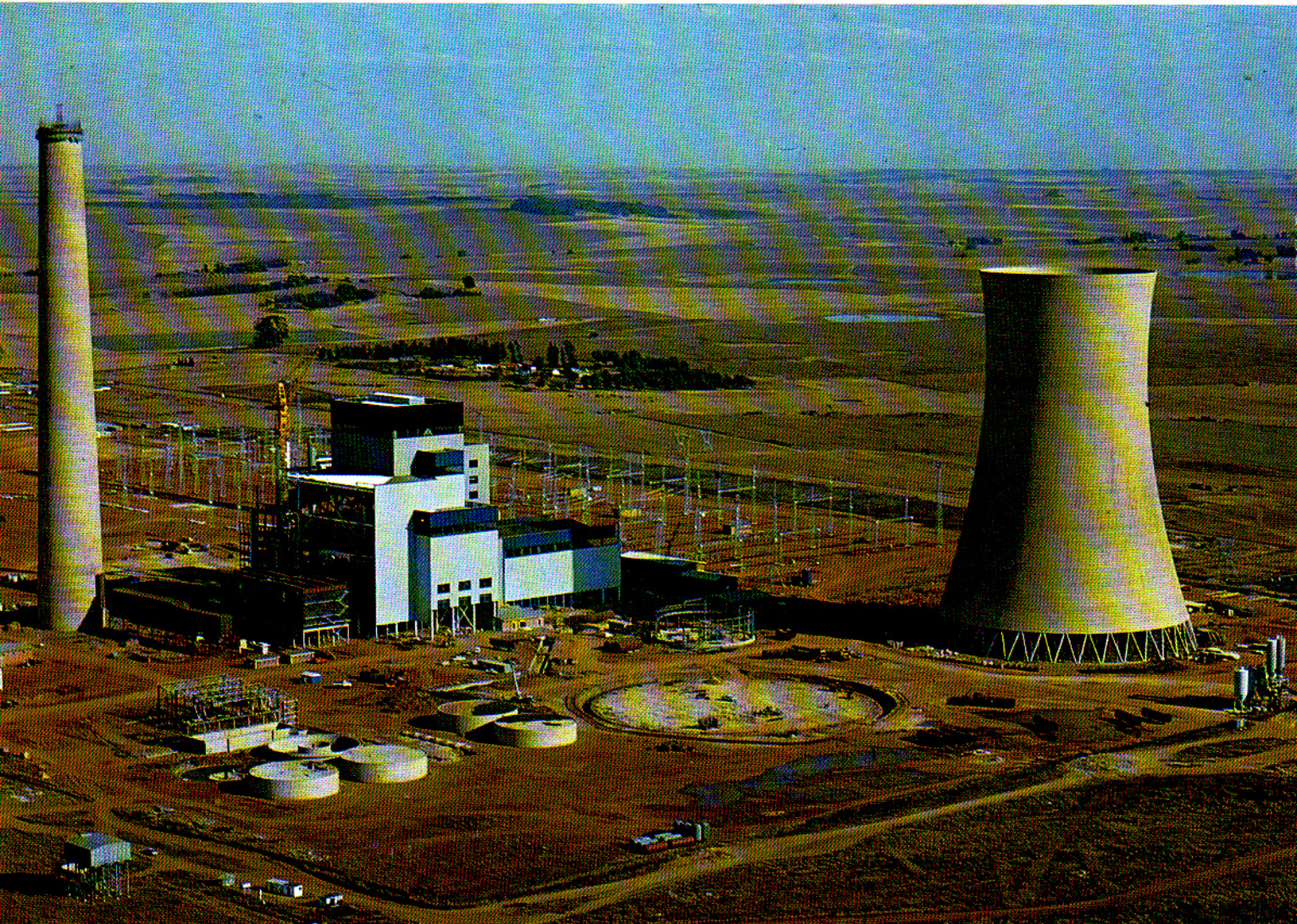
* Before existence of Orange River Undertaking

** Growth rates not meaningful

this undertaking were due mainly to the sustained growth of the developing ferro-metals industries in its area of supply. The Cape Western Undertaking, with an increase of 13,6 per cent in its sales during 1973, due in large measure to the increase in supply to the Municipality of Cape Town, maintained the yearly average growth of the past five years.

Rural supplies

Continued progress is being made with the expansion of Escom's rural networks, and a total of 2 238 new farm supplies were connected during 1973. Table 8 on page 15 illustrates how Escom's distribution undertakings have contributed to this development over the six-year period ending in 1973.



Kriel Power Station.

Central generating undertaking

During the year under review, the power stations under the control of the Central Generating Undertaking were operated in a manner intended to minimise the national total generating cost. This co-ordinated operation of power stations, and the distribution of their output to consumers throughout the country were made possible by the interconnected transmission network.

As indicated in Statement No. 6 on page 76, a total of 53 040 million units of electricity was generated in Escom's power stations during 1973, and this exceeds the corresponding figure for 1972 by 11,9 per cent. During 1972 the corresponding increase was 9,1 per cent. The electricity purchased from Port Elizabeth Municipality and from the Department of Water Affairs (hydro-electric power station at the Paul Sauer Dam) for supplies to consumers in the small and isolated Cape Eastern Undertaking is tabulated in Statement No. 2 on page 71. Table 9 below shows the units of electricity distributed for consumption each year in all Escom's undertakings, for the five-year period 1969 to 1973 inclusive.

The one-hour non-simultaneous maximum demands experienced each year by the undertakings are given in Table 10. Table 11 shows in a similar manner the demands experienced each year by the different undertakings during the hour of occurrence of the yearly peak demand on the national interconnected system, the time and date of occurrence of the national peak demand being

given. There is diversity between the demands of the individual distribution undertakings: the yearly peak demand on the national interconnected system is lower than the aggregate of the non-simultaneous demands of the individual undertakings. This is one of the advantages that accrues to the combined systems as a result of the interconnection of Escom's undertakings.

The Central Generating Undertaking, established in terms of the Electricity Amendment Act of 1971 and a permit issued by the Electricity Control Board, has completed the second year of its existence. The operation of all Escom's power stations, with the exception of West Bank Power Station in the Border Undertaking, was controlled during the year under review by the Central Generating Undertaking. West Bank Power Station was transferred to the Central Generating Undertaking on 1st January 1974. The establishment of this undertaking has enabled Escom to rationalise its functions, and to separate the task of power generation and transmission from that of the distribution and sale of electricity. The Central Generating Undertaking has also taken over the major transmission systems from inland to Natal and the Cape, together with the major Rosherville Workshops.

Installed plant for generation and transmission

The major power station equipment taken into service during 1973 and under construction or on order as at 31st

Table 9
Electricity supplied to Escom's undertakings, millions of units

	1969	1970	1971		1972	1973
Pooled power station supplies to Undertakings:				(1) Central Generating Undertaking supplies to Distribution Undertakings:		
Rand and O.F.S.*	21 791,4	24 038,3	25 499,1	Rand and O.F.S.	26 959,4	30 036,2
Natal	4 850,2	5 339,9	6 407,6	Natal	7 370,2	8 041,1
Eastern Transvaal*	3 916,4	4 408,5	4 687,2	Eastern Transvaal	5 438,8	6 205,4
Cape Western	1 982,0	2 321,5	2 755,7	Cape Western	3 078,8	3 495,8
Cape Northern	716,9	796,7	879,9	Cape Northern	999,8	1 182,6
Orange River	9,0	52,9	101,8	Orange River	156,8	257,8
				Border	**	4,2
				(2) Central Generating Undertaking own consumption	9,2	20,0
				(3) Sub-total: supplied by Central Generating Undertaking	44 013,0	49 243,1
Border	334,2	363,2	408,0	(4) Border Undertaking	462,1	516,0
Cape Eastern (purchased)	6,5	7,1	8,3	(5) Cape Eastern Undertaking (purchased)	9,7	11,3
Total, all Escom	33 606,6	37 328,1	40 747,6	Total, all Escom	44 484,8	49 770,4

* Includes electricity purchased from municipalities and other sources.

** Before interconnection with Central Generating Undertaking.

ELECTRICITY SUPPLY COMMISSION

Map showing
LICENSED AREAS OF SUPPLY

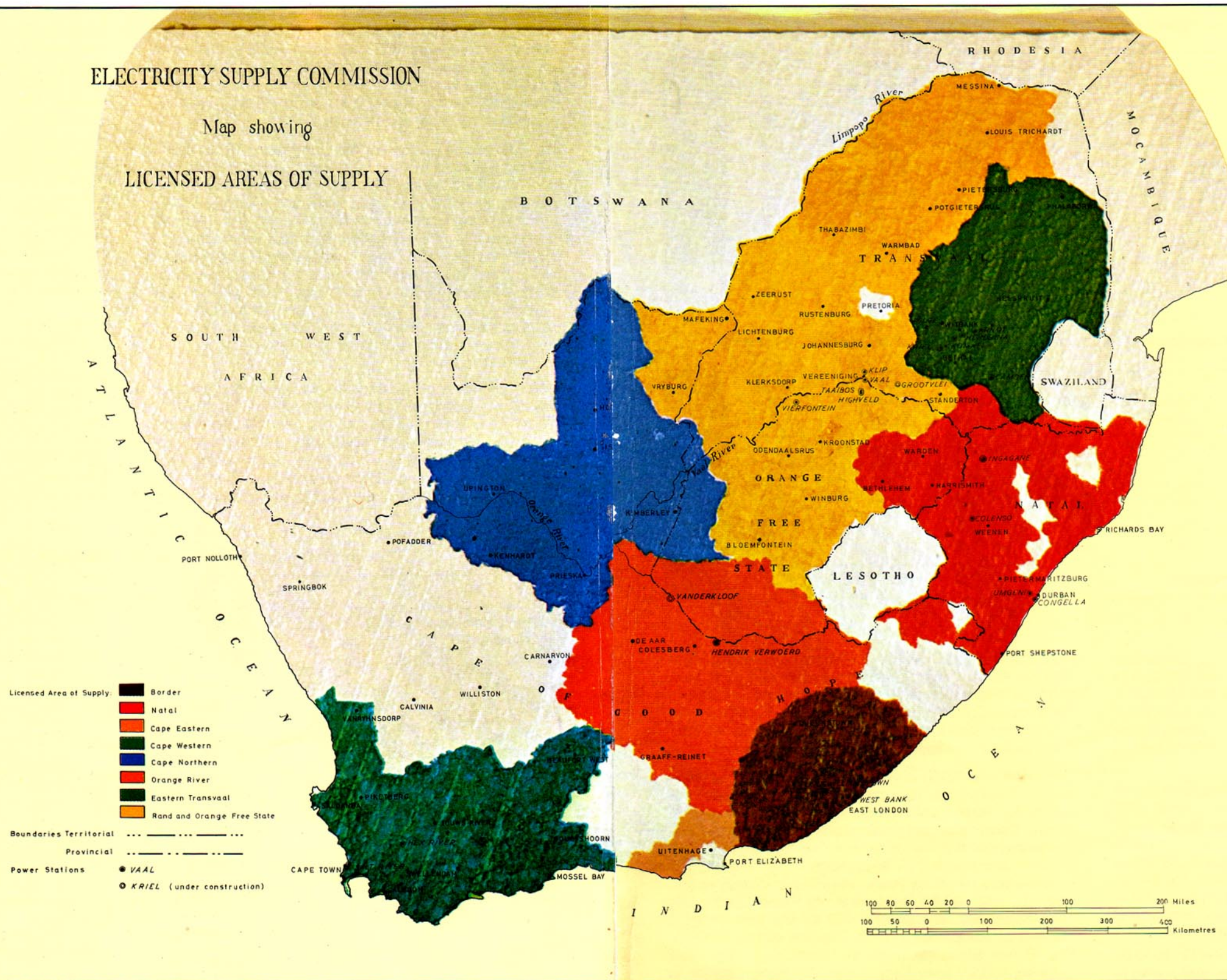


Table 10
Hourly maximum demand of Escom's undertakings over the last five years, megawatts

Undertaking	1969	1970	1971	1972	1973
Rand and Orange Free State	3 277,1	3 624,4	3 878,4	4 054,9	4 467,8
Natal	794,0	867,0	1 060,0	1 177,0	1 263,0
Eastern Transvaal	575,5	615,3	680,4	786,1	
Cape Western	326,8	389,8	442,8	491,7	
Cape Northern	127,3	139,8	157,1	179,5	201,9
Orange River	7,6	12,4	20,5	30,3	88,2
Border	67,7	70,2	80,3	88,3	100,8
Cape Eastern	2,0	2,0	2,3	2,5	2,3
Aggregate of non-simultaneous maximum demands	5 178,0	5 720,9	6 321,8	6 810,3	7 545,9

Table 11
Demand in each undertaking at the time of maximum demand in total Escom system, megawatts

Undertaking	Time: Date:	1969 09h00 25/7/69	1970 12h00 16/7/70	1971 09h00 17/6/71	1972 10h00 1/8/72	1973 09h00 13/7/73
Rand and Orange Free State		3 277,1	3 624,4	3 878,4	4 026,8	4 440,0
Natal		747,4	825,3	994,3	1 088,0	1 222,0
Eastern Transvaal		541,2	598,2	565,8	772,0	827,0
Cape Western		315,5	357,5	432,4	470,4	542,0
Cape Northern		114,5	136,8	144,8	163,0	197,0
Orange River		—	10,3	18,3	23,0	31,0
Border		59,0	69,0	63,0	87,0	91,0
Maximum simultaneous demand on total Escom system ..		5 054,7	5 621,5	6 097,0	6 630,2	7 350,0

December 1973 is given in Table 12. At 31st December 1973 the installed generating plant comprised 184 boilers of total steam raising capacity 11 649 kg/s and 135 turbo-generator sets of total capacity 10 141,5 MW. Included in the 135 turbo-generator sets are 7 steam-electric house sets of total capacity 49 MW and 2 hydro-electric sets of total capacity 160 MW.

Statement No. 1 on pages 00 and 00 in this report gives full details of power station plant installed as at 31st December 1973. Due allowance has been made for all plant de-commissioned, and the "assigned sent-out rating in MW" has been indicated. This is the maximum power which can be fed into the grid network from the power stations listed. Statement No. 1 continues on pages 68 to 70 with an indication of the transmission lines, cables, and transformers in service as at 31st December 1973.

The interconnected grid system was extended in 1973 by the completion of three major 400 kV transmission lines in

the Cape: a second line from the Hydra distribution station near De Aar to the Droërvier distribution station in April, and from Droërvier to the Muldersvlei distribution station in the Western Cape in September, and a line from the Hydra distribution station to the Poseidon distribution station near Cookhouse in the Eastern Cape in November.

During the year 1973 the 400 kV Vulcan distribution station near Witbank was placed in service. The importance of this distribution station derives from it being the input point of three of Escom's largest power stations: it will ultimately be connected to Arnot, Hendrina, and Kriel Power Stations by two, two, and one 400 kV lines respectively. The two 400 kV lines from Hendrina Power Station are already in service. The first 400 kV line from Arnot Power Station has been completed. The second 400 kV line from Arnot is planned for completion in 1974. The first 400 kV line from Kriel Power Station is being surveyed at present. Two outgoing 400 kV lines from Vulcan distribution station to

Table 12
Power station plant taken into service during 1973 and on order at 31st December 1973.

Name of Power Station	Plant taken into service in 1973		Plant under construction or on order	
	Boilers kg/s	Generators MW	Boilers kg/s	Generators MW
Coal-fired steam:				
Arnot	333	350	666	700
Grootvlei	214	200	215	200
Hendrina	214	200	856	800
Kriel	—	—	2 640	3 000
Hydro:				
Hendrik Verwoerd	—	—	—	160
Vanderkloof	—	—	—	220

Apollo distribution station are already in service; the third 400 kV line from Vulcan to Apollo is approaching completion and will be placed in service early in 1974.

Particulars are given below of power stations under construction for the Central Generating Undertaking, or in the planning and design stage:

Grootvlei power station

This coal-fired power station, situated in the Southern Transvaal between Balfour and Villiers, has been planned for an ultimate capacity of six coal-fired sets of 200 MW, with steam conditions 10,3 MPa (abs.) and 538° C. The fifth set was placed in service early in 1973.

Of the five sets now in commercial service, one is coupled to a dry cooling tower, which enables the condenser cooling water to be cooled without loss of water by evaporation. The sixth set, planned for commercial service in September 1977, will also be of the dry-cooled type.

With the sixth set in operation, Escom will thus have two large turbo-generator sets employing dry cooling towers. The experience gained on these two sets will enable Escom to formulate a long-term policy in regard to the adoption of the dry cooling process on a larger scale.

Hendrina power station.

This coal-fired power station, situated near Hendrina in the Eastern Transvaal, is planned for an ultimate capacity of 2 000 MW made up of ten 200 MW sets with steam conditions 10,3 MPa (abs.) and 538° C.

The sixth set in this power station was placed in service in 1973. The seventh and eighth sets are well advanced in construction and are planned for commercial service during 1974 and 1975 respectively. The remaining two sets are planned for completion in 1976.

Arnot power station

This coal-fired power station, situated near Middelburg in the Eastern Transvaal, is planned for an ultimate capacity of 2 100 MW made up of six 350 MW sets with steam conditions 15,9 MPa (abs.) and 510° C/510° C.

The fourth boiler-turbine set was placed in service during the year, and the remaining two sets are planned for completion in 1974 and 1975 respectively.

Kriel power station

The design and construction of this coal-fired power station, situated between Bethal and Ogies in the Eastern Transvaal, is proceeding according to plan. The ultimate installed capacity will comprise 3 000 MW made up of six 500 MW boiler-turbine sets employing steam conditions of 16 MPa (abs.) and 510° C/510° C.

The first cooling tower shell was completed towards the end of the year. In November 1973, the first turbine foundation, comprising 1 500 cubic metres of concrete, was cast in a continuous three-day pour.

The construction of the water supply pipeline from the Usutu River, which will serve partly to supply Kriel Power Station with water, was connected in December 1973.

Hendrik Verwoerd power station

The first two 80 MW turbo-generator sets in this hydro-electric power station have continued to give satisfactory service. Civil work for the third and fourth 80 MW sets was commenced in 1973, and the bottom sections of the foundations have been completed. The contract for these sets has been placed. The locally-manufactured portion of the turbines has arrived at site and is in the process of being installed. The station is planned for completion before the winter of 1976.



A rain forest created by a modern cooling tower.

Vanderkloof power station

This hydro-electric power station, situated at the P.K. le Roux Dam, is planned for an ultimate capacity of two 110 MW turbo-generator sets. The station is planned for completion before the winter of 1977.

The progress of construction has been satisfactory. Excavation of the underground machine cavern is proceeding well, despite some difficulties with rock conditions. A road tunnel giving access to the dam for the Department of Water Affairs which crosses Escom's works has been excavated for the Department and the tunnel is being lined. The contract for the two turbo-generator sets has been placed.

Matla power station

Escom's firm plans include the provision of an additional, new coal-fired power station, to be named Matla Power Station, at an Eastern Transvaal pithead. The coal contract for this station has been awarded to General Mining and Finance Corporation Limited.

It is envisaged that this coal-fired power station will have a total installed capacity of 3 600 MW made up of six 600 MW boiler-turbine sets, having steam conditions of 16,1 MPa (abs.) and 535° C/535° C. Tenders have been invited for the first two sets, with an option on the third. The first two are planned for commissioning in September 1978 and September 1979 respectively. The remaining sets will in all probability follow at yearly intervals.

Generation of electricity

Statement No. 6 on pages 76 and 77 lists the operating statistics of the various power stations for the year 1973. Continuity of supply was maintained throughout the year.

In common with electric power utilities in other countries, Escom is experiencing problems with the increasingly complex modern plant installed in recent years. In collaboration with the suppliers of such plant, Escom has done a good deal of work to locate and rectify the causes of plant failure so that improved plant availability can be achieved. The central maintenance workshops at Rosherville have played a major part in this. Monitoring and analysis of plant failure statistics – an important function of Escom's Information and Decision System – have helped in the recognition of problem areas. In Escom's discussions with plant designers and manufacturers, the great importance of plant reliability is constantly stressed.

As a result of the co-ordinated operation of all power stations connected to the grid network, the older pithead power stations inland and the coal-fired power stations at the coast have been relegated to peak-load and reserve duty. During the year under review, the Central Generating Undertaking has been involved in the problems of re-

organising operating staff in power stations such as Klip, Taaibos, Highveld, Colenso, and Umgeni, to cope with the shutting down and starting up of several boilers and turbo-generator sets over the night period.

By clarification, chemical treatment, and recycling, Escom continued with its efforts to conserve water. These processes also assisted in the virtual elimination of pollutants in water effluents from the power stations. Plans are also being implemented to combat air pollution from power station chimneys, and Escom has authorised an appreciable expenditure for this purpose.

With technical assistance from the Central Electricity Generating Board in Britain, the undertaking's instrument division is designing and building a sophisticated power station operation simulator for the training of operators for modern boiler and turbo-generator plant. This simulator will be ready in 1974.

Maintenance

The central maintenance department at Rosherville was concerned, during the year under review, with the maintenance of plant, equipment, and buildings. The workshop facilities were augmented by the installation of a large rotor lathe capable of handling rotors of mass up to 150 tons, for turbo-generators of capacity up to 1 300 MW. Other large new machine tools installed during the year include a portable radial drilling machine, a vertical boring mill, a combination turret lathe, and a slotting machine. At present, a 65 ton dynamic balancing machine is being erected, and a number of additional lathes and other new machines have been ordered to accommodate the increased demands being made on the workshops.

Of the total capacity of turbo-generating plant installed in Escom power stations by the end of 1973, amounting to 10 141,5 MW, the central plant maintenance specialists carried out guarantee inspections on 1 300 MW, overhauls on 1 227 MW, and major maintenance on 1 977 MW. This amounts to 4 504 MW of turbo-generating plant, representing more than 40 per cent of the total installed capacity. In addition, planned routine, preventive and breakdown maintenance was carried out on many other turbo-generators throughout the system.

During the year, 76 boilers underwent major maintenance. Fifty of these were overhauled, three were guarantee-inspected, while additional or other work was carried out on the remainder.

As a part of the overall Escom Information and Decision System, the Central Generating Undertaking proposes to computerise the determination of its master outage programme. This task, started in 1973 and to be continued in 1974, involves the optimal allocation of available resources of generating plant while meeting the fluctuating demand of Escom's consumers.

For the purpose of work scheduling at the central maintenance workshops in Rosherville, a computerised system was investigated during the year. The main effort is at present directed towards the collection of the data required. To develop and test the new system, it has been decided to give special attention to the maintenance operations at Grootvlei Power Station and at Rosherville workshops.

Coal supplies

The tonnages of coal burnt each year in Escom power stations situated in different areas of the country are indicated in Table 13 below for the six years 1968 to 1973 inclusive. In Table 14, Escom's costs per ton of coal delivered to its power stations in these areas are shown as yearly averages over the same period. The rate of increase during the year under review, and the average yearly increase over the past five years are shown in the two right-hand columns of both these tables.

During the year under review, as is shown in Table 14, the overall cost to Escom per ton of coal burnt increased by 6,2 per cent, which is much less than the local increase of 21,8 per cent experienced in the Western Cape, and also less

than the increase of 10,9 per cent applicable to the group of pithead power stations of the Transvaal and Orange Free State.

The higher coal prices in 1973 were due to an increase, at the beginning of the year, of some 30 per cent in the tariffs on the transport of coal, and an increase, from July, of 20 per cent in the controlled price applicable to certain coal supplies. The figures in Tables 13 and 14 reveal the benefits of co-ordination among power stations connected to the national transmission network. The tabulated figures for the Natal region already contain this benefit, the cost per ton of coal burnt having remained steady from 1972 to 1973 by drastic reduction of supplies to the Colenso, Congella and Umgeni Power Stations while a high tonnage was maintained at the pithead Ingagane Power Station.

The tables thus demonstrate how the Central Generating Undertaking was able to mitigate the effects of rising coal costs throughout the country, to the ultimate benefit of Escom's consumers, by using the grid network to the best possible advantage. Thus the base-load duty could be carried by the pithead power stations with lower operating costs, while the coal-fired power stations in the coastal

Table 13
Coal burnt per year in different areas, millions of tons

Geographic area	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Transvaal and O.F.S.	15,569	16,097	17,755	19,515	21,618	25,009	15,7	10,0
Natal	2,457	2,734	2,871	3,067	2,450	2,013	-17,8	-3,0
Western Cape	0,919	0,956	0,797	0,604	0,622	0,591	-5,0	-7,8
Eastern Cape*	0,189	0,196	0,208	0,230	0,263	0,295	12,1	9,4
Total	19,134	19,983	21,631	23,416	24,953	27,908	11,8	7,9

* Not yet incorporated in Central Generating Undertaking.

Table 14
Yearly average cost of coal burnt in different areas, Rand per ton

Geographic area	1968	1969	1970	1971	1972	1973	Percentage increase 1972/73	Average yearly increase over 5 years, per cent.
Transvaal and O.F.S.	1,80	1,82	1,76	1,76	1,83	2,03	10,9	2,5
Natal	3,92	3,91	3,82	4,08	4,10	4,13	0,7	1,1
Western Cape	6,41	6,58	6,58	7,06	7,44	9,06	21,8	7,4
Eastern Cape*	5,84	6,04	6,13	6,31	6,83	8,17	19,6	7,1
Overall average	2,33	2,38	2,26	2,25	2,25	2,39	6,2	0,6

* Not yet incorporated in Central Generating Undertaking.

regions with higher operating costs were assigned to peak-load generation and reserve standby. Following the completion of the second 400 kV transmission line from the Transvaal to Natal in September 1972, the tonnage of coal burnt during 1973 at Umgeni Power Station was 42,6 per cent less than in the previous year. The tables reveal, however, that the benefits offered by this policy have now been fully exploited: in 1973 there was a sudden rise of 6,2 per cent in Escom's overall coal cost per ton, whereas the average annual increase over the past five years has been only 0,6 per cent. The virtual impossibility of further resistance to such escalation rates is better understood if it is borne in mind that the severe increase of 6,2 per cent per year refers to Escom's national average cost per ton of coal, after the strategic allocation of generating load

among its various power stations. It is felt that a further increase in the cost of coal can be expected in 1974.

During the year a policy of stockpiling coal at pithead power stations as a means of reconciling colliery output with the fluctuating burning rates and to meet emergencies was actively pursued. By the end of the year 900 000 tons had been put on the ground and it is estimated that this will rise to 1,5 million tons during 1974.

Plant outages and transmission limitations have resulted in some of the older stations in the Vaal triangle being continued to operate at high loads and this has taxed colliery output capacity to the extent that on occasion load has had to be re-allocated and coal imported by rail. This position has been further aggravated by mining difficulties, and a tight coal supply position in this area is expected to

Table 15
Water used in Escom power stations, Megalitres

Area and source of water	Potable water		Crude river water		Water from other sources including boreholes, dams and sewage		Sea water circulated (estimated)	
	1972	1973	1972	1973	1972	1973	1972	1973
Western Cape:								
Cape Town Municipality	259	240						
Worcester Municipality	637	535						
Hex River			—	35				
Sea water (estimated)							279 000	296 000
Total Western Cape	896	775	—	35			279 000	296 000
Border:								
East London Municipality	100	95						
Sea water (estimated)							138 000	121 000
Total Border	100	95					138 000	121 000
Natal:								
Durban Municipality	3 410	2 000						
Sea water (estimated)							124 535	90 980
Tugela River			2 186	1 587				
Ngagane River			9 785	11 051				
Total Natal	3 410	2 000	11 971	12 638			124 535	90 980
Transvaal and O.F.S.:								
Vaal River	989	1 124	46 854	49 589				
Bronkhorstspuit			6 387	7 244				
Komati River			39 633	49 885				
Usutu Complex			23 158	20 661				
Other	66	71			185	179		
Total Transvaal and O.F.S.	1 055	1 195	116 032	127 379	185	179		
Total all Escom	5 461	4 065	128 003	140 052	185	179	541 535	507 980



Open-cast coal mine supplying Hendrina Power station.

persist for some time until steps now being taken to increase output produce the required results.

The ash-filling of underground workings being pioneered at Springfield Colliery was started in July and is proving a satisfactory method for disposal of ash at a cost comparable to that of surface disposal. Plans are now being considered to proceed with the second stage of recovering more coal from these areas, which was the primary objective of the project.

The pioneer open-cast working at Optimum Colliery has met all expectations, and during the year it was agreed to start open-cast operation at Arnot Colliery as well. Here again, besides cost advantages the primary objective of recovering more "in situ" coal is being pursued, and expectations are that over 80% recovery instead of the 35% generally achieved at present from underground mines will be realised.

The extraction of metallurgical coal from power station supplies was discussed at length during the year. There are, however, only very limited possibilities and whilst agreement in principle has been reached, no active steps have as yet been taken in this direction.

Water supplies

The quantities and source of water used in Eskom's power stations are shown in Table 15 on page 25.

Escom's efforts to conserve water were continued during the year under review. In co-operation with the Department of Water Affairs, good progress was made at many of the power stations towards the elimination of water effluents.

The water consumption of Escom's power stations has once again improved in 1973. Comparative consumption figures for the past four years, during which water-conservation measures were introduced at Escom power stations, are given in Table 16 below.

Using the year 1970 as a base, the figures given in Table 16 show that the yearly generation of electricity had increased by the end of 1973 by 33,3 per cent while the corresponding increase in water consumption was 14,1 per cent.

As in previous years, the improvement in 1973 is due to two factors – more of the load is being carried by the large, more efficient power stations in the Transvaal, and the re-use and chemical treatment of water is reducing the consumption at these power stations.

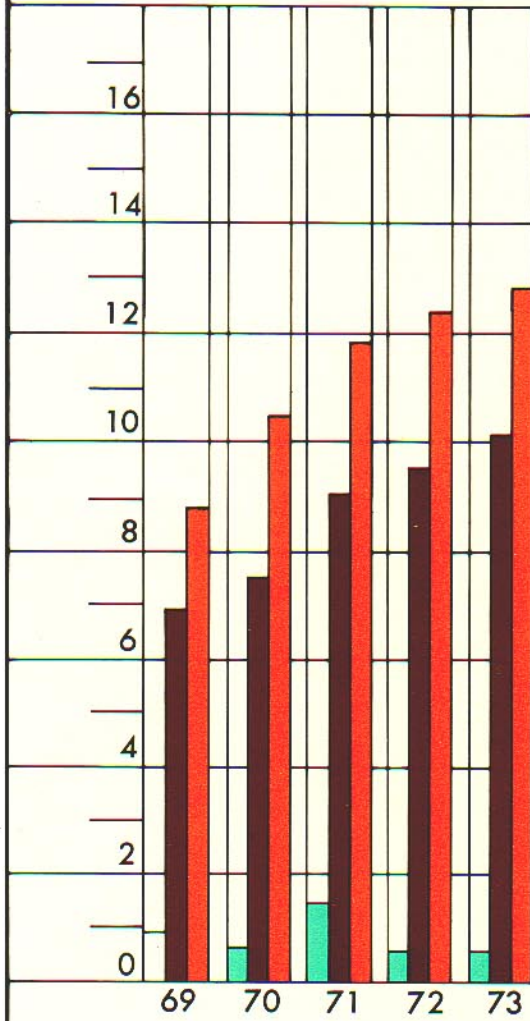
Investigations into the feasibility of using dry towers instead of wet towers for cooling the condenser water in power stations are proceeding. Tests on the 200 MW set at Grootvlei Power Station are being continued in order to study over a long period not only water saving by dry tower cooling, but also the significance of possible effects of the weather on the overall performance and efficiency of the installation.

