ELECTRICITY SUPPLY COMMISSION

ANNUAL REPORT
for the year ended 31st December 1972
with a review of activities to April 1973

Contents

Caption to frontispiece
A view of the Hendrik Verwoerd Dam with Escom's hydro station in the right foreground, which was opened by the State President, Mr. J. J. Fouche, on 4th March 1972.

Hierdie verslag is ook in Afrikaans verkrygbaar

ELECTRICITY SUPPLY COMMISSION

To the Honourable
THE MINISTER OF
ECONOMIC AFFAIRS
House of Parliament
Cape Town

3rd May, 1973

Sir
As required by Section 19 of the Electricity Act, 1958, the Commission has the honour to present its fiftieth Annual Report and Accounts covering its work for the financial year ended 31st December, 1972.

Escom Centre, 204 Smit Street, Johannesburg

Members of Commission and Management

Members of the Electricity Supply Commission

Dr. R. L. Straszacker, *Chairman*
W. H. Andrag
Dr. A. J. du Toit
D. J. Malan
E. Pavitt
H. H. L. Abrahamse
K. F. Morrison

Members of the Management Committee

General Manager
Jan H. Smith
Pr.Eng., M.A.(Oxon), B.Sc.(Oxon), B.Sc.(Eng.) (Cape Town)

Assistant General Manager
I. D. van der Walt
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Senior Manager (Operations)
F. W. Stutterheim
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Senior Manager (Design and Construction)
Dr. N. Troost
Pr.Eng., D.Sc.(Eng.) (Witwatersrand)

Financial Manager
J. A. Bothma
C.A.(S.A.), B.Com.(Pretoria)

Commercial Manager
A. J. Levy
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Administrative Manager and Chief Legal Adviser
P. J. T. Oosthuizen
B.A., LL.B. (Orange Free State)

Economic Consultant
H. M. Torr
B.Com. (Witwatersrand)

Deputy Senior Manager (Design and Construction)
N. T. van der Walt
M.Sc.(Eng.) (Witwatersrand)

Personnel Manager
J. L. van der Walt
Pr.Eng., B.Sc.(Eng.) (Witwatersrand), B.Admin.(UNISA)

Managers of the Commission's Undertakings

Border
F. O. Pearce
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Cape Eastern
F. O. Pearce (Acting until 31st July 1972)
J. P. Rodger (Acting from 1st August 1972)

Cape Northern
J. L. Rothman
B.Sc.(Eng.) (Stellenbosch)

Cape Western
G. D. G. Davidson
Pr.Eng., M.Sc.(Tech.) (Manchester), B.Sc.(Eng.) (Witwatersrand)

Central Generating
I. C. McRae
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Eastern Transvaal
J. S. van Velden
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Natal
H. P. Alexander
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Orange River
J. P. Rodger
Pr.Eng., B.Sc.(Eng.) (Cape Town)

Rand and Orange Free State
J. H. Harden
Pr.Eng., B.Sc.(Eng.) (Witwatersrand)

Swawek

T. A. Theron
Pr.Eng., B.Sc.(Eng.) (Cape Town)
Manager until 30th April 1972

J. P. Brand
Pr.Eng., M.Sc.(Eng.) (Cape Town)
Manager as from 1st May 1972
General manager as from 1st August 1972

Principal features and events of the year

Total sales of electricity during 1972 amounted to 41 649 million kWh, reflecting an increase of 9,5 per cent over the 38 040 kWh sold in 1971. A growth rate of 9 per cent or more in the sales of electricity has now been attained for the fourth successive year. This high rate of growth is due mainly to increased sales to municipalities and to the industrial sector. Sales of electricity to the mining industry nevertheless still comprised 35 per cent of Escom's total electricity sales in 1972.

Following the amendment of the Electricity Act in 1971 and the granting of the necessary permit by the Electricity Control Board, the Central Generating Undertaking was established on 1st January 1972, with the function of generating electricity and supplying it in bulk to six of Escom's distribution undertakings which were at that date interconnected by a nation-wide transmission system. The first year of operation of the Central Generating Undertaking, which happened to coincide with the 50th year of Escom's existence, has been successful. The integrated operation of Escom's power stations, which are now administered by the Central Generating Undertaking, gives rise to economic and other advantages.

The 400 kV transmission system linking the Transvaal power stations with the Cape Western Undertaking was strengthened during 1972 by the provision of a second line from Grootvlei to Hydra. Similarly, the 400 kV link to Natal was strengthened by the installation of a second line from Camden to Chivelston.

With the exception of the Border Undertaking and the small Cape Eastern Undertaking, which are not yet connected to the national transmission system, the electricity requirements of all Escom's distribution undertakings have since the 1st January 1972, been supplied by the Central Generating Undertaking.

As a result of the extension of the national transmission system to furnish a partial bulk supply to the Port Elizabeth Municipality it will become advantageous to incorporate the Cape Eastern Undertaking with the Orange River Undertaking. Subject to the approval of the Electricity Control Board the extension of the area of the Orange River Undertaking to include Port Elizabeth and the amalgamation of the two undertakings will take place in 1973. The West Bank power station in the Border Undertaking, at present still isolated, is to be linked in 1973 with the interconnected power stations of the Central Generating Undertaking, and an application for this transfer will be made to the Electricity Control Board.

The establishment of the Central Generating Undertaking and the interconnection of the power stations operated by this undertaking bring about a change in the geographic pattern of power generation in South Africa. A principle laid down in the permit granted by the Electricity Control Board is that the Central Generating Undertaking must operate "in the manner calculated to be the most efficient and economical manner of producing electricity from all the sources of supply available to it." In these new circumstances, the output of a given power station is not necessarily governed by the demand for electricity in the vicinity where it happens to be situated, but is determined by the most economic contribution which it can make towards the total demand for electricity to be supplied by the Central Generating Undertaking to Escom's distribution undertakings. The concept of optimum operation of interconnected power sources involves a number of aspects: savings in overall coal costs, a reduction of the power station reserve cover required to ensure reliability of supplies, and the benefits of scale with regard to both the amount of power generation and the size of generating units which can be installed. On the debit side are the capital-related and other costs associated with the national transmission system interconnecting the power sources with the distribution undertakings, but this is off-set by savings in the transport of coal.

The generation of electricity is reduced as much as possible in the coastal coal-fired power stations where fuel costs are high as a result of railage, and the inland power stations in the north, where fuel costs are low, are operated at the highest possible load factor. During the year 1972, only 38 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 supplied from the north via the transmission system. Approximately 39 per cent of the electricity required by the Natal Undertaking in 1972 was supplied from the Eastern Transvaal power stations via the transmission system. Power generation in the coal-fired power stations of the coastal provinces will be further reduced in the future, and the national transmission system of the Central Generating Undertaking will be extended and strengthened.

In the present stage of development the new coal-fired power stations which are being built to supply the new power demands of Escom's distribution undertakings are all located on the Transvaal coalfields. During 1972, a third 350 MW set at Arnot power station and a fifth 200 MW set at Hendrina were placed in service. The programme for 1973 provides for an additional set in each of these power stations, as well as an additional 200 MW set (the fifth) in the Grootvlei power station. Preliminary work is in progress with the large Kriel power station which on completion will have a capacity of 3 000 MW made up of six 500 MW sets. The first set in this power station will be placed in service in 1975. In the second half of the seventies, the present capacity of 160 MW of the Hendrik Verwoerd hydro-electric power station will be doubled, and the Vanderkloof hydro-electric power station at the P. K. le Roux Dam will be placed in service with a total generating capacity of 220 MW.

The programme for the importation of electricity from the Cabora Bassa hydro-electric power station in the Portuguese territory of Mozambique is proceeding according to plan, and it is expected that this source of power will be utilised from 1975 onwards.

The growth in the demand for electricity will be met up to the year 1979 by the further development of the four coal-fired power stations mentioned (Grootvlei, Arnot, Hendrina and Kriel), together with the planned increase of the hydro-electric generating capacity of the Hendrik Verwoerd and Vanderkloof power stations plus the agreed power import from Cabora Bassa. Further steps which must be taken to increase the sources of electricity supply to provide for the requirements of the eighties are at present under consideration.

Investigations into the establishment of Koeberg, Escom's first nuclear power station at Duinefontein, near

Cape Town, are continuing. Whereas a tentative date of September 1981 had been proposed for bringing the first nuclear set into service, further technical studies of the behaviour of the 400 kV transmission system under fault conditions, including the condition which would arise on the unexpected loss of a large nuclear set in the Western Cape, and further investigations into costs led to the decision to strengthen the transmission system by the construction of a third 400 kV line from the north. This third line is scheduled for completion by the winter of 1983, and will provide for the growth of load in the Western Cape. As a result of this decision, the commissioning date of the first nuclear set has been deferred.

The strengthening of the transmission link between the Western Cape and the coal-fired power stations of the Transvaal, and the prospect of the introduction, in the future, of base-load nuclear generating plant in the Western Cape both point towards the attractiveness of a major pumped storage scheme in that region. The feasibility of such a scheme is being studied.

The continued extension of the national transmission grid in South Africa allows an optimal exploitation of the country's resources for electric power generation, and demands thorough consideration of the schemes to be selected for the various generating duties which arise: base load, intermediate load, peak load, and reserve. Apart from the Koeberg nuclear power station and a pumped-storage station in the Western Cape, the other schemes under consideration include the exploitation of the Tugela River for hydro-electric power generation, the construction of a large new coal-fired power station, the installation of additional, large sets at three of Escom's smaller, existing coal-fired power stations, other pumped-storage schemes and gas-turbines at strategic points of the national transmission system.

The tentative proposal of the Swazi Government concerning the possibility of a coal-fired power station in Swaziland, with Escom as the most important purchaser of electricity, constitutes a further possible source of power which may be utilised during the eighties. The economic feasibility of the scheme is at present being investigated.

During the financial year 1972 contributions amounting to R13 596 000 were made to the Capital Development Fund, set up under the Electricity Amendment Act 1971, and this amount was invested, in terms of the Act, in Escom stocks. The amount represents 5,3 per cent of the revenue for the year; but the effect upon tariffs was largely off-set by reductions in the contributions to the Reserve Fund and, on account of the current high rates of interest, the amounts required to be set aside to the Redemption Fund. The contribution in 1972 was below the rate of contribution prescribed by the Act; but the Capital Development Fund is regarded as an essential aid to financing the ever-increasing capital needs of Escom and the contributions will have to be raised in future years to build up the Fund effectively.

Escom found the financial situation in 1972 somewhat easier than it was in 1971. On the South African capital market there was a drop in the high interest rates which applied in 1971, and favourable short and long-term loans were also obtained on overseas markets. During the year 1972, long-term loans to the value of R177 million were raised, those from the local market constituting R152 million, and those from overseas R25 million.

As a result of rising costs Escom was obliged, during 1972, to raise tariffs in certain undertakings, as follows:

Rand and Orange Free State Undertaking
An increase in the surcharge from the previous level of 5 per cent to 12,5 per cent from January 1972.

Eastern Transvaal Undertaking
A surcharge of 5 per cent on tariffs from January 1972.

Orange River Undertaking
A surcharge of 5 per cent on tariffs from January 1972.

Natal Undertaking
A surcharge of 5 per cent on tariffs from July 1972.

Cape Western Undertaking
An increase in the surcharge from the previous level of 5 per cent to 10 per cent from July 1972.

Cape Northern Undertaking
A decrease in the discount from the previous level of 20 per cent to 15 per cent from July 1972.

The trend towards rising costs continues and has compelled Escom to introduce further tariff increases in all undertakings from April 1973.

Escom acts as an agent for the South West Africa Water and Electricity Corporation (SWAWEK) with regard to, inter alia, the design, construction and operation of power stations and transmission systems. During 1972 the first two 30 MW coal-fired sets were placed in service in the Van Eck power station at Windhoek, and the installation of a third set will be completed early in 1973. To conserve water, these sets employ the direct dry-cooling system. The Van Eck power station was officially opened on 31st July 1972 by the Minister of Economic Affairs, Mr. S. L. Muller.

Preparatory work is proceeding on the Ruacana hydro-electric power station which is to be built on the Kunene River which forms the border between South West Africa and Angola. This station is planned to house five 80 MW machines on completion. The first three 80 MW sets are planned for commercial service during 1977. Contracts for civil work and for these first three turbo-generators were placed in the last quarter of 1972.

The first phase of the transmission system to be provided for SWAWEK comprises about 720 km of 220 kV transmission lines, 313 km of 66 kV transmission lines, four large distribution stations and three smaller transformer substations. Most of this distribution system was placed in service during 1972. Electricity from the Van Eck power station is already being supplied to, among others, the Tsumeb copper mine and the Oamites mine 56 km south of Windhoek. Early in 1973, supplies were made available to the municipalities of Swakopmund and Walvisbaai.

During Escom's 50-year existence, its organisational structure has been gradually adapted to changing circumstances. As a result of the widening scope of its activities, the complexity of its modern equipment, and the importance of modern business principles in combating rising costs, a modification of the organisational structure is at present being carried out. The differentiation between line and staff functions is being stressed, as well as the accounta-

bility of managers at all levels for the optimum utilisation of funds, manpower, equipment and material.

A computer-based information system is being designed and implemented along the organisational lines of corporative management as an important part of the programme of reorganisation. For this purpose, a number of computers, which will be interconnected, are being installed. Level 1 of the computer system is the strategic level, devoted mainly to long-range planning and control as an aid to senior management. At this level, summarised information is received from the other two computer levels. Level 2 is the tactical level at which resources will be evaluated and controlled on a daily basis. Because of Escom's size, this level will be split into four geographical areas, with a computer in each area. Level 3 is the operational level, where the action takes place and transactions are recorded. Level 3 computers are planned for each large power station and will, in particular, be used by power station personnel in determining day-to-day running costs. They will also be used to produce power station accounts, pay-rolls, stores control reports and performance reports for power station equipment.

A new head office complex is at present being planned for Escom. A suitable site has been bought on the northern boundary of the municipal area of Sandton. This site was carefully chosen to take advantage of the new through roads and motorways in the vicinity. Two firms of architects, one in Johannesburg and one in Pretoria, have been engaged for the design of the building. The design embodies a low structure with high utilisation factor.