Table 16
Water consumption of Escom power stations over the past four years

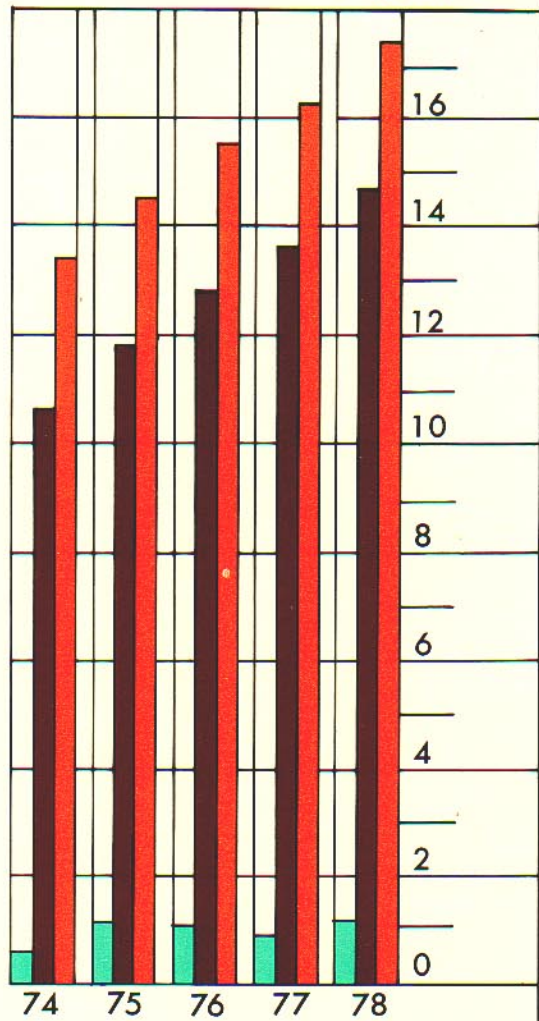
	1970	1971	1972	1973
Electricity generated, million units	39 796	43 379	47 411	53 040
Percentage increase on previous year	—	9,0	9,3	11,9
Water consumed, megalitres	126 303	130 350	133 464	144 117
Percentage increase on previous year	—	3,2	2,4	8,0
Specific water consumption, litres/unit generated	3,17	3,00	2,82	2,72
Percentage decrease on previous year	—	5,4	6,0	3,5

Capacity of Republic's Power Stations

Expansion over the last five years, thousands of MW




Planned expansion over the next five years, thousands of MW




69	920	6 985	9 883
70	600	7 583	10 500
71	1 460	9 043	11 900
72	550	9 593	12 400
73	550	10 143	12 900

74	550	10 692	13 400
75	1 130	11 822	14 500
76	1 090	12 930	15 500
77	810	13 740	16 300
78	1 100	14 633	17 400

 Installed by Escom during year

 Total MW installed by Escom

 Total MW installed in Republic

Research and development

Research and development continued during the year with many long-term investigations started in the past, such as measures to reduce pollution, earth resistivity surveys, the performance of insulators in coastal areas, and the measurement of radio and television interference from transmission lines.

Electrical research

The Research Division started, on the electrical side, a number of new investigations during 1973: the effect of switching noise and corona on carrier protection; the propagation of high-frequency energy over power lines; the performance of transistorised control and indicating instruments in the vicinity of radio transmitters; the effect of bush or veld fires below transmission lines; the development of statically-charged barriers to protect transmission lines against faults; the performance of vibration dampers on overhead line conductors in wind; and safety aspects regarding work on overhead lines in the vicinity of atmospheric disturbances. Suitable sites at Rosherville for the tower testing and extra-high voltage research stations have been chosen and carefully investigated.

Mechanical research

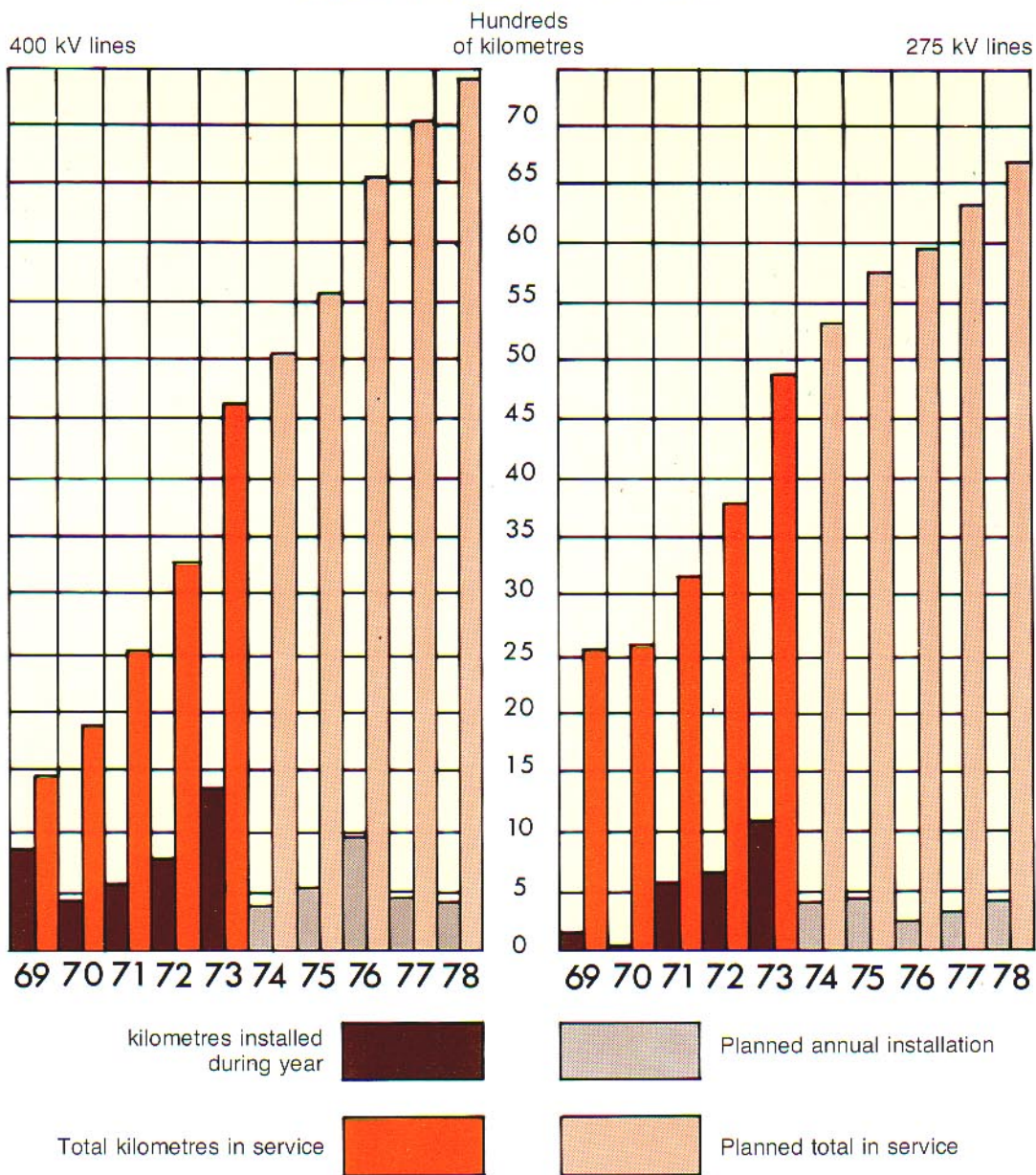
On the mechanical side, short-term programmes of plant investigation and material testing were put in hand. These cover the investigation and testing of equipment and materials associated with boiler plant, turbo-generator plant and water-supply pipelines. Some examples of this re-

search include work on a coal-abrasiveness standard and wear in boiler plant; investigations into the ability of pipeline protective coatings to withstand the stripping effect of clay soils; exposure tests on various epoxy coatings for application by painting; and investigations into the stresses in a chimney shell during construction and operation.

Research liaison

Co-operation with the Council for Scientific and Industrial Research, South African Bureau of Standards, and the Universities has been maintained through joint research projects and through national committees on which Escom is represented such as the National Advisory Committee on Electrical Engineering and the Co-ordinating Committee for High Voltage Research and Testing Facilities. Escom also serves on numerous committees convened by the South African Bureau of Standards to draw up standards and codes of practice and also various committees convened by the Atomic Energy Board. Contact with overseas research activities is ensured through membership of the Electrical Research Association of England, Conférence Internationale des Grands Réseaux Électriques, where Escom representatives serve on the Administrative Council and on two of the study committees, the World Energy Conference, and through contact with similar electric utilities in other countries such as the Central Electricity Generating Board in England and the Electricité de France in France.

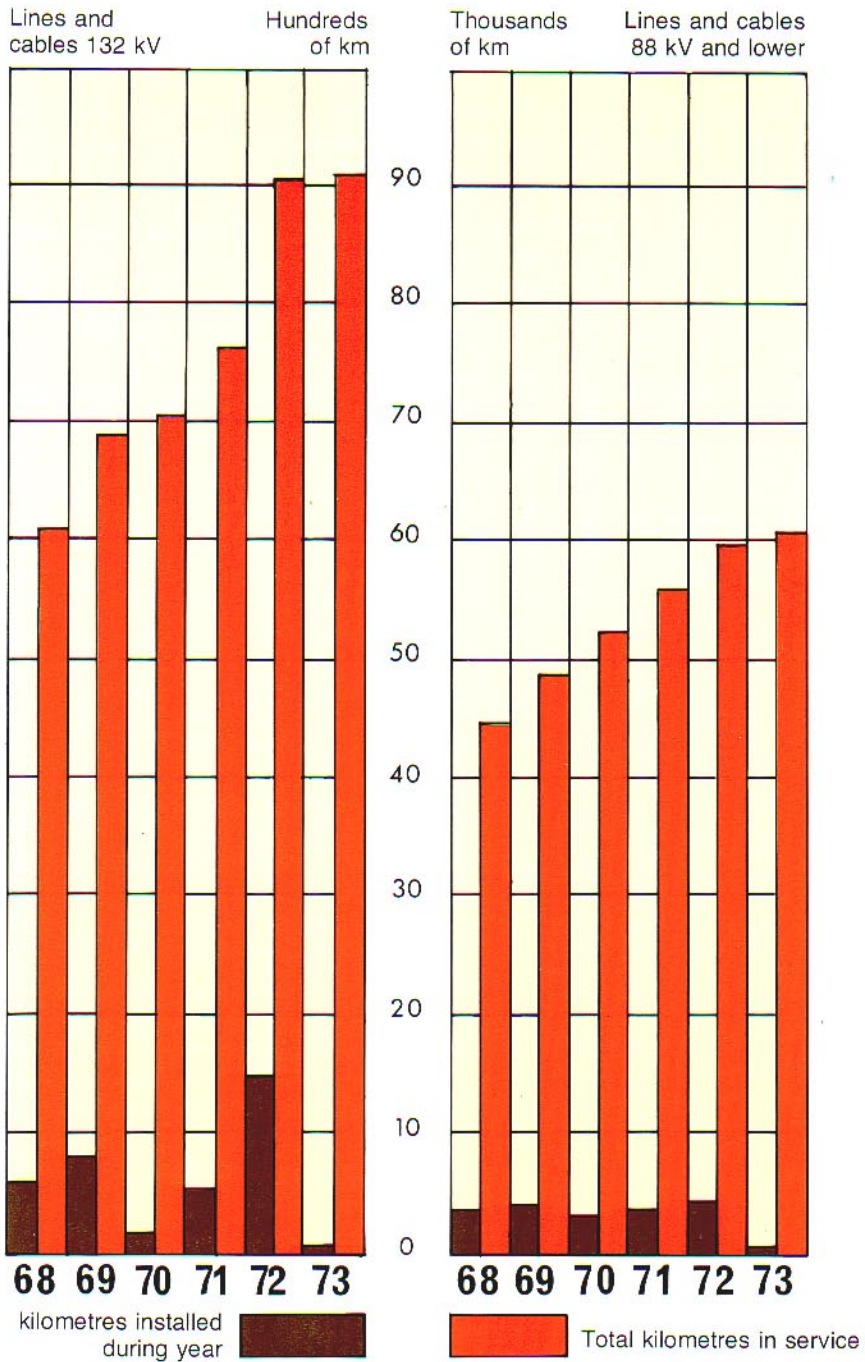
Expansion of Escom's Distribution System



400 kV Lines	
Installed during year	Total
879,9	1 479,9
439,3	1 915,8
587,6	2 503,4
771,1	3 274,5
1 355,8	4 630,3
390,0	5 020,3
540,0	5 560,3
960,0	6 520,3
480,0	7 000,3
440,0	7 440,3

275 kV Lines	
Installed during year	Total
139,4	2 551,7
46,8	2 598,5
577,0	3 175,5
650,2	3 825,7
1 068,5	4 894,2
410,0	5 304,2
450,0	5 754,2
240,0	5 994,2
320,0	6 314,2
370,0	6 684,2

Expansion of Escom's Transmission System



Lines and cables 132 kV	
Installed during year	Total
594.5	6 080.3
817.7	6 898.0
164.9	7 062.9
537.9	7 600.8
1466.0	9 066.8
10.9	9 077.7

68
69
70
71
72
73

Lines and cables 88 kV and lower	
Installed during year	Total
3 670.2	44 928.1
3 993.5	48 921.6
3 396.5	52 318.1
4 532.0	55 850.1
0.100	59 860.1
3.179	60 178.0

Personnel

The total personnel employed by Escom decreased by 1,8% compared with the increase of 7,5% during 1972. The decrease is attributed to the completion of construction projects at various power stations, which resulted in a considerable reduction of construction personnel, particularly non-Whites. During the year strong emphasis was placed on a productivity campaign for non-Whites. The personnel employed at 31st December 1973, were as follows:

Salaried White Employees	5 489,
reflecting an increase during 1973 of 7,8%	
Monthly-paid White Employees	4 718,
reflecting a decrease during 1973 of 0,7%	
Non-White Employees	17 761,
reflecting a decrease during 1973 of 4,7%	
TOTAL	27 968,
reflecting a decrease during 1973 of 1,8%	

To cope with the acquisition of specialised technical staff, two overseas recruitment campaigns were arranged to recruit staff in short supply in the Republic. During 1973, 58 recruited immigrants accepted service in various categories of technical employment.

In addition, 13 immigrants referred to Escom by the Department of Immigration, were engaged. As in previous years, the co-operation and assistance of the Departments of Immigration and Interior were excellent.

Industrial relations

Approximately 54% of Escom's White employees belong to various employees' associations or trade unions. Regular meetings were held during the year between Escom Management and representatives of the Salaried Staff Association and the Trade Unions.

The bulk of Escom's non-White labour force of 17 761 employees were unaffected by the work stoppages which occurred earlier in the year, mostly in the Natal (Durban) area. The stoppages were staged in conjunction with demands for higher wages. Escom's favourable position may be ascribed to its policy of continually reviewing wages and keeping in pace with the increased cost of living. During the year non-White wages were adjusted by 41,8% to cater for the increased cost of living and to fit in with Escom's aptitude and job evaluation systems now being developed and which, it is believed, will result in increased productivity.

Much progress has been made in the updating of the standard of accommodation provided, both permanent and mobile, for non-White employees. The reaction of the Bantu staff to the improved accommodation has been most satisfactory.

Education and training

Due to the rate of industrial expansion and the shortage of

qualified staff it became necessary to increase materially the training of existing employees, both white and non-White, for greater productivity. To achieve this a new Education Department was established to plan, organise, co-ordinate and functionally control all Escom's personnel development and training throughout the Republic. As a result all formal training centres which existed in 1972 were centralised under the new Department for control, integration of activities and standardisation of training.

During 1973 training was provided at Klip Training Centre for 618 employees in the generation and distribution undertakings. Courses included power plant operation, power line construction and maintenance, material handling, and control of stores. The increased demand for training has necessitated an appreciable extension of the present facilities for the forthcoming year.

At the Rosherville Apprentice Training Centre a total of 426 apprentices were each trained for periods of three months in workshop practice. Of a total of 108 apprentices prepared for the Government Trade Test, 79 (73%) were successful. Plans have been finalised and work has commenced on an expansion programme to build additional workshops to provide basic training for Engineers-in-Training and Pupil Technicians. It is gratifying to note that more than 75% of the apprentices who completed training with Escom during 1973 have remained in Escom's service.

A new training centre is being established to provide specialised tuition in Draughting and Contracts Engineering to meet Escom's specific requirements in these fields. Courses will commence during 1974.

A total of 262 (223 in 1972) Escom employees attended courses and seminars offered by external organisations to improve individual knowledge and performance in 22 different fields. Twelve departments and undertakings participated in external training at a total cost to Escom of R27 120 (R11 400 in 1972).

In-company training was given by Escom to 360 middle-management staff on its Information and Decision System and the role of the computer. A further 69 courses were held for 487 employees for detailed instruction on the various aspects of computer systems and applications.

Under the Escom Bursary Loan Scheme, 37 new bursaries were granted to students during 1973. Students were sponsored at all major Universities throughout the Republic in the following courses: Electrical, Mechanical and Civil Engineering, Chemistry, Land Surveying, Commerce, Architecture, Quantity Surveying and Computer Science. The total number of bursars for 1973 was 117 (93 in 1972) at a total annual cost of R108 600 (R72 900 in 1972).

Escom also grants Dr. H.J. van der Bijl Scholarships to children of Escom employees. During 1973, 15 Scholar-

ships were granted, bringing the total number of students studying under this scheme to 44, at a total cost of R49 020 a year.

The growing importance of the role played by technicians in industry is recognised by Escom. As at 31st December 1973 a total of 187 pupil technicians were undergoing training in the various disciplines applicable to its organisation.

To improve its overall productivity, Escom has increased considerably its activity in the training of Bantu staff. During 1973, 58 training courses were held for 1 471 Bantu employees. Courses included subjects such as accident prevention, human relations in industry, communications, labour regulations, health and welfare and the basis of good instruction for Bantu supervisors.

To keep abreast of the latest technological developments 31 senior Escom employees proceeded overseas for discussions, negotiations and training during the year.

Due to an ever-increasing demand for knowledge throughout the organisation it is anticipated that the Education Department will need to expand considerably in the near future in endeavouring to satisfy Escom's requirements.

Amenities, sport, and recreation

The total membership of the Escom Pension and Provident Fund was 9 215 plus 1 093 pensioners, including widow pensioners.

During the year the Escom Medical Aid Society amended its rules to comply with the amendments to the Medical Schemes Act. The Society now provides benefits to 10 299 members and 21 397 dependants, and has a turnover of R1 750 000. It has been able to build up a satisfactory reserve without having to increase membership subscriptions.

All non-White employees are now provided with free medical attention and medicines through part-time Medical Officers. The incidence of tuberculosis in Escom's non-White labour force is now negligible – all employees are X-rayed on engagement and at regular intervals thereafter.

The 22 Escom sport and recreation clubs throughout the Republic affiliated to the Federation of Escom Clubs have

continued to grow from strength to strength, and are assisting materially in fostering an *esprit de corps* amongst Escom employees. Membership has increased from 6 882 on 1st May 1972, when the Federation was established, to 10 500 on 31st December 1973. Inter-club competitions were arranged throughout the year, thus establishing an important social link throughout the organisation.

Close attention continues to be given to sport and recreation for Bantu employees, with facilities for all types of sport being provided as the need arises.

Three salaried non-Whites were admitted to the Escom Pension Fund. A contributory pension fund for non-Whites, in lieu of the present non-contributory scheme, is under investigation.

Prevention of accidents

The injury-frequency rate and the fatality rate in respect of all Escom employees have decreased substantially over the past few years. The rate of lost-time injuries per million man-hours worked, having decreased continuously from 11,9 in 1969 and 10,4 in 1970 to 8,5 in 1971, increased slightly to 9,1 in 1972 and then dropped to 7,6 for the year 1973. The fatality rate dropped from an average of 1,2 fatalities per five million man-hours worked over the 3-year period ending 31st December 1973 to a figure of 0,6 for the year 1973.

The programme for the prevention of accidents has also contributed towards the improvement of Escom's operating efficiency through better house-keeping, reduction of damage to plant and equipment, reduction of man-hours lost by employees as a result of injuries, and reduction of man-hours devoted by managers and supervisors to the consequences of accidents.

During the year 1973, eighteen Escom work-centres qualified for national safety awards from the National Occupational Safety Association. This is a noteworthy achievement, particularly in view of the more stringent requirements introduced by the Association in 1973 for the granting of its award.

In addition to the ten Escom work-centres which achieved a million man-hours without a single lost-time injury prior to 1973, there were five additional work-centres which attained this distinction during 1973.

Capital expenditure

During 1973 expenditure on construction works amounted to R180 million (R177 million in 1972) made up of:

Table 17
Capital expenditure

Power station development	R85 million
Transmission, distribution and reticulation systems	R95 million

A variety of assets were either sold or written off, amounting to a value of R12 million, thus bringing the nett capital expenditure for the year to R168 million (R170 million in 1972).

The total value of fixed assets earning revenue was increased by R173 million (R137 million in 1972), and at the year-end stood at R1 699 million. The additional items include the continued commissioning of generating sets at the power stations: Grootvlei (R30 million), Hendrina (R26 million) and Arnot (R35 million).

Expenditure on contract works under construction and still to be completed at 31st December 1973 amounted to R244 million (R248 million in 1972), the main concentrations of work in progress being at the Hendrina, Arnot and Kriel Power Stations.

The expansion in capital works has led to an increase in the amount of working capital required. The value of stores, materials, movable plant, and equipment at the end of 1973 increased by R9 million to R82 million.

Loans and the capital market

Long term loans totalling R118 million (R177 million in 1972) were raised during the year, as follows:

Table 18
Long term loans, millions of Rand

	1973	1972
Local market-public-issues	55	152
Local market-private placement	30	—
Foreign market-public issues	33	25
Foreign market-private placement	—	—
Total	118	117

Two long term local loans amounting to R36 million were repaid during 1973.

Local market

The conditions on the local market for fixed interest securities were fairly easy during the first eight months of 1973 but tended to tighten somewhat in September. This change was reflected not so much in an actual increase in yields as in a degree of reluctance on the part of investors to support new issues at existing yields.

In spite of the fact that a decline in interest rates was expected, Escom's first public issue of the year yielding 8,42%, during March, was not well supported.

An even poorer response was received for Escom's second public issue yielding 8%, in September, during the tight market conditions at that time.

Two short term loans were undertaken in 1973. The first in July when excess liquidity in the banking sector gave Escom the opportunity of raising funds for 3 years at a yield of 6,48%. A high discount on blocked rand enabled Escom to create a 5-year loan with an interest rate of 7¼% in November.

Nett sales of Escom stocks from internal fund portfolio realised R40 million (R8 million in 1972) during 1973. The increase over 1972 nett sales can be attributed to certain institutional investors buying large blocks of stock.

Foreign market

Due to currency fluctuations and monetary uncertainty, the operations of overseas capital markets were limited to D-mark and Swiss Franc issues, with sporadic issues in other denominated currencies in the first half of the year.

Because of demand, interest rates on these issues increased during the year.

In January Escom obtained a SF50 million Bond Issue with a coupon of 6½% and issued at par. In April a DM100 million Public Bond Issue was issued yielding 7,23% per annum to the investor.

With the aid of the three major Swiss banks Escom undertook four Swiss Franc note issues providing 5 and 7-year money at coupon rates between 6½-7¼%.

The hardening of short term rates in Europe and the Swiss International Bank's request not to take up loans in Swiss Francs outside Switzerland resulted in the temporary repayment of all except one revolving credit.

Refinancing facilities turnover amounted to only R3 million in 1973 (R16 million in 1972). The decrease was due to high short term interest rates.

Certain high cost import financing facilities were repaid during 1973.

Capital development fund

Contributions amounting to R15,4 million (R13,6 million in 1972) were made to the Capital Development Fund during 1973.

The amount standing to the credit of the fund on 31st December 1973 was R31,4 million (R14,1 million in 1972).

Reserve fund

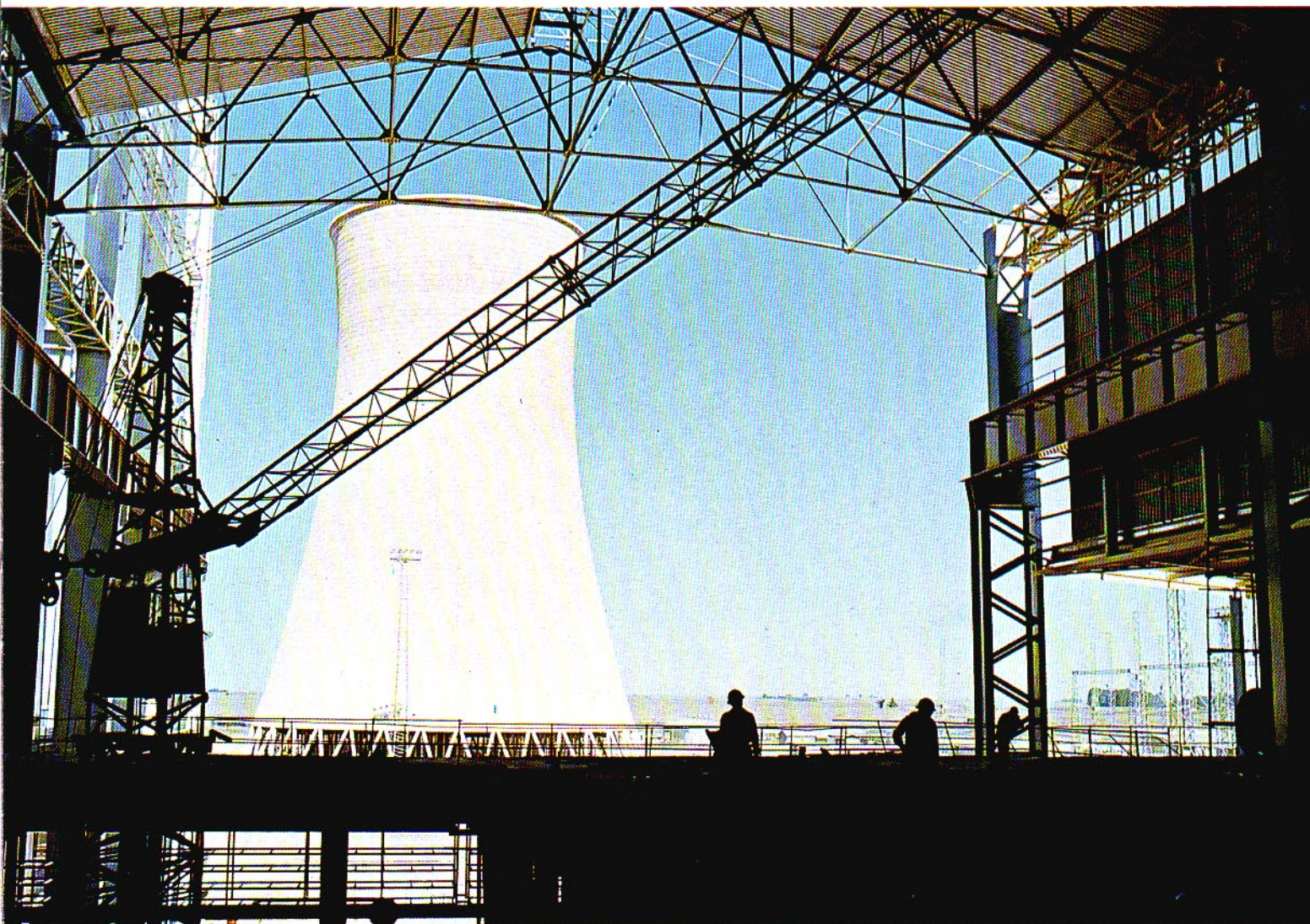
The Reserve Fund received increased contributions of R3,8 million (R3,1 million in 1972) during the year.

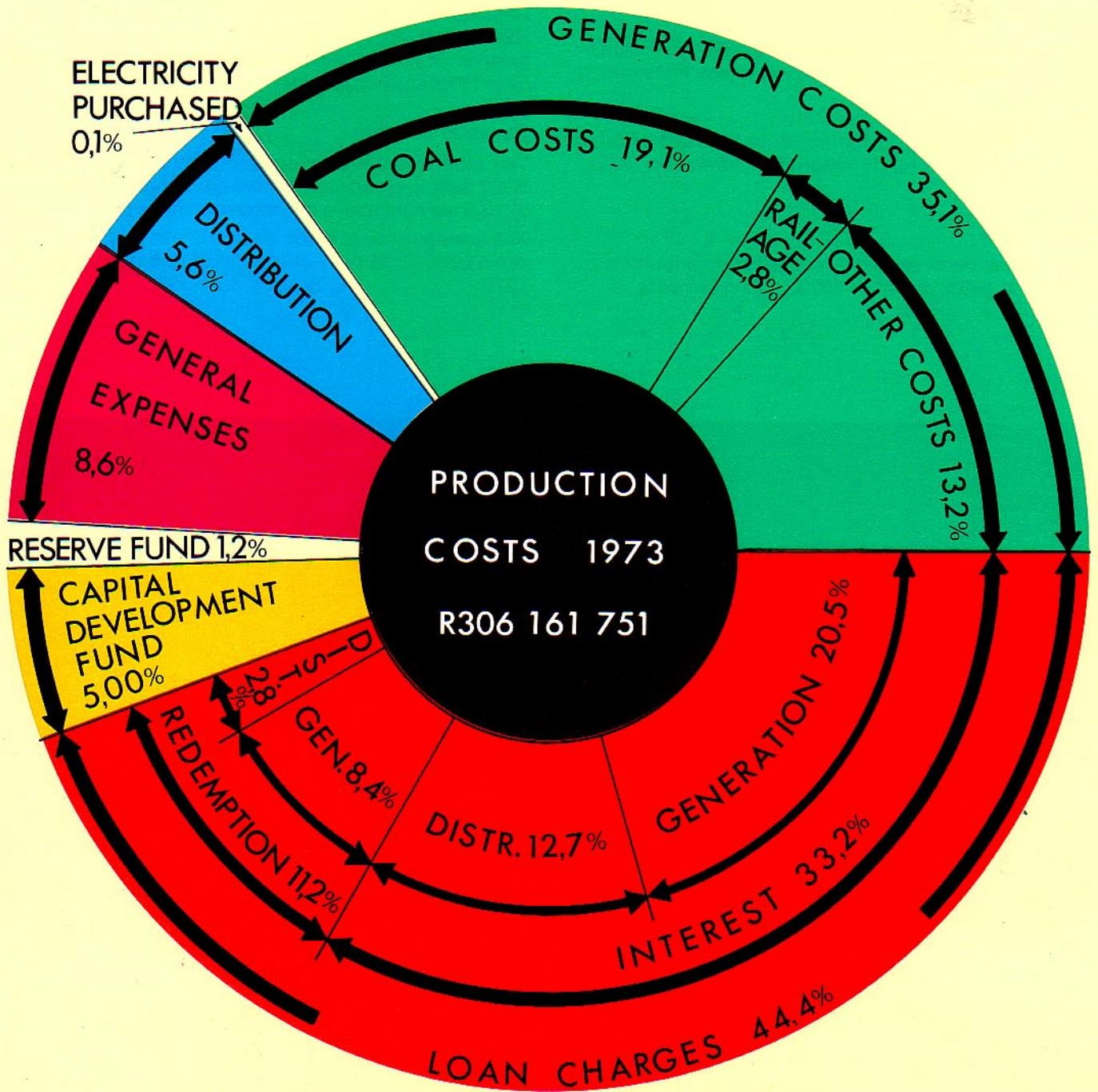
Replacement and betterment expenditure amounted to R2,0 million (R1,1 million in 1972) leaving the Fund with a balance of R163,0 million, an increase of R12,9 million over 1972 derived primarily from interest earned.

Revenue account

The total revenue from sales of electricity in 1973 was R302 million, which represented an increase of R48 million or 18,8 per cent above the corresponding figure for 1972.

The average price at which electricity was sold was 0,648 4 cents per unit, as compared with 0,610 8 cents per unit in 1972.

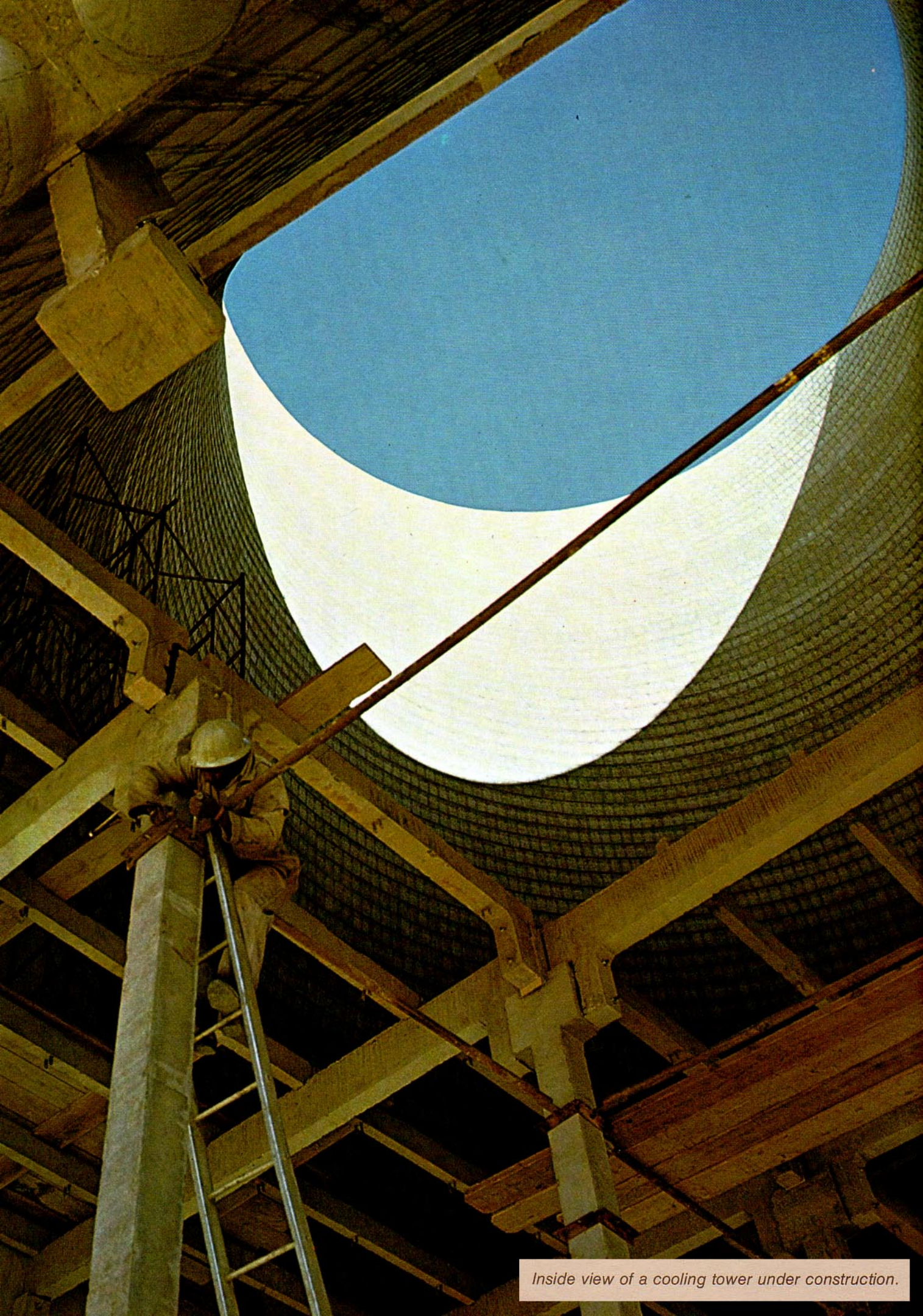




Statistical summary

Revenue, costs, output and sales and other figures relating to the operation of Escom's Undertakings during the years 1969 to 1973 are as follows:

	1969	1970	1971	1972	1973	Per cent increase 1973 over 1972
Total costs	174 606 000	195 866 000	219 640 000	258 014 000	306 162 000	18,7
Difference between revenue and costs	732 000	—2 391 000	—55 000	—3 620 000	—4 128 000	
Revenue from sales of electricity	175 338 000	193 475 000	219 585 000	254 394 000	302 034 000	18,7
Average price per unit sold	0,5565c	0,5545c	0,5772c	0,6108c	0,6484c	6,2
Average cost per unit sold	0,5542c	0,5614c	0,5774c	0,6195c	0,6573c	6,1
Cost of coal consumed (including railage)	47 453 000	48 807 000	52 705 000	56 113 000	66 837 000	19,1
Railage on coal consumed	10 647 000	9 577 000	9 388 000	8 332 000	8 556 000	2,7
Coal consumed (metric tons)	19 982 911	21 630 578	23 416 164	24 952 806	27 907 929	11,8
Units generated	35 966 956 724	39 796 184 973	43 472 521 686	47 411 105 106	53 039 850 474	11,87
Units sent out	33 598 182 607	37 320 784 837	40 739 391 193	44 475 062 412	49 770 384 163	11,91
Units purchased	7 969 311	7 260 727	8 326 899	9 653 576	11 269 761	16,74
Units sold	31 505 591 370	34 890 575 085	38 040 020 852	41 648 918 788	46 578 438 899	11,84



Inside view of a cooling tower under construction.

Auditors' report and accounts

The report of the auditors

The Chairman and Members,
Electricity Supply Commission,
Johannesburg

Gentlemen,

We have completed the audit of the books and accounts of the Commission for the year ended 31st December 1973.

Redemption fund

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

The State President has, in terms of Section 10(2) of the Act, directed that the provisions relating to the establishment of the Redemption Fund should not apply to each of the loans listed under the heading "Foreign Bond Issues" and "Direct Placings" on Schedule No. 5.

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

The Commission has fixed redemption periods not exceeding 25 years from the dates of issue of the respective loans.

In the records of the Commission, the Fund is divided into sections corresponding to its Undertakings but investments are held in a common pool consisting of investments prescribed in the Schedule to the Act.

At 31st December 1973 an amount of R31 877 000, being part of the accruals to the Redemption Fund, had not been invested in securities prescribed by the Act, but the major portion had been used in meeting capital expenditure. This position was rectified in January 1974, when R30 million was invested in a loan raised by the Commission.

In valuing the Fund at 31st December 1973, we have taken into account the market value of the investments at that date. The value of the Fund at 31st December 1973 was in excess of the sum required, in terms of the Schedule to the Act, for the redemption of the respective loans.

Foreign loans

The loan periods of the Foreign Bond Issues and Direct Placings are not less than 10 years or more than 15 years.

Provision is being made for repayment by setting aside amounts over periods of 15 years except in the cases of the U.S. \$15 000 000 and Units of Account 15 000 000 Loans, where the period is 19 years. The differences, if any, between the amounts set aside and instalments payable are being met from temporary borrowings.

A further exception is the U.S. \$20 000 000 Loan listed under "Direct Placings" which is repayable by half-yearly instalments over a period of nine years from 1st June 1968. Contributions in respect of this loan are being charged to Revenue Accounts of Undertakings on a 25 year sinking fund basis, the shortfall being met from local loans raised partly for this purpose.

Reserve fund and capital development fund

Amounts determined by the Commission, and approved by the Minister, have been set aside to the Reserve Fund and the Capital Development Fund.

At 31st December 1973 an amount of R13 216 000, being part of the amount set aside to the Capital Development Fund, had not been invested in securities prescribed by the Act, but the major part had been used in meeting capital expenditure. This position was rectified in January 1974, when R13 000 000 was invested in a loan raised by the Commission. The remaining amounts set aside have been invested in the securities prescribed by the Electricity Act, 1958.

Verification of landed properties, rights and investments

Head office administration, engineering and general expenses

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

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

(a) Capital and Reserve Fund expenditure.

(b) Revenue Accounts of Undertakings.

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

Revenue accounts

The following is a summary of the operations of the Commission's Undertakings for 1972 and 1973:

	Surplus (deficit)		Accumulated Surplus (deficit)	Amounts set aside to Reserve and Capital Development Funds	
	1972	1973	at 31.12.73	1972	1973
Cape Western	(737 000)	(399 000)	(1 449 000)	600 000	670 000
Cape Northern	(259 000)	(198 000)	106 000	130 000	175 000
Cape Eastern	(43 000)	(65 000)	(249 000)	7 000	16 000
Border	235 000	437 000	268 000	111 000	126 000
Orange River	16 000	(8 000)	(283 000)	42 000	100 000
Natal	(2 607 000)	(1 134 000)	(1 229 000)	1 275 000	1 327 000
Eastern Transvaal	(2 052 000)	(2 819 000)	(1 875 000)	1 233 000	908 000
Rand and O.F.S.	1 820 000	58 000	(2 139 000)	1 254 000	1 304 000
Central Generating	—	—	—	12 000 000	14 500 000
	R(3 627 000)	R(4 128 000)	R(6 850 000)	R16 652 000	R19 126 000

Operations during the year resulted in deficits at all the Undertakings other than Border and Rand and O.F.S. Undertakings.

Charges for electricity being supplied have been increased with effect from 1st April 1974 at Cape Eastern, Orange River, Natal and Eastern Transvaal Undertakings.

General

As a result of our audit of the books and accounts of the Commission for the year 1973 and subject to the foregoing remarks, in terms of Section 18(8) of the Electricity Act, 1958, we report as follows:

- We have found the accounts of the Commission to be in order.
- The accounts issued present a true and correct view of the financial position of the Commission and its transactions and of the results of trading.
- Due provision, in terms of the Act, has been made for the redemption and repayment of moneys borrowed by or advanced to the Commission.
- As formerly, the land and rights, buildings and civil works, and machinery and plant are set out in the Balance Sheet on a cost basis.
- Sums fixed by the Commission have been set aside to the Reserve Fund and Capital Development Fund under Section 13 as prescribed.
- All our requirements as auditors have been complied with and carried out.

Yours faithfully,

Halsey, Button & Perry
Alex. Aiken & Carter

Chartered Accountants (S.A.) Auditors.

Johannesburg
30th April 1974

Balance sheet

at 31st December 1973

	R000	R000
		1972
Borrowings	1 751 663	1 649 914
Loans outstanding (Schedule No. 5)	1 611 113	1 477 811
Other borrowings	140 550	172 103
Import financing facilities taken up	27 726	33 850
Other short term advances	112 824	138 253
Capital reserve		
Loans repaid	256 958	215 087
Machinery and plant financed out of reserve fund	10 360	10 360
	267 318	225 447
Less: Cost of land and rights, buildings and civil works and machinery and plant sold and scrapped	57 868	46 191
	209 450	179 256
Exchange adjustment of foreign liabilities (Note 2)	3 417	7 254
	206 033	172 002
Balance on revenue account (Account Nos. 4 to 12)	(6 850)	(2 722)
	199 183	169 280
Capital development fund (Account No. 1)	31 367	14 148
Redemption fund (Account No. 2)	312 369	302 220
Amount set aside for repayment of foreign loans	10 807	7 083
Reserve fund (Account No. 3)	163 016	150 070
Creditors and provisions	80 429	75 644
Creditors	49 683	49 301
Interest accrued on loans	26 828	22 886
Sundry provisions	3 918	3 457
	2 548 834	2 368 359

	R000	R000
		1972
Capital expenditure at cost (Schedule No. 1)	1 942 949	1 774 350
Land and rights	20 131	17 057
Buildings and civil works	377 180	351 095
Machinery and plant	1 301 968	1 158 545
Total in commission	1 699 279	1 526 697
Works under construction	243 670	247 653
Stores and movable plant	81 845	73 142
Stores and materials at cost	66 860	60 793
Movable plant and equipment at cost less depreciation	14 985	12 349
Investments of capital development fund (Schedule No. 2)	18 151	14 097
Nominal value R18 400 000 (1972: R14 400 000)		
Market value R17 733 000 (1972: R14 550 000)		
Investments of redemption fund (Schedule No. 3)	280 492	298 446
Nominal value R294 805 000 (1972: R315 854 000)		
Market value R257 471 000 (1972: R282 453 000)		
Investments of reserve fund (Schedule No. 4)	160 021	148 139
Nominal value R166 222 000 (1972: R154 991 000)		
Market value R144 678 000 (1972: R137 659 000)		
Sundry investments	16 568	11 127
Electricity Supply Commission foreign loan bonds including interest accrued	3 706	793
Nominal value R4 043 000 (1972: R823 000)		
Market value R3 511 000 (1972: R805 000)		
Entire share capital of the Rand Mines Power Supply Company Limited	1	1
Housing loans to employees secured by first mortgage	12 861	10 333
Debtors and payments in advance	47 627	31 742
Debtors	31 325	25 429
Payments in advance	16 302	6 313
Cash on deposit, on current account, on hand and at call	7 079	17 316
Less: amounts due to bankers	5 898	1 181
	2 548 834	2 368 359

- Note 1**
- (a) Commitments in respect of that portion of contracts and orders placed for fixed assets which has not yet been completed or executed amount to approximately R324 000 000 (R323 000 000 in 1972).
- (b) The Commission is committed to:
- (1) The payment of approximately R1 833 000 (R878 000 in 1972) in respect of loans granted 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 31st December, 1985.
- (3) The purchase from certain stockholders of Electricity Supply Commission Local Registered Stock as follows:
- 6¾ per cent 1991 at R97 per cent;
- (i) R4 500 000 not later than September 1976, and
- (ii) R2 000 000 at the option of the stockholder;
- (4) The purchase from certain stockholders of Electricity Supply Commission Local Registered Stock at the option of the stockholder, as follows:
- (i) R7 700 000 – 9¼ per cent 1996 at par
- (ii) R10 000 000 – 9¼ per cent 1997 at par and
- (iii) R15 000 000 – 8¼ per cent 1998 at a price based on a redemption yield to maturity of 8½% per annum
- provided that:
- (i) the options are exercised before 31st December 1975, 1977 and 1978 respectively, and
- (ii) the Commission shall not be obliged to repurchase more than R17 700 000 of stock in the abovementioned loans.
- Note 2**
- (a) As a result of changes in rates of exchange, liabilities in respect of certain foreign borrowings, repayable over periods up to 1986, have been adjusted. Net losses arising from the adjustments are being written off over the periods of the borrowings.
- (b) The currencies most favourable to the bondholders at 31st December 1973 were used in those instances where the instalments which fall due in respect of loans raised in European Units of Account are payable in the currency of the bondholder's choice.
- Note 3**
- The Commission has indemnified the Electricity Supply Commission Pension and Provident Fund against any loss resulting from the negligence, dishonesty or fraud of the Fund's officers or of the Trustees.
- Note 4**
- The investments of the Capital Development Fund, the Redemption Fund and the Reserve Fund include investments with a nominal value of R466 466 000 (R472 284 000 in 1972) in Electricity Supply Commission Stocks.
- Note 5**
- Payments in advance includes an amount of R1 211 925, in respect of price adjustments on coal supplied during 1973 and in prior years. This amount will be recovered during 1974 by an adjustment of tariffs.

Capital expenditure

at 31 December 1973

Schedule No. 1

	R000										
	Total	Cape Western	Cape Northern	Cape Eastern	Border	Orange River	Natal	Eastern Transvaal	Rand & O.F.S.	Central Generating	Head office
Totals at											
31 December 1972	1 774 350	70 535	28 527	1 382	27 839	11 364	91 271	89 717	275 663	1 168 572	9 480
Expenditure during 1973 . .	180 277	8 823	3 599	91	3 383	4 914	13 309	10 126	36 063	98 189	1 780
	1 954 627	79 358	32 126	1 473	31 222	16 278	104 580	99 843	311 726	1 266 761	11 260
Less											
Assets decommissioned . .	11 678	125	4	—	528	—	455	15	281	10 270	—
Totals at											
31 December 1973	1 942 949	79 233	32 122	1 473	30 694	16 278	104 125	99 828	311 445	1 256 491	11 260
Consisting of:											
Land and Rights	20 131	1 654	563	12	186	121	3 020	2 032	7 174	4 321	1 048
Buildings and Civil Works .	377 180	5 629	1 775	72	4 390	442	10 548	9 008	16 960	323 670	4 686
Machinery and Plant	1 301 968	65 584	27 476	1 316	18 862	9 787	82 290	77 146	248 386	770 857	264
In commission	1 699 279	72 867	29 814	1 400	23 438	10 350	95 858	88 186	272 520	1 098 848	5 998
Works under construction .	243 670	6 366	2 308	73	7 256	5 928	8 267	11 642	38 925	157 643	5 262

Investments of the capital development fund

at 31st December 1973

Schedule No. 2

			R000	
Description			Nominal value	Book value
Escom internal registered stock				
8,500 per cent	1997	Loan No. 95	7 000	6 744
8,250 per cent	1997	Loan No. 98	7 400	7 313
8,375 per cent	1998	Loan No. 100	2 000	1 991
8,000 per cent	1998	Loan No. 103	2 000	2 000
			18 400	18 048
Interest accrued				102
				18 150
Market value			R17 733	

Investments of the redemption fund

at 31st December 1973

Schedule No. 3

				R000
Description	Loan No.	Nominal value	Book value	
Escom internal registered stock				
3,000 per cent	1968/74	14	10	9
3,500 per cent	1969/74	16	348	338
3,750 per cent	1969/74	17	442	426
5,000 per cent	1971/74	31	4 569	4 513
5,000 per cent	1971/75	32	746	701
4,625 per cent	1975/80	33	6 058	5 406
4,875 per cent	1975/80	34	6 385	5 755
5,125 per cent	1976/81	35	3 647	3 266
5,125 per cent	1977/82	36	1 176	1 037
5,125 per cent	1976/82	37	3 732	3 312
5,125 per cent	1977/83	38	9 147	8 078
5,375 per cent	1978/83	39	163	146
5,625 per cent	1979/84	40	2 381	2 163
5,375 per cent	1979/84	42	7 052	6 254
5,375 per cent	1979/85	43	6 143	5 410
5,375 per cent	1980/85	44	7 409	6 485
5,500 per cent	1980/86	45	4 852	4 290
5,875 per cent	1981/86	46	7 565	6 893
6,250 per cent	1981/86	47	4 586	4 296
6,125 per cent	1982/87	49	6 351	5 898
5,250 per cent	1982/87	50	6 529	5 540
5,000 per cent	1983/88	51	10 221	8 329
5,000 per cent	1980/83	52	1 051	915
5,000 per cent	1982/84	53	3 318	2 817
5,500 per cent	1982/84	54	3 520	3 124
5,875 per cent	1983/85	55	10 218	9 473
6,500 per cent	1983/85	56	4 467	4 257
6,500 per cent	1989/91	58	9 284	8 802
6,750 per cent	1991	60	4 044	3 907
6,875 per cent	1992	61	6 043	5 926
6,500 per cent	1992	64	3 068	2 905
6,875 per cent	1992	65	3 821	3 699
6,500 per cent	1993	70	2 774	2 555
6,875 per cent	1993	71	5 261	5 060
6,500 per cent	1993	75	1 790	1 555
6,875 per cent	1993	76	84	71
6,500 per cent	1994	78	3 618	3 395
6,875 per cent	1994	79	10 946	10 715
6,000 per cent	1974	80	12 154	12 051
6,500 per cent	1994	81	3 575	3 274
6,875 per cent	1994	82	9 230	8 853
7,500 per cent	1995	83	208	189
7,000 per cent	1995	84	59	48
8,750 per cent	1995	85	8 085	8 084
8,500 per cent	1995	86	1 196	1 171
9,250 per cent	1996	87	2 909	2 909
8,750 per cent	1996	88	53	53
9,250 per cent	1996	89	4 450	4 450
9,250 per cent	1996	90	10 620	10 620
8,750 per cent	1996	91	7 723	7 359
9,125 per cent	1997	93	611	610
8,750 per cent	1997	94	914	881
8,500 per cent	1997	95	13 302	12 817
8,250 per cent	1997	96	6 848	6 768
Carried forward		254 756	237 858	

				R000
Description	Loan No.	Nominal value	Book value	
Brought forward		254 756	237 858	
8,000 per cent	1997	97	180	174
8,250 per cent	1997	98	10 709	10 583
8,375 per cent	1998	100	2 245	2 235
8,000 per cent	1998	101	2 110	2 019
6,250 per cent	1976	102	3 000	2 988
8,000 per cent	1998	103	8 186	8 186
7,625 per cent	1998	104	2 137	2 052
7,250 per cent	1979	105	8 850	8 772
				2 741,91
Republic of South Africa				
5,250 per cent	1979	300		288
6,000 per cent	1985	500		486
Municipal stock				
Bloemfontein				
5,375 per cent	1975/80	80		71
Cape Town				
3,000 per cent	1976	167	200	179
5,375 per cent	1980/85	203	300	259
Durban				
3,250 per cent	1965/75	48	90	84
3,250 per cent	1966/76	49	100	91
3,000 per cent	1967/77	50	668	578
5,375 per cent	1974/79	68	120	109
Germiston				
5,375 per cent	1985	16	20	17
Johannesburg				
3,000 per cent	1967/77	21	60	52
5,375 per cent	1974/79	36	194	177
		294 805	277 258	
Interest accrued				3 234
				280 492
Market value				R257 471

Investments of the reserve fund

at 31st December 1973

Schedule No. 4

Description	Loan No.	R000	
		Nominal value	Book value
Escom internal registered stock			
3,000 per cent	1968/74	14	117
3,500 per cent	1969/74	16	56
3,750 per cent	1969/74	17	75
5,000 per cent	1971/74	31	681
5,000 per cent	1971/75	32	1 593
4,625 per cent	1975/80	33	502
4,875 per cent	1975/80	34	1 400
5,125 per cent	1976/81	35	1 622
5,125 per cent	1977/82	36	679
5,125 per cent	1976/82	37	1 573
5,125 per cent	1977/83	38	2 330
5,375 per cent	1978/83	39	89
5,625 per cent	1979/84	40	1 420
5,375 per cent	1979/84	42	1 400
5,375 per cent	1979/85	43	303
5,375 per cent	1980/85	44	1 000
5,500 per cent	1980/86	45	1 800
5,875 per cent	1981/86	46	2 582
6,250 per cent	1981/86	47	2 650
6,125 per cent	1982/87	49	2 000
5,250 per cent	1982/87	50	3 500
5,000 per cent	1983/88	51	5 055
5,000 per cent	1980/83	52	3 795
5,000 per cent	1982/84	53	2 400
5,500 per cent	1982/84	54	2 182
5,875 per cent	1983/85	55	3 700
6,500 per cent	1983/85	56	2 600
6,500 per cent	1989/91	58	4 200
6,750 per cent	1991	60	4 494
6,875 per cent	1992	61	5 000
6,875 per cent	1992	65	9 000
6,875 per cent	1993	71	7 235
6,500 per cent	1993	75	1 665
6,875 per cent	1993	76	8 753
6,500 per cent	1994	78	2 002
6,875 per cent	1994	79	6 998
6,000 per cent	1974	80	4 250
6,500 per cent	1994	81	2 000
6,875 per cent	1994	82	3 500
7,500 per cent	1995	83	1 869
7,000 per cent	1995	84	1 674
8,750 per cent	1995	85	9 103
8,500 per cent	1995	86	1 901
9,250 per cent	1996	87	2 355
9,250 per cent	1996	89	28
9,250 per cent	1996	90	1 355
8,750 per cent	1996	91	212
9,125 per cent	1997	93	757
8,750 per cent	1997	94	98
8,500 per cent	1997	95	4 014
8,250 per cent	1997	96	227
8,250 per cent	1997	98	6 500
8,375 per cent	1998	100	2 950
6,250 per cent	1976	102	9 649
8,000 per cent	1998	103	2 000
7,250 per cent	1979	105	5 000
Carried forward		155 893	148 601

Description	Loan No.	R000	
		Nominal value	Book value
Brought forward		155 893	148 601
Republic of South Africa			
5,250 per cent	1979	700	673
Municipal stock			
Bloemfontein			
5,375 per cent	1975/80	100	89
Cape Town			
5,000 per cent	1975	185	94
5,375 per cent	1980/85	203	600
5,500 per cent	1981/86	208	850
5,500 per cent	1983/88	219	610
5,500 per cent	1980	227	100
6,500 per cent	1981	240	210
Durban			
3,750 per cent	1964/74	41	1
3,000 per cent	1967/77	50	1
5,375 per cent	1974/79	68	600
5,375 per cent	1976/80	70	800
6,000 per cent	1972/77	74	334
5,000 per cent	1984	84	500
5,500 per cent	1982	87	450
6,000 per cent	1980	88	500
6,000 per cent	1981	91	1 000
6,500 per cent	1981	93	1 000
East London			
3,750 per cent	1964/74	6	1
Germiston			
5,375 per cent	1985	16	150
Johannesburg			
5,375 per cent	1974/79	36	120
5,500 per cent	1975	38	10
Pietermaritzburg			
5,000 per cent	1972/74	74	24
Port Elizabeth			
5,000 per cent	1969/74	25	26
Pretoria			
5,000 per cent	1961/81	7	246
5,125 per cent	1972/75	37	52
5,375 per cent	1975/78	44	100
5,375 per cent	1975/78	47	100
6,250 per cent	1977/82	49	200
5,500 per cent	1980/83	56	200
6,500 per cent	1981/84	59	200
Rand Water Board			
6,500 per cent	1984	33	250
7,000 per cent	1987	35	200
		166 222	157 977
Interest accrued			2 044
			160 021
Market value		R144 678	

Loans outstanding

at 31st December 1973

Schedule No. 5

R000				
Internal registered stock				
Loan No.	Per cent			Outstanding
14	6 000	3,000	1968/74	6 000
16	6 000	3,500	1969/74	6 000
17	6 000	3,750	1969/74	6 000
31	16 000	5,000	1971/74	16 000
32	20 000	5,000	1971/75	20 000
33	16 000	4,625	1975/80	16 000
34	16 000	4,875	1975/80	16 000
35	16 500	5,125	1976/81	16 500
36	20 000	5,125	1977/82	20 000
37	22 000	5,125	1976/82	22 000
38	24 000	5,125	1977/83	24 000
39	24 000	5,375	1978/83	24 000
40	22 000	5,625	1979/84	22 000
42	20 000	5,375	1979/84	20 000
43	16 000	5,375	1979/85	16 000
44	16 000	5,375	1980/85	16 000
45	17 000	5,500	1980/86	17 000
46	16 000	5,875	1981/86	16 000
47	18 000	6,250	1981/86	18 000
49	18 000	6,125	1982/87	18 000
50	22 000	5,250	1982/87	22 000
51	29 000	5,000	1983/88	29 000
52	40 000	5,000	1980/83	40 000
53	20 000	5,000	1982/84	20 000
54	20 000	5,500	1982/84	20 000
55	32 000	5,875	1983/85	32 000
56	38 000	6,500	1983/85	38 000
58	30 000	6,500	1989/91	30 000
60	35 000	6,750	1991	35 000
61	35 000	6,875	1992	35 000
64	12 000	6,500	1992	12 000
65	37 000	6,875	1992	37 000
70	10 000	6,500	1993	10 000
71	70 000	6,875	1993	70 000
75	22 000	6,500	1993	22 000
76	48 000	6,875	1993	48 000
78	20 000	6,500	1994	20 000
79	30 000	6,875	1994	30 000
80	20 000	6,000	1974	20 000
81	10 000	6,500	1994	10 000
82	25 000	6,875	1994	25 000
83	18 000	7,500	1995	18 000
84	3 000	7,000	1995	3 000
85	35 000	8,750	1995	35 000
86	10 000	8,500	1995	10 000
87	45 000	9,250	1996	45 000
88	10 000	8,750	1996	10 000
89	20 000	9,250	1996	20 000
90	30 000	9,250	1996	30 000
91	10 000	8,750	1996	10 000
92	20 000	9,250	1997	20 000
93	22 000	9,125	1997	22 000
94	5 000	8,750	1997	5 000

Carried forward 1 168 500

R000				
Internal registered stock				
Loan No.		Per cent		Outstanding
Brought forward				
95	25 000	8,500	1997	25 000
96	28 000	8,250	1997	28 000
97	7 000	8,000	1997	7 000
98	45 000	8,250	1997	45 000
99	30 000	8,250	1998	30 000
100	20 000	8,375	1998	20 000
101	5 000	8,000	1998	5 000
102	30 000	6,250	1976	30 000
103	24 000	8,000	1998 (a)	24 000
104	6 000	7,625	1998 (b)	6 000
105	30 000	7,250	1979 (c)	30 000
				1 418 500

R000

Foreign bond issues						
541	S.F.	50 000	(8 275)	5,000	1959/74	828
557	D.M.	50 000	(8 921)	6,500	1965/80	6 245
562	U.S.\$	15 000	(10 776)	7,000	1967/77	4 310
574	Units of account	15 000	(10 906)	7,000	1968/78	7 768
577	D.M.	100 000	(18 034)	6,500	1968/83	18 176
578	D.M.	100 000	(19 583)	8,500	1970/85	19 583
580	Units of account	12 000	(8 627)	9,250	1970/80	7 251
584	D.M.	100 000	(19 556)	8,000	1971/86	19 556
592	Units of account	20 000	(14 210)	8,250	1971/86	14 967
598	U.S.\$	20 000	(14 304)	8,500	1971/86	14 304
604	D.M.	100 000	(25 132)	6,250	1972/87	25 132
607	S.F.	50 000	(8 293)	6,500	1973/88	8 293
610	D.M.	100 000	(24 975)	7,000	1973/88	24 975

Direct placings						
559	U.S.\$	20 000	(14 357)	6,250	1966/76	4 989
589	D.M.	10 000	(2 054)	8,000	1971/86	2 054
593	D.M.	20 000	(3 644)	8,500	1971/86	3 644
596	D.M.	20 000	(4 016)	8,500	1971/86	4 016
597	D.M.	40 000	(9 437)	8,500	1971/83	9 437

						1 614 028
Less payable by stockholders in respect of						
Local Registered Stock:						2 915
103	On or before 15th January 1974					(a) 1 484
104	On or before 15th January 1974					(b) 1 055
105	On application					(c) 376

R1 611 113

Capital development fund account

for the year ended 31st December 1973

Account No. 1

	R000	R000	
			1972
Amounts set aside from revenue accounts		15 366	13 596
Cape Western Undertaking	335		300
Cape Northern Undertaking	175		130
Cape Eastern Undertaking	8		7
Border Undertaking	63		37
Orange River Undertaking	50		32
Natal Undertaking	477		425
Eastern Transvaal Undertaking	454		411
Rand and Orange Free State Undertaking	1 304		1 254
Central Generating Undertaking	12 500		11 000
		1 853	552
Income from investments			
Interest earned	1 849		548
Adjustment of book values	4		4
Accumulated balance brought forward		14 148	—
Balance as shown in balance sheet		31 367	14 148

Redemption fund account

for the year ended 31st December 1973

Account No. 2

	R000	R000	
			1972
Repayment of internal registered stock	36 000	—	
3 per cent 1967/73 (Loan no. 13)	6 000	—	
3,125 per cent 1968/73 (Loan no. 15)	30 000	—	
Balance as shown in balance sheet	312 369		302 220
Cape Western Undertaking	18 875	16 714	
Cape Northern Undertaking	8 171	7 442	
Cape Eastern Undertaking	198	160	
Border Undertaking	7 657	6 839	
Orange River Undertaking	453	275	
Natal Undertaking	19 414	16 463	
Eastern Transvaal Undertaking	19 904	17 477	
Rand and Orange Free State Undertaking	61 707	78 849	
Central Generating Undertaking	166 059	148 445	
Head Office	3 885	3 628	
Undertaking which has been sold	6 046	5 928	
	<u>348 369</u>	<u>302 220</u>	

	R000	R000	
			1972
Balance at beginning of year	302 220		253 854
Cape Western Undertaking	16 714	25 835	
Cape Northern Undertaking	7 442	6 452	
Cape Eastern Undertaking	160	129	
Border Undertaking	6 839	5 956	
Orange River Undertaking	275	360	
Natal Undertaking	16 463	40 821	
Eastern Transvaal Undertaking	17 477	31 316	
Rand and Orange Free State Undertaking	78 849	134 214	
Central Generating Undertaking	148 445	—	
Head Office	3 628	2 958	
Undertaking which has been sold	5 928	5 813	
Amounts contributed during the year as per revenue accounts	23 760		22 750
Cape Western Undertaking	1 284	1 301	
Cape Northern Undertaking	543	499	
Cape Eastern Undertaking	22	20	
Border Undertaking	442	444	
Orange River Undertaking	142	122	
Natal Undertaking	1 562	1 497	
Eastern Transvaal Undertaking	1 313	1 126	
Rand and Orange Free State Undertaking	3 369	2 957	
Central Generating Undertaking	15 083	14 784	
Other contributions	58		67
Proceeds of sales of fixed property	1 382		6 237
Interest earned on investments	20 833		18 372
Adjustment of values of investments	116		940
	<u>348 369</u>	<u>302 220</u>	

We hereby certify that we are satisfied as to the correctness of the accounts and books of the Redemption Fund and as to the maintenance of the fund at the amount required by the schedule to the Electricity Act 1958, subject to the remarks contained in our report dated 30th April 1974.