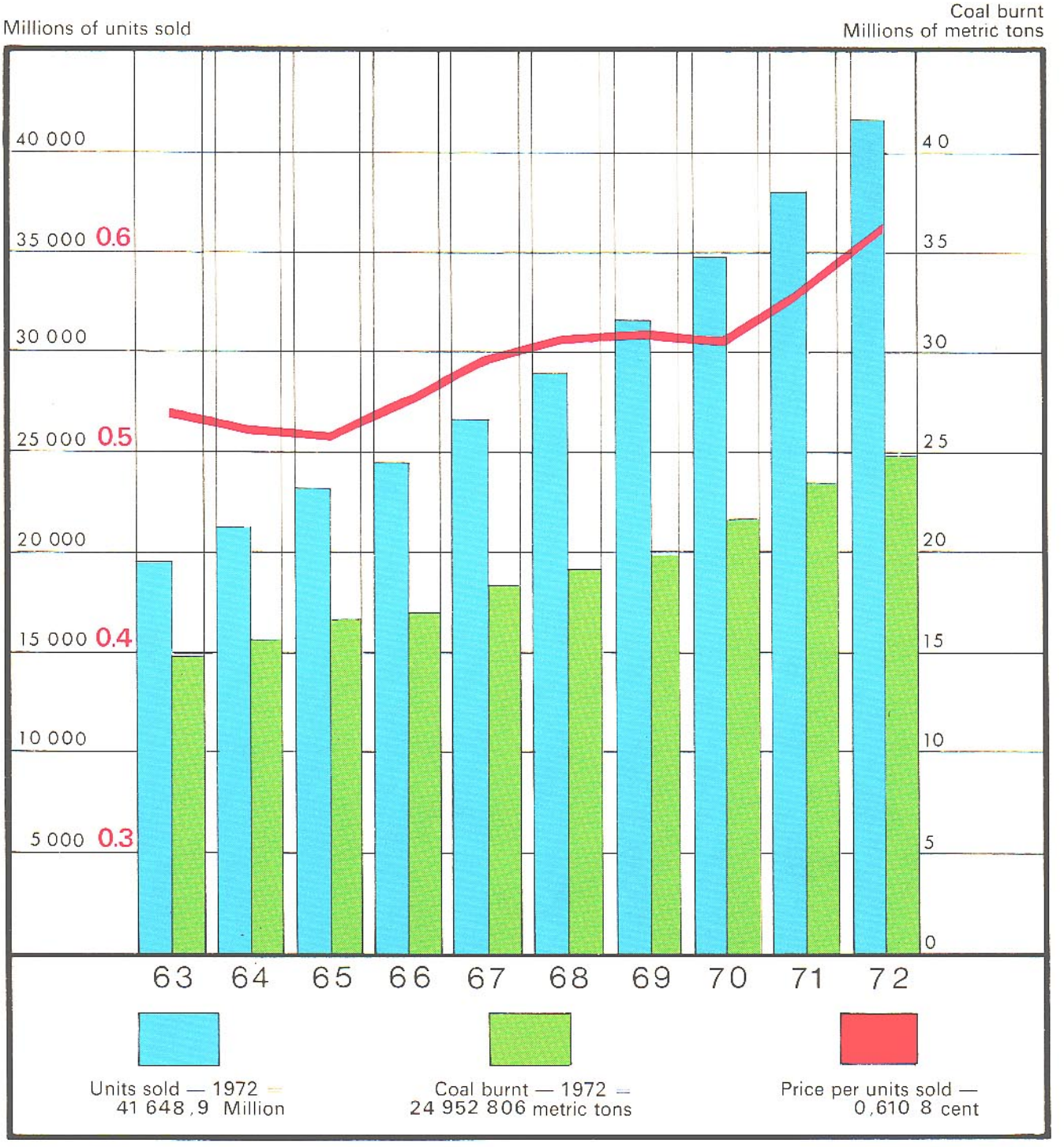
On 1st March 1973, Escom celebrated its Golden Jubilee. For this occasion, a banquet was held in Johannesburg on the 19th March. A commemorative booklet has been prepared which reviews Escom's activities over the past fifty years. The theme of this publication is Escom's progress in the achievement of a cheap and abundant supply of electricity in the Republic of South Africa.

Sales of electricity

Escom's total sales of electricity during the year 1972 amounted to 41 649 million kWh, which reflected an increase of 9,49 per cent over the corresponding figure for the year 1971. The average cost per unit sold in these years was 0,577 4 cent in 1971 and 0,619 5 cent in 1972. The average revenue per unit sold increased from 0,577 2 cent in 1971 to 0,610 8 cent in 1972. The growth of Escom's sales over the ten-year period 1963 to 1972 is shown in the diagram below, together with the yearly average price per unit sold and the yearly total quantity of coal burnt. The figures represented are the annual averages and totals for all undertakings. Similar figures for the individual undertakings are given in later sections of this report.

Total sales of electricity for the year 1972 in the main categories of supply with the corresponding figures for the year 1971 and the rate of increase during the year under review, are given below (see table 1). The final column indicates the average rate of growth over the ten-year period ending in 1972.

The mining industry continues to be Escom's largest consumer, having purchased 34,8 per cent of all units sold



in 1972. Electricity sold for mining purposes in 1972 exceeded the figure for 1971 by only 2 per cent. This is well below the average annual increase of 4,6 per cent in sales to the mining industry during the ten-year period ending in 1972, and reflects the gradual lessening of the growth rate of electricity sales to the gold mining industry.

There are however important new developments in other branches of the mining industry. Sales of electricity to different sectors of the mining industry for the period 1965 to 1972 are given in the tables below (see tables No. 2 and 3).

Industrial consumers accounted for 30,4 per cent of

Table No. 1: **Total units sold**

	1962	1971	1972	Increase 1971/72 %	Average annual increase in 10 years %
Bulk supplies					
Municipalities	3 573 766 595	9 264 502 567	10 716 123 010	15,67	11,61
Direct supplies					
Traction	1 296 352 748	2 616 331 430	2 782 239 091	6,34	7,94
Mining	9 246 759 274	14 227 066 399	14 508 564 567	1,98	4,61
Industrial	3 700 839 193	11 013 786 657	12 641 525 374	14,78	13,07
Domestic	296 379 011	906 249 053	987 901 131	9,01	12,79
Street lighting	6 940 008	12 084 746	12 565 615	3,98	6,12
Total	18 121 036 829	38 040 020 852	41 648 918 788	9,49	8,68

Table No. 2: **Electricity sold to mining sector**

	Units sold (millions)							
	1965	1966	1967	1968	1969	1970	1971	1972
Gold mining (including uranium)	9 345	9 469	9 946	10 339	10 647	11 504	11 662	11 773
Diamond	230	250	264	281	282	288	297	325
Coal mines	365	412	453	480	495	535	563	589
Platinum	210	257	308	378	653	941	962	990
Copper	14	195	235	256	282	343	374	422
Iron ore (including manganese)	66	72	74	81	80	88	92	101
Chrome	8	10	11	14	17	20	25	31
Asbestos	66	83	91	107	118	137	152	161
Other	40	64	59	59	68	91	100	117
Total	10 344	10 812	11 441	11 995	12 642	13 947	14 227	14 509

Table No. 3: **Electricity sold to gold mining industry**

	Units sold (millions)							
	1965	1966	1967	1968	1969	1970	1971	1972
Witwatersrand	2 663	2 528	2 492	2 329	2 186	2 144	1 974	1 801
Klerksdorp	1 560	1 702	1 851	1 987	2 178	2 283	2 355	2 561
Far West Rand	2 194	2 271	2 410	2 639	2 759	3 439	3 602	3 622
Orange Free State	2 533	2 538	2 700	2 804	2 913	3 002	3 095	3 144
Eastern Transvaal	395	430	493	580	611	636	636	645
Total	9 345	9 469	9 946	10 339	10 647	11 504	11 662	11 773

Table No. 4: **Electricity sold to industrial sector**

	Units sold (millions)						
	1966	1967	1968	1969	1970	1971	1972
Building and cement (including quarrying) . . .	530	562	646	716	782	824	878
Chemical (including pharmaceutical)	1 098	1 214	1 241	1 272	1 376	1 444	1 639
Engineering (including the motor industry) . . .	415	544	562	535	569	618	592
Foodstuffs, consumer goods and commercial .	935	1 022	1 111	1 088	1 407	1 673	1 852
Iron, steel and base metals	2 435	2 680	2 967	3 672	4 114	5 034	6 272
Paper and paper products	416	469	493	542	485	494	520
Other	240	238	419	749	875	927	889
Total	6 069	6 729	7 439	8 574	9 608	11 014	12 642

Escom's total sales of electricity in 1972. The increase of 14,78 per cent for the year is higher than the average annual increase of 13,07 per cent for sales in the industrial category during the ten-year period ending in 1972. Important contributors to the high rate of industrial growth reflected in the electricity sales for 1972 were the ferro-metal industries in the Eastern Transvaal.

Escom's figures relating to industrial supplies do not present a complete picture since they do not include supplies of electricity furnished to industrial consumers by municipalities, or supplies generated by industrial undertakings for their own use. However, Escom's sales figures do give a broad picture of industrial development. Sales by Escom to the main sectors of industry are given in the table above (see Table No. 4). The iron, steel, and base-metal industries are Escom's largest consumer group in the industrial sector, and the rate of growth in these industries continues to be higher than the average for all industries. In 1972 sales to this consumer group represented 49,6 per cent of Escom's total sales of electricity to the industrial sector.

Sales of electricity under the heading of "Bulk supplies to municipalities" comprised 25,7 per cent of Escom's total electricity sales in 1972. Bulk sales of electricity during 1972 showed an increase of 15,67 per cent over the corresponding figure for 1971. This is high in relation to the average annual increase of 11,61 per cent experienced in respect of bulk sales of electricity during the ten-year period ending in 1972. The high growth rate in respect of bulk supplies furnished to municipalities is partly due to the increased partial bulk supply taken by the City of Cape Town, and the partial bulk supplies taken during 1972 by the cities of Pretoria and Bloemfontein. The municipalities of Johannesburg, Port Elizabeth, Kroonstad, Upington, George, Oudtshoorn, and Mossel Bay have also contracted to take partial bulk supplies from Escom to meet the growth beyond the output of their own power stations.

Sales of electricity in the category of bulk supplies include electricity sold to neighbouring territories. The following table shows the increase in these sales during the past two years (see Table No. 5).

Electricity sold to the South African Railways for traction increased by 6,34 per cent to 2 782 million units in 1972. The percentage increase for 1972 is somewhat less than the average annual increase of 7,94 per cent experienced in these sales during the ten-year period ending in 1972. Details of the development which took place in 1972 in respect of railway electrification are given in a later section of this report dealing with operations in each of the separate undertakings. The 1972 sales of electricity for railway traction in each of the undertakings concerned are compared with the 1971 figures in the table below (see Table No. 6).

In Table No. 7 on page 11, the total sales of electricity in each of Escom's undertakings are given for the years 1971 and 1972, and the various rates of growth during 1972 can be compared with those attained over a ten-year period ending 1972. It is interesting to note that during 1972 all the undertakings except the Rand and Orange Free State Undertaking experienced growth rates higher than 11 per cent. Disregarding the small though rapidly growing Orange River and Cape Eastern Undertakings, the largest percentage increase in units sold by the undertakings was the figure of 14,76 per cent achieved in the Eastern Transvaal Undertaking. This was due mainly to the demands of the developing ferro-metals industries in that undertaking. Next came

Table No. 5:
Electricity sold to neighbouring territories (kWh)

	1970	1971	1972
Lesotho	8 824 906	12 259 196	16 634 095
Mozambique . .	576 800	786 800	15 508 000

Table No. 6: **Electricity sold: S.A.R. traction**

Undertaking	Units sold (millions) 1971	1972	Per cent increase
Cape Northern	203,6	203,0	−0,29
Cape Western	420,2	424,3	0,98
Eastern Transvaal . .	299,2	327,1	9,32
Natal	819,7	893,5	9,00
Rand and O.F.S. . . .	873,7	934,4	6,95

Natal Undertaking with a percentage increase in units sold of 14,26 per cent. The second inland undertaking to achieve an exceptionally high rate of growth in units sold was the Cape Northern Undertaking, with a figure of 13,43 per cent—attributable mainly to copper mining developments in its area of supply. The tendency in recent years for high rates of growth in units sold by the coastal undertakings has been maintained in the Border Undertaking with a figure of 12,06 per cent and in the Cape Western Undertaking, with a figure of 11,10 per cent. The units sold by the Rand and O.F.S. Undertaking increased by 6,72 per cent as compared with an average of 6,5 per cent per year over the ten-year period ending 1972.

Continued progress is being made with the expansion of Escom's rural networks, and a total of 2 218 new farm supplies were connected during 1972. Table No. 8 below illustrates how Escom's undertakings have contributed to this development over the ten-year period ending in 1972.

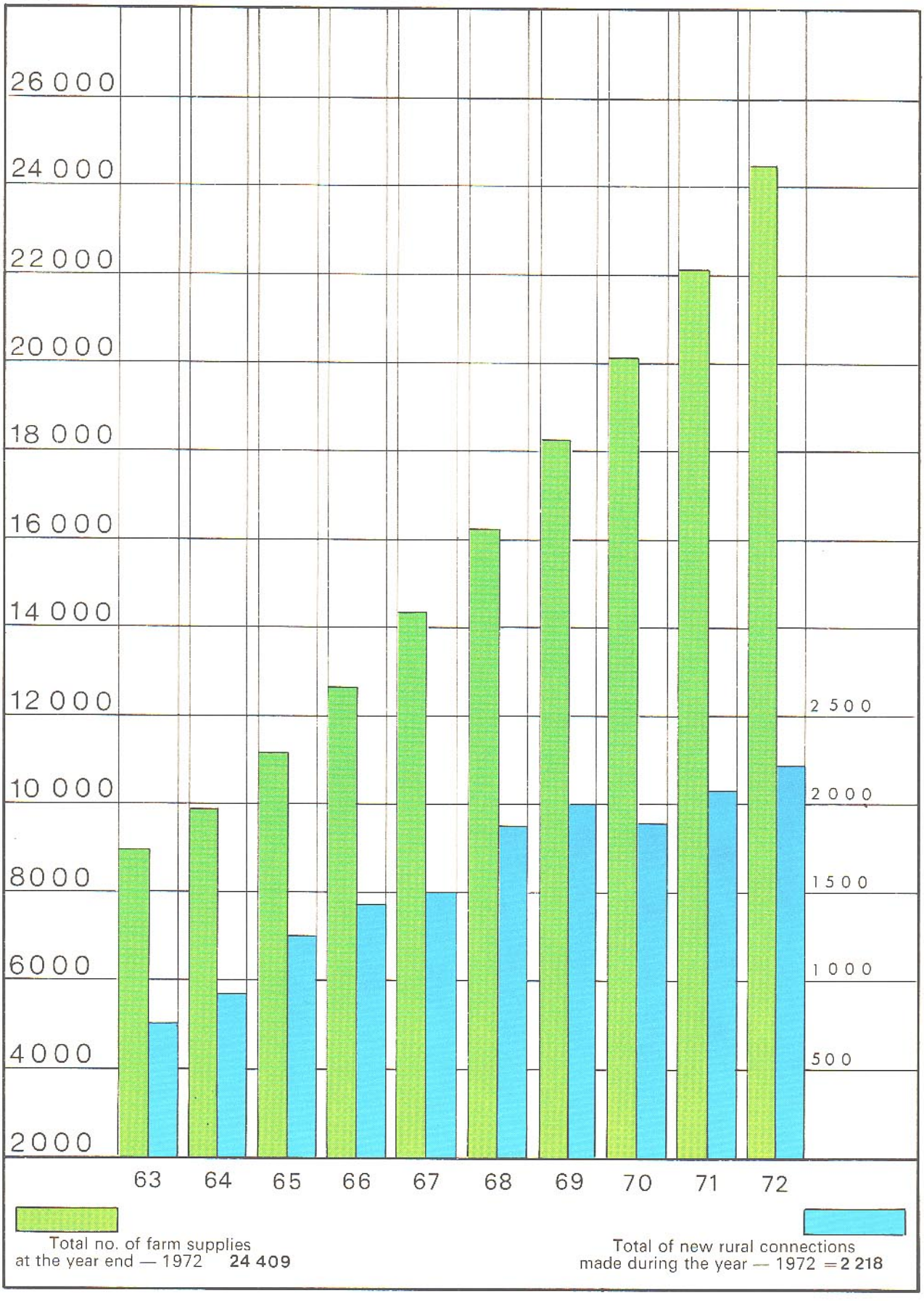
Table No. 7: **Total sales of electricity—Escom Undertakings**

Undertaking	Units sold 1962	1971	1972	Increase 1971/72 %	Average annual increase in 10 years %
Cape Western	945 016 912	2 494 472 478	2 771 290 262	11,10	11,36
Cape Northern	224 938 860	789 677 686	895 770 296	13,43	14,82
Cape Eastern	—	7 105 193	8 406 612	18,32	—
Border	188 602 113	399 915 539	448 160 431	12,06	9,04
Natal	2 320 478 067	6 072 318 560	6 937 976 230	14,26	11,57
Eastern Transvaal	1 012 152 795	4 561 509 148	5 234 653 620	14,76	17,86
Rand and O.F.S.	13 429 848 082	23 619 963 129	25 208 163 275	6,72	6,50
Orange River	—	95 059 119	144 498 062	52,01	—
Total Escom	18 121 036 829	38 040 020 852	41 648 918 788	9,49	8,68

Table No. 8: **Total number of farming supplies at the year end**

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Cape Western	4 214	4 340	4 556	4 778	4 972	5 155	5 269	5 527	5 805	5 866
Natal	1 888	2 036	2 164	2 356	2 614	2 936	3 347	3 707	4 140	4 652
Rand and O.F.S.	1 022	1 322	1 765	2 440	3 288	4 221	5 147	5 862	6 719	7 570
Cape Northern	853	957	998	1 056	1 278	1 387	1 531	1 662	1 777	2 033
Border	241	264	320	365	410	458	501	571	642	688
Cape Eastern	—	80	233	283	319	330	368	378	387	388
Eastern Transvaal	776	875	1 095	1 335	1 498	1 735	2 057	2 411	2 717	3 187
Orange River	—	—	—	—	—	—	—	—	4	25
Total	8 994	9 874	11 131	12 613	14 379	16 222	18 220	20 118	22 191	24 409

Supplies to farmers



System operation and generation of electricity

Upon its establishment, in terms of the Electricity Amendment Act of 1971 and a permit issued by the Electricity Control Board, the Central Generating Undertaking on the 1st January 1972 took over the existing power stations of the Rand and Orange Free State, Eastern Transvaal, Cape Western, and Natal Undertakings so that they would henceforth be operated as a single, integrated system of pooled power stations. The Central Generating Undertaking has also taken over the major transmission systems to Natal and the Cape, together with the major Rosherville workshops. The establishment of the Central Generating 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.