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

Reserve fund account

for the year ended 31st December 1973

Account No. 3

	R000	R000	
			1972
Amounts set aside from revenue accounts		3 760	3 056
Cape Western Undertaking	335		300
Cape Northern Undertaking	—		—
Cape Eastern Undertaking	8		—
Border Undertaking	63		74
Orange River Undertaking	50		10
Natal Undertaking	850		850
Eastern Transvaal Undertaking	454		822
Rand and Orange Free State Undertaking	—		—
Central Generating Undertaking	2 000		1 000
Income from investments		11 178	10 506
Interest earned	10 788		9 836
Adjustment of book values	390		670
		14 938	13 562
Less: Expenditure during the year		1 992	1 134
Cape Western Undertaking	22		10
Cape Northern Undertaking	—		—
Cape Eastern Undertaking	—		—
Border Undertaking	10		40
Orange River Undertaking	—		4
Natal Undertaking	372		169
Eastern Transvaal Undertaking	15		—
Rand and Orange Free State Undertaking	310		24
Central Generating Undertaking	1 263		887
		12 946	12 428
Accumulated balance brought forward		150 070	137 642
Balance as shown in balance sheet		163 016	150 070

Consolidated revenue account

for the year ended 31st December 1973

	R000	R000
		1972
Sales of electricity		
Traction	24 391	22 015
Bulk	85 959	68 221
Mining	85 605	74 048
Industrial	89 446	75 947
Domestic and lighting	16 633	14 163
	<u>302 034</u>	<u>254 394</u>
Cost of electricity	107 436	88 940
<i>Generation</i>		
<i>Operation</i>		
Fuel	68 634	57 259
Water and stores	3 782	3 682
Salaries and wages	13 957	11 277
Other expenses	836	756
<i>Maintenance</i>		
Stores	5 696	4 485
Salaries and wages	12 937	10 275
Other expenses	1 477	1 111
	<u>107 319</u>	<u>88 845</u>
Electricity purchased	117	95
	<u>17 082</u>	<u>13 486</u>
Distribution		
<i>Operation and maintenance</i>		
Stores	2 512	2 104
Salaries and wages	12 317	9 591
Other expenses	2 253	1 791
	<u>26 460</u>	<u>21 737</u>
General expenses		
Local administration and technical management	8 139	6 166
Head office administration and engineering (including research of R897 000 – 1972 R804 000)	8 357	6 799
Other expenses	9 964	8 772
	<u>136 058</u>	<u>117 206</u>
Loan charges		
Interest and finance charges	101 858	86 631
Redemption of local loans	23 760	22 750
Repayment of foreign loans	10 440	7 825
	<u>19 126</u>	<u>16 652</u>
Amounts set aside to		
Capital Development fund	15 366	13 596
Reserve Fund	3 760	3 056
	<u>306 162</u>	<u>258 021</u>
Deficit for the year	4 128	3 627
	<u>302 034</u>	<u>254 394</u>
Deficit for the year	4 128	3 627
Accumulated surplus/(deficit) brought forward	(2 722)	905
Accumulated deficit as shown in Balance Sheet	<u>6 850</u>	<u>2 722</u>

Cape Western Undertaking revenue account

for the year ended 31st December 1973

Account No. 4

	R000	R000
		1972
Sales of electricity		
Traction	5 490	4 870
Bulk	10 820	7 872
Industrial	14 736	12 434
Domestic and lighting	6 104	5 163
	<u>37 150</u>	<u>30 339</u>
Cost of electricity	25 059	20 503
Supplied by Central Generating Undertaking		
Distribution	2 549	2 140
<i>Operation and maintenance</i>		
Stores	243	222
Salaries and wages	1 881	1 542
Other expenses	425	376
	<u>2 634</u>	<u>2 207</u>
General expenses	2 634	2 207
Local administration and technical management	1 173	989
Head office administration and engineering	360	300
Other expenses	1 101	918
	<u>6 637</u>	<u>5 626</u>
Loan charges	6 637	5 626
Interest and finance charges	5 353	4 325
Redemption of local loans	1 284	1 301
	<u>670</u>	<u>600</u>
Amounts set aside to	670	600
Capital Development Fund	335	300
Reserve Fund	335	300
	<u>37 549</u>	<u>31 076</u>
Deficit for the year	399	737
	<u>37 150</u>	<u>30 339</u>
Deficit for the year	399	737
Accumulated deficit brought forward	1 050	313
	<u>1 449</u>	<u>1 050</u>
Accumulated deficit as shown in Balance Sheet	1 449	1 050

Cape Northern Undertaking revenue account

for the year ended 31st December 1973

Account No. 5

	R000	R000
		1972
Sales of electricity		
Traction	2 183	1 854
Bulk	2 011	1 456
Mining	4 202	3 341
Industrial	1 281	1 090
Domestic and lighting	436	374
	<u>10 113</u>	<u>8 115</u>
Cost of electricity	5 702	4 554
Supplied by Central Generating Undertaking		
Distribution	844	740
<i>Operation and maintenance</i>		
Stores	87	75
Salaries and wages	431	374
Other expenses	130	93
Debited from other undertakings	196	198
	<u>810</u>	<u>595</u>
General expenses		
Local administration and technical management	446	310
Head office administration and engineering	147	112
Other expenses	217	173
	<u>2 780</u>	<u>2 355</u>
Loan charges		
Interest and finance charges	2 237	1 856
Redemption of local loans	543	499
	<u>175</u>	<u>130</u>
Amounts set aside to		
Capital Development Fund	175	130
	<u>10 311</u>	<u>8 374</u>
Deficit for the year	198	259
	<u>10 113</u>	<u>8 115</u>
Deficit for the year	198	259
Accumulated surplus brought forward	304	563
	<u>106</u>	<u>304</u>
Accumulated surplus as shown in Balance Sheet		

Cape Eastern Undertaking revenue account

for the year ended 31st December 1973

Account No. 6

	R000	R000
		1972
Sales of electricity		
Bulk	39	31
Industrial	167	134
Domestic and lighting	120	91
	<u>326</u>	<u>256</u>
Electricity purchased	117	93
Distribution	68	43
<i>Operation and maintenance</i>		
Stores	4	3
Salaries and wages	52	33
Other expenses	12	7
	<u>36</u>	<u>24</u>
General expenses	36	24
Local administration and technical management	9	7
Head office administration and engineering	7	5
Other expenses	20	12
	<u>154</u>	<u>132</u>
Loan charges	154	132
Interest and finance charges	132	112
Redemption of local loans	22	20
	<u>16</u>	<u>7</u>
Amounts set aside to	16	7
Capital Development Fund	8	7
Reserve Fund	8	—
	<u>391</u>	<u>299</u>
Deficit for the year	65	43
	<u>326</u>	<u>256</u>
Deficit for the year	65	43
Accumulated deficit brought forward	184	141
	<u>249</u>	<u>184</u>
Accumulated deficit as shown in Balance Sheet	249	184

Border Undertaking revenue account

for the year ended 31st December 1973

Account No. 7

	R000	R000
		1972
Sales of electricity		
Bulk	5 698	4 654
Industrial	825	590
Domestic and lighting	562	458
	<u>7 085</u>	<u>5 702</u>
Cost of electricity	3 374	2 561
Supplied by Central Generating Undertaking	24	—
Local generation		
<i>Operation</i>	3 350	2 561
Fuel	2 410	1 796
Water and stores	38	27
Salaries and wages	453	371
Other expenses	36	7
<i>Maintenance</i>		
Stores	85	80
Salaries and wages	323	272
Other expenses	5	8
Distribution	493	374
<i>Operation and maintenance</i>		
Stores	62	45
Salaries and wages	362	273
Other expenses	69	56
General expenses	752	619
Local administration and technical management	396	302
Head office administration and engineering	116	105
Other expenses	240	212
Loan charges	1 903	1 802
Interest and finance charges	1 461	1 358
Redemption of local loans	442	444
Amounts set aside to	126	111
Capital Development Fund	63	37
Reserve Fund	63	74
	<u>6 648</u>	<u>5 467</u>
Surplus for the year	437	235
	<u>7 085</u>	<u>5 702</u>
Surplus for the year	437	235
Accumulated deficit brought forward	169	404
Accumulated surplus/(deficit) as shown in Balance Sheet	268	(169)

Orange River Undertaking revenue account

for the year ended 31st December 1973

Account No. 8

	R000	R000
		1972
Sales of electricity		
Bulk	1 175	694
Industrial	1 122	898
Domestic and lighting	7	2
	<u>2 304</u>	<u>1 594</u>
Cost of electricity	1 321	789
Supplied by Central Generating Undertaking		
Distribution	39	79
<i>Operation and maintenance</i>		
Stores	3	9
Salaries and wages	52	44
Other expenses	30	26
	<u>85</u>	<u>79</u>
Less debited to other undertakings	46	—
	<u>264</u>	<u>206</u>
General expenses		
Local administration and technical management	167	106
Head office administration and engineering	48	35
Other expenses	89	65
	<u>304</u>	<u>206</u>
Less debited to other undertakings	40	—
	<u>588</u>	<u>462</u>
Loan charges		
Interest and finance charges	807	682
Redemption of local loans	142	122
	<u>949</u>	<u>804</u>
Less debited to other undertakings	361	342
	<u>100</u>	<u>42</u>
Amounts set aside to		
Capital Development Fund	50	32
Reserve Fund	50	10
	<u>2 312</u>	<u>1 578</u>
Surplus/(deficit) for the year	(8)	16
	<u>2 304</u>	<u>1 594</u>
Surplus/(deficit) for the year	(8)	16
Accumulated deficit brought forward	275	291
	<u>283</u>	<u>275</u>
Accumulated deficit as shown in Balance Sheet		

Natal Undertaking revenue account

for the year ended 31st December 1973

Account No. 9

	R000	R000
		1972
Sales of electricity		
Traction	7 822	7 140
Bulk	30 575	25 500
Mining	1 507	1 356
Industrial	15 063	12 740
Domestic and lighting	2 317	1 928
	<u>57 284</u>	<u>48 664</u>
Cost of electricity	43 410	38 534
Supplied by Central Generating Undertaking		
Distribution	3 160	2 462
<i>Operation and maintenance</i>		
Stores	440	285
Salaries and wages	2 042	1 574
Other expenses	678	603
	<u>2 236</u>	<u>1 803</u>
General expenses		
Local administration and technical management	1 070	824
Head office administration and engineering	447	384
Other expenses	719	595
	<u>8 285</u>	<u>7 197</u>
Loan charges		
Interest and finance charges	6 573	5 550
Redemption of local loans	1 562	1 497
Repayment of foreign loans	150	150
	<u>1 327</u>	<u>1 275</u>
Amounts set aside to		
Capital Development Fund	477	425
Reserve Fund	850	850
	<u>58 418</u>	<u>51 271</u>
Deficit for the year	1 134	2 607
	<u>57 284</u>	<u>48 664</u>
Deficit for the year	1 134	2 607
Accumulated surplus/(deficit) brought forward	(95)	2 512
Accumulated deficit as shown in Balance Sheet	<u>1 229</u>	<u>95</u>

Eastern Transvaal Undertaking revenue account

for the year ended 31st December 1973

Account No. 10

	R000	R000
		1972
Sales of electricity		
Traction	2 557	2 315
Bulk	3 505	2 097
Mining	8 676	7 888
Industrial	18 835	15 244
Domestic and lighting	649	550
	<u>34 222</u>	<u>28 094</u>
Cost of electricity	24 780	20 478
Supplied by Central Generating Undertaking	24 212	19 977
Electricity supplied by other undertakings	568	501
	<u>2 041</u>	<u>1 339</u>
Distribution		
<i>Operation and maintenance</i>		
Stores	235	224
Salaries and wages	1 532	1 103
Other expenses	274	12
	<u>1 788</u>	<u>1 363</u>
General expenses		
Local administration and technical management	671	477
Head office administration and engineering	433	332
Other expenses	684	554
	<u>7 524</u>	<u>5 733</u>
Loan charges		
Interest and finance charges	6 405	4 800
Redemption of local loans	1 312	1 126
	<u>7 717</u>	<u>5 926</u>
Less debited to other undertakings	193	193
	<u>908</u>	<u>1 233</u>
Amounts set aside to		
Capital Development Fund	454	411
Reserve Fund	454	822
	<u>37 041</u>	<u>30 146</u>
Deficit for the year	2 819	2 052
	<u>34 222</u>	<u>28 094</u>
Deficit for the year	2 819	2 052
Accumulated surplus brought forward	944	2 996
Accumulated surplus/(deficit) as shown in Balance Sheet	<u>(1 875)</u>	<u>944</u>

Rand and O.F.S. Undertaking revenue account

for the year ended 31st December 1973

Account No. 11

	R000	R000
		1972
Sales of electricity		
Traction	6 339	5 836
Bulk	32 136	25 917
Mining	71 220	61 463
Industrial	37 417	32 817
Domestic and lighting	6 438	5 597
	<u>153 550</u>	<u>131 630</u>
Cost of electricity	120 019	101 050
Supplied by Central Generating Undertaking	120 587	101 551
Less electricity supplied to other undertakings	568	501
	<u>7 846</u>	<u>6 309</u>
Distribution		
<i>Operation and maintenance</i>		
Stores	1 439	1 241
Salaries and wages	5 964	4 648
Other expenses	635	618
	<u>8 038</u>	<u>6 507</u>
Less debited to other undertakings	192	198
	<u>4 053</u>	<u>3 611</u>
General expenses		
Local administration and technical management	1 305	1 113
Head office administration and engineering	1 343	1 108
Other expenses	1 405	1 390
	<u>20 270</u>	<u>17 586</u>
Loan charges		
Interest and finance charges	17 469	15 163
Redemption of local loans	3 369	2 957
	<u>20 838</u>	<u>18 120</u>
Less debited to other undertakings	568	534
	<u>1 304</u>	<u>1 254</u>
Amount set aside to		
Capital Development Fund	1 304	1 254
	<u>153 492</u>	<u>129 810</u>
Surplus for the year	58	1 820
	<u>153 550</u>	<u>131 630</u>
Surplus for the year	58	1 820
Accumulated deficit brought forward	2 197	4 017
	<u>2 139</u>	<u>2 197</u>
Accumulated deficit as shown in Balance Sheet	2 139	2 197

Central Generating Undertaking schedule of costs and allocation

for the year ended 31st December 1973

Account No. 12

	R000	R000
		1972
Electricity supplied to undertakings		
Cape Western	25 059	20 503
Cape Northern	5 702	4 554
Border	24	—
Orange River	1 321	789
Natal	43 410	38 534
Eastern Transvaal	24 212	19 977
Rand and Orange Free State	120 587	101 551
	<u>220 315</u>	<u>185 908</u>
Generation and transmission	104 051	86 284
<i>Operation</i>		
Fuel	66 224	55 463
Water and stores	3 744	3 655
Salaries and wages	13 504	10 906
Other expenses	800	749
<i>Maintenance</i>		
Stores	5 611	4 405
Salaries and wages	12 614	10 003
Other expenses	1 472	1 103
Debited from other undertakings	82	—
	<u>—</u>	<u>—</u>
Electricity purchased	—	2
Interconnectors	1 122	1 069
General expenses	13 847	11 309
Local administration and technical management	2 902	2 038
Head office administration and engineering	5 456	4 418
Other expenses	5 489	4 853
	<u>—</u>	<u>—</u>
Loan charges	86 795	75 244
Interest and finance charges	61 421	52 785
Redemption of local loans	15 084	14 784
Repayment of foreign loans	10 290	7 675
	<u>—</u>	<u>—</u>
Amounts set aside to	14 500	12 000
Capital Development Fund	12 500	11 000
Reserve Fund	2 000	1 000
	<u>—</u>	<u>—</u>
	<u>220 315</u>	<u>185 908</u>

Statistical and other statements

Power stations: principal equipment installed

as at 31st December 1973

Statement No. 1

Undertakings and power stations	Type	Station capacity			Boilers		Main generators		House sets	
		Boilers kg/s	Generators MW	Assigned sent out rating MW	No.	Continuous maximum rating each kg/s	No.	Normal rating each MW	No.	Normal rating each MW
Central Generating Undertaking: Stations under construction										
Arnot	Steam	1 332,4	1 400,0	1 320	4	333,1	4	350,0		
Grootvlei	Steam	856,8	1 000,0		4	214,2	5	200,0		
		230,6			1	230,6				
		1 087,4	1 000,0	950	5		5			
Hendrina	Steam	1 285,2	1 200,0	1 140	6	214,2	6	200,0		
Sub-total steam stations		3 705,0	3 600,0		15					
Hendrik Verwoerd	Hydro		160,0	160			2	80,0		
Group total		3 705,0	3 760,0	3 570	15		17			
Completed stations in Transvaal and Orange Free State										
Camden	Steam	1 814,4	1 600,0	1 520	8	226,8	8	200,0		
Highveld	Steam	554,4	480,0	440	8	69,3	8	60,0		
Klip	Steam	567,5	396,0		25	22,7	12	33,0	4	7,0
			28,0						4	
		567,5	424,0	380	25		12		4	
Komati	Steam	567,0	500,0		5	113,4	5	100,0		
		566,8	500,0		4	141,7	4	125,0		
		1 133,8	1 000,0	925	9		9			
Taaibos	Steam	584,8	480,0	440	8	73,1	8	60,0		
Vaal	Steam		297,0				9	33,0		
		430,2	21,0		18	23,9			3	7,0
		430,2	318,0	280	18		9		3	
Vierfontein	Steam	503,5	360,0	335	19	26,5	12	30,0		
Wilge	Steam	62,8			4	15,7				
		201,6	60,0		4	50,4	2	30,0		
		73,1	180,0		1	73,1	3	60,0		
		337,5	240,0	220	9		5			
Group total		5 926,1	4 902,0	4 540	104		71		7	

Undertakings and power stations	Type	Station capacity			Boilers		Main generators		House sets	
		Boilers kg/s	Generators MW	Assigned sent out rating MW	No.	Continuous maximum rating each kg/s	No.	Normal rating each MW	No.	Normal rating each MW
Completed stations in Western Cape										
Salt River No. 1	Steam	75,6	60,0		6	12,6	3	20,0		
Salt River No. 2	Steam	328,0	120,0		10	32,8	4	30,0		
			120,0				2	60,0		
		328,0	240,0		10		6			
Total 1 and 2		403,6	300,0	285	16		9			
Hex River	Steam	100,8	60,0		4	25,2	3	20,0		
		69,2	60,0		2	34,6	2	30,0		
		170,0	120,0	110	6		5			
Group total		573,6	420,0	395	22		14			
Completed stations in Natal:										
Colenso	Steam	113,5	75,0		5	22,7	3	25,0		
		50,4	30,0		2	25,2	1	30,0		
		163,9	105,0	89	7		4			
Ingagane	Steam	567,0	500,0	465	5	113,4	5	100,0		
Congella	Steam	201,6	70,0		8	25,2	2	35,0		
			37,0				1	37,0		
		201,6	107,0	97	8		3			
Umgeni	Steam	181,6	120,0		8	22,7	4	30,0		
		164,0	120,0		5	32,8	2	60,0		
		345,6	240,0	225	13		6			
Group total		1 278,1	952,0	876	33		18			
Total, Central Generating Undertaking		11 482,8	10 034,0	9 381	174		120		7	
Border Undertaking										
West Bank No. 1	Steam	27,6	22,5		4	6,9	3	7,5		
West Bank No. 2	Steam	85,6	45,0		4	21,4	3	15,0		
		53,0	40,0		2	26,5	2	20,0		
		138,6	85,0		6		5			
Total 1 and 2		166,2	107,5	101	10		8			
Border total		166,2	107,5	101	10		8			
Total all Escom		11 649,0	10 141,5	9 482	184		128		7	

Transmission lines and cables

Circuit kilometres (excluding service connections on reticulation systems)

at 31st December 1973

Statement No. 1
continued

(a) Transmission Lines

Undertaking	400 kV	275 kV	132 kV	88 kV	66 kV
Border		159,85			390,63
Cape Eastern					
Cape Northern		206,60	2 022,27		593,86
Cape Western			1 094,69		1 738,71
Eastern Transvaal		706,20	1 424,86	939,94	261,24
Natal		1 184,39	1 150,85	2 155,43	
Orange River		478,94	100,83		590,08
Rand & O.F.S.	212,46	2 158,19	3 127,86	5 721,56	84,90
Central Generating	4 417,79		140,82		
Totals	4 630,25	4 894,17	9 062,18	8 816,93	3 659,42
A	4 630,25	4 894,17	9 062,18		15 848,19

(b) Underground Cables

Border					
Cape Eastern					
Cape Northern					0,32
Cape Western			15,54		38,68
Eastern Transvaal					
Natal				1,89	
Orange River					
Rand & O.F.S.				25,03	
Totals			15,54	26,92	39,00
B			15,54		323,35

(c) Total lines and cables

A+B=C	1973	4 630,25	4 894,17	9 077,72	8 843,85	3 698,42
		4 630,25	4 894,17	9 077,72		16 171,54
D	1972	3 274,52	3 825,64	9 066,80		15 438,17
Additions C-D=E	1973	1 355,73	1 068,53	10,92		733,37

	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
		57,47	442,92	1 242,41		5,78		157,80	2 456,86
			223,73	218,74				15,85	458,32
			1 021,01	1 705,87				109,21	5 658,82
		161,16	876,27	5 196,90	537,37			2 233,57	11 838,67
			3 756,53	3 934,28	82,20	13,52	79,39	322,68	11 520,84
		791,65	455,04	6 842,83	9,78		1,53	771,97	13 363,47
			891,76	70,56					2 132,17
	2 361,56		1 549,89	9 965,57	548,37			1 238,45	26 968,81
	2 361,56	1 010,28	9 217,15	29 177,16	1 177,72	19,30	80,92	4 849,53	78 956,57
									44 521,78

			0,02	28,47		2,54		32,84	63,87
								2,03	2,03
				2,00	0,75			29,44	32,51
		120,47	5,66	763,40	15,46	4,51		926,38	1 890,10
			40,77	50,31	2,85	1,67	4,78	127,01	227,39
		4,45	3,79	308,54	8,02	0,47	0,02	182,32	509,50
	132,18	0,33	168,41	264,87	612,77	0,23		344,97	1 548,79
	132,18	125,25	218,65	1 417,59	639,85	9,42	4,80	1 644,99	4 274,19
									3 935,30

		2 493,74	1 135,53	9 435,80	30 594,75	1 817,57	28,72	85,72	6 494,52	83 230,76
									48 457,08	
									44 421,91	76 027,04
									4 035,17	7 203,72

Capacity of transformers in service

at 31st December 1973

Statement No. 1
continued

Undertaking	Number		MVA	
	1972	1973	1972	1973
Border	992	1 082	183 130	604 880
Cape Eastern	457	511	12 940	14 750
Cape Northern	2 348	2 677	1 155 945	1 208 895
Cape Western	7 923	8 462	2 165 194	2 252 393
Eastern Transvaal	4 474	4 995	4 301 475	4 947 195
Natal	6 618	7 235	6 417 067	7 174 087
Orange River	82	177	612 670	2 359 545
Rand and Orange Free State	12 946	14 193	23 207 149	25 529 216
Compressor Stations Rand	24	24	145 030	145 030
Central Generating	1 054	1 099	15 492 717	16 344 897
Totals	36 918	40 455	53 693 317	60 580 888

Power purchased from outside sources in 1973

Statement No. 2

Undertaking	Purchased from	Maximum demands	Units
Cape Eastern	Water Affairs Department (Paul Sauer Dam)		3 506 570
	Port Elizabeth Municipality (Aloes)	1 833 kVA	6 426 031
	Port Elizabeth Municipality (Summit)	936 kVA	1 337 160
Total units purchased			— 11 269 761
Total units sold			— 46 578 438 899
Purchased as percentage of sales			— 0,024

Coal burnt at Escom power stations

Average cost per metric ton

Statement No. 3

Power station	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
	R	R	R	R	R	R	R	R	R	R	R	R
1 Brakpan	2,01	2,03	—	—	—	—	—	—	—	—	—	—
2 Colenso	3,70	3,84	3,71	4,16	4,31	4,30	4,20	4,39	4,39	4,51	4,68	5,20
3 Congella	4,31	3,96	3,58	3,77	3,92	4,01	4,19	5,24	5,26	5,44	5,82	6,39
4 Hex River	5,43	5,74	5,70	5,88	6,14	6,38	6,22	6,36	6,43	7,35	7,30	8,60
5 Highveld	1,69	1,71	1,83	1,79	1,81	1,95	2,07	2,23	2,23	2,19	2,15	2,20
6 Ingagane	—	2,50	2,49	2,71	2,78	2,78	2,77	2,53	2,51	2,75	3,02	3,27
7 Kimberley Central ...	4,30	4,54	4,52	4,49	4,67	—	—	—	—	—	—	—
8 Klip	2,35	2,25	2,23	2,39	2,74	2,91	3,12	2,93	2,74	2,86	2,89	3,23
9 King William's Town	—	5,05	—	—	5,02	—	—	—	—	—	—	—
10 Komati	1,42	1,69	1,48	1,29	1,37	1,27	1,40	1,41	1,33	1,37	1,50	1,60
11 Rosherville	2,30	2,35	2,37	2,41	2,74	—	—	—	—	—	—	—
12 Salt River	5,54	5,91	5,86	5,97	6,23	6,56	6,48	6,64	6,61	7,01	7,46	9,13
13 Taaibos	1,93	1,87	1,74	1,72	1,82	1,96	2,05	2,11	2,04	1,92	2,06	2,14
14 Umgeni	4,72	4,82	4,76	5,00	5,31	5,61	5,58	5,45	5,57	5,84	6,08	6,75
15 Vaal	1,05	1,14	1,15	1,15	1,20	1,28	1,27	1,22	1,17	1,32	1,25	1,64
16 Vereeniging	1,12	1,18	1,16	1,17	1,46	1,42	1,45	1,01	—	—	—	—
17 Vierfontein	1,16	1,58	1,57	1,70	1,85	1,82	1,87	1,72	1,76	1,85	1,85	2,34
18 West Bank	5,26	5,53	5,52	5,62	5,75	5,85	5,84	6,04	6,13	6,31	6,83	8,17
19 Wilge	1,07	1,05	1,06	1,09	1,20	1,44	1,47	1,36	1,38	1,58	1,66	1,79
20 Witbank	1,26	1,27	1,28	1,40	1,51	1,50	1,55	1,76	1,57	—	—	—
21 Camden	—	—	—	—	—	2,00	1,55	1,79	1,82	1,69	1,69	1,84
22 Grootvlei	—	—	—	—	—	—	—	1,84	1,67	1,83	2,09	2,16
23 Hendrina	—	—	—	—	—	—	—	—	1,95	1,72	1,89	2,13
24 Arnot	—	—	—	—	—	—	—	—	—	1,67	1,97	2,12

Units sold by undertakings to all consumers during the past forty-six years

(million units)

Statement No. 4

	Border	Cape Eastern	Cape Northern	Cape Western	Eastern Transvaal	(1) Klip	Natal (3) Central	Natal (3) Southern	Natal	Orange River	Rand and O.F.S.	Sabie (2)	Vaal (1)	Total
1928	—	—	—	31,0	464,3	—	114,2	15,6	—	—	—	2,8	—	627,9
1929	—	—	—	47,9	543,1	—	123,9	78,9	—	—	—	3,2	—	797,0
1930	—	—	—	49,8	619,0	—	117,1	99,2	—	—	—	4,6	—	889,6
1931	—	—	—	52,1	603,4	—	101,1	103,9	—	—	—	6,6	—	867,1
1932	—	—	—	64,3	610,3	—	100,3	109,8	—	—	—	6,1	—	890,7
1933	—	—	—	100,7	639,4	—	109,2	118,5	—	—	—	6,3	—	974,1
1934	—	—	—	73,6	648,2	—	124,9	131,1	—	—	—	7,3	—	985,2
1935	—	—	—	80,0	727,9	—	154,3	149,9	—	—	—	7,2	—	1 119,2
1936	—	—	—	85,8	696,4	557,0	171,5	170,5	—	—	—	6,9	—	1 688,0
1937	—	—	—	94,0	684,5	1 349,9	210,6	189,4	—	—	—	7,2	—	2 535,6
1938	—	—	—	98,8	768,1	1 666,9	234,9	209,5	—	—	—	7,2	—	2 985,5
1939	—	—	—	106,5	767,7	2 193,2	266,2	233,7	—	—	—	6,4	—	3 573,7
1940	—	—	—	119,8	853,3	2 566,5	281,1	242,7	—	—	—	6,7	—	4 070,2
1941	—	—	—	136,2	862,6	2 675,9	302,4	270,3	—	—	—	6,6	—	4 254,0
1942	—	—	—	151,8	873,4	2 707,8	307,7	273,7	—	—	—	6,3	—	4 320,8
1943	—	—	—	145,7	849,1	2 669,1	312,4	293,4	—	—	—	5,9	—	4 275,6
1944	—	—	—	158,7	889,2	2 703,6	336,0	321,6	—	—	—	6,7	—	4 415,8
1945	—	—	—	165,9	830,7	2 643,0	333,2	348,8	—	—	—	6,6	377,9	4 706,1
1946	—	—	—	184,6	896,9	2 614,3	347,0	369,7	—	—	—	7,4	582,5	5 002,4
1947	56,2	—	—	198,6	887,7	2 547,2	346,0	402,6	—	—	—	7,6	668,6	5 114,5
1948	69,2	—	—	222,4	633,2	1 207,4	367,9	448,7	—	—	—	7,3	435,1	5 576,9
1949	68,7	—	—	249,5	358,2	—	371,8	513,0	—	2 185,7	—	7,0	—	6 222,2
1950	79,9	—	53,9	271,9	378,5	—	406,5	561,8	—	—	4 653,9	6,3	—	6 910,6
1951	88,1	—	58,5	303,5	386,8	—	433,4	617,0	—	—	5 151,8	6,1	—	7 456,5
1952	97,7	—	61,3	341,2	425,0	—	454,0	655,6	—	—	5 563,2	6,1	—	8 080,6
1953	107,8	—	67,1	375,5	409,9	—	492,3	713,2	—	—	6 039,6	6,4	—	8 732,2
1954	118,2	—	70,7	436,2	270,5	—	532,5	777,7	—	—	6 559,9	5,6	—	9 676,6
1955	130,8	—	73,2	527,1	394,6	—	546,4	870,8	—	—	7 465,2	5,7	—	10 964,0
1956	139,1	—	78,7	585,1	505,9	—	595,4	957,7	—	—	8 416,3	6,0	—	12 019,5
1957	143,1	—	86,1	698,6	536,6	—	621,7	1 018,7	—	—	9 151,6	5,9	—	12 763,1
1958	152,9	—	115,2	826,0	584,1	—	616,1	1 104,1	—	—	9 652,5	3,0	—	13 602,2
1959	165,0	—	171,4	861,8	633,3	—	629,4	1 228,6	—	—	10 200,6	—	—	14 724,5
1960	172,3	—	185,2	871,6	762,0	—	649,3	1 409,0	—	—	11 034,8	—	—	16 094,1
1961	178,8	—	191,3	860,0	901,5	—	684,0	1 497,5	—	—	12 044,8	—	—	17 013,2
1962	188,6	—	224,9	945,0	1 012,2	—	731,0	1 589,5	—	—	12 700,0	—	—	18 121,0
1963	204,9	—	264,9	1 051,4	1 212,1	—	779,0	1 764,6	—	—	13 429,8	—	—	19 500,0
1964	228,8	0,4	311,4	1 163,9	1 553,6	—	—	—	2 922,1	—	14 223,1	—	—	21 247,5
1965	250,5	1,6	393,2	1 267,4	1 936,8	—	—	—	3 182,5	—	15 067,3	—	—	23 143,3
1966	272,4	2,5	442,4	1 367,0	2 408,2	—	—	—	3 498,5	—	16 111,3	—	—	24 554,3
1967	294,2	3,2	519,9	1 533,1	2 829,6	—	—	—	3 720,6	1,1	16 563,4	—	—	26 657,1
1968	310,5	4,1	609,6	1 666,2	3 191,4	—	—	—	4 121,5	2,4	17 755,4	—	—	28 885,0
1969	330,5	5,7	657,9	1 824,3	3 824,4	—	—	—	4 636,7	8,0	18 979,3	—	—	31 505,6
1970	360,4	6,1	714,9	2 101,0	4 294,1	—	—	—	5 073,5	47,3	20 218,1	—	—	34 890,6
1971	399,9	7,1	789,7	2 494,5	4 561,5	—	—	—	6 072,3	95,0	22 293,4	—	—	38 040,0
1972	448,1	8,4	895,8	2 771,3	5 234,6	—	—	—	6 938,0	144,5	23 620,0	—	—	41 648,9
1973	504,6	9,6	1 060,1	3 148,8	6 097,5	—	—	—	7 581,3	238,8	25 208,2	—	—	46 578,4

Notes

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

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

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

Units sold and number of consumers, 1973

Statement No. 5

in licensed areas of undertakings

Undertakings	Traction			Bulk			Mining		
	Units	Per cent of total	Consumers	Units	Per cent of total	Consumers	Units	Per cent of total	Consumers
Border				441 028 420	3,45	16			
Cape Eastern				1 979 640	0,02	1			
Cape Northern	231 722 844	8,00	3	230 225 150	1,80	18	456 835 618	2,89	
Cape Western	450 802 116	15,57	6	1 193 772 829	9,36	45			
Eastern Transvaal	351 255 007	12,13	7	569 494 475	4,47	30	1 557 451 895	9,86	
Natal	895 956 142	30,95	14	4 417 284 545	34,64	32	167 944 819	1,06	
Orange River				137 312 743	1,08	28			
Rand and O.F.S.	965 768 327	33,35	2	5 760 568 817	45,18	156	13 617 742 818	86,19	
Total electricity	2 895 504 436	100,00	32	12 751 666 619	100,00	326	15 799 975 150	100,00	

in provinces of South Africa and neighbouring territories

Cape	644 524 960	22,26	8	2 036 591 805	15,97	96	416 820 418	2,64
Lesotho				19 730 377	0,15	2		
Natal	780 580 192	26,96	12	4 305 988 780	33,77	22	167 944 819	1,06
O.F.S.	194 677 609	6,72	2	756 323 307	5,93	70	3 352 576 913	21,22
Mozambique				151 216 000	1,19	2		
Swaziland				8 434 801	0,07	1		
Transvaal	1 275 721 675	44,06	10	5 473 381 549	42,92	133	11 862 633 000	75,08
Total electricity	2 895 504 436	100,00	32	12 751 666 619	100,00	326	15 799 975 150	100,00
Per cent of total	6,22			27,38			33,92	

Consumers	Industrial			Domestic and street lighting			Total units sold		
	Units	Per cent of total	Consumers	Units	Per cent of total	Consumers	Units	Per cent of total	Total number of consumers
	39 163 970	0,28	416	24 461 711	2,21	3 357	504 654 101	1,08	3 789
	4 275 933	0,03	143	3 397 500	0,31	618	9 653 073	0,02	762
74	114 261 396	0,81	716	27 056 758	2,45	3 272	1 060 101 766	2,28	4 083
	1 135 268 396	8,09	8 221	368 915 891	33,38	55 750	3 148 759 232	6,76	64 022
94	3 584 485 198	25,56	3 254	34 824 235	3,15	4 220	6 097 510 810	13,09	7 605
32	1 958 720 697	13,96	5 087	141 393 615	12,79	19 489	7 581 299 818	16,28	24 654
	101 261 910	0,72	57	213 429	0,02	45	238 788 082	0,51	130
102	7 088 599 558	50,55	2 155	504 992 497	45,69	30 283	27 937 672 017	59,98	32 698
Total	14 026 037 058	100,00	20 049	1 105 255 636	100,00	117 034	46 578 438 899	100,00	137 743

65	1 392 386 122	9,93	9 570	421 449 185	38,13	62 695	4 911 772 490	10,55	72 434
							19 730 377	0,04	2
32	1 940 156 314	13,83	4 507	131 162 752	11,87	17 668	7 325 832 857	15,73	22 241
23	644 915 240	4,60	451	45 276 635	4,10	3 457	4 993 769 704	10,72	4 003
							151 216 000	0,32	2
							8 434 801	0,02	1
182	10 048 579 382	71,64	5 521	507 367 064	45,90	33 214	29 167 682 670	62,62	39 060
Total	14 026 037 058	100,00	20 049	1 105 255 636	100,00	117 034	46 578 438 899	100,00	137 743
	30,11			2,37			100,00		

Power station operating statistics, year 1973

Statement No. 6

Undertaking and power station	Units generated GWh	Units sent out GWh	Maximum demands 1 hour sent out kW	Station load factors per cent		Overall thermal efficiency per cent Generated
				A	B	
Central Generating Undertaking						
Stations under construction						
Arnot	5 804,7	5 335,0	1 187 338	58,2	51,3	36,7
Grootvlei	6 117,1	5 815,4	971 640	70,8	68,3	35,0
Hendrina	7 403,7	7 059,7	1 131 933	78,9	71,2	34,6
Sub-total, steam stations	19 325,5	18 210,1	—	—	—	—
Hendrik Verwoerd Hydro	190,3	189,3	166 000	13,5	13,0	—
Group total	19 515,8	18 399,4	—	—	—	—
Completed stations:						
Transvaal and O.F.S.:						
Camden	9 346,8	8 922,5	1 330 056	67,0	76,6	31,6
Highveld	2 206,6	2 046,2	460 016	53,1	50,8	28,6
Klip	1 362,5	1 236,9	373 882	37,2	37,8	20,3
Komati	6 797,9	6 301,1	833 319	77,8	86,3	30,5
Taaibos	2 336,9	2 153,2	449 788	55,9	54,6	27,0
Vaal	2 055,2	1 914,5	285 573	78,1	76,5	21,5
Vierfontein	2 022,0	1 878,5	306 518	64,0	70,0	24,4
Wilge	1 678,4	1 552,6	225 566	80,6	78,6	26,2
Group total	27 806,3	26 005,5	—	—	—	—
Western Cape:						
Hex River	144,1	132,4	112 780	13,7	13,4	22,7
Salt River Nos. 1 and 2	1 036,2	983,7	240 200	39,4	46,8	27,5
Group total	1 180,3	1 116,1	—	—	—	—
Natal:						
Colenso	146,6	132,1	79 960	16,9	18,8	19,9
Congella	256,3	230,2	108 100	27,1	24,3	21,0
Ingagane	3 161,1	2 967,0	492 000	72,8	68,8	31,7
Umgeni	432,6	392,9	221 600	19,9	20,2	21,3
Group total	3,996,0	3 722,2	—	—	—	—
Total C.G.U.	52 499,0	49 243,2	—	—	—	—
Border Undertaking						
West Bank Nos. 1 and 2	540,6	516,0	100 840	58,3	58,4	24,1
Total all Escom	53 039,6	49 759,2	7 350 MW	62,6	77,3	—

Sent out	Availability %	Total water consumed litre/USO	Coal burnt metric ton	kg of coal per unit sent out	Calorific value of coal MJ per kg as received (weighted average)	MJ per unit sent out	Coal cost		
							Total rand	Per metric ton rand	Per unit sent out cent
33,8	65,0	2,91	2 532 376	0,475	22,31	10,60	5 371 287	2,12	0,1007
33,3	83,4	1,90	3 075 049	0,529	20,45	10,82	6 652 273	2,16	0,1144
32,9	86,5	2,36	3 228 775	0,457	23,85	10,90	6 891 783	2,13	0,0976
—	—	—	—	—	—	—	—	—	—
—	95,9	—	—	—	—	—	—	—	—
—	—	—	8 836 200	—	—	—	—	—	—
30,1	72,7	2,27	4 552 485	0,510	23,38	11,92	8 382 619	1,84	0,0939
26,5	89,6	3,33	1 306 503	0,639	21,14	13,51	2 875 086	2,20	0,1405
18,5	93,5	5,66	1 184 312	0,957	20,37	19,58	3 820 765	3,23	0,3089
28,3	83,9	2,73	3 303 336	0,524	24,20	12,68	5 289 637	1,60	0,0839
24,9	83,6	3,30	1 439 256	0,668	21,56	14,40	3 085 061	2,14	0,1433
20,0	95,8	5,02	1 836 020	0,960	18,75	18,00	3 012 094	1,64	0,1573
22,7	86,7	4,54	1 486 265	0,791	20,08	16,01	3 471 065	2,34	0,1848
24,2	89,5	4,57	1 065 060	0,686	21,68	14,87	1 911 764	1,79	0,1231
—	—	—	16 173 237	0,622	22,04	—	31 848 091	1,97	0,1225
20,8	95,1	4,30	85 174	0,643	26,89	17,29	* 732 283	8,60	0,5532
26,1	93,9	0,24	505 387	0,513	26,82	13,76	*4 615 431	9,13	0,4692
—	—	—	590 561	0,529	26,83	—	5 347 714	9,06	0,4791
18,0	74,1	12,01	104 762	0,793	25,29	20,05	544 829	5,20	0,4124
18,9	95,4	1,08	177 418	0,771	24,73	19,07	1 134 479	6,39	0,4928
29,7	89,7	3,60	1 451 596	0,489	24,76	12,11	4 752 201	3,27	0,1602
19,3	83,0	4,46	279 311	0,711	26,22	18,64	1 884 769	6,75	0,4797
—	—	—	2 013 087	0,541	24,99	—	8 316 278	4,13	0,2234
—	—	—	27 613 085	0,561	22,42	—	64 427 426	2,33	0,1308
23,0	98,3	0,09	294 844	0,571	27,36	15,62	2 410 003	8,17	0,4671
—	82,5	—	27 907 929	0,561	22,47	—	66 837 429	2,39	0,1343

$$\text{Station load factors A} = \frac{\text{U.S.O.} \times 100}{(\text{Assigned S.O. Rating}) \times \text{Hours in Year}}$$

$$\text{Availability \%} = \frac{\text{Capacity Hours Available} \times 100}{\text{Total Capacity Hours in year}}$$

$$\text{Station load factors B} = \frac{\text{U.S.O.} \times 100}{(\text{Station M.D. S.O.}) \times \text{Hours in Year}}$$

*Provisional

Generation summary

Statement No. 6
continued

		Units generated	Units sent out	Coal burnt metric ton
Electricity total units	Steam	52 849 512 113	49 569 825 071	27 907 929
	Hydro	190 338 361	189 289 331	
Sub-total		53 039 850 474	49 759 114 402	27 907 929
Power purchased		—	11 269 761	—
Total for 1973		53 039 850 474	49 770 384 163*	27 907 929
Total for 1972		47 411 105 106	44 484 715 988*	24 952 806
Increase for 1973 (units or tons)		5 628 745 368	5 285 668 175	2 995 123
(Per cent)		11,87	11,88	11,84

*Total units sent out include consumption by C.G.U.

Escom's share in electricity production for the Republic of South Africa

Statement No. 7

Calendar year	(i) Census year for national statistics	Capital expenditure at cost		Escom		Electricity generated, millions of units			Electricity sold or used, millions of units		
		Total staff	thousands of Rand	Installed capacity MW	Coal burnt thousands of metric tons	(iv) Escom + V.F.P.	(ii) (iii) Republic of S.A.	g/h %	Escom	(iv) Escom + V.F.P.	(ii) Republic of S.A.
a	b	c	d	e	f	g	h	i	j	k	l
1925	1925-26	—	1 879	1,3	—	—	1 761	—	0,1	—	1 517
1926	1926-27	—	4 181	61,3	—	—	1 889	—	161,7	—	1 694
1927	1927-28	—	12 973	121,3	—	—	2 110	—	551,0	—	1 807
1928	1928-29	—	14 582	175,6	1 755,3	1 422,2	2 300	61,8	627,9	1 411,4	2 008
1929	1929-30	633	15 310	194,6	1 892,5	1 516,7	2 454	61,8	797,0	1 560,5	2 127
1930	NA(v)	688	15 429	215,6	1 965,3	1 766,3	NA(v)	—	889,6	1 632,4	NA(v)
1931	NA	664	15 863	215,6	2 029,5	1 857,4	NA	—	867,1	1 689,5	NA
1932	NA	645	16 095	227,6	2 166,4	2 028,7	NA	—	890,7	1 814,2	NA
1933	1932-33	678	16 547	247,6	2 306,1	2 246,4	2 947	76,2	974,1	1 920,0	2 462
1934	1933-34	706	18 273	287,6	2 568,5	2 525,9	3 309	76,3	985,2	2 140,3	2 854
1935	1934-35	778	22 468	307,6	2 859,7	2 848,4	3 773	75,5	1 119,2	2 414,9	3 246
1936	1935-36	862	26 591	486,8	3 251,6	3 406,7	4 603	74,0	1 688,0	2 820,6	3 768
1937	1936-37	1 024	30 050	519,8	3 487,4	3 980,6	5 336	74,6	2 535,6	3 288,5	4 361
1938	1937-38	1 097	34 297	623,3	3 788,8	4 452,8	5 933	75,1	2 985,4	3 639,7	4 898
1939	1938-39	1 100	36 645	737,6	4 000,0	4 740,7	6 574	72,1	3 573,7	4 095,6	5 453
1940	1939-40	1 189	38 662	770,6	4 196,6	5 098,3	7 168	71,1	4 070,2	4 516,9	6 122
1941	1940-41	NA	40 808	771,3	4 448,6	5 444,9	7 592	71,7	4 254,0	4 833,5	6 505
1942	1941-42	NA	43 763	770,5	4 637,4	5 538,9	7 799	71,0	4 320,8	4 920,0	6 768
1943	1942-43	1 238	46 574	795,4	4 515,6	5 404,0	7 700	70,2	4 275,6	4 765,8	6 638
1944	1943-44	1 328	48 036	796,8	4 684,9	5 597,8	8 043	69,6	4 415,8	4 970,5	6 920
1945	1944-45	1 531	49 913	862,3	4 816,4	5 748,7	8 329	69,0	4 706,1	5 101,1	7 142
1946	1945-46	1 836	52 852	975,7	4 827,9	5 895,6	8 557	68,9	5 002,4	5 218,8	7 338
1947	1946-47	2 169	57 650	1 033,1	5 443,4	6 035,9	8 788	68,7	5 114,5	5 341,7	7 494
1948	1947-48	2 692	90 816	1 385,0	5 557,4	6 553,5	9 481	69,1	5 576,9	5 787,0	8 089
1949	1948-49	8 764	100 234	1 411,9	5 774,8	7 075,3	10 013	70,7	6 222,2	—	8 829
1950	1949-50	9 352	115 129	1 439,8	6 323,4	7 773,6	11 187	69,5	6 910,6	—	9 750
1951	1950-51	10 336	137 283	1 520,5	6 663,1	8 326,6	11 895	70,0	7 456,5	—	10 474
1952	1951-52	10 889	176 559	1 624,5	7 113,3	8 778,0	12 517	70,1	8 080,6	—	11 234
1953	1952-53	11 518	218 739	1 806,0	7 393,8	9 442,0	13 744	68,7	8 732,2	—	11 806
1954	1953-54	12 317	270 621	2 051,0	8 025,0	10 651,9	15 184	70,2	9 676,6	—	12 820
1955	1954-55	12 490	304 342	2 377,7	8 999,7	12 214,5	17 172	71,1	10 964,0	—	14 310
1956	1955-56	12 977	342 068	2 734,8	9 688,6	13 578,4	18 535	73,3	12 019,5	—	15 781
1957	1956-57	13 421	377 265	2 826,7	10 220,5	14 638,8	20 133	72,7	12 763,1	—	17 321
1958	1957-58	14 312	417 701	3 036,5	10 784,1	15 582,6	21 165	73,6	13 602,2	—	18 132
1959	1958-59	13 947	453 130	3 289,4	11 548,7	16 926,5	22 561	75,0	14 724,5	—	19 334
1960	1959-60	14 654	491 471	3 408,9	12 512,6	18 543,3	24 365	76,1	16 094,1	—	20 968
1961	1960-61	15 441	529 565	3 558,9	13 194,8	19 575,4	25 699	76,2	17 013,2	—	22 066
1962	1961-62	16 467	581 579	3 758,9	13 955,5	20 805,5	26 969	77,1	18 121,0	—	23 706
1963	1962-63	16 804	637 076	4 175,9	14 721,1	22 312,4	29 399	75,9	19 500,0	—	25 257
1964	1964	17 172	679 193	4 499,6	15 654,7	24 355,3	32 020	76,1	21 247,5	—	NA
1965	1965	17 851	741 109	4 624,7	16 726,8	26 440,4	34 490	76,7	23 143,3	—	29 144
1966	1966	18 579	840 782	4 806,3	16 982,6	27 395,5	36 481	75,1	24 554,3	—	NA
1967	1967	19 817	950 863	5 845,3	18 307,7	30 421,7	39 636	76,7	26 657,1	—	34 037
1968	1968	20 893	1 114 390	6 344,6	19 123,9	33 061,2	42 971	76,9	28 885,0	—	NA
1969	1969	21 644	1 271 785	6 982,6	19 982,9	33 967,0	45 968	78,2	31 505,6	—	39 610
1970	1970	22 696	1 429 862	7 583,3	21 630,6	39 796,2	50 791	78,4	34 890,6	—	NA
1971	1971	25 050	1 604 755	9 013,3	23 416,2	43 472,5	54 998	79,0	38 040,0	—	NA
1972	1972	26 735	1 774 350	9 551,3	24 952,8	47 411,1	59 142	80,2	41 648,9	—	NA
1973	1973	27 968	1 943 017	10 141,5	27 907,9	53 039,9	64 818	81,8	46 578,4	—	NA

Footnotes:

(i) The definition of census year changed as from 1932-33 and again as from 1957-58.

(ii) The national statistics shown in columns (h) and (l) are compiled by the Department of Statistics.

(iii) The particulars shown in column (h) in respect of the years 1964, 1966 and 1968 to 1971 are estimates of the total electricity generated, based on the results of a sample survey conducted by the Department of Statistics.

(iv) V.F.P.=Victoria Falls and Transvaal Power Co.

(v) NA=Statistics not available.

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 31st December 1973

Statement No. 8

Rand and O.F.S. Undertaking

Immovable property acquired for considerations amounting to	R2 548 981,00
Servitudes and other interest in or over land or other property acquired or hired	R802 082,49

Eastern Transvaal Undertaking

Immovable property acquired for consideration amounting to	R98 650,00
Servitudes and other interest in or over land or other property acquired or hired	R174 244,63

Cape Northern Undertaking

Immovable property acquired for considerations amounting to	R6 943,75
Servitudes and other interest in or over land or other property acquired or hired	R37 687,16

Cape Western Undertaking

Immovable property acquired for considerations amounting to	R71 610,00
Servitudes and other interests in or over land or other property acquired or hired	R59 702,48

Cape Eastern Undertaking

Immovable property acquired for considerations amounting to	Nil
Servitudes and other interest in or over land or other property acquired or hired	R2 563,65

Border Undertaking

Immovable property acquired for considerations amounting to	R31 663,00
Servitudes and other interest in or over land or other property acquired or hired	R63 495,06

Natal Undertaking

Immovable property acquired for considerations amounting to	R950 659,00
Servitudes and other interests in or over land or other property acquired or hired	R267 692,00

Orange River Undertaking

Immovable property acquired for considerations amounting to	R98 782,67
Servitudes and other interest in or over land or other property acquired or hired	R52 860,86

Central Generating Undertaking

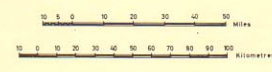
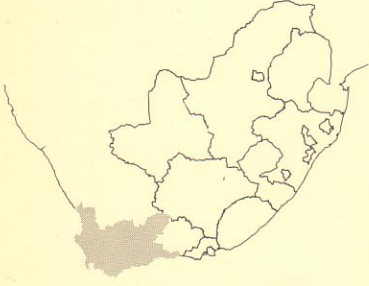
Immovable property acquired for considerations amounting to	R439 418,00
Servitudes and other interest in or over land or other property acquired or hired	Nil

Escom's distribution undertakings

- The development and operation of Escom's separate distribution undertakings are reviewed on the following pages.

General note:

Working costs include interest charges and Redemption Fund contributions on loan capital and amounts set aside to Reserve Fund and Capital Development Fund.



AREA OF SUPPLY 40 900 SQUARE MILES 805 900 SQUARE KILOMETRES

CAPE WESTERN UNDERTAKING
REFERENCE

- Area of Supply
- ESC. Power Stations
- Transmission Lines
- Transmission Lines under Construction

Cape Western Undertaking

The licensed area of supply of this undertaking was not increased during the year under review. The licensed area of supply as at 31st December 1973 is shown on page 82. During 1973 a total of 3 496 million units of electricity were supplied to this distribution undertaking by the Central Generating Undertaking. Of the total, 1 116 million units or 31,9 per cent (38,0 per cent in 1972) were sent out from the Salt River and Hex River Power Stations situated in the Western Cape, the remainder being imported from the north.

Sales of electricity

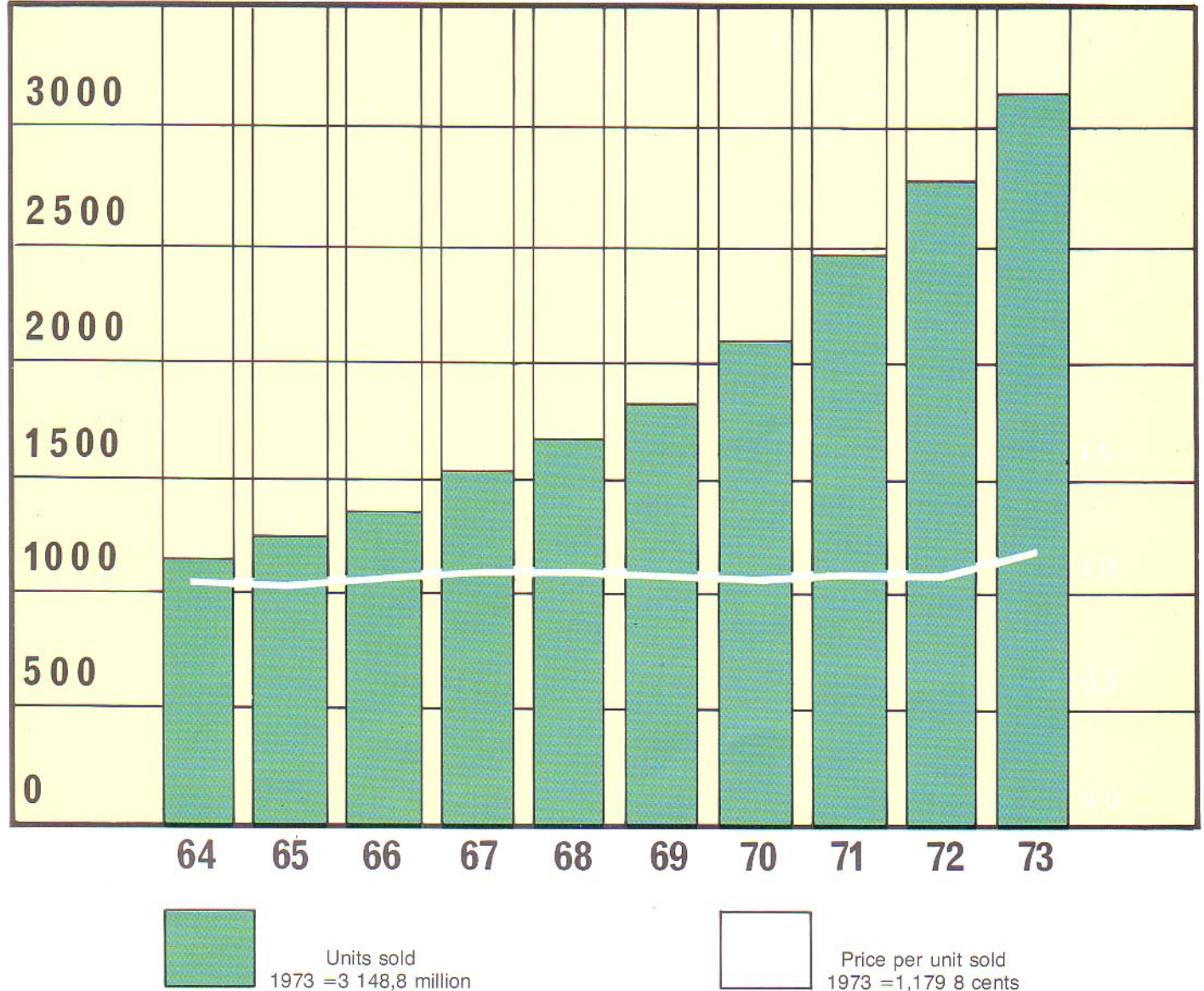
As shown in the table on page 85 the total units sold in

1973 exceeded the corresponding total for the preceding year by 13,6 per cent (11,1 per cent in 1972). During the year, bulk sales to municipalities overtook and exceeded industrial sales, their percentages of the total sales being 37,9 per cent (34,9 per cent in 1972) and 36,1 per cent (37,6 per cent in 1972) respectively. Bulk sales to municipalities have thus become the largest sector of Escom's total sales in this undertaking.

The graph below indicates the increase in sales of electricity over the period 1964 to 1973, the white line indicating the average price per unit sold.

Millions of units sold

Price per unit sold, cents



Development of the undertaking

During the year, the last link of the second 400 kV line from the Transvaal, the section between Droërivier distribution station near Beaufort West and Muldersvlei distribution station, was placed in service, thus considerably improving the reliability of supply to this undertaking.

The transmission system for supplies to the southern Cape area Oudtshoorn, George, Mossel Bay, Knysna, and Plettenberg Bay was completed in 1973. This supply system will be extended in 1974 to include Albertinia, Stilbaai, Riversdale, and Heidelberg.