Installed generating capacity

Major items of power station equipment taken into service during 1972 and under construction or on order as at 31st December 1972 are given in Table No. 1. "Principal equipment installed" is detailed in "Statement No. 1" on pages 58 to 61 of this report. Other statistical statements appear on pages 58 to 72.

As a result of problems experienced in 1972 with new power station equipment, the electricity supplied by the new, large power stations with low fuel costs was less than had been budgeted for, and more electricity had to be generated in the smaller power stations with high fuel costs. Unexpected modifications had to be carried out on the generator stators at Grootvlei, the turbine and generator rotors of the Camden sets, and the turbine rotors of the Hendrina sets. Initially, problems were also experienced with the boiler supplying steam to the 200 MW dry-cooled set at Grootvlei power station. It is expected that design modifications to the boiler will enable this set to give satisfactory service, so that experience can be acquired with this dry-cooling system. The abovementioned problems with some of the large new sets placed a heavy load on the maintenance department of the Central Generating Undertaking in 1972, with the result that the programme of planned overhauls has been delayed. The availability of newly-commissioned power station equipment is receiving particular attention, since it is an important factor in the reduction of costs.

System operation

The 400 kV transmission system was further extended when the second line between Camden power station in the Eastern Transvaal and Chivelston distribution station in Natal was placed in service in September 1972. After this strengthening of the link between the system of the Natal Undertaking and the power stations on the Transvaal coalfields it became possible to reduce appreciably the output from the power stations in Natal, and thus to save on the costs of coal railage. The transmission system from the north to the Cape Western Undertaking was also strengthened during 1972 by duplication of the line between Grootvlei and Hydra distribution station near De Aar. Further extension of the transmission system will enable the Border Undertaking (with East London as the most important load centre) to join the pooled system during the second half of 1973, and the Orange River Undertaking to expand its area of supply to include Port Elizabeth.

Generation of electricity

A total of 47 411 million units of electricity was generated in Escom's power stations during 1972 and this exceeds the corresponding figure for 1971 by 9,06 per cent.

As shown in Statement No. 5, electricity was purchased from Port Elizabeth Municipality and from the Department of Water Affairs (the hydro-electric power station at the Paul Sauer dam) for the small and isolated Cape Eastern Undertaking.

Table No. 2 on page 16 shows the units sent out from Escom's power stations and fed into the systems of the various distribution undertakings.

Of the units fed into the system of the Cape Western Undertaking in 1972, 62 per cent were imported from the northern power stations by means of the partly completed 400 kV transmission system, and the remaining 38 per cent were sent out from power stations in the Cape Western Undertaking. Similarly, the duplication of the 400 kV line from Camden to Chivelston distribution station in September 1972 led to a further increase in the import of power by the Natal Undertaking from the power stations in the north. During the last three months of 1972, 51,4 per cent of the units of electricity fed into the Natal system were imported from the northern power stations. This is an appreciable increase over the equivalent figure of 31,6 per cent for the last three months of 1971. Thus, although the total units supplied to the Natal Undertaking during the last quarter of 1972 showed an increase of 9,2 per cent over the units fed to the Natal Undertaking during the same quarter of 1971, it was possible to reduce the quantity of coal railed to the Natal power stations situated at railheads during the quarters concerned from 340 316 tons to 159 192 tons, or by 53,2 per cent.

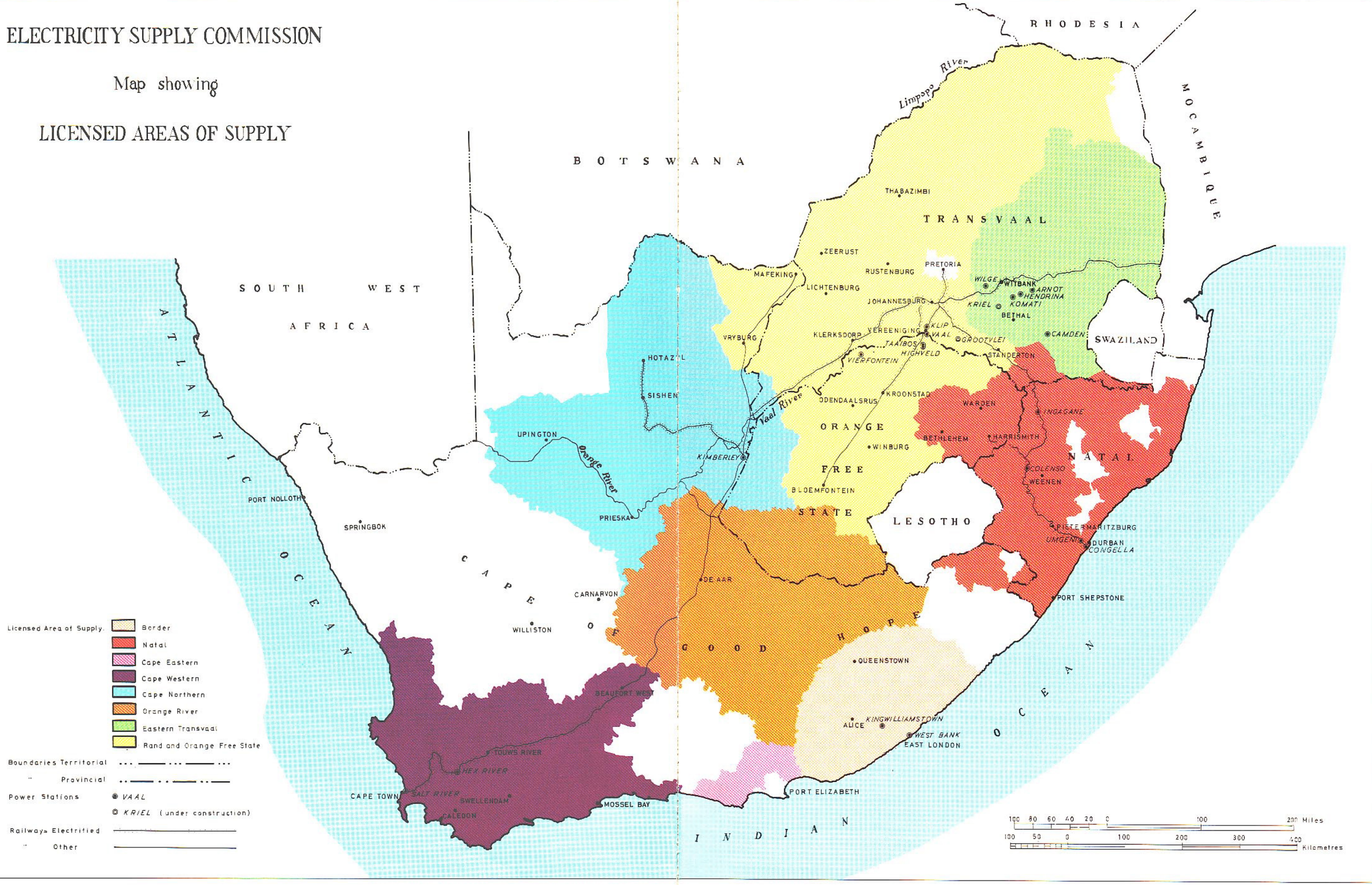
Table No. 1:

	Plant taken into service in 1972		Plant under construction or on order	
	Boilers kg/s	Generators MW	Boilers kg/s	Generators MW
Hendrina Power Station	214,2	200	1 071,0	1 000
Arnot Power Station	334,0	350	1 002,0	1 050
Kriel Power Station	—	—	2 640,0	3 000
Hendrik Verwoerd Power Station	—	—	—	160

ELECTRICITY SUPPLY COMMISSION

Map showing

LICENSED AREAS OF SUPPLY



The one-hour maximum demands (sent out) for different Escom undertakings for the past seven years are given in the Table No. 3 below:

There is diversity between the demands of the individual undertakings, and the total demand on the Escom system is lower than the aggregate of the demands on 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 hourly maximum demands on the Escom system as a whole are given in the Table No. 4 on page 17 for the past four years, together with the load magnitudes of the separate distribution undertakings during this hour of highest load on the total Escom system.

Water supplies to Escom's power stations

The quantities and sources of water used in Escom's power stations are shown in Table No. 5 on page 17. As in 1970 and 1971, the quantity of water drawn from the Vaal river again decreased in 1972. Although the water drawn from this source in 1972 was 2,8 per cent less than in 1971, the units generated in power stations dependent on the Vaal river for a water supply increased by 1,67 per cent. The total consumption of water in the northern pooled power stations in 1972 exceeded the figure for 1971 by only 4,65 per cent whereas the 1972 output of these power stations, in units of electricity sent out, was 11,6 per cent higher than that in 1971. This economy in the use of water can be attributed, as in 1971, to the improved chemical treatment of cooling water, as a result of which, moreover, the discharge of undesirable blowdown water to neighbouring rivers and streams is eliminated.

The first signs became evident in 1972 of the contribution towards overall water savings which was made by the 200 MW Grootvlei turbo-generator and associated dry-cooling system.

Coal supplies

During the year 1972, Escom's suppliers of coal continued to meet all the demands for output which were made—despite fluctuations in these demands which were sometimes severe, as a result of forced outages of newly commissioned, large generating units. Unavoidable breakdowns of these large units have compelled the older, less efficient power stations to be operated at higher output than had been planned on the basis of economic considerations. In spite of these difficulties, the coal burnt, expressed as a national total per unit sent out from all coal-burning

Table No. 2: **System units sent out**

Undertaking	1970	1971	1972
Rand and Orange Free State including units purchased	24 038 301 821	25 499 117 027	26 959 438 637
Eastern Transvaal including units purchased	4 408 509 835	4 687 206 086	5 438 792 715
Natal	5 339 920 912	6 407 615 317	7 370 199 845
Cape Western	2 321 450 252	2 755 735 000	3 078 753 475
Cape Northern	796 660 488	879 930 806	999 728 487
Orange River	52 899 109	101 829 257	156 844 959
Central Generating (own use)	—	—	9 228 224
Sub-total (S.O. Central Generating)	*	*	44 012 986 342
Border	363 186 420	407 963 700	462 078 230
Cape Eastern (units purchased)	7 116 727	8 320 899	9 651 416
Total all Escom	37 328 045 564	40 747 718 092	44 484 715 988

*Before the establishment of the Central Generating Undertaking

Table No. 3: **Hourly maximum demand (MW sent out) of Escom's Undertakings over the last seven years**

Undertaking	1966	1967	1968	1969	1970	1971	1972
Rand and Orange Free State	2 644,4	2 863,0	3 114,7	3 277,1	3 624,4	3 878,4	4 054,9
Natal	613,3	660,0	712,0	794,0	867,0	1 060,0	1 177,0
Eastern Transvaal	368,4	424,7	485,2	575,5	615,3	680,4	786,1
Cape Western	260,6	276,6	298,6	326,8	389,8	442,8	491,7
Cape Northern	79,2	102,2	117,5	127,3	139,8	157,1	179,5
Border	54,6	58,9	64,9	67,7	70,2	80,3	88,3
Orange River	—	—	—	7,6	12,4	20,5	30,3
Cape Eastern	1,1	1,5	1,7	2,0	2,0	2,3	2,5

Table No. 4: **Magnitude of load in each distribution undertaking at the time of maximum demand in total Escom system—MW**

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

Table No. 5: **Water used in Escom power stations** (megalitres)

Source	Potable water		Crude river water		Water from other sources including boreholes, dams and sewage		Sea water circulated (estimated)	
	1971	1972	1971	1972	1971	1972	1971	1972
Western Cape								
Cape Town Municipality	243	259						
Worcester Municipality	635	637						
Sea water (estimated)							238 187	279 000
	878	896					238 187	279 000
Border								
East London Municipality	88	100						
Sea water (estimated)							121 600	138 000
	88	100					121 600	138 000
Natal								
Durban Municipality	4 345	3 410						
Sea water (estimated)							252 969	124 535
Tugela River			2 791	2 186				
Ngagane River			10 369	9 785				
	4 345	3 410	13 160	11 971			252 969	124 535
Transvaal and O.F.S.								
Vaal River	769	989	48 470	46 854				
Olifants River			—					
Bronkhorstspruit			6 642	6 387				
Komati River			32 007	39 633				
Usutu Complex			23 940	23 158				
Other	51	66			7	185		
	820	1 055	111 059	116 032	7	185		
Total—All Escom	6 131	5 461	124 219	128 003	7	185	612 756	541 535

power stations has decreased by 0,82 per cent, and the national total cost per unit sent out from all coal-fired stations has decreased by 0,93 per cent. These percentage reductions are revealed by a comparison of the national totals given in Statement No. 4 on page 66, with the corresponding figures for the year 1971. Such a comparison shows that an increase during 1972 of 7,4 per cent in the national total of units sent out from all the coal-burning power stations was accompanied by a lesser increase—6,46 per cent—in the national total coal cost during the same period.

The national average cost per ton of coal burnt has remained at its 1971 level of R2,25 despite the localised increases reflected in Table No. 6:

Table No. 6: **Cents per metric ton**

	1971	1972
Northern power stations . . .	176,4	183,4
Natal power stations	408,7	410,1
Cape power stations	689,0	743,6
National average	225,1	225,0

The reason for the national average cost remaining static during 1972 is that, notably in Natal, less of the expensive, railed coal was burnt in power stations supplied from railheads, while more of the cheaper, pithead coal was burnt at the power stations situated on coalfields. This has become possible through the existence of the national 400 kV transmission network.

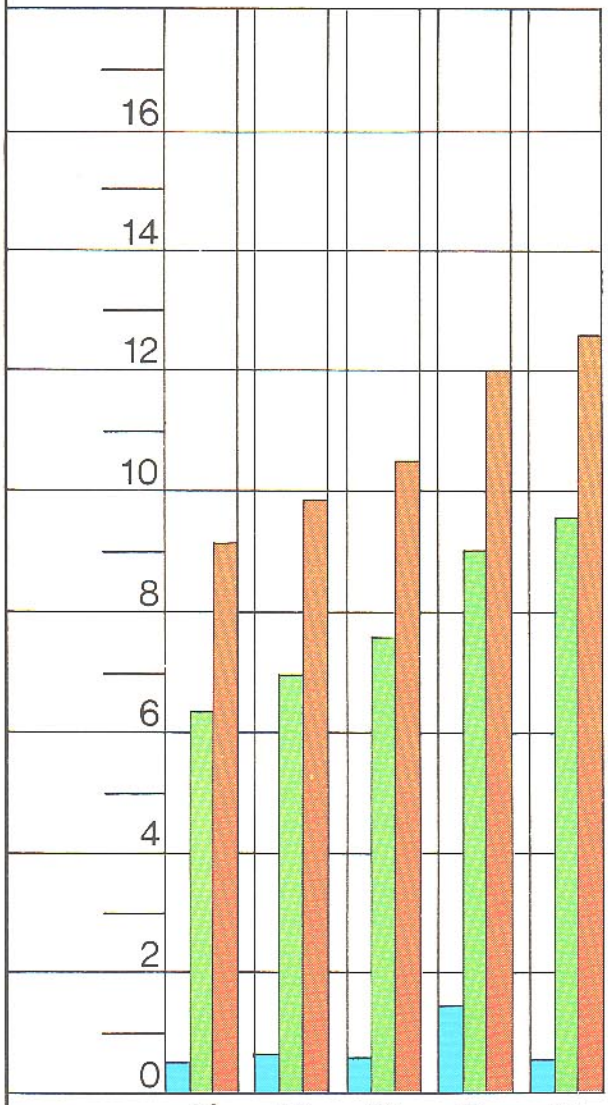
The increases in the cost of coal in the Cape and Natal arise from price control determinations which are relatively large on account of the interval between price control adjustments. That the increase in the cost per ton of coal supplied to the northern power stations was only from 176,4 to 183,4 cents per ton—an increase of 4,0 per cent—is due in part to the increase in output from new collieries but also to the control exercised by Escom's suppliers over their expenditure. In the light of price movements in 1972 this is a praiseworthy contribution towards curbing inflation. One feature of the current coal costs is that non-mechanised collieries have been able to hold their costs; but in the light of the upward adjustment of wages in the mining industry this is not expected to continue during 1973. It is expected that in future years the mechanised collieries—some with open-cast mining operations—should demonstrate their worth in combating cost inflation and thus justify the higher capital outlay involved in this method of mining.

Escom's policy of laying down ground stockpiles of coal has been extended to all the pithead power stations. Stockpiles not only afford their associated collieries the advantage of a more uniform rate of production, but have also proved their worth already in meeting unexpected demands arising from colliery and power station plant outages.

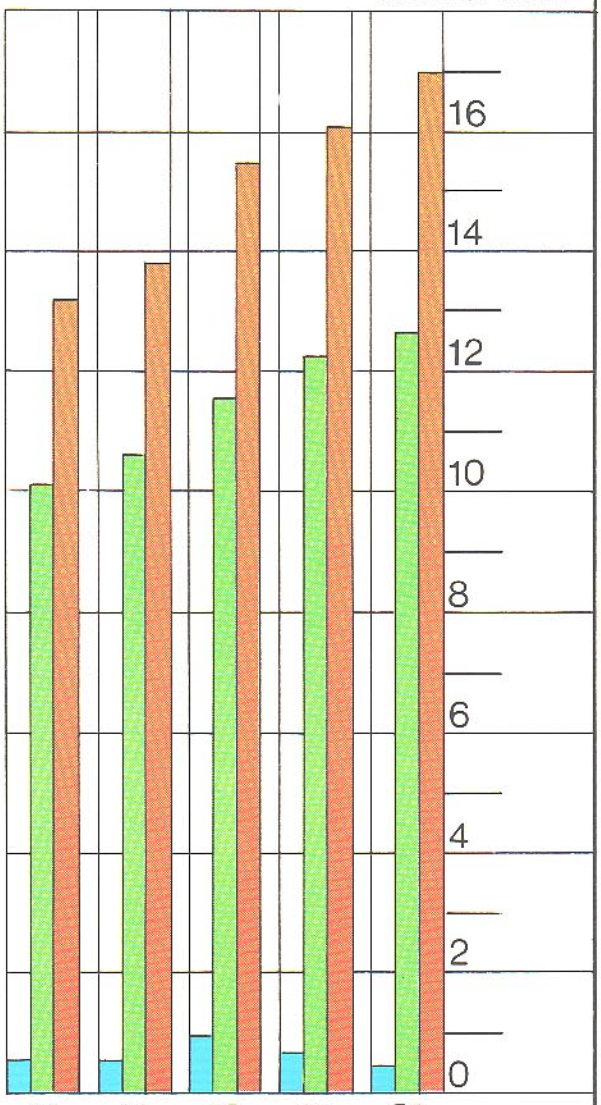
Where circumstances are favourable, ash from power stations is returned to the associated coal mines for disposal underground. This procedure not only reduces the number of unsightly ash-dumps on surface, but also raises the percentage recovery of coal which can be achieved underground.

Capacity of the Republic's Power Stations

Expansion over the last five years
Thousands of MW



Planned expansion over the next five years
Thousands of MW



68	500	6345	‡ 9149
69	640	6985	‡ 9844
70	598	7583	• 10500
71	1430	9013	• 12000
72	538	9551	• 12600

73	556	10107	• 13200
74	518	10625	• 13800
75	930	11555	‡ 15500
76	660	12215	‡ 16100
77	420	12635	‡ 17000

Installed by Escom during year *

Total MW Installed in Republic

Total MW Installed by Escom

* Including de-commissioning of obsolete plant.

" Includes 1.07 x Cabora Bassa supplies delivered at Apollo

‡ Based on figures given by Department of Statistics.

• Estimated from 1969 and earlier figures given by Department of Statistics.

ERRATUM

The green and brown panels in the colour key have been transposed

Development of Escom's power stations

Particulars are given below of Escom power stations which are under construction, being extended, or in the planning and design stage.

Grootvlei Power Station

Grootvlei power station, situated in the Southern Transvaal between Balfour and Villiers, is designed for six coal-fired sets of 200 MW with steam conditions of 103 bar and 538°C. The first two sets were placed in service in 1969, the third in 1970, and the fourth in 1971. The fourth set is coupled to a dry-cooling tower which eliminates evaporation losses in the cooling circuit and in this way achieves appreciable savings in water consumption. The experience gained with this first large dry-cooling installation will be of considerable importance in the planning and design of future power stations. Utilities abroad are also interested in its performance.

A fifth set with a "wet-cooled" tower will be placed in service at Grootvlei Power Station early in 1973.

Hendrina Power Station

This coal-fired power station, situated near Hendrina in the Eastern Transvaal, will on completion contain ten 200 MW sets operating with steam conditions of 103 bar and 538°C. The first two sets were placed in service in 1970, the third and fourth in 1971, and the fifth in 1972. The sixth and seventh sets are at an advanced stage of construction, and are expected to go into service towards the end of 1973 and 1974 respectively. Contracts have been placed for the remaining three sets which are planned for completion in the years 1975, 1977, and 1978.

Arnot Power Station

This coal-fired power station is situated near Middelburg in the Eastern Transvaal, and is designed for six 350 MW sets operating under steam conditions of 159 bar and 510°C, with reheat to 510°C. The first two sets went into service in 1971, followed by a third in 1972. The last three sets are planned to go into service at yearly intervals in 1973, 1974, and 1975.

This power station is Escom's first to employ the reheat cycle. Use is also made of digital computers for data-logging, performance calculations, and for monitoring start-up procedures.

The first water supply pipeline from Kafferskraal dam, on the Komati river with a normal capacity of some 145 000 cubic metres per day, was placed in service in September 1972 in order to supply a part of the water requirements of the Arnot and Kriel power stations. A second pipeline is planned for 1975 or 1976, depending upon water consumption.

Kriel Power Station

Design and construction is in progress of this large coal-fired power station which is being built between Bethal and Ogies in the Eastern Transvaal. The planned ultimate capacity is 3000 MW made up of six 500 MW sets operating on the reheat cycle, with steam conditions of 160 bar and 510°C, with reheat to 510°C.

A considerable amount of work was done in 1972 on foundations and other civil-engineering work. The first 200 permanent houses in the residential area will be completed early in 1973. This housing will be used initially by the construction staff, who will then vacate it for the operating staff.

According to the programme for Kriel Power Station, the first 500 MW set is to be placed in service in 1975, and the second in 1976. The expected year of completion of this power station to its ultimate capacity of six 500 MW sets is 1981.

In collaboration with the Department of Water Affairs, design work is in progress with the first phase of a scheme for the supply of water to Kriel power station from the Usutu River.

Hendrik Verwoerd Power Station

The first two 80 MW sets in this hydro-electric power station at the Hendrik Verwoerd Dam were placed in service in 1971, and have given satisfactory service since then. To complete this power station, two more sets of 80 MW capacity each, will be placed in service in 1976. The contracts for more sets and for the civil work were placed at the end of 1972.

Vanderkloof Power Station

The Vanderkloof hydro-electric power station is to be built at the P. K. le Roux dam on the Orange river, downstream of the Hendrik Verwoerd dam.

Escom plans to place two 110 MW sets comprising this power station in service for the winter of 1978.

Good progress is being made with the final design of this power station. The civil works contract was placed before the end of 1972, and tenders have been received for the machines.

Koeberg Power Station

Escom is retaining its plan to build the first nuclear power station in the Republic, Koeberg Power Station, at Duinefontein, some 30 km north of Cape Town.

The deferment of the commissioning date of the first nuclear set has already been referred to on page 6. In the meantime, the Marine Effluent Research Unit of the University of Cape Town is assisting Escom with studies of the seabed and beach which affect the positioning and construction of offshore water intakes and outlets for the power station, and of ocean currents and waves which affect the dispersion of effluents from the power station.

Research and development

Research and the development of new techniques continued during 1972 in many fields associated with the generation, transmission, and distribution of electricity. New projects were started in radio interference, tower testing, extra-high voltage, and the prevention of pollution, while work was continued in fields such as earth conditions and their influence on underground installations, the handling of coal, ash, and water, performance of equipment, and the investigation of failures.

The mechanical research division is engaged in short-term programmes connected with the testing of material and equipment. Experimental investigations were carried out to assist with the compilation of standards for ear-protectors and telephone booths in noisy environments. At the commissioning stage of the Hendrik Verwoerd power station, measurements were taken to determine stresses in the turbine spiral casings and in the steel reinforcing and concrete surround during load rejection, and with aeration at various load levels.

Plant tests were carried out in respect of butterfly valves, pipelines, and instrument mounts. Materials tests were carried out involving handrail stanchions and floor gratings. The relative resistance of pipeline protective coatings to the stripping action of clay soils is also being investigated. The application of the radio isotope dilution technique of flow measurement has been continued. A project has been started to measure the flow rate of pulverised fuel.

The long-term projects of the mechanical research division comprise, inter alia, the compilation of standards for the measurement of coal abrasiveness, and the determination of the relationship between abrasiveness and wear in boiler equipment. The investigation of air pollution by power stations has been resumed, and the treatment of effluent is receiving attention.

The electrical research division was engaged mainly in long-term investigations. A rig to simulate equipment faults and interruptions to supply was set up to obtain statistical data concerning the behaviour of electrical equipment. Field work was performed to determine the supply harmonics at the Apollo distribution station, the infeed point of the Cabora Bassa high voltage d.c. line, and work was also done to determine the nature and cause of carrier protection maloperation, in order to develop a more reliable and safe system for this kind of protection. The effect which radio and television interference due to power lines has on the communication services of the country is under investigation. At a number of distribution stations field work has been done in connection with the grounding of earth mats to determine whether satisfactory standards of safety are attained. Investigations are also in progress, in collaboration with the Council for Scientific and Industrial Research, to find a reliable means of measuring the voltages and currents in high-voltage transmission lines without having to make direct connections. The feasibility is also being investigated of erecting an extra-high voltage testing station, mainly for over-voltage and impulse testing of transmission lines and equipment. This is being done in anticipation of the introduction, in the future, of an operating voltage of 750 kV. The pollution of transmission line insulators is being investigated near Sasolburg, in the vicinity of heavy industries, and in a coastal region near Duinefontein.

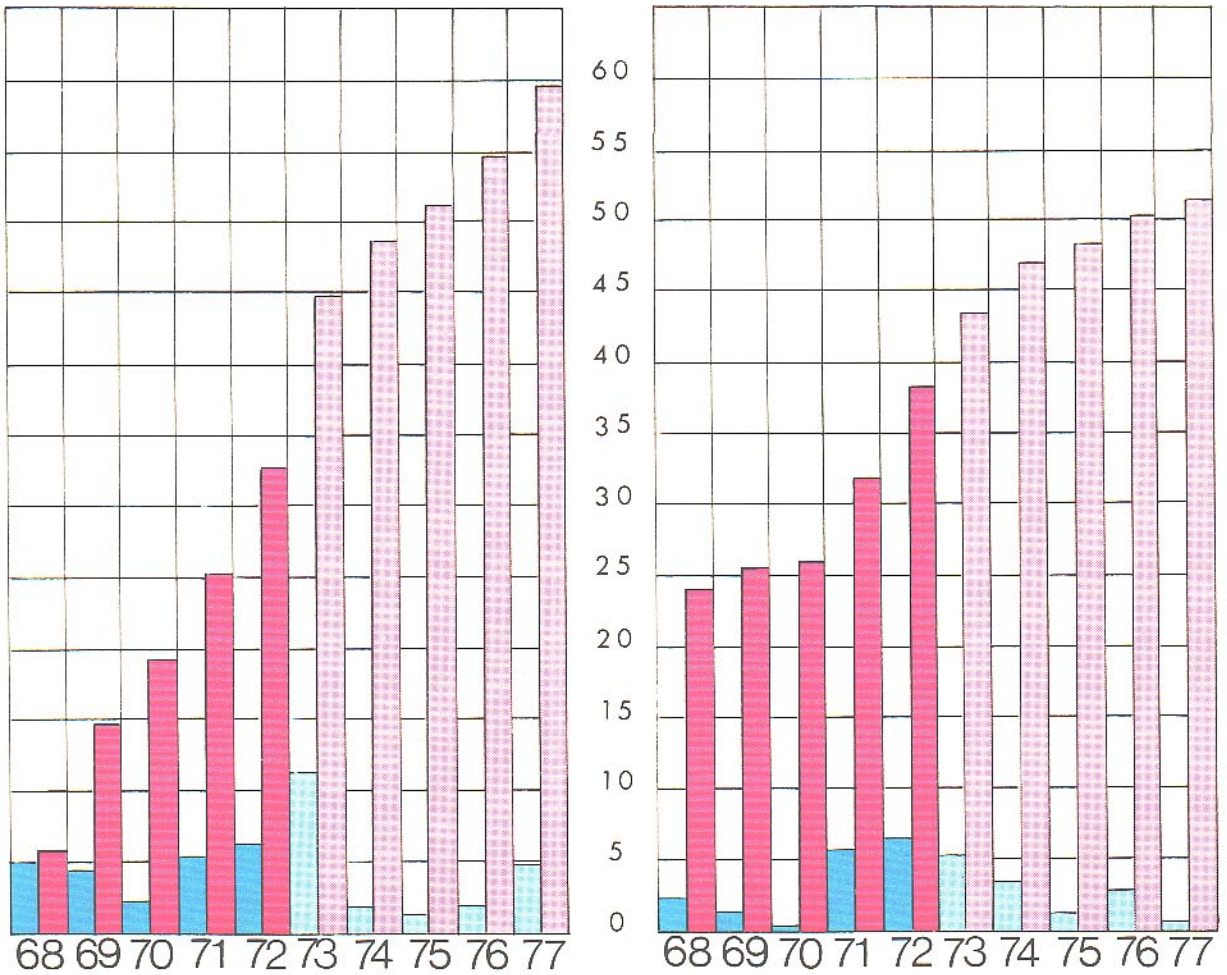
Collaboration has been maintained with the Council for Scientific and Industrial Research, the South African Bureau of Standards, and the Universities through joint research projects and by means of national committees on which Escom is represented, such as the National Advisory Committee on Electrical 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, participation in the International Conference on Large Electric Systems C.I.G.R.E., where Escom representatives serve on the Administrative Council and on two of the study committees, participation in 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 Electricite de France.