The second 132 kV line from Muldersvlei distribution station to Stikland distribution station will be in service by the end of the year. All the double-circuit 66 kV lines from Stikland distribution station to five major substations are planned for completion during 1974.

Construction of the double-circuit 132 kV lines from Firgrove distribution station to Lourens River substation has been delayed by negotiations over wayleaves. However, it is hoped that both the Stellenbosch and Lourens River substations will be brought into service in 1974. The construction of a 132/33 kV section of the substation at Acacia was continued during the year, and is planned for completion in 1974.

The 66 kV Laingsburg-Sutherland line was completed and placed in service at 33 kV during the year, thus providing supplies to Sutherland town and observatory. The 66 kV system was extended from Graafwater to Vredendal distribution station during 1973. In 1974, the Vredendal substation will be constructed, together with the necessary 22 kV and 11 kV lines to enable supplies to be given to Vredendal, Vanrhynsdorp, Lutzville, and the surrounding areas.

A considerable increase is expected in the supply of elec-

tricity in the Saldanha area. To cater for this, the erection of a second 132 kV line is planned from Muldersvlei distribution station to Moorreesburg. From here, two 132 kV lines are planned to Langebaan substation, which in turn will supply Iscor and Saldanha by means of 66 kV lines.

The new Boston 33/11 kV substation at Bellville was completed, and the 33 kV cables to supply it will be laid early in 1974. Much work was done during the year on underground reticulation systems for new townships in the Tygerberg municipal areas, and for the provision of supplies to new industries and increased supplies to existing industrial consumers.

The total number of farming supplies furnished by the undertaking increased from 6 071 at the end of 1972 to 6 389 at the end of 1973. The new supplies were furnished over a wide area, the regions of greatest activity having been De Hoek-Porterville, Rietpol (near Bredasdorp), Worcester-Botha-Goudini, Citrusdal, and Wellington. It is clear that farmers in the Western Cape, as a result of the growing shortage of good farm labour, are finding more applications for electricity and are consequently achieving a more effective utilisation of their supplies. In pumping applications, electrical drives are replacing stationary diesel and petrol engines which are less convenient and more expensive to maintain; electricity is being used on an increasing scale for irrigation and fruit refrigeration.

Financial

Details of the units sold to the different classes of consumers, the total revenue derived therefrom, and the working costs are shown in the table below. The average price per unit sold during 1973 of 1,179 8 cents is 7,7 per cent higher than the figure for 1972. Total sales revenue for the year amounted to R37 150 302 and exceeded the corresponding figure for 1972 by 22,5 per cent.

Cape Western Undertaking

Consumer	Sales of electricity								Revenue from sales		Average price per unit sold	
	Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973
Traction	6	6	15,31	14,32	424 254 138	450 802 116	+0,96	+6,26	4 870 235	5 490 287	1,148 0	1,217 8
Bulk	42	45	34,94	37,91	968 388 212	1 193 772 829	+22,87	+23,27	7 872 389	10 820 418	0,812 9	0,906 4
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	7 818	9 223	37,61	36,05	1 042 088 396	1 135 268 396	+7,47	+8,94	12 433 538	14 735 639	1,193 1	1,297 9
Domestic	51 524	56 704	11,81	11,40	327 370 278	358 913 300	+6,38	+9,64	4 921 784	5 815 546	1,503 4	1,620 3
Street lighting	44	46	0,33	0,32	9 189 238	10 002 591	+5,55	+8,85	240 967	288 412	2,622 3	2,883 3
Total	59 434	66 024	100,00	100,00	2 771 290 262	3 148 759 232	+11,10	+13,62	30 338 913	37 150 302	1,094 8	1,179 8
									1972	1973	Accumulated to 31/12/73	
									R	R	R	
Total revenue									30 338 913	37 150 302		
Working costs									31 075 601	37 549 975		
Surplus									—	—		
Deficit									736 688	399 673	1 449 346	

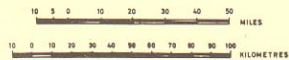
B O T S W A N A



CAPE NORTHERN UNDERTAKING

- REFERENCE -

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



AREA OF SUPPLY.....55 900 SQUARE MILES (144 800 SQUARE KILOMETRES)

Cape Northern Undertaking

The map on page 86 shows the licensed area of supply as at 31st December 1973.

In January 1973, an extension of the licensed area was approved, to supply the Cape Blue Mines (Pty) Ltd., for its Pomfret mine at Tosca, approximately 30 km from the Botswana border, and other possible mining ventures in that vicinity.

Sales of electricity

The table on page 89 compares the electricity sales for 1973 with those of the previous year. During the year under review, sales increased by 18,4 per cent to 1 060 million units. The mining industry increased its dominance of

sales in this undertaking, attaining 43,1 per cent of the total in 1973 (41,2 per cent in 1972). The mining sector grew by 23,7 per cent in 1973 (26,3 per cent in 1972). The slight decrease of traction sales in 1972 was reversed in 1973 with increased sales of 14,1 per cent.

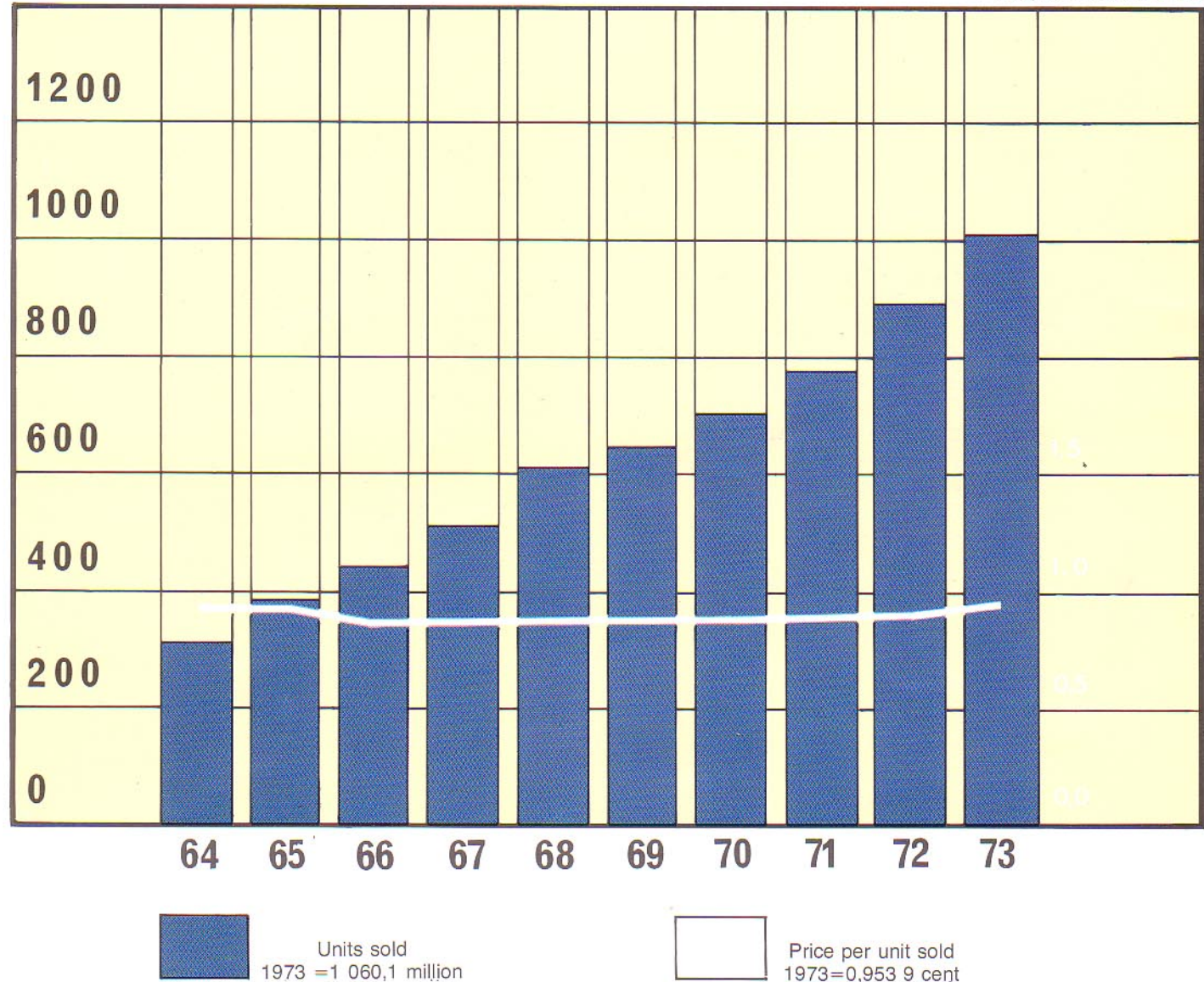
The graph below indicates the increase in sales over the period 1964 to 1973, and the change in the average price per unit sold.

Development of the undertaking

The 220 kV transmission line and series capacitor station between Hydra distribution station near De Aar and Cuprum distribution station in the Prieska area were placed in

Millions of units sold

Price per unit sold, cents



service in July 1973 at 132 kV. A 132 kV transmission line to supply the Pomfret asbestos mine near Tosca is progressing favourably and is planned for completion in August 1974. A supply to Keimoes was provided as scheduled in December 1973. A supply to Kakamas is scheduled for the first quarter of 1974.

Major additions to the 275 kV and 132 kV transmission systems between Kimberley and Sishen are in progress, mainly to cater for the increase in power required by Iscor at Sishen. To provide supplies to proposed cement factories at Silverstreams and Danielskuil, a 275/132 kV distribution station will be built in the vicinity of Kimberley. This distribution station will be linked with the new substations in the Silverstreams and Sishen areas by means of a 275 kV line.

A 66 kV substation and associated 66 kV transmission lines to provide an additional supply for the town of Kuruman is scheduled for completion during April 1974.

Escom's terms for supplies of electricity have been accepted by the Okiep Copper Mine in the Springbok area and by the Phelps-Dodge Exploration Corporation, which will be mining in the vicinity of Aggeneis. An enquiry has also been received from Iscor in connection with the electrification of the Sishen-Saldanha railway line. Terms were quoted to, and accepted by, the Cape Blue Mines Limited for a supply to their mine at Koegas and the Marydale Village Management Board for a bulk supply to their village.

To provide additional supplies to the South African Railways, three new traction substations were placed in service between Kimberley and Bloemhof during the year. A further four traction substations on this section will be brought into service in 1974, as well as an additional twelve traction substations in the section between Kimberley and Sishen.

The total number of farming supplies furnished by the undertaking increased from 2 033 at the end of 1972 to 2 130 at the end of 1973. The scheme to supply farmers along the Modderivier east of Perdeberg was completed during the year. In addition, a scheme to supply farmers west of the existing Perdeberg West farmers, was also completed. Escom's terms to supply a scheme in the Plooyburg area were accepted, and the scheme is scheduled for completion during the fourth quarter of 1974.

Extensive investigations have been carried out in the Straussburg-Melkstrom areas north of Upington, as well as the section along the Orange River, downstream from Upington, as far as the Augrabies Falls. Terms similar to those accepted by the Plooyburg farmers are being quoted to the farmers in the Straussburg-Melkstrom areas. If accepted, supplies will be made available during 1974/75.

The cost of providing supplies in these new areas will be somewhat high, but it is hoped that farmers will, by increasing their utilisation of supplies, be able to accept Escom's terms.

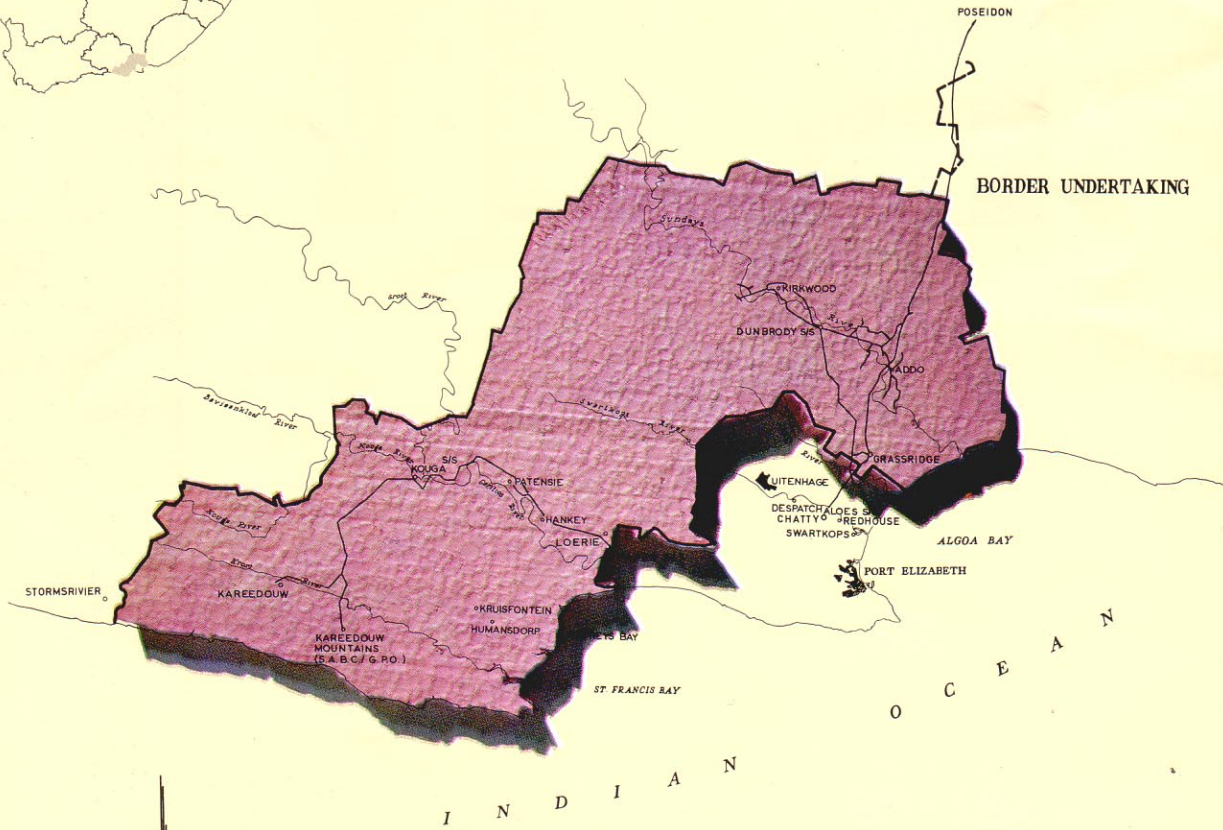
Financial

Details of the number of units of electricity sold to consumers in different categories, revenue received, and operating costs are shown for the years 1972 and 1973 in the table below.

The average price per unit sold increased by 5,3 per cent from 0,905 9 cents per unit in 1972 to 0,953 9 cents per unit in 1973. Total sales revenue for the year amounted to R10 112 635 and exceeded the corresponding figure for 1972 by 24,6 per cent.

Cape Northern Undertaking

Consumer		Sales of electricity							Revenue from sales		Average price per unit sold		
		Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973	
Traction	3	3	22,67	21,86	203 045 040	231 722 844	-0,28	+14,12	1 853 588	2 182 208	0,912 9	0,941 7	
Bulk	17	18	21,24	21,72	190 239 500	230 225 150	+11,13	+21,02	1 455 278	2 010 934	0,765 0	0,873 5	
Mining	77	74	41,23	43,09	369 365 067	456 835 618	+26,25	+23,68	3 341 266	4 201 948	0,904 6	0,919 8	
Industrial	628	716	12,16	10,78	108 926 795	114 261 396	+8,39	+4,90	1 090 244	1 280 879	1,000 9	1,121 0	
Domestic	3 159	3 259	2,67	2,52	23 919 231	26 753 160	+11,00	+11,85	367 702	429 160	1,537 3	1,604 1	
Street lighting	13	13	0,03	0,03	274 663	303 598	-1,52	+10,53	6 724	7 506	2,448 2	2,472 3	
Total	3 897	4 083	100,00	100,00	895 770 296	1 060 101 766	+13,43	+18,35	8 114 802	10 112 635	0,905 9	0,953 9	
									1972	Accumulated to			
										1973	31/12/73		
									R	R	R		
Total revenue									8 114 802	10 112 635			
Working costs									8 373 487	10 310 390			
Surplus									—	—	106 491		
Deficit									258 685	197 755			



BORDER UNDERTAKING

CAPE EASTERN UNDERTAKING
REFERENCE

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



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

Cape Eastern Undertaking

The licensed area of supply of this undertaking was not increased during 1973. The extent of the licensed area as at 31st December 1973 is shown on the map on page 90. The undertaking consists essentially of rural and urban schemes in the valleys of the Sundays and Gamtoos Rivers.

Electricity for the network in the Sundays River valley is purchased from Port Elizabeth Municipality. For consumers in the Gamtoos valley, Escom purchases power from the hydro-electric power station of the Department of Water Affairs at the Paul Sauer Dam.

During the year under review, there were long periods when it was not possible to operate the hydro-electric power station because of insufficient water. As a result, an appreciable portion of the Gamtoos valley requirements had to be purchased from Port Elizabeth Municipality. The purchases from Port Elizabeth, for both the Gamtoos and Sundays valley requirements, comprised 80,4 per cent of Escom's total sales of electricity in this undertaking (79,3 per cent in 1972).

When the hydro-electric power station is not operating, Escom purchases electricity from the Port Elizabeth Municipality. When, on the other hand, the output from the hydro-electric power station exceeds the demand of Escom's network in this valley, the surplus power is taken by Port Elizabeth Municipality.

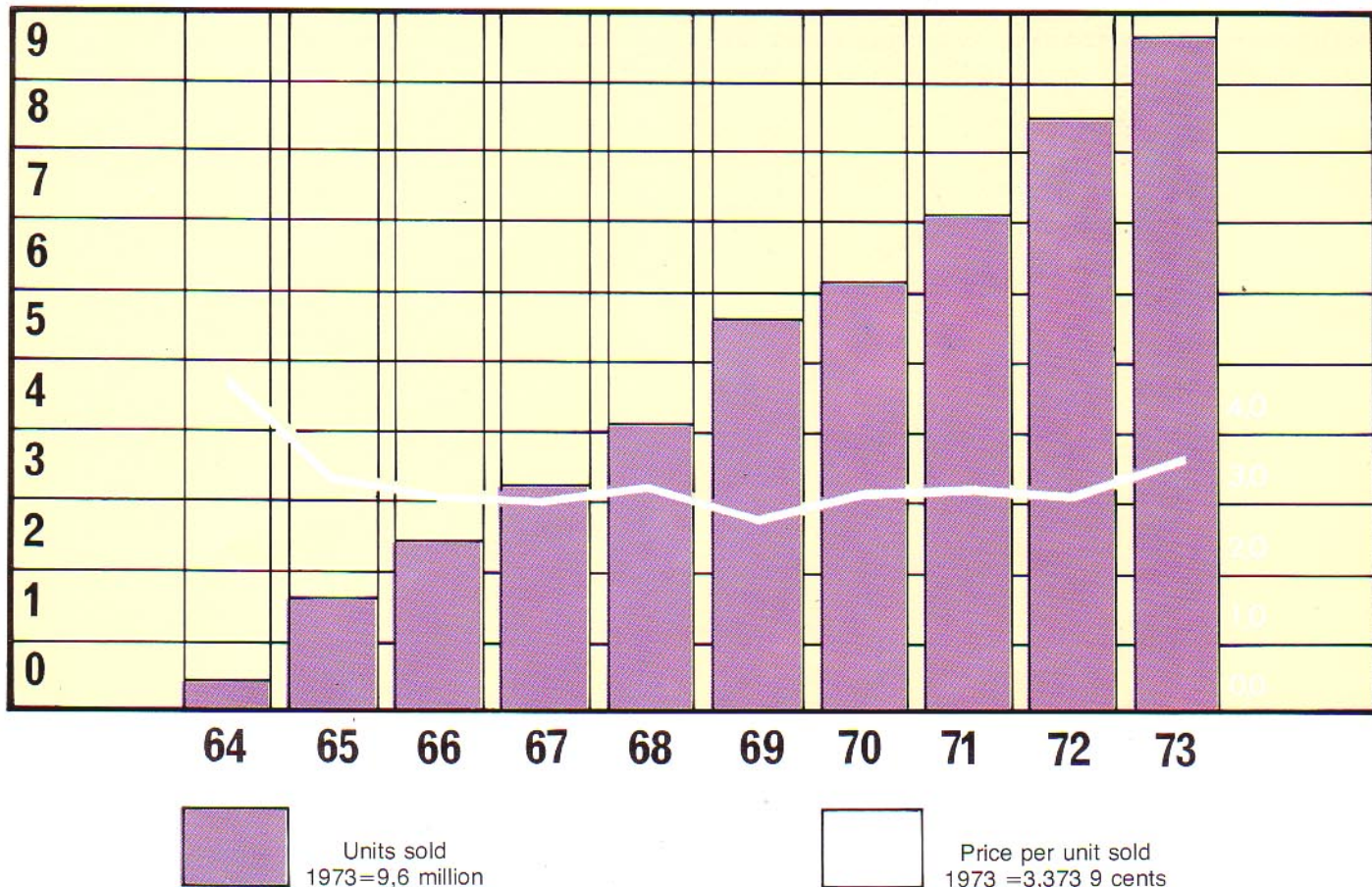
In the near future, the licensed area of the Orange River Undertaking will be extended to include the present Cape Eastern Undertaking, which will then cease to exist as a separate undertaking. The merging of the two undertakings will be effected after completion of the transmission link between the national network and the Eastern Cape area.

Sales of electricity

The graph below indicates the increase in the sales of electricity in the undertaking since it came into operation in 1964. The white line on the graph indicates the average price per unit sold. The sales of electricity indicated by this graph exclude the occasional supplies taken by Port

Millions of units sold

Price per unit sold, cents



Elizabeth Municipality when the hydro-electric power generated at the Paul Sauer Dam exceeds the needs of Escom's network in the Gamtoos valley.

In 1973, 9,653 million units of electricity were sold to consumers in the licensed area of the Cape Eastern Undertaking, and this shows an increase of 14,8 per cent over the corresponding figure for the preceding year (18,3 per cent in 1972).

Development of the undertaking

A new centralised depot for the undertaking was opened during the year at Uitenhage.

In the Sundays River valley, 33 additional rural connections were made. Of these, 26 were domestic consumers. The valley is experiencing an economic revival, following the good citrus crop in the 1972/73 season.

The Gamtoos valley also benefited from a good crop, and 16 additional farms were connected during 1973. A further 35 consumers were connected in the Hankey, Patensie, Kareedouw, and Loerie areas, comprising 3 large power, 10 small power, and 22 domestic users.

Further growth in the demand for electricity is expected when a constant supply of water becomes available from the Orange-Fish tunnel, and more pumps are installed. An

increase in the demand may also arise from the conversion of diesel to electric pump drives as a result of the high cost of diesel fuel.

The economic feasibility of strengthening the Gamtoos valley system via a 66 kV line from Despatch is under investigation. This would also facilitate the provision of supplies to Humansdorp, Jeffreys Bay, and Sea Vista.

Financial

The table below gives details of the units of electricity sold to the various classes of consumers, the total revenue, and the total working cost. In this table, the units taken by Port Elizabeth Municipality from surplus generation in the hydro-electric power station at the Paul Sauer Dam are not included as sales by the Cape Eastern Undertaking.

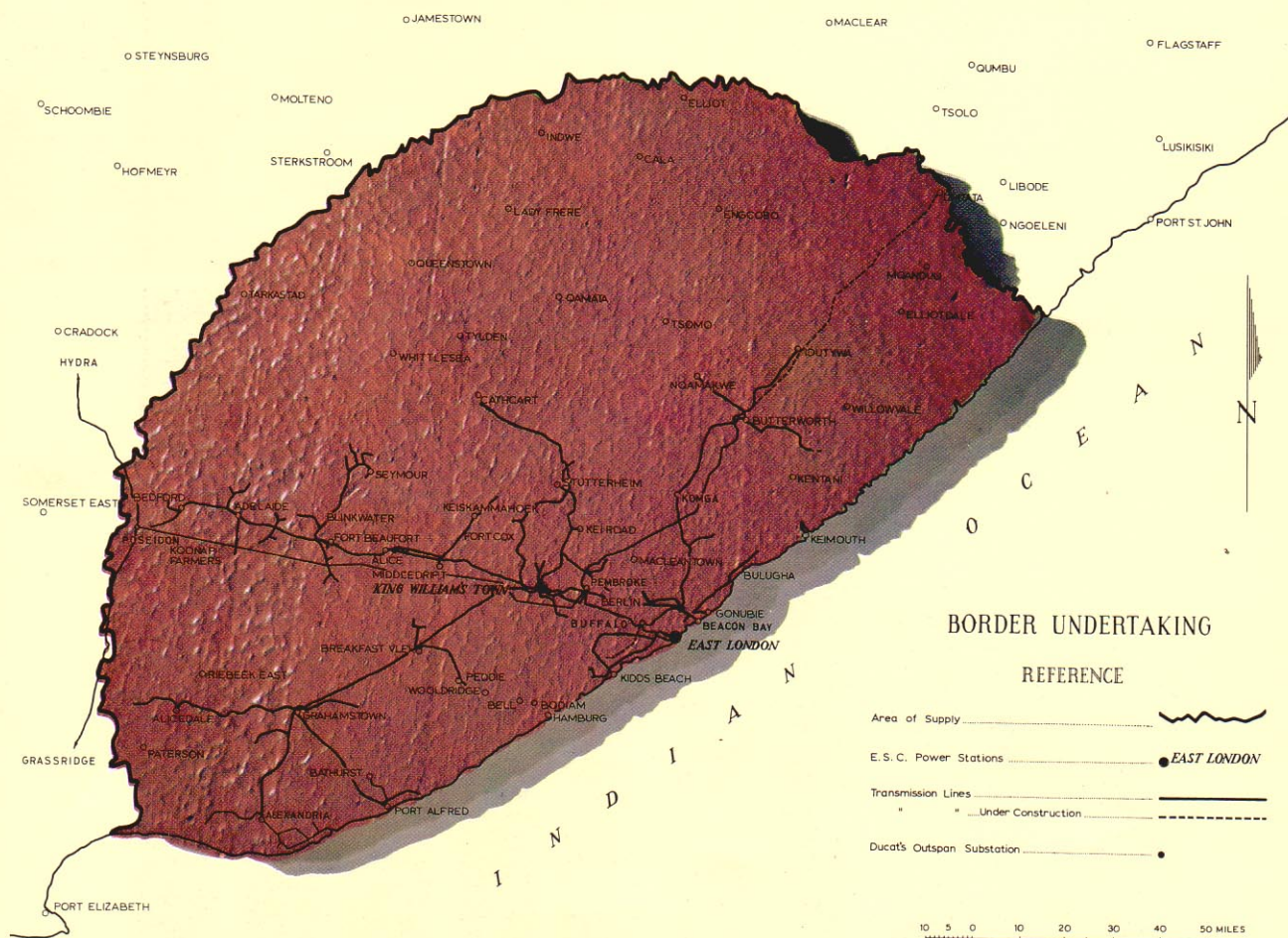
The working costs of the undertaking are influenced to a considerable extent by the output of the hydro-electric power station at the Paul Sauer Dam, as regular sustained operation of this power station lessens the need to purchase supplementary power for the Gamtoos valley.

The average price per unit sold increased by 10,6 per cent from 3,050 9 cents per unit in 1972 to 3,373 9 cents per unit in 1973. Total sales revenue for the year amounted to R325 687 as compared with R256 480 for 1972.

Cape Eastern Undertaking

Consumer	Sales of electricity								Revenue from sales		Average price per unit sold	
	Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk	1	1	21,25	20,51	1 786 080	1 979 640	+16,00	+10,83	32 366	38 953	1,812 1	1,967 7
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	116	143	46,53	44,30	3 911 703	4 275 933	+18,69	+9,31	133 518	167 335	3,413 3	3,913 4
Domestic	558	615	31,91	34,73	2 682 889	3 352 153	+19,43	+24,95	89 250	117 076	3,326 6	3,492 6
Street lighting	3	3	0,31	0,46	25 940	45 347	+10,35	+14,81	1 346	2 323	5,188 9	5,122 7
Total	678	762	100,00	100,00	8 406 612	9 653 073	+18,32	+14,83	256 480	325 687	3,050 9	3,373 9
									1972	1973	Accumulated to 31/12/73	
									R	R	R	R
Total revenue									256 480	325 687		
Working costs									299 080	390 808		
Surplus									—	—		
Deficit									42 600	65 121		249 187

Note: Above units sold by Cape Eastern Undertaking do not include units taken by Port Elizabeth Municipality at Summit substation from the hydro-electric power station of the Department of Water Affairs.



AREA OF SUPPLY.....21,500 SQUARE MILES (55,700 SQUARE KILOMETRES)

BORDER UNDERTAKING REFERENCE

Area of Supply

E. S. C. Power Stations EAST LONDON

Transmission Lines
 " "
 " " Under Construction

Ducat's Outspan Substation

10 5 0 10 20 30 40 50 MILES

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

Border Undertaking

The licensed area of supply of the Border Undertaking as at 31st December 1973 is shown on the map on page 94. There was no extension of the licensed area of supply during 1973. The electricity required in this undertaking was generated at West Bank Power Station, which had, by the end of the year under review, not yet been taken over by the Central Generating Undertaking. The power generating resources of the Border Undertaking were augmented in 1973 by interconnection with the national 400 kV transmission network in December. West Bank Power Station was formally transferred to the Central Generating Undertaking on 1st January 1974.