Expansion of Escom's Distribution System

400 kV Lines

Hundreds of kilometres

275 kV Lines



kilometres installed during year

Planned annual installation

Total kilometres in service

Planned total in service

400 kV Lines		Year	275 kV Lines	
Installed during year	Total		Installed during year	Total
–	596,6	68	218,3	2 412,3
879,9	1 479,9	69	139,4	2 551,7
439,3	1 915,8	70	46,8	2 598,5
587,6	2 503,4	71	577,0	3 175,5
771,1	3 274,5	72	650,2	3 825,7
1 224,0	4 498,5	73	505,0	4 330,7
358,0	4 856,5	74	363,0	4 693,7
248,0	5 104,5	75	123,0	4 816,7
360,0	5 464,5	76	260,0	5 076,7
498,0	5 962,5	77	60,0	5 136,7

Expansion of Escom's Transmission System

Lines and cables 132 kV		Year	Lines and cables 88 kV and lower	
Installed during year	Total		Installed during year	Total
98,4	5 485,8	67	3 665,5	41 257,9
594,5	6 080,3	68	3 670,2	44 928,1
817,7	6 898,0	69	3 993,5	48 921,6
164,9	7 062,9	70	3 396,5	52 318,1
537,9	7 600,8	71	3 532,0	55 850,1
1466,0	9 066,8	72	4 010,0	59 860,1

Personnel

The staff employed by Escom as at 31st December 1972 was a total of 26 937, made up of 9 566 White and 17 371 non-White employees. Due to competition on the labour market, it was not always possible to recruit all the personnel required. Two campaigns were conducted overseas to recruit immigrants with the specialised knowledge necessary for Escom's continued development. The 90 immigrants brought to South Africa in 1972 virtually equalled the figure of 91 recruited in 1971.

Education and training

New bursaries were granted to 42 students in 1972 for study at various universities in the fields of Electrical and Mechanical Engineering, Land Surveying, Computer Science, and Architecture. The total number of bursars for 1972 was 93 (87 in 1971) and the cost to Escom amounted to R72 900 (R72 000 in 1971).

Escom also grants H. J. van der Bijl Scholarships to dependants of deserving Escom employees for study in fields not necessarily related to Escom's activities. Nineteen new scholarships were granted during 1972, bringing the total, including renewals and reinstatements, to 42 by the end of the year. The cost amounted to R37 410 (R41 670 in 1971).

An improved and more sophisticated induction and training scheme for 41 post-graduate engineers in their first and second years of training was instituted in accordance with the requirements of the S.A. Council for Professional Engineers. This scheme will also ensure more effective placement of young engineers within the Escom organisation. Towards implementation of the recommendations of the Straszacker Report, which stressed the important role of the technician in industry, a standard policy was formulated to handle the expected increase in the number of pupil technicians in the future. A total of 186 pupil technicians were in training in various categories during 1972 (87 in 1971). Since the opening of the new training centre and hostel for apprentices at Rosherville in April, the percentage pass in the trade test has improved from 61,9 per cent in 1971 to 76 per cent in 1972. Apprentices from all centres in the Republic undergo a period of training each year at Rosherville, which now caters for 400 annually.

The benefits of supervised training of operators are becoming evident since the appointment of staff training supervisors and the establishment of training sections at power stations. These sections collaborate with the Training Centre at Klip Power Station for assistance and guidance in training techniques. New employees are to be given an inaugural training period at power stations to acquaint them with accident prevention, welfare, recreation, service conditions, and the medical aid scheme. They are then to be given intensive "on the job" training, their progress being checked by periodic testing. Promotion will be granted on the successful passing of a standard test.

Staff are also receiving training in computer packages and techniques from the Information Systems Department.

Escom has appointed Senior Bantu Training Officers, each with the function of controlling a team of 20 Bantu Training Instructors stationed at various centres throughout the Republic to give intensive induction and on-the-job training to Bantu employees. To meet the needs of Escom's expanding Bantu training programmes, the number of teams of training instructors will be considerably increased in the near future. Training facilities at Klip Power Station are being extended to provide advanced courses to accommodate up to 30 Bantu supervisors at any one time.

With a view to keeping abreast of the latest scientific and technological developments, 49 senior Escom employees proceeded overseas for discussions, negotiations and training during the year. Moreover, 223 employees attended courses, seminars, and symposia locally, to improve their performance in various fields. To assist immigrants to acquire proficiency with the two official languages, qualified tutors were appointed at power stations where possible. The needs of head office employees in this respect were met by enrolment on suitable language laboratory courses. During 1972, arrangements were made for 162 employees to attend such courses.

Prevention of accidents

Escom's campaign for the prevention of accidents continued to make good progress in 1972. The rate of lost-time injuries per million man-hours worked, which had decreased continuously from 11,9 in 1969, 10,4 in 1970, and 8,5 in 1971, increased slightly to 9,1 during 1972. This figure for the year 1972 is still well below the national average for all industry excluding Escom. The number of lost-time injuries, which had decreased from 613 in 1968 to 505 in 1971, increased to 570 during 1972; but the change during this period in man-hours of exposure to accidents was from 38,8 million in 1968 to 58,9 million in 1971, and 62,3 million in 1972.

By the end of 1972, the following nine Escom power stations had attained the distinction of an award for one million injury-free man-hours:

Hendrina Power Station (Operation); Komati Power Station; Vierfontein Power Station; Klip Power Station; Salt River Power Station; Hex River Power Station; Colenso Power Station; West Bank Power Station; Hendrina Power Station (Construction site).

During the year 1972, the Straszacker Floating Trophy for an operating record of three million man-hours without a single lost-time injury was awarded to Vierfontein Power Station.

Amenities and recreation

The year 1972 was a successful one for the Escom Medical Aid Society. The surplus of income over expenditure achieved by the Society will enable it to build up the required reserve towards meeting unforeseen commitments in the future. Approximately 20 500 claims were paid each month in respect of the Society's 9 561 members and their dependants.

Good progress was made with the computerisation of control of the Escom salary increment system and of employees' contributions to the pension fund. By microfilming of pension records, a large saving of space has been achieved with no sacrifice of rapid accessibility. Further work in this direction is proceeding.

In the sphere of recreation, the most important event of the year was the inauguration of the Federation of

Escom Clubs. The main function of the Federation is to co-ordinate sporting activities, not only between one club and another, but also among the various areas, on a national basis. The Federation has become the responsible body between the clubs and the management of Escom. The amenities of the Escom (Rand Undertaking) Sports Club, which for 60 years had catered for most of the popular outdoor sports, were taken over by the Federation. The establishment of the Federation has increased the autonomy of the clubs and created an incentive to make better use of the amenities available to them.

Considerable emphasis is continuously placed on the well-being of Escom's non-White labour force. Better conditions of housing, and more and improved amenities have been or are to be provided at centres where these are considered to be inadequate. In this regard, the National Building Research Institute has been asked to undertake a study into housing for use by construction teams. Standard conditions for the medical treatment of non-White employees have been formulated. Where considered necessary, part-time medical officers will be appointed, while Escom will bear the costs of medical treatment incurred by an employee. Sport and recreation continues to be fostered, and in the Transvaal and O.F.S. alone 42 soccer teams are participating in an Escom league.

Financial

Capital expenditure
During 1972, expenditure on construction works amounted to R177 million (1971:R177 million) made up of:

Table No. 1:

Power station development	R83 million
Transmission and distribution systems, and expenditure at undertakings for extensions to supplies	R94 million

A variety of assets were either sold or written off, amounting to a value of R7 million, thus bringing the nett capital expenditure for the year to R170 million (1971: R175 million).

The total value of fixed assets earning revenue was increased by R137 million (1971: R225 million), and at the year end stood at R1 390 million. The additional items include the continued commissioning of generating sets at the power stations Grootvlei (R8 million), Hendrina (R18 million), and Arnot (R44 million).

Expenditure on contract works under construction and still to be completed at 31 December 1972 amounted to R248 million (1971: R215 million), the main concentrations of work in progress being at the Grootvlei, Hendrina, Arnot, and Kriel power stations.

The expansion in capital works has brought a proportionate increase in the amount of working capital required, so that the value of stores, materials, movable plant, and equipment at the end of 1972 increased by R12 million to R73 million.

Loans and the capital market
Long-term loans totalling R177 million (1971: R185 million) were raised during the year, as follows:

Table No. 2:	Million rand 1972	1971
Local market—public issues	152	95
Local market—private placement	—	20
Foreign market—public issues	25	51
Foreign market—private placement	—	19
Total	177	185

Local market
The first public placement on the local market in February 1972 enjoyed a very lively response. However, during 1972 the coupon rates of local stocks dropped from 9,25 per cent per annum for the first placement to 8,25 per cent for the placement at the end of November, which was issued subject to discount with a yield to redemption of 8,365 per cent. During the second half of the year the position became tighter on the capital market, evidently mainly because investors withheld funds in the expectation of a general improvement in market conditions, and a pattern of higher interest rates in the near future.

During the year 1972 there was a stable yet lively market in Escom stocks, and it was possible to realise a total nett income of nearly R8 million from the portfolios of Escom's internal funds. Great interest was shown in Escom stocks, especially by foreign investors, sales to Rhodesia in this category reaching a figure of R5 million.

Foreign market
The relative stability in the international monetary system during the first half of the year was followed by a period of instability, characterised by excess liquidity in the money markets of the countries with strong currencies. As a consequence of this, there was a drop in foreign short-term interest rates. In the short term, Escom was able to make good use of these circumstances, and has received offers of re-financing facilities at rates ranging from $1\frac{7}{8}$ per cent per year for a term of one month to 5 per cent per year for a term of six months.

No other South African institution has as yet taken advantage of this new facet of financing by making use of bank overdrafts and the issue of short-term promissory notes in foreign countries. The utilisation of these facilities during the year yielded a total sum of R16 million at an average cost of approximately 3,91 per cent per year. These good results can only press Escom to continue with this type of financing, and involve more foreign banks in it. The nett increase in foreign short-term loans and advances during 1972 comprised R11 million.

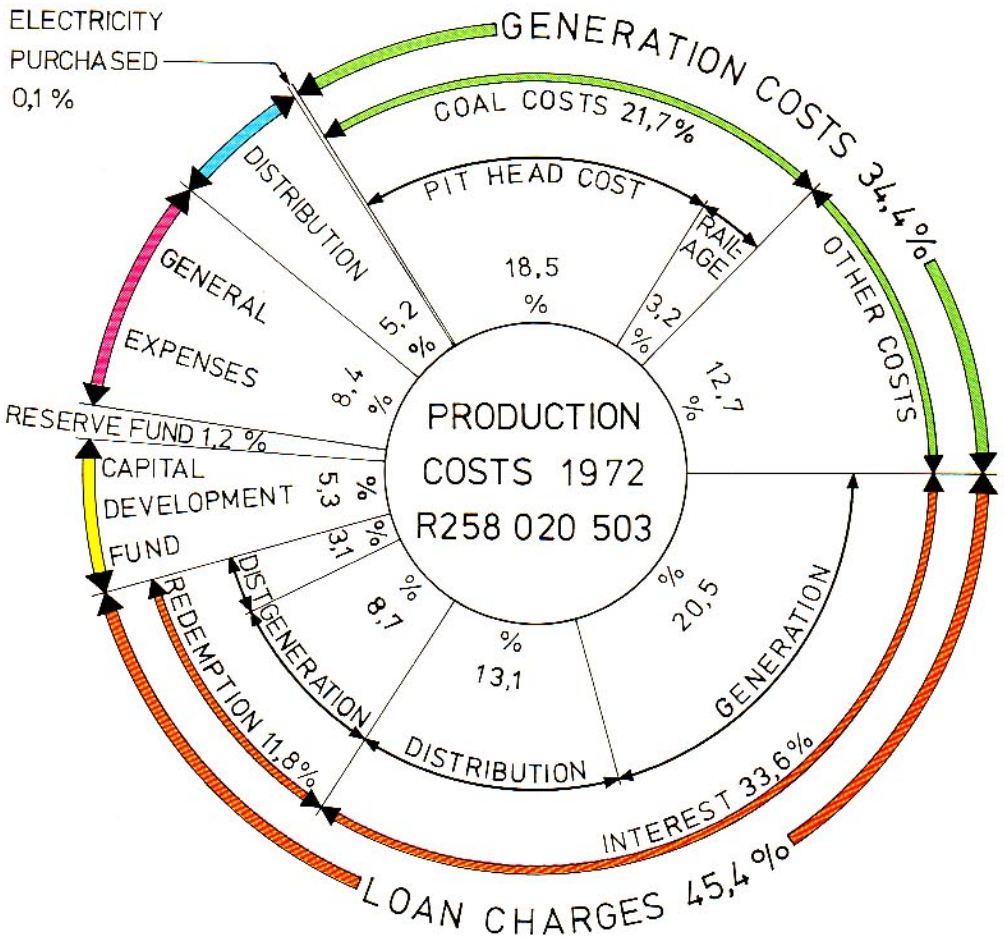
There was a corresponding drop in long-term rates in the foreign capital market, and in August Escom raised a DM 100 million (R25 million) bond issue with a coupon of 6,25 per cent and an issue price of 99,25 per cent.

As a result of the general improvement in Escom's liquidity position, foreign short-term loans and revolving credit loans totalling R22 million, which could have been renewed, were repaid during the year.

Capital development fund
As reported earlier in this report, contributions amounting to R13 596 000 were made to the Capital Development Fund, established in terms of the Electricity Amendment Act of 1971.

It is a requirement of the Act that moneys in the Capital Development Fund are invested in the Commission's own stocks, and that interest and profit earned from such investments will accrue to the Fund. The amount standing to the credit of the Fund on the 31st December 1972 was R14 148 000.

Revenue Account
The total revenue from sales of electricity in 1972 was R254 million, which represented an increase of R34 million or 15,5 per cent above the corresponding figure for 1971. The average price at which electricity was sold was 0,6108 cent per unit, as compared with 0,5772 cent per unit in 1971.



COSTS 1972
CIRCLE DIAGRAM

Note
A significant change in the diagram is the inclusion of the contributions from revenue to the Capital Development Fund. In comparison with earlier years, the amounts set aside for redemption of loans and to the Reserve Fund are lower.

Statistical summary

Revenue, costs, output and sales, and other figures relating to the operation of the Commission's Undertakings during the years 1968 to 1972 are as follows:

	1968	1969	1970	1971	1972	Per cent increase 1972 over 1971
Total revenue	161 475 000	176 106 000	193 475 000	219 585 000	254 394 000	15,9
Total costs	161 993 000	175 374 000	195 866 000	219 640 000	258 014 000	17,5
Difference between revenue and costs	-518 000	732 000	-2 391 000	—55 000	—3 620 000	
Sales of electricity	160 757 000	175 338 000	193 475 000	219 585 000	254 394 000	15,9
Net costs (less sundry revenue)	161 275 000	174 606 000	195 866 000	219 640 000	258 014 000	17,5
Average price per unit sold	0,5550c	0,5565c	0,5545c	0,5772c	0,6108c	5,821
Average cost per unit sold	0,5608c	0,5566c	0,5614c	0,5774c	0,6195c	7,291
Average net cost per unit sold	0,5583c	0,5542c	0,5545c	0,5772c	0,6108c	5,821
Cost of coal consumed (including railage)	44 604 000	47 453 000	48 807 000	52 705 000	56 113 000	6,5
Railage on coal consumed	10 571 000	10 647 000	9 577 000	9 388 000	8 332 000	-11,248
Coal consumed (metric tons)	19 133 931	19 982 911	21 630 578	23 416 164	24 952 806	6,562
Units generated	33 061 253 244	35 966 956 724	39 796 184 973	43 472 521 686	47 411 105 106	9,060
Units sent out	30 843 479 863	33 598 182 607	37 320 784 837	40 739 391 193	44 475 062 412	9,170
Units purchased	7 911 573	7 969 311	7 260 727	8 326 899	9 653 576	15,932
Units sold	28 885 008 545	31 505 591 370	34 890 575 085	38 040 020 852	41 648 918 788	9,487

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, 1972.

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 "Long Term Direct Foreign Loans" on Schedule No. 3.

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

The Commission has fixed redemption periods 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.

On the establishment of the Central Generating Undertaking, with effect from 1st January, 1972, the book value of assets relating to the generation of electricity and the main transmission system were re-allocated to the new undertaking. Consequently it was necessary to create a new section, for the Central Generating Undertaking, in the Redemption Fund records. The amounts transferred to this section in respect of loans raised in the past to finance the relevant expenditure were calculated from information contained in the Fund's records. In our opinion the apportionment of the amounts in the fund was fair and reasonable.

In valuing the Fund at 31st December, 1972, we have taken into account the market value of the investments at that date. The value of the Fund at 31st December, 1972, 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 Long Term Direct Foreign Loans 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 "Long Term Direct Foreign Loans" 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. The amounts so set aside have been invested in securities prescribed by the Electricity Act, 1958.

Verification of landed properties, rights and investments

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

Head office administration, engineering and general expenses

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

(a) Capital and Reserve Fund expenditure.

(b) Revenue Accounts of Undertakings.

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

Revenue accounts

The following is a summary of the operations of the Commission's Undertakings for 1970 and 1971:

	Surplus (deficit) 1971	1972	Accumulated surplus (deficit) at 31.12.72	Amounts set aside to Reserve Fund only 1971	Amounts set aside to Reserve and Capital Development Funds 1972
Cape Western	R99 000	(R737 000)	(R1 050 000)	R1 086 000	R600 000
Cape Northern	(98 000)	(259 000)	304 000	175 000	130 000
Cape Eastern	(44 000)	(43 000)	(184 000)	—	7 000
Border	(60 000)	235 000	(169 000)	110 000	111 000
Orange River	(120 000)	16 000	(275 000)	10 000	42 000
Natal	748 000	(2 607 000)	(95 000)	1 300 000	1 275 000
Eastern Transvaal	(644 000)	(2 052 000)	944 000	1 848 000	1 233 000
Rand and O.F.S.	64 000	1 820 000	(2 197 000)	4 039 000	1 254 000
Central Generating	—	—	—	—	12 000 000
	(R55 000)	(R3 627 000)	(R2 722 000)	R8 568 000	R16 652 000

Amounts set aside to Reserve Fund, 1970: R15 202 000.

Operations during the year resulted in surpluses at Border, Orange River and Rand and O.F.S. Undertakings and deficits at the other undertakings.

Charges for electricity being supplied have been increased with effect from 1st April, 1973, at all undertakings.

General

As a result of our audit of the books and accounts of the Commission for the year 1972, and subject to the foregoing remarks, in terms of Section 18 (8) of the Electricity Act, 1958, we report as follows:

(a) We have found the accounts of the Commission to be in order.

(b) The accounts issued present a true and correct view of the financial position of the Commission and its transactions and of the results of trading.

(c) Due provision, in terms of the Act, has been made for the redemption and repayment of moneys borrowed by or advanced to the Commission.

(d) As formerly, the land and rights, buildings and civil works, and machinery and plant are set out in the Balance Sheet on a cost basis.

(e) Sums fixed by the Commission have been set aside to the Reserve Fund and Capital Development Fund under Section 13 as prescribed.

(f) All our requirements as auditors have been complied with and carried out.

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

Johannesburg
26th April, 1973

Electricity Supply Commission
Established under the Electricity Act, 1922

Balance Sheet

31st December 1972

	R000		R000	
			1971	
Borrowings		**1 649 914**		1 471 398
Loans outstanding (Schedule No. 5)	**1 477 811**		1 300 750	
Other borrowings	**172 103**		170 648	
Import financing facilities taken up	**33 850**		23 237	
Other short-term advances	**138 253**		147 411	
Capital reserve				
Loans repaid	**215 087**		209 355	
Machinery and plant financed out of Reserve Fund	**10 360**		10 360	
	225 447		219 715	
Less: Cost of land and rights, buildings and civil works and machinery and plant sold and scrapped	**46 191**		39 107	
	179 256		180 608	
Exchange adjustment of foreign liabilities (Note 2)	**7 254**		7 551	
	172 002		173 057	
Balance on revenue accounts (Accounts Nos. 4 to 12)	**(2 722)**		905	
		169 280		173 962
Capital Development Fund (Account No. 1)		**14 148**		—
Redemption Fund (Account No. 2)		**302 220**		253 854
Amount set aside for repayment of foreign loans		**7 083**		5 525
Reserve Fund (Account No. 3)		**150 070**		137 642
Creditors and provisions		**75 644**		68 203
Creditors	**49 301**		43 257	
Interest on accrued loans	**22 886**		21 490	
Sundry provisions	**3 457**		3 456	
		2 368 359		2 110 584

	R000		R000	
			1971	
Capital expenditure at cost (Schedule No. 1)		**1 774 350**		1 604 755
Land and rights	**17 057**		15 401	
Buildings and civil works	**351 095**		321 064	
Machinery and plant	**1 158 545**		1 053 630	
Total in commission	**1 526 697**		1 390 095	
Works under construction	**247 653**		214 660	
Stores and movable plant		**73 142**		60 861
Stores and materials at cost	**60 793**		51 325	
Movable plant and equipment at cost less depreciation	**12 349**		9 536	
Investments of Capital Development Fund (Schedule No. 2)		**14 097**		—
Nominal value R14 400 000 (1971: R —)				
Market value R14 550 000 (1971: R —)				
Investments of Redemption Fund (Schedule No. 3)		**298 446**		248 239
Nominal value R315 854 000 (1971: R265 602 000)				
Market value R282 453 000 (1971: R212 452 000)				
Investments of Reserve Fund (Schedule No. 4)		**148 139**		134 487
Nominal value R154 991 000 (1971: R141 212 000)				
Market value R137 659 000 (1971: R113 598 000)				
Sundry investments		**11 127**		9 769
Electricity Supply Commission foreign loan bonds including interest accrued	**793**		1 006	
Nominal value R824 000 (1971: R1 047 000)				
Market value R805 000 (1971: R974 000)				
Entire share capital of the Rand Mines Power Supply Company Limited	**1**		1	
Housing loans to employees secured by first mortgage	**10 333**		8 762	
Debtors and payments in advance		**31 742**		24 969
Debtors	**25 429**		20 628	
Payments in advance	**6 313**		4 341	
Cash on deposit, on current account, on hand and at call, less amounts due to bankers		**17 316**		27 504
		2 368 359		2 110 584

Notes to the Balance Sheet

at 31st December, 1972

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 R323 000 000 (1971: R328 000 000).

(b) The Commission is committed to:

(1) The payment of approximately R878 000 (1971: R724 000) 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 (1971: Two instalments of R50 000 each and R191 000 annually up to 31st December 1985).

(3) The purchase from certain stockholders of Electricity Supply Commission Local Registered Stock as follows:

$6\frac{3}{4}$ per cent 1991 at R97 per cent.

(i) R4 500 000 (1971: R4 500 000) not later than September 1976, and

(ii) R2 000 000 (1971: R2 000 000) at the option of the stockholder.

$9\frac{1}{4}$ per cent 1996 at par.

R7 700 000 (1971: R7 150 000) at the option of the stockholder to be exercised before 31st December, 1975.

$9\frac{1}{4}$ per cent 1997 at par.

R10 000 000 (1971: Nil) at the option of the stockholder to be exercised before 31st December, 1977.

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, 1972 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 bondholders' 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 R472 284 000 in Electricity Supply Commission Stocks.

Capital Expenditure

Schedule No. 1

on 31st December 1972

R000

	Total	Cape Western	Cape Northern	Cape Eastern	Border	Orange River	Natal	Eastern Transvaal	Central Generating	Rand and O.F.S. Generation	Rand and O.F.S. Distribution	Rand and O.F.S. Head Office
Totals at 31st December 1971	1 604 755	141 526	26 314	1 239	24 046	34 832	202 353	161 886	—	715 106	288 191	9 262
Transfer to Central Generating	—	–76 648	—	—	—	–26 343	–118 816	–83 018	1 060 004	–715 106	–40 073	—
	1 604 755	64 878	26 314	1 239	24 046	8 489	83 537	78 868	1 060 004	—	248 118	9 262
Expenditure during 1972	176 679	5 673	2 214	143	3 797	2 875	7 927	10 860	112 836	—	29 787	567
	1 781 434	70 551	28 528	1 382	27 843	11 364	91 464	89 728	1 172 840	—	277 905	9 829
Less: Assets decommissioned	7 084	16	1	—	4	—	193	11	4 268	—	2 242	349
Totals at 31st December 1972	1 774 350	70 535	28 527	1 382	27 839	11 364	91 271	89 717	1 168 572	—	275 663	9 480
Consisting of:												
Land and rights	17 057	1 509	444	12	174	119	2 248	1 774	3 415	—	6 314	1 048
Buildings and civil work	351 095	5 226	1 314	98	3 728	314	9 693	7 532	302 766	—	15 737	4 687
Plant and machinery	1 158 545	56 846	23 249	1 155	18 654	7 339	76 353	65 856	683 863	—	224 968	262
In commission	1 526 697	63 581	25 007	1 265	22 556	7 772	88 294	75 162	990 044	—	247 019	5 997
Works under construction	247 653	6 954	3 520	117	5 283	3 592	2 977	14 555	178 528	—	28 644	3 483

Investments of the Capital Development Fund

Schedule No. 2

at 31st December 1972

Description			Nominal value	Book value
			R	R
Local Registered Escom Stocks				
8,500 per cent	1997	Loan No. 95	7 000 000	6 742 000
8,250 per cent	1997	Loan No. 98	7 400 000	7 312 000
			14 400 000	14 054 000
Interest accrued				43 000
				14 097 000
Market value			R14 550 000	

Investments of the Redemption Fund

Schedule No. 3

at 31st December 1972

Description		Loan No.	Nominal value	Book value
Local Registered Escom Stocks			R	R
3,000 per cent	1967/73	13	831 000	826 000
3,000 per cent	1968/74	14	10 000	9 000
3,125 per cent	1968/73	15	7 586 000	7 440 000
3,500 per cent	1969/74	16	349 000	325 000
3,750 per cent	1969/74	17	442 000	408 000
5,000 per cent	1971/74	31	4 569 000	4 386 000
5,000 per cent	1971/75	32	746 000	679 000
4,625 per cent	1975/80	33	8 934 000	7 854 000
4,875 per cent	1975/80	34	7 780 000	6 928 000
5,125 per cent	1976/81	35	3 513 000	3 115 000
5,125 per cent	1977/82	36	1 071 000	937 000
5,125 per cent	1976/82	37	4 203 000	3 697 000
5,125 per cent	1977/83	38	9 034 000	7 912 000
5,375 per cent	1978/83	39	3 972 000	3 532 000
5,625 per cent	1979/84	40	5 084 000	4 601 000
5,375 per cent	1979/84	42	7 099 000	6 269 000
5,375 per cent	1979/85	43	6 103 000	5 343 000
5,375 per cent	1980/85	44	7 267 000	6 333 000
5,500 per cent	1980/86	45	4 832 000	4 248 000
5,875 per cent	1981/86	46	7 452 000	6 775 000
6,250 per cent	1981/86	47	6 027 000	5 657 000
6,125 per cent	1982/87	49	6 279 000	5 822 000
5,250 per cent	1982/87	50	6 448 000	5 444 000
5,000 per cent	1983/88	51	10 113 000	8 194 000
5,000 per cent	1980/83	52	5 805 000	5 023 000
5,000 per cent	1982/84	53	3 390 000	2 856 000
5,500 per cent	1982/84	54	3 362 000	2 979 000
5,875 per cent	1983/85	55	10 198 000	9 437 000
6,500 per cent	1983/85	56	6 741 000	6 447 000
6,500 per cent	1989/91	58	9 281 000	8 789 000
6,750 per cent	1991	60	4 951 000	4 810 000
6,875 per cent	1992	61	5 943 000	5 839 000
6,500 per cent	1992	64	3 081 000	2 914 000
6,875 per cent	1992	65	3 808 000	3 687 000
6,500 per cent	1993	70	2 758 000	2 537 000
6,875 per cent	1993	71	5 343 000	5 138 000
6,500 per cent	1993	75	1 805 000	1 563 000
6,875 per cent	1993	76	50 000	42 000
6,500 per cent	1994	78	3 612 000	3 386 000
6,875 per cent	1994	79	10 889 000	10 663 000
6,000 per cent	1974	80	12 154 000	11 887 000
6,500 per cent	1994	81	3 554 000	3 252 000
6,875 per cent	1994	82	9 254 000	8 870 000
7,500 per cent	1995	83	66 000	59 000
7,000 per cent	1995	84	58 000	48 000
8,750 per cent	1995	85	7 601 000	7 600 000
8,500 per cent	1995	86	1 259 000	1 231 000
9,250 per cent	1996	87	806 000	806 000
8,750 per cent	1996	88	11 000	10 000
9,250 per cent	1996	89	4 493 000	4 493 000
9,250 per cent	1996	90	10 490 000	10 490 000
8,750 per cent	1996	91	7 740 000	7 370 000
9,125 per cent	1997	93	473 000	472 000
8,750 per cent	1997	94	901 000	866 000
8,500 per cent	1997	95	13 619 000	13 116 000
8,250 per cent	1997	96	7 154 000	7 069 000
8,000 per cent	1997	97	1 768 000	1 701 000
8,250 per cent	1997	98	31 060 000	30 691 000
Carried forward			313 222 000	292 875 000

Description		Loan No.	Nominal value	Book value
			R	R
Brought forward			313 222 000	292 875 000
Republic of South Africa				
5,250 per cent	1979		300 000	287 000
6,000 per cent	1985		500 000	485 000
Municipal stocks				
Bloemfontein				
5,375 per cent	1975/80		80 000	70 000
Cape Town				
3,000 per cent	1976	167	200 000	172 000
5,375 per cent	1980/85	203	300 000	257 000
Durban				
3,250 per cent	1965/75	48	90 000	81 000
3,250 per cent	1966/76	49	100 000	88 000
3,000 per cent	1967/77	50	668 000	557 000
5,375 per cent	1974/79	68	120 000	108 000
Germiston				
5,375 per cent	1985	16	20 000	17 000
Johannesburg				
3,000 per cent	1967/77	21	60 000	50 000
5,375 per cent	1974/79	36	194 000	175 000
			315 854 000	295 222 000
Interest accrued				3 224 000
				298 446 000
Market value	R282 453 000			