Sales of electricity

As shown in the table on page 97 the total units of electricity sold in the Border Undertaking in 1973 exceeded the corresponding total for the preceding year by 12,6 per cent

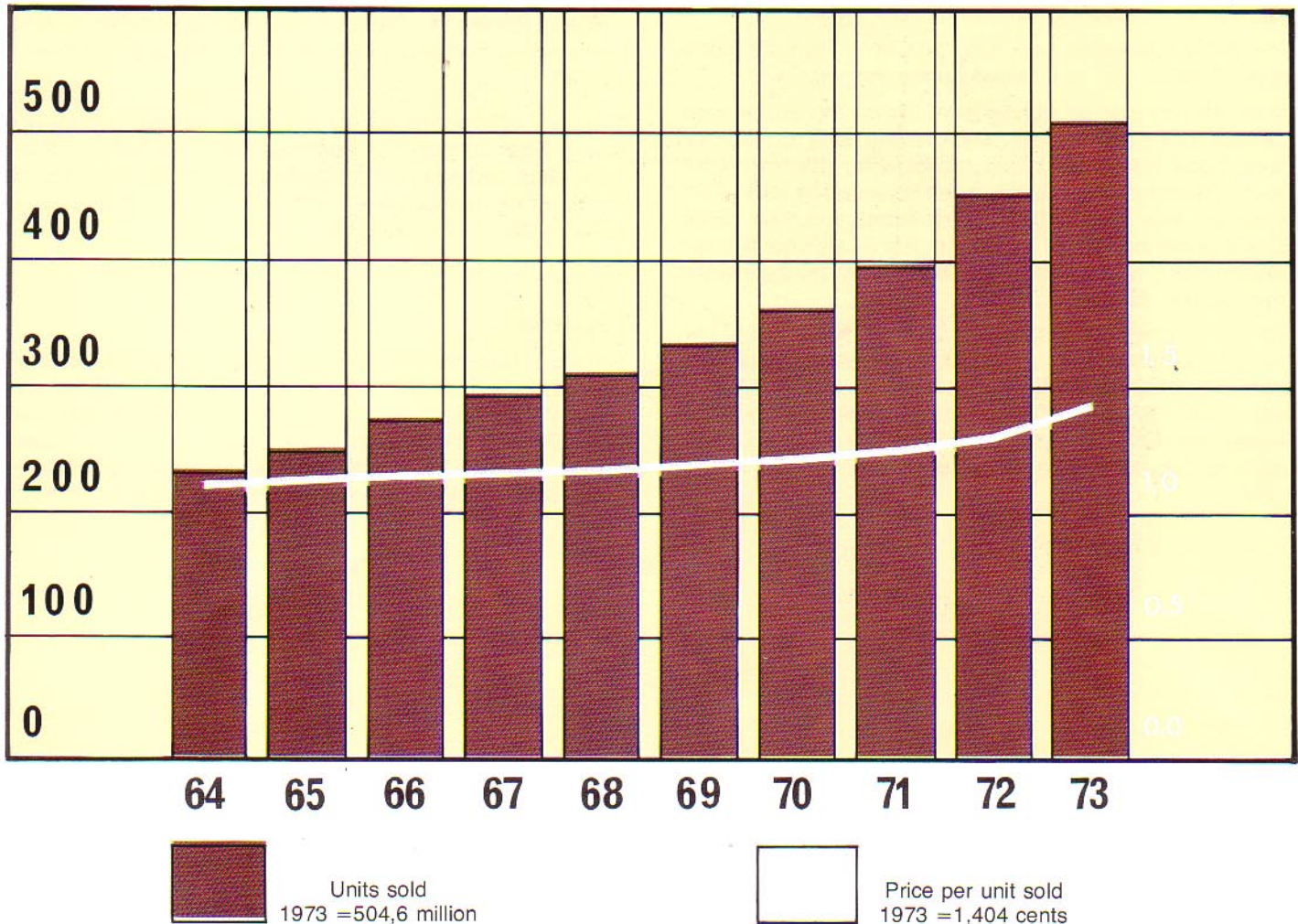
(12,1 per cent in 1972). Bulk supplies to municipalities comprised 87,4 per cent of total sales (89,2 per cent in 1972). The major consumer of bulk supplies was the municipality of East London, which accounted for 70 per cent of the undertaking's total sales (all categories). The sales to Berlin and East London during 1973 were 10,4 per cent more than in the preceding year (8,9 per cent in 1972). Good Hope Textiles continued as a major consumer of the industrial sector. The graph below indicates the increase in sales of electricity over the period 1964 to 1972, and the change during this period in the average price per unit sold.

Development of the undertaking

The transmission link between this undertaking and the Escom national network was completed in December 1973. This link is the first 400 kV line from Hydra distribution station near De Aar to Poseidon distribution station

Millions of units sold

Price per unit sold, cents



near Bedford. The 220 kV line from Poseidon distribution station to Pembroke distribution station near King William's Town was completed in May 1973, and the work on Pembroke distribution station itself was completed in December 1973. At Poseidon distribution station, the Pembroke 220 kV feeder was energised when Border Undertaking was coupled with the national transmission network in December 1973. Buffalo distribution station, which is to be the new 132 kV point of supply for East London Municipality, was completed in October 1973. A third 66 kV transmission line was erected from Buffalo to Gately substation, and the Gately and Riverview substations were prepared to receive output from West Bank Power Station.

The 132 kV line from Pembroke distribution station to Lamplough substation at Butterworth was completed during the year. Increased supplies were given to Butterworth from January 1974. Erection of the Zimbane substation near Umtata will be completed early in 1974. The construction of the Lamplough-Zimbane 132 kV line was well advanced by the end of the year 1973, which will enable supplies to be given to Umtata by mid-1974.

The 66 kV substation near King William's Town for Good Hope Textiles was completed during the year.

Work was completed during the year on the 66 kV Aloe Glen switching station which will form the base of the 66 kV North Coast scheme. A much needed strengthening of the South Coast system will have been achieved by mid-1974, when the new 22/11 kV Prospect substation near Kidds Beach is planned to be in service. Servitudes have been obtained for the 22 kV line which is to supply this substation from Buffalo distribution station.

Servitudes have been obtained for the first portion of the 132 kV line from Pembroke distribution station to Queens-town substation, as far as Kubusie, where a 66/22/11 kV substation is to be installed to strengthen the supply in the Stutterheim/Cathcart area. Erection of the line from Pembroke to Kubusie will be carried out during the first half of 1974.

The necessary servitudes are being negotiated for a 22 kV transmission line from Buffalo distribution station to Fort Jackson substation. Construction of the line will commence early in 1974, and completion is planned in the second half of the year. The 11 kV system in the Alexandria area was extended during the year to the township of Boesmansriviermond and Kenton-on-Sea.

The first portion of the new V.H.F. radio communication system was placed in service, with repeater stations at Mount Kempt and Governor's Kop. An additional repeater station is to be installed at Needs Camp in the second half of 1974.

The total number of farming supplies furnished by the undertaking increased from 688 at the end of 1972 to 716 at the end of 1973. By the end of the year, the Zuney scheme to the west of Alexandria had 37 points of supply; likewise, the Boknes area south-west of Alexandria had 30 points of supply.

The feasibility of additional rural schemes in the Keimond, Tylden, Paterson, Salem (near Kenton-on-Sea), and Shawpark (north-east of Port Alfred) areas is being investigated.

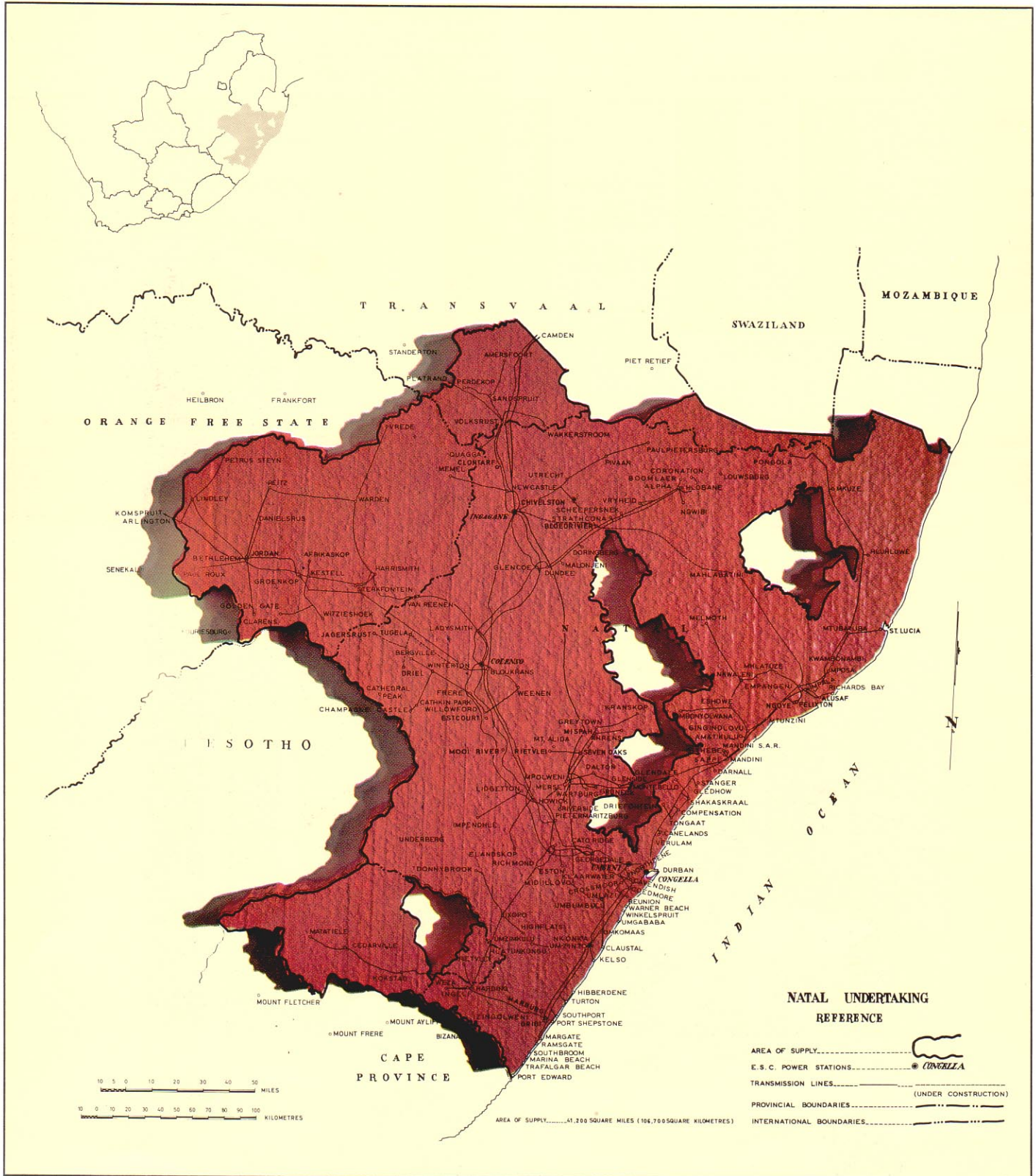
The new office complex for the undertaking's headquarters in East London has been virtually completed. Steps have been taken to set up a system Control Centre, based at Pembroke distribution station, for the control of all operations on the undertaking's networks.

Financial

Details of revenue and costs are given in the table below. The average price per unit sold increased by 10,3 per cent from 1,272 4 cents per unit in 1972 to 1,404 cents per unit in 1973, largely due to increased coal costs. Total sales revenue for the year amounted to R7 085 328 and exceeded the corresponding figure for 1972 by 24,3 per cent.

Border Undertaking

Consumer	Sales of electricity				Revenue from sales		Average price per unit sold					
	Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk	15	16	89,22	87,39	399 829 206	441 028 420	+9,46	+10,30	4 653 669	5 704 255	1,163 9	1,293 4
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial . . .	383	416	6,00	7,76	26 879 201	39 163 970	+69,93	+45,70	590 190	819 031	2,195 7	2,091 3
Domestic . . .	2 999	3 348	4,73	4,79	21 189 628	24 163 285	+13,94	+14,03	447 137	548 650	2,110 2	2,270 6
Street lighting	8	9	0,05	0,06	262 396	298 426	+11,61	+13,73	11 397	13 392	4,343 4	4,487 5
Total	3 405	3 789	100,00	100,00	448 160 431	504 654 101	+12,06	+12,61	5 702 393	7 085 328	1,272 4	1,404 0
									1972	1973	Accumulated to 31/12/73	
									R	R	R	
Total revenue									5 702 393	7 085 328		
Working costs									5 467 674	6 647 960		
Surplus									234 719	437 368	268 416	
Deficit									—	—		



ORANGE FREE STATE

TRANSVAAL

LESOTHO

SWAZILAND

MOZAMBIQUE

CAPE PROVINCE

INDIAN OCEAN

**NATAL UNDERTAKING
REFERENCE**

- AREA OF SUPPLY.....
- E. S. C. POWER STATIONS.....
- TRANSMISSION LINES..... (UNDER CONSTRUCTION)
- PROVINCIAL BOUNDARIES.....
- INTERNATIONAL BOUNDARIES.....



AREA OF SUPPLY.....11,200 SQUARE MILES (104,700 SQUARE KILOMETRES)

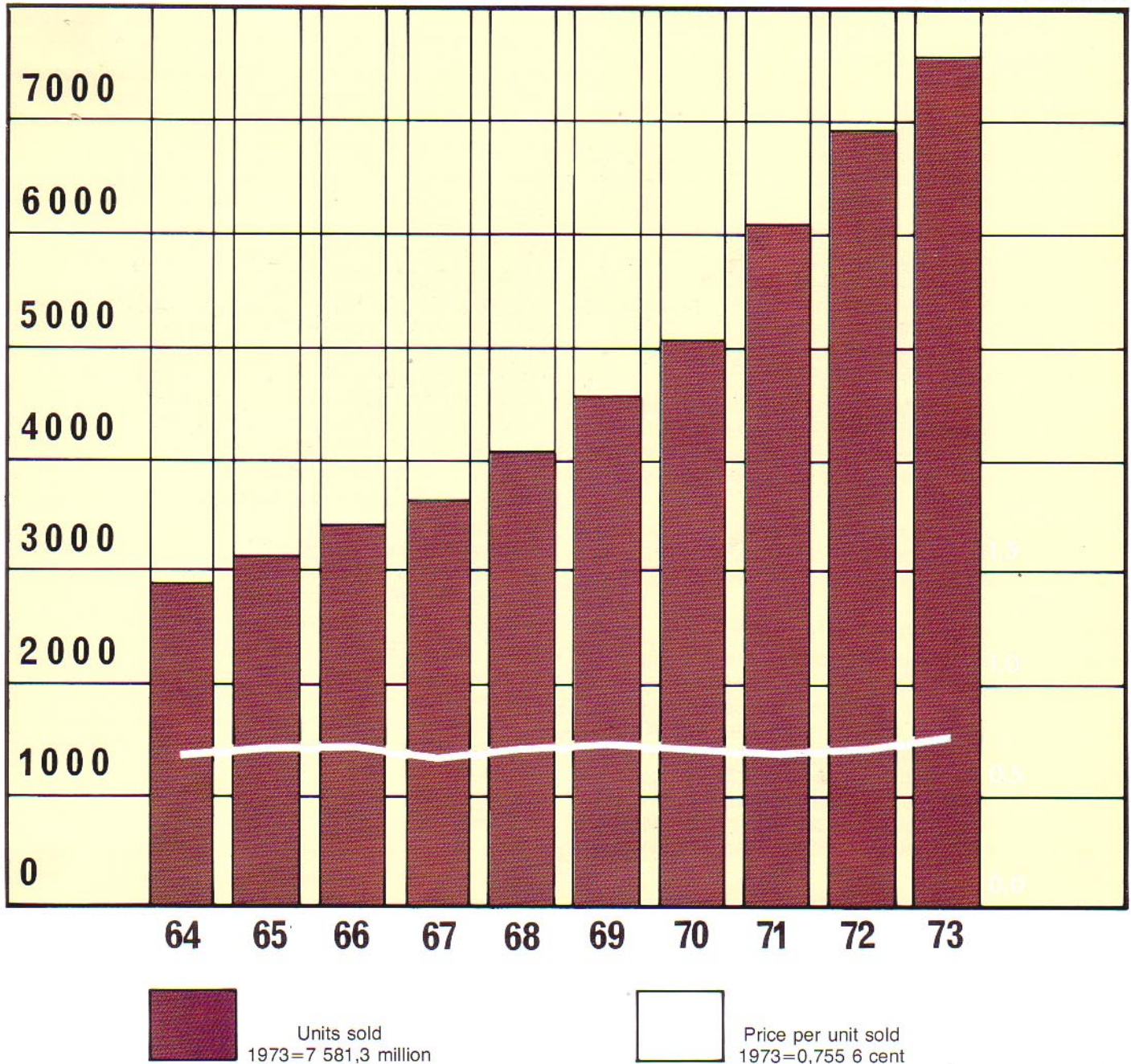
Natal Undertaking

The licensed area of supply, at 31st December 1973, of the Natal Undertaking, which combines the areas of supply of the Natal Central Licence and the Natal Southern Licence, is as shown on the map on page 98. There were no extensions to the licensed area of supply during the year under review.

With duplicate 400 kV transmission lines in service throughout the year, it was possible to increase the imports of electricity into Natal from the large pithead power stations of the Eastern Transvaal. Of Natal's total electricity requirement, only 46,3 per cent was sent out from power stations situated in that province.

Millions of units sold

Price per unit sold, cents



Sales of electricity

The remarkable rates of growth of electricity sales achieved in recent years in this undertaking (19,7 per cent in 1971, and 14,3 per cent in 1972) were not sustained in 1973, the total sales for this year – 7 581 million units – being 9,3 per cent above the 1972 sales. The reason for the reduced tempo of overall growth in this undertaking can be found by considering the corresponding rates of growth if supplies to Alusaf at Richards Bay are disregarded: 9,9 per cent in 1971; 9,2 per cent in 1972; and 10,3 per cent in 1973.

These figures show that the overall growth of 9,3 per cent attained in 1973 reflects a stage of consolidation at Alusaf, following the vigorous development of this new venture during the two preceding years. A further aspect, not immediately obvious, is that the overall growth rate for 1973 also tends to obscure the high rate of growth of 10,3 per cent achieved in the remaining sales excluding Alusaf.

As shown in the table on page 101 bulk supplies to municipalities and particularly to Durban, continue to dominate electricity sales in the Natal Undertaking, having accounted for 58,3 per cent of total sales in 1973 (56,9 per cent in 1972). The 1972 increase of bulk sales to municipalities – 11,8 per cent of bulk sales in the preceding year – was again achieved in 1973.

Supplies for traction fluctuate from year to year, depending upon the requirements of the South African Railways. Thus, there was almost no growth in traction supplies during 1973, as compared with an increase of 9 per cent in 1972.

The graph on page 99 indicates the increase in sales of electricity over the period 1964 to 1973 and the change, during this period, in the average price per unit sold.

Development of the undertaking

To strengthen the interconnection of Natal Undertaking with the national transmission network, the 400 kV system is being extended from Chivelston distribution station, south of Newcastle, to Mersey distribution station near Pietermaritzburg. The present 400 kV transmission line, which is being operated temporarily at 275 kV, is to be supplemented with a second 400 kV line, at present under construction. Mersey distribution station is being extended for 400 kV operation, the planned completion date being August 1974.

The establishment of new industries by Iscor at Newcastle and by Alusaf at Richards Bay has had a stimulating effect on the development of the surrounding areas. At Newcastle, the Incandu 400/132 kV substation to supply Iscor and the Municipality was placed in service in October. Con-

struction is planned to commence early in 1974 to provide for a 132 kV supply to the Richards Bay Town Board.

To cater for development in the vicinity of Ladysmith, a 275/132 kV substation for supplies to Ladysmith Municipality, is planned for completion during 1975.

Work is in progress for the provision of a supply to Paulpietersburg.

To cater for the growing demand for electricity in the Tongaat area, the construction is planned of the new Driefontein 132/33 kV substation, inland of Tongaat. This project is planned for completion by the end of 1974.

The growing demand of the Durban Municipality requires the provision of an additional point of supply. For this reason, a 275/132 kV substation is planned at Illovo, south of Durban, for completion during 1975.

The supply to Port Shepstone and the surrounding areas is to be strengthened by extending the 132 kV line from Nkonka substation near Umzinto to the new Oribi 132/88 kV substation near Port Shepstone. The work is planned for completion by July 1974.

The South African Railways have only recently finalised their traction requirements for the sections between Newcastle and Platrand and between Vryheid and Richards Bay. The necessary extensions to the transmission system to provide supplies are being planned. The proposed 88 kV line between Vryheid and Richards Bay for traction purposes will also be used to supply Ulundi, the probable seat of the Kwa Zulu Government.

Progress with rural development was maintained during the year, with the connection of new farming supplies over a wide area of the undertaking. The total number of farming supplies increased from 4 652 at the end of 1972 to 5 080 at the end of 1973. In addition, 297 non-farming supplies were also furnished in rural areas during the year.

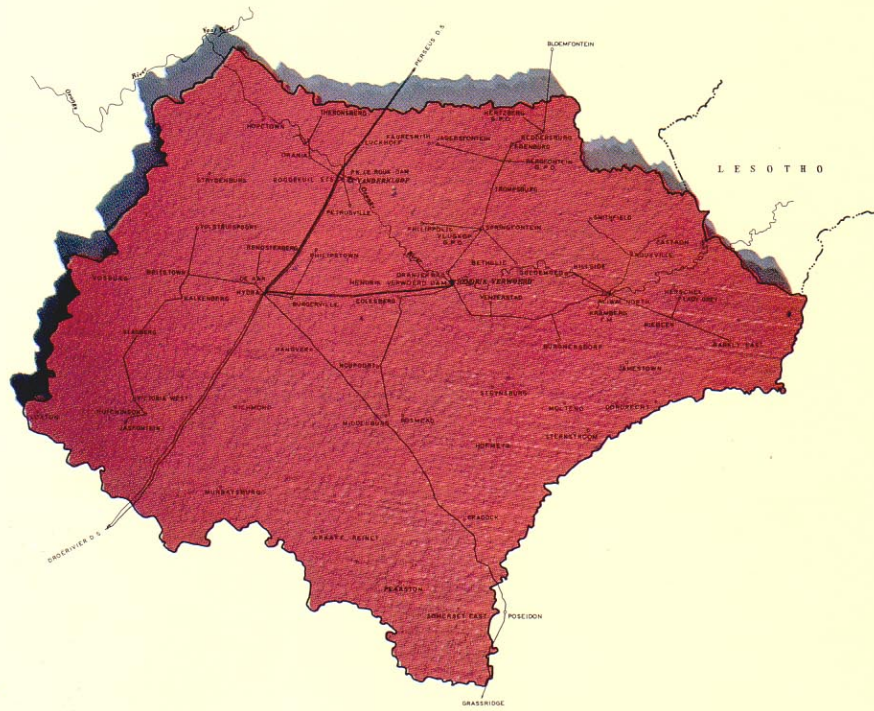
There was continued interest in supplies of electricity for farming purposes in the North Zululand areas of Pongola and Mtubatuba where 63 new supplies were given during 1973, bringing the total to 104. Considerable development is expected in those areas, and also in the Hluhluwe and Mkuze districts.

Financial

Details of units of electricity sold to the various classes of consumers, the total revenue, and the working costs for 1973 are given in the table below. The revenue from electricity sales increased by 17,7 per cent to R57 284 140 and the average price per unit sold increased by 7,7 per cent from 0,701 4 cents per unit in 1972 to 0,755 6 cents per unit in 1973.

Natal Undertaking

Consumer	Sales of electricity								Revenue from sales		Average price per unit sold	
	Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973
Traction	14	14	12,88	11,81	893 522 841	895 956 142	+9,01	+0,27	7 140 174	7 821 904	0,799 1	0,873 0
Bulk	30	32	56,94	58,27	3 950 383 918	4 417 284 545	+11,83	+11,82	25 500 457	30 574 776	0,645 5	0,692 1
Mining	31	32	2,35	2,22	163 233 710	167 944 819	+1,06	+2,89	1 356 131	1 507 552	0,830 8	0,897 6
Industrial	4 529	5 087	26,03	25,83	1 805 911 577	1 958 720 697	+24,83	+8,46	12 739 915	15 063 218	0,705 5	0,769 0
Domestic	18 136	19 409	1,77	1,84	122 761 635	139 156 554	+11,79	+13,36	1 880 184	2 259 531	1,531 6	1,623 7
Street lighting	76	80	0,03	0,03	2 162 549	2 237 061	+3,86	+3,45	47 381	57 159	2,190 9	2,555 1
Total	22 816	24 654	100,00	100,00	6 937 976 230	7 581 299 818	+14,26	+9,27	48 664 242	57 284 140	0,701 4	0,755 6
									1972	1973	Accumulated to 31/12/73	
									R	R	R	
Total revenue									48 664 242	57 284 140		
Working costs									51 271 272	58 417 954		
Surplus									—	—		
Deficit									2 607 030	1 133 814	1 228 793	

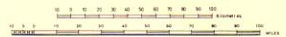


ORANGE RIVER UNDERTAKING

REFERENCE

- AREA OF SUPPLY
- TRANSMISSION LINES
- TRANSMISSION LINES UNDER CONSTRUCTION
- E.S.C. POWER STATIONS KENDJIE VERWERK VAN DER BEEK (UNDER CONSTRUCTION)

AREA OF SUPPLY: 1:500 SQUARE MILES (1:500 SQUARE KILOMETRES)



Orange River Undertaking

The licensed area of supply of the Orange River Undertaking as at 31st December 1973 is shown on the map on page 102. Since the 1st August 1972, this undertaking has been delegated the management and control of the Cape Eastern Undertaking. The extension of the area of the Orange River Undertaking to include the licensed area of supply of the Cape Eastern Undertaking and the City of Port Elizabeth will take place in 1974. The Minister's approval to this change has already been obtained.

Sales of electricity

This recently established undertaking is still in a stage of rapid initial development. During the year 1973, a total of 239 million units of electricity were sold — an increase of some 65 per cent over the corresponding sales for the preceding year. (52 per cent in 1972). The temporary supplies of electricity given to Orange-Fish Tunnel contractors reached a peak level during 1973, comprising 39,5 per cent of the undertaking's total supplies, and can be expected to diminish gradually over the next few years.

The graph below indicates the increase in sales of electricity over the period 1964 to 1973 and the change, during this period, in the average price per unit sold.

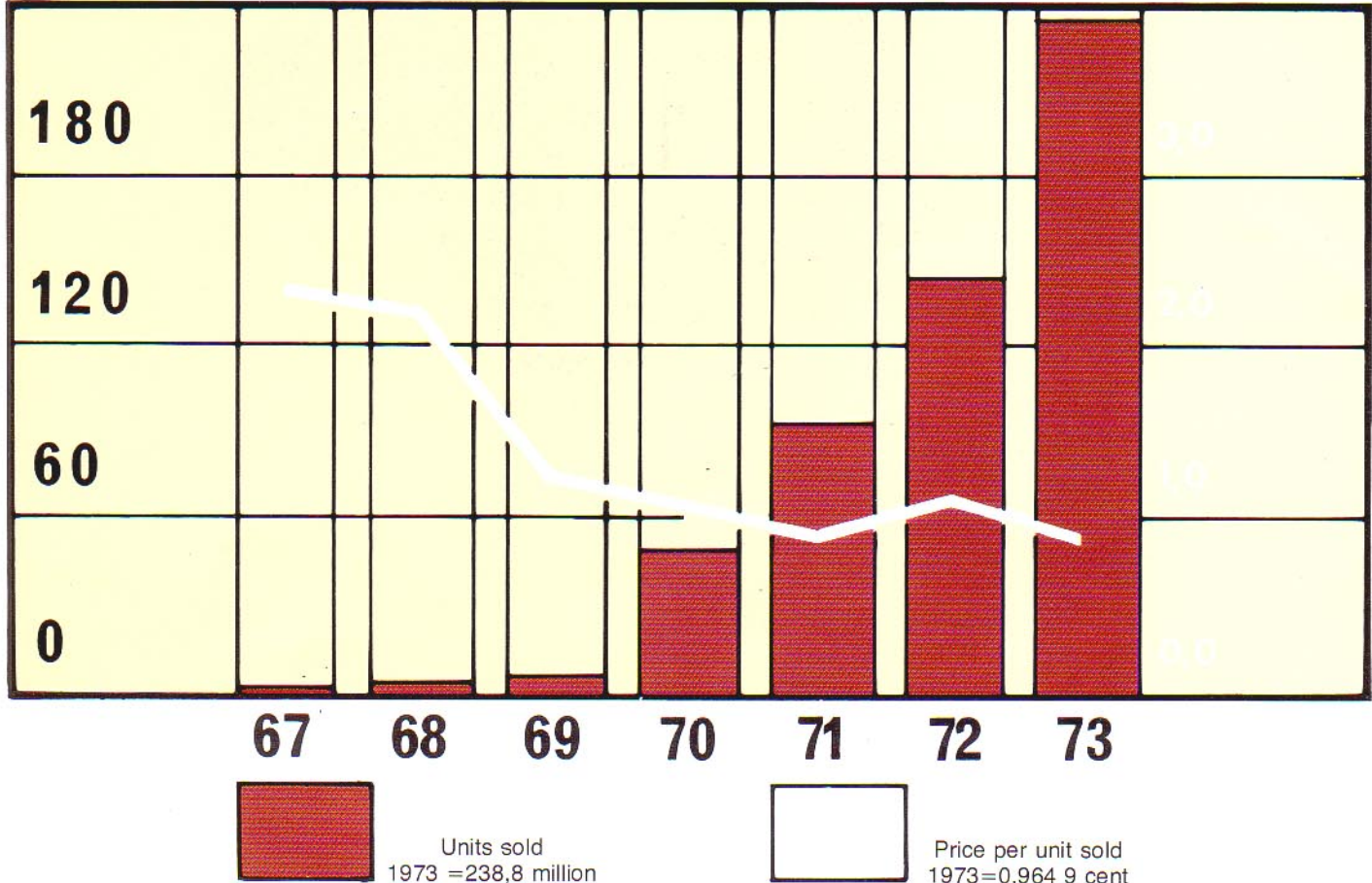
Development of the undertaking

The completion of the first 400 kV line from Hydra distribution station to Poseidon distribution station near Bedford, a 220 kV line from Poseidon to Grassridge distribution station near Couga, and two 132 kV lines from Grassridge to Chatty substation near Despatch, enabled Port Elizabeth to receive a partial supply from Escom from the 1st November 1973.

The 22 kV transmission system in the De Aar-Britstown-Victoria West areas enabled Escom to provide supplies to Britstown Municipality and to the Post Office microwave station at Kalkenberg in October 1973. Supplies were also given towards the end of the year to Victoria West Municipality and to a number of other Post Office microwave stations.

Millions of units sold

Price per unit sold, cents



The completion of an 11 kV transmission line from Oranjekrag substation to Norvalspont substation enabled a supply to be given to the South African Railways at Norvalspont in December 1973.

A 66 kV extension from Poseidon distribution station to supply the municipalities of Cradock, Somerset East, and Graaff-Reinet is to be commenced in 1974. Supply over a 66 kV line is to be given to Steynsburg in 1974.

Rural electrification made further progress during the year, the number of farming supplies having increased from 25 at the end of 1972 to 73 by the end of 1973.