Investments of the Reserve Fund

Schedule No. 4

at 31st December 1972

Description		Loan No.	Nominal value	Book value
Local Registered Escom Stocks			R	R
3,000 per cent	1967/73	13	39 000	39 000
3,000 per cent	1968/74	14	106 000	99 000
3,125 per cent	1968/73	15	5 717 000	5 631 000
3,500 per cent	1969/74	16	37 000	36 000
3,750 per cent	1969/74	17	49 000	46 000
5,000 per cent	1971/74	31	385 000	375 000
5,000 per cent	1971/75	32	1 389 000	1 324 000
4,625 per cent	1975/80	33	500 000	440 000
4,875 per cent	1975/80	34	1 380 000	1 230 000
5,125 per cent	1976/81	35	1 500 000	1 343 000
5,125 per cent	1977/82	36	516 000	458 000
5,125 per cent	1976/82	37	1 500 000	1 327 000
5,125 per cent	1977/83	38	2 280 000	2 000 000
5,375 per cent	1978/83	39	2 000 000	1 783 000
5,625 per cent	1979/84	40	1 420 000	1 286 000
5,375 per cent	1979/84	42	1 400 000	1 238 000
5,375 per cent	1979/85	43	200 000	176 000
5,375 per cent	1980/85	44	1 000 000	873 000
5,500 per cent	1980/86	45	1 800 000	1 584 000
5,875 per cent	1981/86	46	2 582 000	2 350 000
6,250 per cent	1981/86	47	2 650 000	2 503 000
6,125 per cent	1982/87	49	2 000 000	1 859 000
5,250 per cent	1982/87	50	3 500 000	2 960 000
5,000 per cent	1983/88	51	5 055 000	4 123 000
5,000 per cent	1980/83	52	4 000 000	3 466 000
5,000 per cent	1982/84	53	2 400 000	2 051 000
5,500 per cent	1982/84	54	2 182 000	1 947 000
5,875 per cent	1983/85	55	3 700 000	3 429 000
6,500 per cent	1983/85	56	2 600 000	2 516 000
6,500 per cent	1989/91	58	4 200 000	3 989 000
6,750 per cent	1991	60	4 500 000	4 389 000
6,875 per cent	1992	61	5 000 000	4 932 000
6,875 per cent	1992	65	9 000 000	8 844 000
6,875 per cent	1993	71	7 235 000	6 973 000
6,500 per cent	1993	75	1 665 000	1 539 000
6,875 per cent	1993	76	8 779 000	8 468 000
6,500 per cent	1994	78	2 002 000	1 880 000
6,875 per cent	1994	79	6 998 000	6 859 000
6,000 per cent	1974	80	4 250 000	4 160 000
6,500 per cent	1994	81	2 000 000	1 836 000
6,875 per cent	1994	82	3 500 000	3 356 000
7,500 per cent	1995	83	2 670 000	2 670 000
7,000 per cent	1995	84	1 845 000	1 746 000
8,750 per cent	1995	85	9 108 000	9 108 000
8,500 per cent	1995	86	1 925 000	1 878 000
9,250 per cent	1996	87	4 797 000	4 797 000
9,250 per cent	1996	89	8 000	8 000
9,250 per cent	1996	90	521 000	521 000
8,750 per cent	1996	91	87 000	87 000
9,125 per cent	1997	93	172 000	172 000
8,750 per cent	1997	94	13 000	13 000
8,500 per cent	1997	95	4 000 000	3 852 000
8,250 per cent	1997	98	6 500 000	6 423 000
Carried forward			144 662 000	136 992 000

Description		Loan No.	Nominal value	Book value
			R	R
Brought forward			144 662 000	136 992 000
Republic of South Africa				
5,250 per cent	1979		700 000	669 000
Municipal stocks				
Bloemfontein				
5,375 per cent	1975/80		100 000	88 000
Cape Town				
5,000 per cent	1975	185	94 000	87 000
5,375 per cent	1980/85	203	600 000	514 000
5,500 per cent	1981/86	208	850 000	721 000
5,500 per cent	1983/88	219	610 000	509 000
5,500 per cent	1980	227	100 000	90 000
6,500 per cent	1981	240	210 000	200 000
Durban				
3,750 per cent	1964/74	41	1 000	1 000
3,000 per cent	1967/77	50	1 000	1 000
5,375 per cent	1974/79	68	600 000	540 000
5,375 per cent	1976/80	70	800 000	711 000
6,000 per cent	1972/77	74	334 000	318 000
5,000 per cent	1984	84	500 000	411 000
5,500 per cent	1982	87	450 000	395 000
6,000 per cent	1980	88	500 000	463 000
6,000 per cent	1981	91	1 000 000	918 000
6,500 per cent	1981	93	1 000 000	950 000
East London				
3,750 per cent	1964/74	6	1 000	1 000
Germiston				
5,375 per cent	1985	16	150 000	124 000
Johannesburg				
5,375 per cent	1974/79	36	120 000	108 000
5,500 per cent	1975	38	10 000	9 000
Pietermaritzburg				
5,000 per cent	1972/74	74	24 000	23 000
Port Elizabeth				
5,000 per cent	1969/74	25	26 000	24 000
Pretoria				
5,000 per cent	1961/81	7	246 000	212 000
5,125 per cent	1972/75	37	52 000	49 000
5,375 per cent	1975/78	44	100 000	92 000
5,375 per cent	1975/78	47	100 000	91 000
6,250 per cent	1977/82	49	200 000	186 000
5,500 per cent	1980/83	56	200 000	174 000
6,500 per cent	1981/84	59	200 000	188 000
Rand Water Board				
6,500 per cent	1984	33	250 000	234 000
7,000 per cent	1987	35	200 000	195 000
			154 991 000	146 288 000
Interest accrued				1 851 000
				148 139 000
Market value		R137 659 000		

Loans outstanding

Schedule No. 5

at 31st December 1972

Loan No.		Local Registered Stocks		
	R			R
13	6 000 000	3,000 per cent	1967/73	6 000 000
14	6 000 000	3,000 per cent	1968/74	6 000 000
15	30 000 000	3,125 per cent	1968/73	30 000 000
16	6 000 000	3,500 per cent	1969/74	6 000 000
17	6 000 000	3,750 per cent	1969/74	6 000 000
31	16 000 000	5,000 per cent	1971/74	16 000 000
32	20 000 000	5,000 per cent	1971/75	20 000 000
33	16 000 000	4,625 per cent	1975/80	16 000 000
34	16 000 000	4,875 per cent	1975/80	16 000 000
35	16 500 000	5,125 per cent	1976/81	16 500 000
36	20 000 000	5,125 per cent	1977/82	20 000 000
37	22 000 000	5,125 per cent	1976/82	22 000 000
38	24 000 000	5,125 per cent	1977/83	24 000 000
39	24 000 000	5,375 per cent	1978/83	24 000 000
40	22 000 000	5,625 per cent	1979/84	22 000 000
42	20 000 000	5,375 per cent	1979/84	20 000 000
43	16 000 000	5,375 per cent	1979/85	16 000 000
44	16 000 000	5,375 per cent	1980/85	16 000 000
45	17 000 000	5,500 per cent	1980/86	17 000 000
46	16 000 000	5,875 per cent	1981/86	16 000 000
47	18 000 000	6,250 per cent	1981/86	18 000 000
49	18 000 000	6,125 per cent	1982/87	18 000 000
50	22 000 000	5,250 per cent	1982/87	22 000 000
51	29 000 000	5,000 per cent	1983/88	29 000 000
52	40 000 000	5,000 per cent	1980/83	40 000 000
53	20 000 000	5,000 per cent	1982/84	20 000 000
54	20 000 000	5,500 per cent	1982/84	20 000 000
55	32 000 000	5,875 per cent	1983/85	32 000 000
56	38 000 000	6,500 per cent	1983/85	38 000 000
58	30 000 000	6,500 per cent	1989/91	30 000 000
60	35 000 000	6,750 per cent	1991	35 000 000
61	35 000 000	6,875 per cent	1992	35 000 000
64	12 000 000	6,500 per cent	1992	12 000 000
65	37 000 000	6,875 per cent	1992	37 000 000
70	10 000 000	6,500 per cent	1993	10 000 000
71	70 000 000	6,875 per cent	1993	70 000 000
75	22 000 000	6,500 per cent	1993	22 000 000
76	48 000 000	6,875 per cent	1993	48 000 000
78	20 000 000	6,500 per cent	1994	20 000 000
79	30 000 000	6,875 per cent	1994	30 000 000
80	20 000 000	6,000 per cent	1974	20 000 000
81	10 000 000	6,500 per cent	1994	10 000 000
82	25 000 000	6,875 per cent	1994	25 000 000
83	18 000 000	7,500 per cent	1995	18 000 000
84	3 000 000	7,000 per cent	1995	3 000 000
85	35 000 000	8,750 per cent	1995	35 000 000
86	10 000 000	8,500 per cent	1995	10 000 000
87	45 000 000	9,250 per cent	1996	45 000 000
88	10 000 000	8,750 per cent	1996	10 000 000
89	20 000 000	9,250 per cent	1996	20 000 000
90	30 000 000	9,250 per cent	1996	30 000 000
91	10 000 000	8,750 per cent	1996	10 000 000
92	20 000 000	9,250 per cent	1997	20 000 000
93	22 000 000	9,125 per cent	1997	22 000 000
94	5 000 000	8,750 per cent	1997	5 000 000
95	25 000 000	8,500 per cent	1997	25 000 000
96	28 000 000	8,250 per cent	1997	(a) 25 759 000
97	7 000 000	8,000 per cent	1997	(a) 5 844 000
98	45 000 000	8,250 per cent	1997	45 000 000
Carried forward				1 306 103 000

(a) To be paid in full not later than 28th February 1973 in accordance with the prospectus.

Loan No.						
		R				R
Brought forward						306 103 000
			Foreign Bond Issues			
541	S.F.	50 000 000	(8 274 721)	5,000 per cent	1959/74	1 655 000
557	D.M.	50 000 000	(8 921 403)	6,500 per cent	1965/80	7 137 000
562	U.S.$	15 000 000	(10 775 862)	7,000 per cent	1967/77	5 388 000
574	Units of account	15 000 000	(10 905 695)	7,000 per cent	1968/78	9 336 000
577	D.M.	100 000 000	(18 033 777)	6,500 per cent	1968/83	18 178 000
578	D.M.	100 000 000	(19 582 885)	8,500 per cent	1970/85	19 583 000
580	Units of account	12 000 000	(8 626 750)	9,250 per cent	1970/80	8 536 000
584	D.M.	100 000 000	(19 556 077)	8,000 per cent	1971/86	19 556 000
592	Units of account	20 000 000	(14 209 591)	8,250 per cent	1971/86	16 600 000
598	U.S.$	20 000 000	(14 303 594)	8,500 per cent	1971/86	14 304 000
604	D.M.	100 000 000	(25 131 943)	6,250 per cent	1972/87	25 132 000
			Direct Placings			
559	U.S.$	20 000 000	(14 356 822)	6,250 per cent	1966/76	7 152 000
589	D.M.	10 000 000	(2 054 443)	8,000 per cent	1971/86	2 054 000
593	D.M.	20 000 000	(3 643 743)	8,500 per cent	1971/86	3 644 000
596	D.M.	20 000 000	(4 016 436)	8,500 per cent	1971/86	4 016 000
597	D.M.	40 000 000	(9 437 168)	8,500 per cent	1971/83	9 437 000
						1 477 811 000

Capital Development Fund Account

Account No. 1

for the year ended 31st December 1972

	R000
Balance per Balance Sheet	**14 148**
	14 148

	R000	
Amounts contributed during the year as per revenue account		**13 596**
Cape Western Undertaking	**300**	
Cape Northern Undertaking	**130**	
Cape Eastern Undertaking	**7**	
Border Undertaking	**37**	
Orange River Undertaking	**32**	
Natal Undertaking	**425**	
Eastern Transvaal Undertaking	**411**	
Rand and Orange Free State Undertaking	**1 254**	
Central Generating Undertaking	**11 000**	
Interest earned on investment		**548**
Adjustment of values of investments (see note)		**4**
		14 148

Note
The book values of all investments are adjusted every year having regard to par values and periods to maturity.

Redemption Fund Account

for the year ended 31st December 1972

Account No. 2

	R000		R000	
			1971	
Repayment of Local Registered Stock		—		5 000
6 per cent 1971 (Loan No. 63)	—		5 000	
Balance per Balance Sheet		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	
		302 220		258 854

	R000		R000	
			1971	
Balance at beginning of the year		253 854		216 409
Cape Western Undertaking	25 835		21 079	
Cape Northern Undertaking	6 452		5 481	
Cape Eastern Undertaking	129		98	
Border Undertaking	5 956		4 815	
Orange River Undertaking	360		119	
Natal Undertaking	40 821		34 114	
Eastern Transvaal Undertaking	31 316		25 268	
Rand and Orange Free State Undertaking	134 214		116 976	
Head Office	2 958		2 735	
Undertaking which has been sold	5 813		5 724	
Amounts contributed during the year per revenue account		22 750		25 485
Cape Western Undertaking	1 301		3 134	
Cape Northern Undertaking	499		569	
Cape Eastern Undertaking	20		23	
Border Undertaking	444		512	
Orange River Undertaking	122		226	
Natal Undertaking	1 497		4 142	
Eastern Transvaal Undertaking	1 126		3 631	
Rand and Orange Free State Undertaking	2 957		13 248	
Central Generating Undertaking	14 784		—	
Other contributions		67		92
Proceeds of sales of fixed property		6 237		1 439
Interest earned on investment		18 372		14 776
Adjustment of values of investments (see note)		940		653
		302 220		258 854

Note

(1) The book values of all investments are adjusted every year having regard to par values and periods to maturity.

(2) Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity as well as the commitment in respect of related loans and cost of operation, maintenance and administration as from January 1972.

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 26th April 1973.

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

Reserve Fund Account

Account No. 3

for the year ended 31st December 1972

	R000	R000	R000	R000
			1971	
Expenditure during the year on replacement and betterment		**1 134**		3 762
Cape Western Undertaking	**10**		—	
Border Undertaking	**40**		19	
Orange River Undertaking	**4**		—	
Natal Undertaking	**169**		192	
Eastern Transvaal Undertaking	—		1 450	
Rand and Orange Free State Undertaking	**24**		2 101	
Central Generating Undertaking	**887**		—	
Balance per Balance Sheet		**150 070**		137 642
		151 204		141 404

	R000	R000	R000	R000
			1971	
Balance at beginning of year		**137 642**		123 518
Amounts contributed during the year per Revenue Account		**3 056**		8 568
Cape Western Undertaking	**300**		1 086	
Cape Northern Undertaking	—		175	
Border Undertaking	**74**		110	
Orange River Undertaking	**10**		10	
Natal Undertaking	**850**		1 300	
Eastern Transvaal Undertaking	**822**		1 848	
Rand and Orange Free State Undertaking	—		4 039	
Central Generating Undertaking	**1 000**		—	
Interest earned on investments		**9 836**		9 059
Adjustment of value of investments (see note)		**670**		259
		151 204		141 404

Note

(1) The book values of all investments are adjusted every year having regard to par values and periods to maturity.

(2) Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity as well as the commitment in respect of related loans and cost of operation, maintenance and administration as from 1st January 1972.