In the Orania area, a scheme for the supply of electricity for pumping purposes is approaching completion, and there is a prospect of extending the scheme downstream. Other areas of rural development were Norvalspont and Aliwal

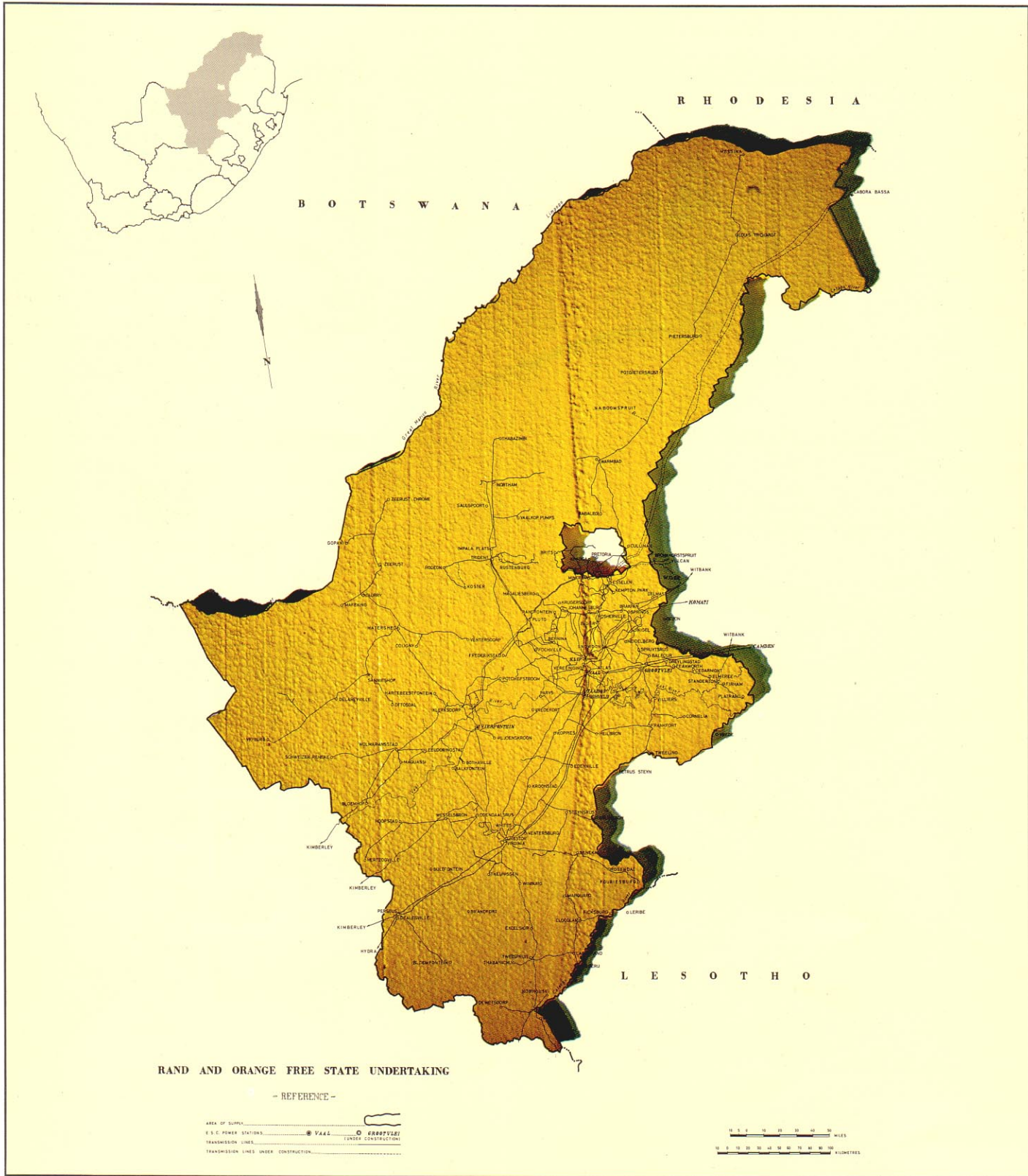
North. Schemes in the vicinity of the Tierpoort Dam in the southern Orange Free State are under investigation.

Financial

Details of revenue and cost are given in the table below. The average price per unit of electricity sold decreased by 12,5 per cent from 1,103 cents per unit in 1972 to 0,964 9 cents per unit in 1973. This reduction was due primarily to the provision of substantial new bulk supplies to municipalities in the undertaking. It will be noted in the table that bulk sales to municipalities supplanted industrial sales during the course of the year as the major contributor to the undertaking's total sales. Total sales revenue for the year amounted to R2 303 966, exceeding the corresponding figure for 1972 by 44,6 per cent.

Orange River Undertaking

Consumer	Sales of electricity								Revenue from sales		Average price per unit sold	
	Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk	26	28	43,29	57,50	62 558 216	137 312 743	+27,58	+119,50	693 536	1 174 273	1,108 6	0,855 2
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	21	57	56,67	42,41	81 885 809	101 261 910	+77,92	+23,66	897 797	1 121 932	1,096 4	1,108 0
Domestic	22	45	0,04	0,09	54 037	213 429	—	+294,97	2 483	7 761	4,595 0	3,636 6
Street lighting	—	—	—	—	—	—	—	—	—	—	—	—
Total	69	130	100,00	100,00	144 498 062	238 788 082	+52,01	+65,25	1 593 816	2 303 966	1,103 0	0,964 9
									1972	1973	Accumulated to 31/12/73	
									R	R	R	
Total revenue									1 593 816	2 303 966		
Working costs									1 571 844	2 311 213		
Surplus									21 972	—		
Deficit									—	7 247	282 565	



Rand and O.F.S. Undertaking

The licensed area of supply of the Rand and O.F.S. Undertaking as at 31st December 1973 is shown on the map on page 106. There was no extension of the licensed area of supply during the year 1973.

Sales of electricity

The rate of growth, in terms of units of electricity sold, which had been 6,7 per cent from 1971 to 1972, increased to 10,8 per cent from 1972 to 1973, with a total of 27 938 million units sold in 1973. As will be noted from the table on page 109, the increased overall rate of growth is attributable mainly to a revival of activity in the mining industry, and to bulk supplies to municipalities.

Bulk supplies to municipalities increased their share of total sales in this undertaking from 18,9 per cent in 1972 to 20,6 per cent in 1973, thus maintaining their position as the

third largest category of consumer. The first and second places were, as in the previous year, taken by the mining and industrial sectors, with contributions to total sales of 48,7 and 25,4 per cent respectively.

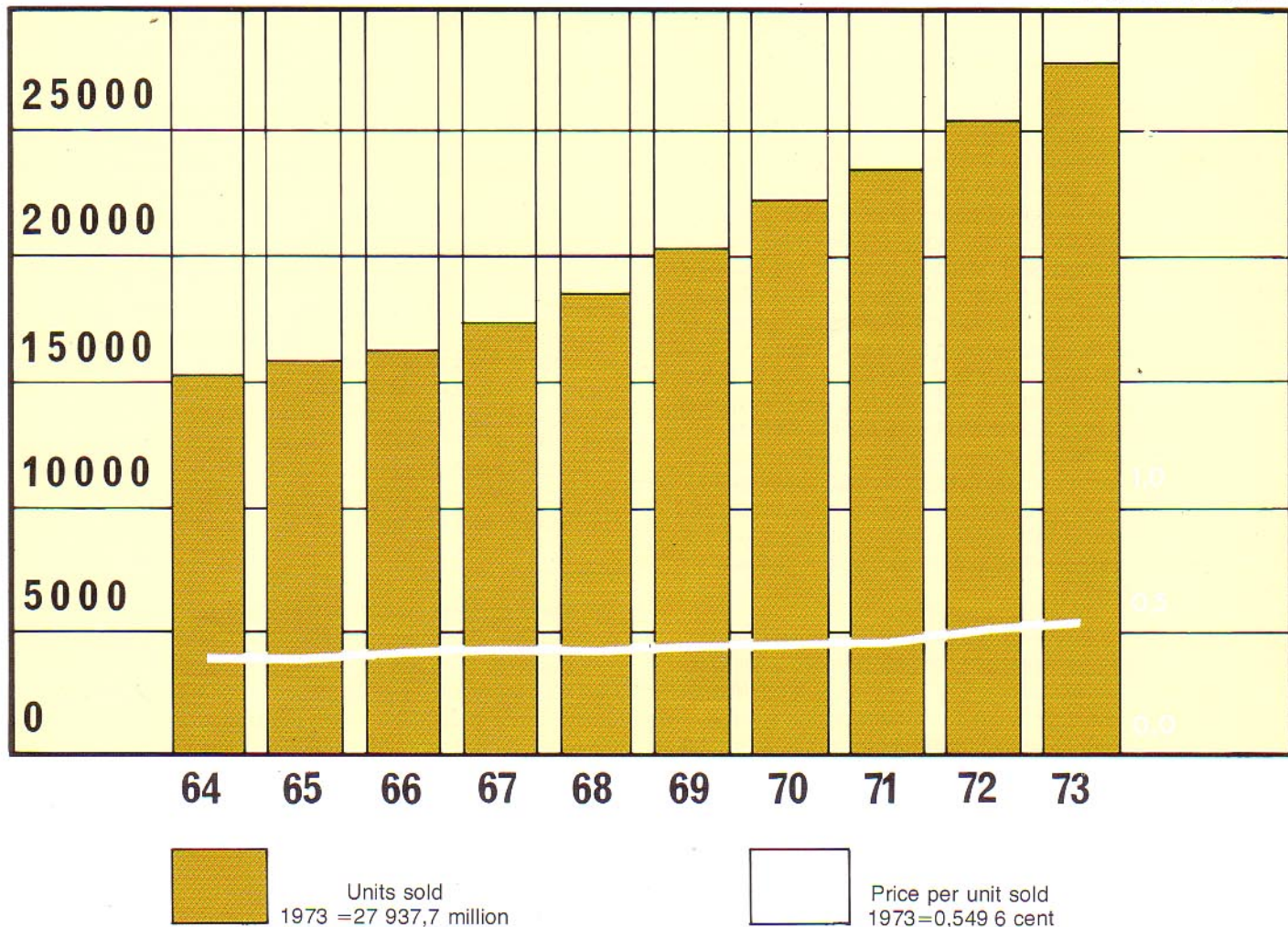
The graph below indicates the increase in sales of electricity over the period 1964 to 1973 and the change, during this period, in the average price per unit sold.

Development of the undertaking

A further strengthening of the transmission system for power supplies to the Central Witwatersrand was achieved with the completion during the year of the two 275 kV lines between Escom's Jupiter distribution station and Johannesburg Municipality's Fordsburg substation. To cater for the growing demand in the developing townships to the north of Johannesburg, the Bordeaux distribution station

Millions of units sold

Price per unit sold, cents



was placed in service in the Randburg area in May 1973, and the Manor distribution station in December 1973 in the Sandton area.

In the Pretoria area, the completion of the second 275 kV line from Escom's Apollo distribution station near Verwoerdburg to the Municipality's Kwagga substation enabled Escom's 132 kV supply to be converted to 275 kV in May 1973.

The second 400 kV line from Pluto distribution station near Tarlton to Hermes distribution station near Stilfontein has been completed. The new Hermes distribution station will be placed in service during the first half of 1974.

The conversion of the 275 kV line from Esselen distribution station to Warmbad substation from 132 kV operation to 275 kV operation, and the installation of 275/132 kV step-down equipment at Warmbad substation, are expected to be completed by the end of this year or early in 1974. Further reinforcement of the Northern Transvaal network involving the erection of a 275 kV line from Warmbad to a 275/132 kV distribution station to be established near Pietersburg during 1974 has been planned to meet the large increases in demand for the area.

The percentage growth rates discussed above are evidence of a spectacular increase in electricity consumption by the platinum mines in the Rustenburg area during 1973. Notifications have been received from these mines of further rapid increases in their demand for electricity in 1974 and 1975. To cater for this development, a further supply point was established and reinforcement of two existing supply points was carried out. The first of the two 400 kV lines between Escom's Apollo and Pluto distribution stations to reinforce the Rustenburg area and Western area networks was placed in service in October 1973. This line is at present operating at 275 kV, pending the completion of Pluto distribution station in March 1974. The second 400 kV line is expected to be in service early in 1974. The 275 kV line from Trident distribution station near Rustenburg to the future Spitskop distribution station near Northam, and a 275 kV line to the future Marikana distribution station were placed in service during the year, but at present are still operating at 88 kV.

Several large primary and secondary industries notified Escom of substantial increases in their demands for electricity. In particular, Metalloys Ltd., received an initial supply for their two new 48 MVA ferromanganese furnaces; this supply is to increase to 80 MW early in 1974. Equipment was also installed for a new 35 MW supply to ISCOR

at Vanderbijl. A 17 MW supply is to be given early in 1974 to AE&CI Ltd., for its new ammonia plant at Modderfontein.

The traction supplies at Wolmerton on the Rosslyn-Brits electrified section, and at Orkney on the Klerksdorp-Kimberley section, were the only additional supplies given to the South African Railways during 1973. An 88 kV line from Klevebank distribution station to the South African Railways' De Wildt traction substation was placed in service in April 1973 to provide an alternative source of supply to the Rosslyn-Brits electrified section and also to the Brits area network. Work is in progress for additional supply points on the Klerksdorp-Fourteen Streams traction section. In addition, applications have been received for a further 41 traction supplies *inter alia* on the Kroonstad-Bloemfontein, Houtkop-Klerksdorp, Union-Volksrust, Welverdiend-Lichtenburg, and Pretoria-Witbank sections, for commissioning during 1974 and 1975.

Escom's supply to Fochville Municipality was transferred from the 42 kV network to the 132 kV network, and the new 132/6,6 kV supply was given in June 1973. Supplies were given to Stella in March 1973, Rosendal in April 1973, and Fouriesburg in June 1973. A new supply to Westonaria Municipality was completed in December 1973.

The undertaking continued to make progress during 1973 with supplies to farmers, and the additional supplies in this category totalled 828 consumers – an increase of 10,9 per cent of the total number of farming supplies in 1972. The undertaking erected 1 272 km of transmission lines to provide these supplies.

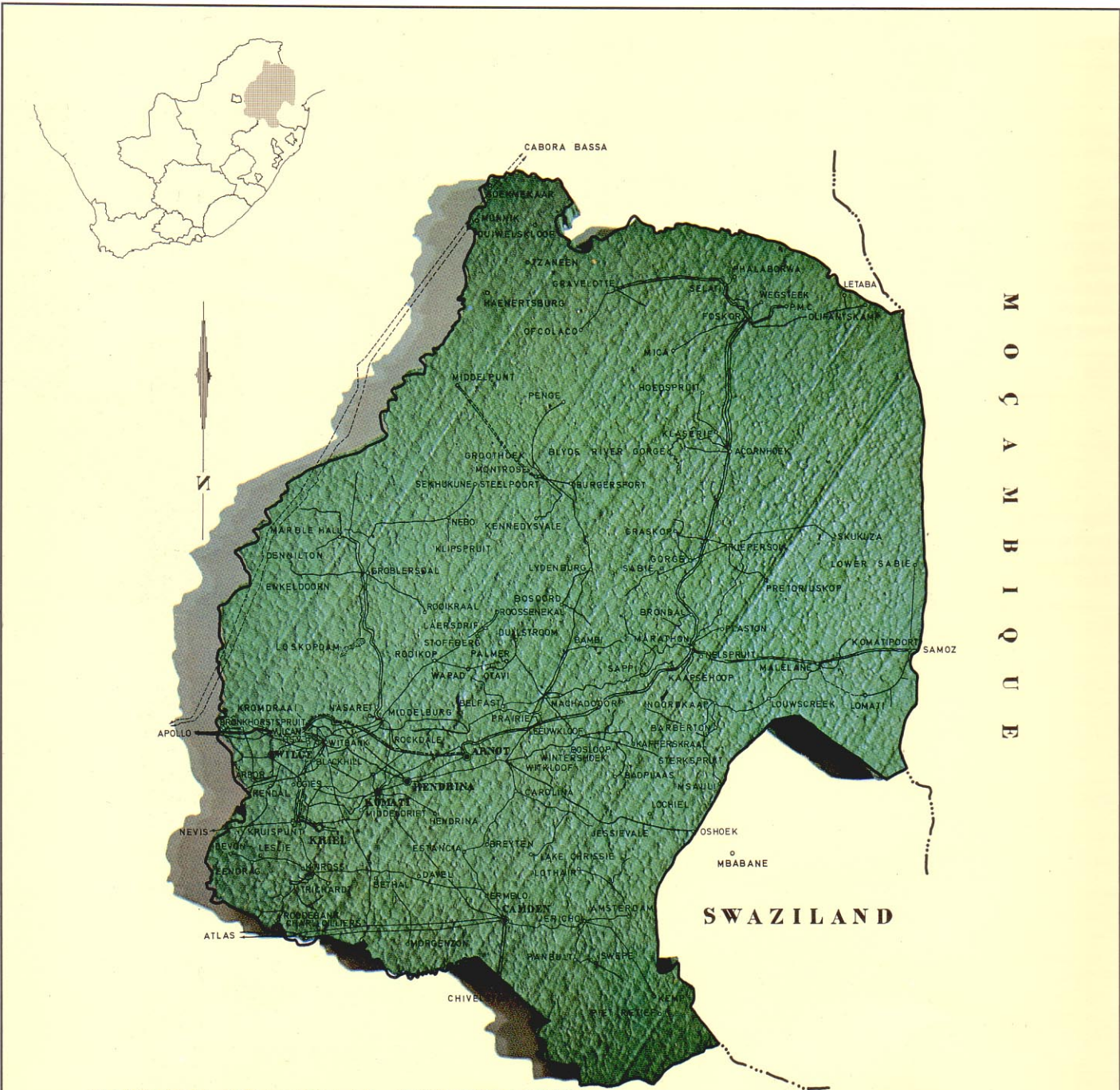
Five regional schemes completed during the year are located in the vicinities of Bultfontein, Theunissen, Villiers, Magaliesburg, and Wolwehoek. A good deal of further expansion was experienced in the Brits, Crocodile River Valley, Vierfontein/Bothaville, and Grootvlei/Heidelberg areas. Construction is still in progress on four schemes in the Bloemhof-West, Rayton, Sannieshof, and Thabazimbi-South areas. Construction is due to begin soon on four new schemes in the Wepener, Cullinan, Bultfontein and Marquard areas.

Financial

Details of units of electricity sold to the various classes of consumers, the total revenue, and the working costs for 1973 are given in the table below. The average price per unit sold increased by 5,2 per cent from 0,522 2 cents per unit in 1972 to 0,549 6 cents per unit in 1973. Total sales revenue for the year amounted to R153 550 320 and exceeded the corresponding figure for 1972 by 16,7 per cent.

Rand and Orange Free State Undertaking

Consumer		Sales of electricity						Revenue from sales		Average price per unit sold			
		Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973	
Traction	2	2	3,71	3,46	934 365 824	965 768 327	+6,95	+3,36	5 835 307	6 339 233	0,624 5	0,656 4	
Bulk	150	154	18,89	20,55	4 762 020 178	5 740 838 440	+17,54	+20,55	25 811 327	32 136 572	0,542 0	0,557 9	
Foreign													
(Lesotho)	2	2	0,06	0,06	16 634 095	19 730 377	+35,69	+18,61	105 464		0,634 0		
Mining	102	102	49,56	48,74	12 492 507 342	13 617 742 818	+1,26	+9,01	61 462 906	71 219 593	0,492 0	0,523 0	
Industrial	2 060	2 155	25,95	25,37	6 543 118 810	7 088 599 558	+10,21	+8,34	32 817 202	37 417 079	0,501 6	0,527 8	
Domestic	27 900	30 277	1,82	1,81	459 438 287	504 901 941	+12,53	+9,90	5 596 192	6 435 471	1,218 1	1,274 6	
Street lighting	5	6	0,01	0,01	78 739	90 556	-29,68	+15,01	1 003	2 372	1,273 8	2,619 4	
Total	30 221		100,00	100,00	25 208 163 275	27 937 672 017	+6,72	+10,83	131 629 401	153 550 320	0,522 2	0,549 6	
									1972	Accumulated to			
										1973	31/12/73		
									R	R		R	
Total revenue										131 629 401	153 550 320		
Working costs										130 310 616	153 492 638		
Surplus										1 820 179	57 682		
Deficit										—	—		
											2 139 429		



EASTERN TRANSVAAL UNDERTAKING

- REFERENCE -

- AREA OF SUPPLY.....
- E. S. C. POWER STATIONS..... **ARNOT**..... **KRIEL**
(UNDER CONSTRUCTION)
- TRANSMISSION LINES.....
- TRANSMISSION LINES UNDER CONSTRUCTION.....



AREA OF SUPPLY.....37 700 SQUARE MILES (97 600 SQUARE KILOMETRES)

Eastern Transvaal Undertaking

The licensed area of supply of the Eastern Transvaal Undertaking as at 31st December 1973 is shown on the map on page 110. There was no extension of the licensed area of supply during the year 1973.

Sales of electricity

The rate of growth of sales of electricity in this undertaking is determined largely by the development of a relatively small number of large industrial concerns which are responsible for much of the total electricity consumed. As shown in the table on page 113, a total of 6 098 million units of electricity was sold during the year 1973. This is an increase of 16,5 per cent over the units sold during a similar period a year earlier. In 1972 the corresponding

rate of growth was 14,8 per cent. Substantial contributors to the higher growth rate attained in 1973 were the industrial concerns Feralloys, Ferrometals, Highveld Development, Transalloys, Rand Carbide, Foskor, and Bosveld Kunsmis.

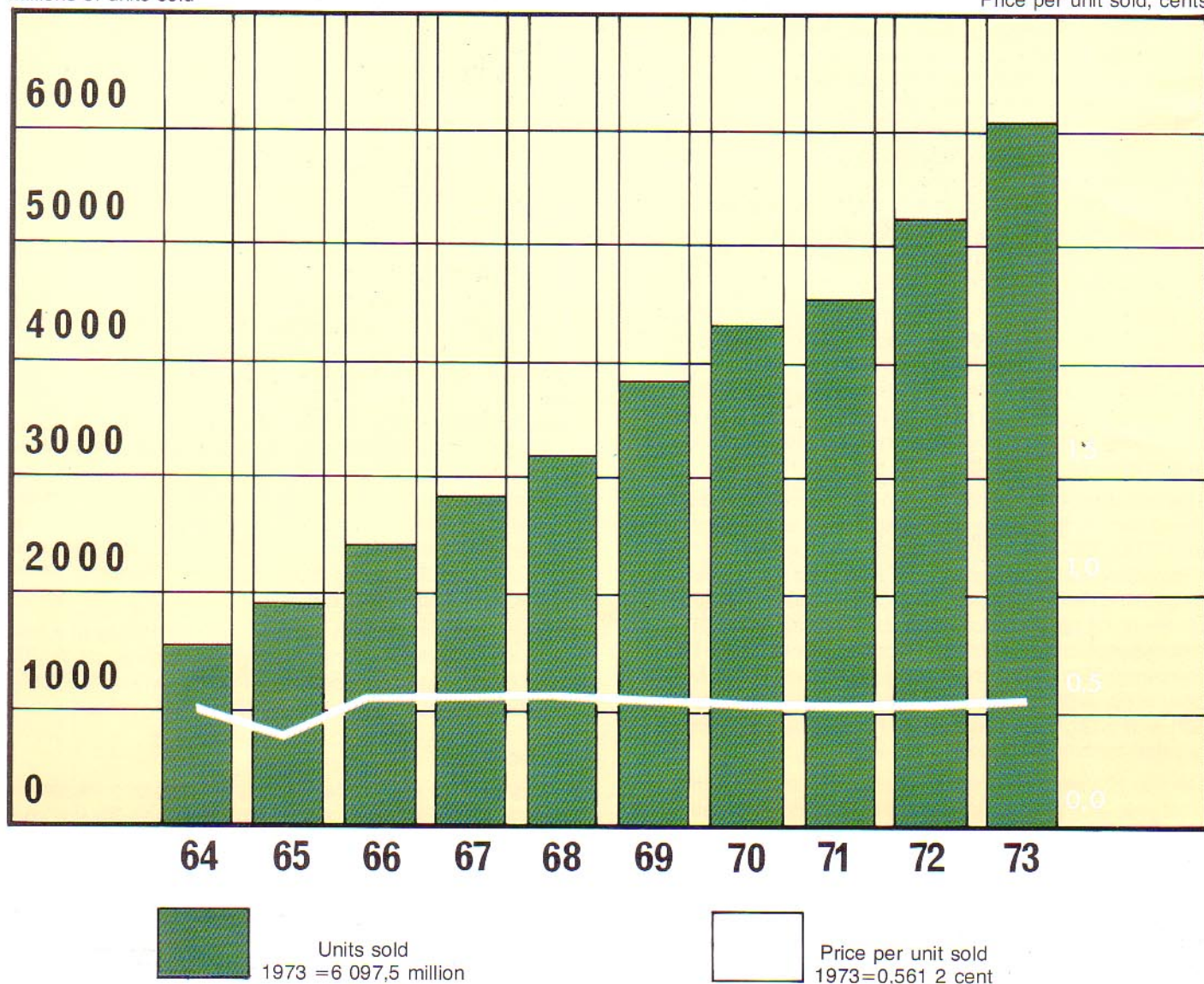
The graph below indicates the increase in sales of electricity over the period 1964 to 1973 and the change, during this period, in the average price per unit sold.

Development of the undertaking

Good progress was made during the year with the construction of additional 275 kV lines. The second 275 kV line from Arnot Power Station to Prairie distribution station near

Millions of units sold

Price per unit sold, cents



Machadodorp was completed and placed in service. A second 275 kV line from Prairie to Marathon distribution station near Nelspruit was completed and placed in service before the end of 1973. A second 275 kV line between Marathon and Acornhoek distribution station is in the process of construction, and will be placed in service in 1974. The progress achieved with extension of the 275 kV network to serve the Lowveld was most gratifying.

Swaziland became the Undertaking's second foreign consumer as a result of the successful completion during the year of the 132 kV line from Witkloof distribution station near Carolina to Oshoek on the Swaziland border. From Marathon distribution station near Nelspruit a 132 kV line was completed during the year to a new chemical plant Delta Manganese in the Nelspruit district. This line is planned for service early in 1974.

The 132 kV network in the undertaking was extended appreciably during the year. Five 132 kV outgoing lines from Vulcan distribution station were taken into service to strengthen supplies to various industries in the Witbank area. A new 132 kV line was taken into service from Selati distribution station near Phalaborwa to Gravelotte distribution station to cater for the increased demand for electricity of the mining industry in the Gravelotte area and of the Tzaneen Municipality and farming supplies in the Ofcolaco area. Gravelotte distribution station is expected to be completed early in 1974.

A redistribution was effected during the year of the loads carried by the existing Foskor distribution station and the new Chemie distribution station in the Phalaborwa area. The 11 kV supply to the phosphate mining operations of Foskor was transferred from the Foskor distribution station to Chemie which is now fully equipped to supply the requirements of both Foskor and Bosveld Kunsmis.

The construction of a 132 kV line from Steelpoort distribution station to a platinum mine in the area will be continued in 1974. To strengthen the 88 kV network in the Middelburg-Groblersdal-Marble Hall area and to cater for its growing demand, a new 132 kV substation, Nasareth, is planned for construction near Middelburg in 1974. This new substation is to receive supplies through two 132 kV lines from Rockdale, an existing substation in the Middelburg area. A start will be made in 1974 with the construction of a 132/22 kV substation, Karino, near Nelspruit, to provide farming supplies in the area.

On the Highveld, further progress was made during the past year with the 132 kV supply to Kriel Power Station, its associated coal mine, and its residential township. The permanent supplies to the township and to the coal mine will be completed in 1974.

The 88 kV and 66 kV networks were also extended considerably during 1973, and further extensions are planned in 1974. This development is taking place mainly in the

Witbank-Bronkhorstspruit-Kendal-Kinross-Bethal-Belfast areas. A 66 kV line from Malelane distribution station to a new substation to be named Lomati was started during the year and is planned for completion in 1974.

A number of pumping stations, forming part of the water supply system to Kriel Power Station from Jericho Dam near Amsterdam, will require power supplies in 1974 and 1975. These supplies will be provided from the existing 88 kV network.

There has been a lively growth in the demand of the larger municipalities in the undertaking. To name a few of these, increased supplies are planned in 1974 to Bethal, Ermelo, Witbank, Middelburg, and Nelspruit.

Electrification of the Witbank-Pretoria railway is planned for 1974. This will necessitate the construction of a new 88 kV transmission system from the Highveld Steel Distribution station near Witbank to a point near Bronkhorstspruit, bordering on the Rand and O.F.S. Undertaking. Three 88 kV and one 132 kV points of supply are to be given to the S.A. Railways on this section. Also planned for 1974 is an additional 88 kV point of supply on their Witbank-Middelburg section, and nine additional 132 kV points of supply on their Middelburg-Waterval Boven-Nelspruit section. A start was made during the year with the construction of five additional 132 kV points of supply on their Nelspruit-Komati section. Completion is planned during the first quarter of 1974.

During 1973, the undertaking maintained the progress of the preceding year in rural electrification. The total number of farming supplies increased from 3 187 at the end of 1972 to 3 634 at the end of 1973, an increase of 14 per cent.

In the Highveld region, the demand for electricity increased as a result of electrification by dairy farmers of their milking and cooling processes. Electrification of irrigation in the Groblersdal-Marble Hall, and Lomati-Komatipoort areas was also continued during the year. Construction is in progress of transmission lines to serve rural schemes, particularly in the Middelburg, Bracken, Panbult, Arnot, Wales, and Komatipoort areas.

Good progress has been made with the planning of a new office complex for the undertaking's headquarters in Witbank. Contractors will commence work early in 1974 and complete the building during 1975.

Financial

Details of units sold to the various classes of consumers, the total revenue, and the total working costs for the year 1973 are given in the table on page 113. The average price per unit sold increased by 4,8 per cent during the year, from 0,536 7 cent per unit in 1972 to 0,561 2 cent per unit in 1973. Total sales revenue for the year amounted to R34 312 857 and exceeded the corresponding figure for 1972 by 22,1 per cent.

Eastern Transvaal Undertaking

Consumer	Sales of electricity								Revenue from sales		Average price per unit sold	
	Number		Proportion %		Units sold		% Change		Rand	Rand	Cents	Cents
Class	1972	1973	1972	1973	1972	1973	72/71	73/72	1972	1973	1972	1973
Traction	7	7	6,25	5,76	327 051 248	351 255 007	+9,32	+7,40	2 315 028	2 557 212	0,707 8	0,728 0
Bulk	25	27	6,66	6,72	348 775 605	409 843 674	+19,24	+17,51	1 999 379	2 456 713	0,573 3	0,599 4
Foreign	2	3	0,30	2,62	15 508 000	159 650 801	+971,02	+29,47	97 709	1 047 971	0,630 1	0,656 4
Mining	89	94	28,34	25,54	1 483 458 448	1 557 451 895	+3,33	+4,99	7 887 836	8 676 459	0,531 7	0,557 1
Industrial	2 945	3 254	57,86	58,79	3 028 803 083	3 584 485 198	+21,41	+18,35	15 244 269	18 834 857	0,503 3	0,525 5
Domestic	4 047	4 199	0,58	0,56	30 485 146	34 236 104	-19,88	+12,30	531 645	628 237	1,743 9	1,835 0
Street lighting	23	21	0,01	0,01	572 090	588 131	-11,53	+2,80	17 664	20 369	3,087 6	3,463 3
Total	7 138	7 605	100,00	100,00	5 234 653 620	6 097 510 810	+14,76	+16,48	28 093 530	34 221 818	0,536 7	0,561 2
									1972	1973	Accumulated to 31/12/73	
									R	R	R	
Total revenue									28 093 530	34 221 818		
Working costs									30 145 942	37 040 813		
Surplus									—	—		
Deficit									2 052 412	2 818 995	1 875 363	