Consolidated Revenue Account

for the year ended 31st December 1972

	R000		R000	
			1971	
Cost of electricity		**88 940**		79 945
Generation				
Operation:				
Fuel	**57 259**		53 587	
Water and stores	**3 682**		2 747	
Salaries and wages	**11 277**		9 252	
Other expenses	**756**		742	
Maintenance:				
Stores	**4 485**		3 840	
Salaries and wages	**10 275**		8 546	
Other expenses	**1 111**		1 149	
	88 845		79 863	
Electricity purchased	**95**		82	
Distribution		**13 486**		11 492
Operation and maintenance				
Stores	**2 104**		1 883	
Salaries and wages	**9 591**		8 034	
Other expenses	**1 791**		1 575	
General expenses		**21 737**		18 440
Local administration and technical management	**6 166**		5 261	
General expenses (including maintenance of quarters, stores expenses, insurance, pension fund contributions, etc.) less rents received	**8 772**		7 793	
Head office administration	**3 581**		2 613	
Head office engineering expenses (including research expenses of R804 000–1971: R731 000)	**3 218**		2 773	
Loan charges		**117 206**		101 194
Interest and financing expenses	**86 631**		70 266	
Redemption of local loans	**22 750**		25 485	
Repayment of foreign loans	**7 825**		5 443	
Amounts set aside towards		**16 652**		8 568
Capital Development Fund	**13 596**		—	
Reserve Fund	**3 056**		8 568	
		258 021		219 639
Sales of electricity		**254 394**		219 584
Traction supplies	**22 015**		19 962	
Bulk supplies	**68 221**		56 879	
Mining supplies	**74 048**		67 097	
Industrial supplies	**75 947**		63 149	
Domestic and lighting supplies	**14 163**		12 497	
Deficit for the year		**3 627**		55
Accumulated surplus brought forward		**905**		960
Accumulated surplus/(deficit) as shown in Balance Sheet		**(2 722)**		905

Cape Western Undertaking Revenue Account

Account No. 4

for the year ended 31st December 1972

	R000		R000	
			1971	
Cost of electricity		20 503		10 847
Supplied by Central Generating Undertaking	16 764		—	
Proportion of pooled generation costs	—		3 777	
Transmission costs payable to other undertakings	3 739		1 191	
Local generation	—		5 879	
Operation:				
Fuel	—		4 171	
Water and stores	—		84	
Salaries and wages	—		709	
Other expenses	—		18	
Maintenance:				
Stores	—		76	
Salaries and wages	—		698	
Other expenses	—		123	
Distribution		2 140		1 934
Operation and maintenance:				
Stores	222		212	
Salaries and wages	1 542		1 383	
Other expenses	376		339	
General expenses		2 207		2 854
Local administration and technical management	989		924	
Other expenses (including maintenance of quarters, stores expenses, rates, insurance pension fund contributions, etc.) less rents received	918		1 272	
Head office administration expenses	158		319	
Head office engineering expenses	142		339	
Loan charges		5 626		10 153
Interest and finance charges	4 325		7 018	
Redemption of local loans	1 301		3 135	
Amounts set aside to		600		1 086
Capital Development Fund	300		—	
Reserve Fund	300		1 086	
		31 076		26 874
Sales of electricity		30 339		26 973
Traction supplies	4 870		4 641	
Bulk supplies	7 872		6 345	
Industrial supplies	12 434		11 250	
Domestic and lighting supplies	5 163		4 737	
Surplus/(deficit) for the year		(737)		99
Accumulated deficit brought forward		313		412
Accumulated deficit as shown in Balance Sheet		1 050		313

Note

Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity, as well as the commitment in respect of associated loans and cost of operation maintenance and administration as from 1st January 1972.

Cape Northern Undertaking Revenue Account

Account No. 5

for the year ended 31st December 1972

	R000		R000	
			1971	
Cost of electricity		**4 554**		3 848
Supplied by central generating undertaking	**4 161**		—	
Proportion of pooled generation costs	—		3 370	
Transmission costs payable to other undertakings	**393**		478	
Distribution		**740**		448
Operation and maintenance:				
Stores	**75**		40	
Salaries and wages	**374**		328	
Other expenses	**93**		80	
Debited from other undertakings	**198**		—	
General expenses		**595**		545
Local administration and technical management	**310**		228	
Other expenses (including maintenance of quarters, stores expenses, rates, insurance pension fund contributions, etc.) less rents received	**173**		143	
Head office administration	**59**		84	
Head office engineering expenses	**53**		90	
Loan charges		**2 355**		2 183
Interest and finance charges	**1 856**		1 614	
Redemption of local loans	**499**		569	
Amounts set aside to		**130**		175
Capital Development Fund	**130**		—	
Reserve Fund	—		175	
		8 374		7 199
Sales of electricity		**8 115**		7 101
Traction supplies	**1 854**		1 754	
Bulk supplies	**1 456**		1 270	
Mining supplies	**3 341**		2 808	
Industrial supplies	**1 090**		938	
Domestic and lighting supplies	**374**		331	
Deficit for the year		**259**		98
Accumulated surplus brought forward		**563**		661
Accumulated surplus as shown in Balance Sheet		**304**		563

Cape Eastern Undertaking Revenue Account

Account No. 6

for the year ended 31st December 1972

	R000		R000	
			1971	
Electricity purchased		93		77
Distribution		43		44
Operation and maintenance:				
Stores	3		R7	
Salaries and wages	33		22	
Other expenses	7		15	
General expenses		24		19
Local administration and technical management	7		5	
Other expenses (including maintenance of quarters, stores expenses, rates, insurance, pension fund contributions, etc.) less rents received	12		8	
Head office administration	3		3	
Head office engineering expenses	2		3	
Loan charges		132		126
Interest and finance charges	112		102	
Redemption of local loans	20		24	
Amounts set aside to				
Capital Development Fund		7		—
		299		266
Sales of electricity		256		222
Bulk supplies	31		30	
Industrial supplies	134		114	
Domestic and lighting supplies	91		78	
Deficit for the year		43		44
Accumulated deficit brought forward		141		97
Accumulated deficit as shown in Balance Sheet		184		141

Border Undertaking Revenue Account

Account No. 7

for the year ended 31st December 1972

	R000		R000	
			1971	
Generation		2 561		2 144
Operation:				
Fuel	1 796		1 489	
Water and stores	27		25	
Salaries and wages	371		309	
Other expenses	7		1	
Maintenance:				
Stores	80		73	
Salaries and wages	272		239	
Other expenses	8		8	
Distribution		374		299
Operation and maintenance:				
Stores	45		31	
Salaries and wages	273		225	
Other expenses	56		43	
General expenses		619		512
Local administration and technical management	302		216	
Other expenses (including maintenance of quarters, stores expenses, rates, insurance pension fund contributions, etc.) less rents received	212		177	
Head office administration	55		58	
Head office engineering	50		61	
Loan charges		1 802		1 840
Interest and finance charges	1 358		1 328	
Redemption of local loans	444		512	
Amounts set aside to		111		110
Capital Development Fund	37		—	
Reserve Fund	74		110	
		5 467		4 905
Sales of electricity		5 702		4 845
Bulk supplies	4 654		4 054	
Industrial supplies	590		400	
Domestic and lighting supplies	458		391	
Surplus/(deficit) for the year		235		(60)
Accumulated deficit brought forward		404		344
Accumulated deficit as shown in Balance Sheet		169		404

Orange River Undertaking Revenue Account

Account No. 8

for the year ended 31st December 1972

	R000		R000	
			1971	
Cost of electricity		**789**		391
Supplied by Central Generating Undertaking	**617**		—	
Proportion of pooled generation costs	—		391	
Transmission costs payable to other undertakings	**172**		—	
Distribution		**79**		54
Operation and maintenance:				
Stores	**9**		8	
Salaries and wages	**44**		36	
Other expenses	**26**		10	
General expenses		**206**		140
Local administration and Technical management	**106**		71	
General expenses (including maintenance of quarters, stores expenses, rates, insurance, pension fund contributions, etc.) less rents received	**65**		46	
Head office administration expenses	**18**		11	
Head office engineering expenses	**17**		12	
Loan charges		**462**		1 084
Interest and finance charges	**682**		961	
Redemption of local loans	**122**		226	
	804		1 187	
Less: Amount debited to pooled costs	—		103	
Debited to other undertakings	**342**		—	
Amounts set aside to		**42**		10
Capital Development Fund	**32**		—	
Reserve Fund	**10**		10	
		1 578		1 679
Transmission costs recovered from other undertakings		—		621
		1 578		1 058
Sales of electricity		**1 594**		938
Bulk supplies	**694**		492	
Industrial supplies	**898**		446	
Domestic and lighting supplies	**2**		—	
Surplus/(deficit) for the year		**16**		(120)
Accumulated deficit brought forward		**291**		171
Accumulated deficit as shown in Balance Sheet		**275**		291

Note

Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity, as well as the commitment in respect of associated loans and cost of operation, maintenance and administration as from 1st January 1972.

Natal Undertaking Revenue Account

Account No. 9

for the year ended 31st December 1972

	R000		R000	
			1971	
Cost of electricity		38 534		20 432
Supplied by Central Generating Undertaking	37 474		—	
Proportion of pooled generation costs	—		2 939	
Transmission costs payable to other undertakings	1 060		14	
Supplied by other undertakings	—		65	
Local generation	—		17 414	
Operation:				
Fuel	—		12 642	
Water and stores	—		385	
Salaries and wages	—		1 663	
Other expenses	—		198	
Maintenance:				
Stores	—		546	
Salaries and wages	—		1 436	
Other expenses	—		544	
Distribution		2 462		2 081
Operation and maintenance:				
Stores	285		303	
Salaries and wages	1 574		1 357	
Other expenses	603		421	
General expenses		1 803		3 316
Local administration and technical management	824		1 138	
General expenses (including maintenance of quarters, stores expenses, rates, insurance, pension fund contributions, etc.) less rents received	595		1 149	
Head office administration	202		499	
Head office engineering	182		530	
Loan charges		7 197		14 067
Interest and finance charges	5 550		9 776	
Redemption of local loans	1 497		4 141	
Repayment of overseas loans	150		150	
Amounts set aside to		1 275		1 300
Capital Development Fund	425		—	
Reserve Fund	850		1 300	
		51 272		41 196
Sales of electricity		48 664		41 944
Traction supplies	7 140		6 365	
Bulk supplies	25 500		22 354	
Mining supplies	1 356		1 307	
Industrial supplies	12 740		10 251	
Domestic and lighting supplies	1 928		1 667	
Surplus/(deficit) for the year		(2 607)		748
Accumulated surplus brought forward		2 512		1 764
Accumulated surplus/(deficit) as shown in Balance Sheet		(95)		2 512

Note

Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity, as well as the commitment in respect of associated loans and cost of operation maintenance and administration as from 1st January 1972.

Eastern Transvaal Undertaking Revenue Account

Account No. 10

for the year ended 31st December 1972

	R000		R000	
			1971	
Cost of electricity		**20 478**		16 336
Supplied by Central Generating Undertaking	**19 977**		—	
Proportion of pooled generation costs	—		15 981	
Electricity supplied by other undertakings	**501**		355	
Distribution		**1 339**		1 260
Operation and maintenance:				
Stores	**224**		192	
Salaries and wages	**1 103**		896	
Other expenses	**12**		172	
General expenses		**1 363**		1 403
Local administration and technical management	**477**		556	
General expenses (including maintenance of quarters, stores expenses, rates, insurance, pension fund contributions, etc.) less rents received	**554**		854	
Head office administration	**175**		399	
Head office engineering	**157**		423	
	1 363		2 232	
Less: Amount debited to pooled costs	—		829	
Loan charges		**5 733**		3 497
Interest and finance charges	**4 800**		8 357	
Redemption of local loans	**1 126**		3 631	
Repayment of foreign loans	—		597	
	5 926		12 585	
Less: Amount debited to pooled costs	—		9 088	
Debited to other undertakings	**193**		—	
Amounts set aside to		**1 233**		1 848
Capital Development Fund	**411**		—	
Reserve Fund	**822**		1 848	
		30 146		24 344
Sales of electricity		**28 094**		23 700
Traction supplies	**2 315**		2 068	
Bulk supplies	**2 097**		1 623	
Mining supplies	**7 888**		7 350	
Industrial supplies	**15 244**		12 067	
Domestic and lighting supplies	**550**		592	
Deficit for the year		**2 052**		644
Accumulated surplus brought forward		**2 996**		3 640
Accumulated surplus as shown in Balance Sheet		**944**		2 996

Note

Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity, as well as the commitment in respect of associated loans and cost of operation, maintenance and administration as from 1st January 1972.

Rand and Orange Free State Undertaking Revenue Account

Account No. 11

for the year ended 31st December 1972

	R000	R000	R000	1971
Cost of electricity		**101 551**		88 968
Supplied by Central Generating Undertaking	**101 363**		—	
Proportion of pooled generation costs	—		88 968	
Transmission costs payable to other undertakings	**188**		—	
Distribution		**6 309**		4 310
Operation and maintenance:				
Stores	**1 241**		1 090	
Salaries and wages	**4 648**		3 787	
Other expenses	**618**		495	
	6 507		5 372	
Less: Debited to other undertakings	**198**		1 062	
General expenses		**3 611**		3 056
Local administration and technical management	**1 113**		2 123	
General expenses (including maintenance of quarters, stores expenses, rates, insurance, pension fund contributions, etc.) less rents received	**1 390**		4 144	
Head office administration	**584**		1 240	
Head office engineering	**524**		1 315	
	3 611		8 822	
Less: Amount debited to pooled costs	—		5 766	
Loan costs		**17 586**		13 844
Interest and finance charges	**15 163**		41 110	
Redemption of local loans	**2 957**		13 247	
Repayment of foreign loans	—		4 696	
	18 120		59 053	
Less: Amount debited to pooled costs	—		45 209	
Debited to other undertakings	**534**		—	
Amounts set aside to		**1 254**		4 039
Capital Development Fund	**1 254**		—	
Reserve Fund	—		4 039	
		130 311		114 217
Sales of electricity		**132 131**		114 281
Electricity supplied to other undertakings	**501**		420	
Traction supplies	**5 836**		5 134	
Bulk supplies	**25 917**		20 712	
Mining supplies	**61 463**		55 632	
Industrial supplies	**32 817**		27 682	
Domestic and lighting supplies	**5 597**		4 701	
Surplus for the year		**1 820**		64
Accumulated deficit brought forward		**4 017**		4 081
Accumulated deficit as shown in Balance Sheet		**2 197**		4 017

Note

Central Generating Undertaking has taken over certain assets associated with the generation and transmission of electricity, as well as the commitment in respect of associated loans and cost of operation, maintenance and administration as from 1st January 1972.

Central Generating Undertaking
Schedule of Costs and Allocation

Account No. 12

for the year ended 31st December 1972

	R000	R000
Generation		**86 284**
Operation:		
Fuel	55 463	
Water and stores	3 655	
Salaries and wages	10 906	
Other expenses	749	
Maintenance:		
Stores	4 405	
Salaries and wages	10 003	
Other expenses	1 103	
Electricity purchased		**2**
Interconnector		**1 069**
General expenses		**11 309**
Local administration and technical management	2 038	
General expenses (including maintenance of quarters, stores expenses, rates, insurance, pension fund contributions, etc.)	4 853	
Head office administration expenses	2 327	
Head office engineering expenses	2 091	
Loan charges		**75 244**
Interest and finance charges	52 785	
Redemption of local loans	14 784	
Repayment of overseas loans	7 675	
Amounts set aside to		**12 000**
Capital Development Fund	11 000	
Reserve Fund	1 000	
		185 908
Electricity supplied to undertakings		**185 908**
Cape Western	20 503	
Cape Northern	4 554	
Orange River	789	
Natal	38 534	
Eastern Transvaal	19 977	
Rand and Orange Free State	101 551	
		185 908

STATISTICAL AND OTHER STATEMENTS

Power stations: Principal equipment installed

as at 31st December, 1972

Central Generating Undertaking

Electric power station	Type	Station capacity: Boilers kg/s	Station capacity: Generators MW	Boilers: No.	Boilers: Continuous maximum rating each kg/s	Main generators: No.	Main generators: Normal rating each MW	House sets: No.	House sets: Normal rating each MW
Camden	Steam	1 814,4	1 600,0	8	226,8	8	200,0		
Highveld	Steam	554,4	480,0	8	69,3	8	60,0		
Klip	Steam	567,5	396,0	25	22,7	12	33,0		
			28,0					4	7,0
		567,5	424,0	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	9		9			
Taaibos	Steam	584,8	480,0	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	18		9		3	
Vierfontein	Steam	503,5	360,0	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	9		5			
Group total		**5 926,1**	**4 902,0**	**104**		**71**			
Arnot	Steam	999,3	1 050,0	3	333,1	3	350,0		
Grootvlei	Steam	642,6	800,0	3	214,2	4	200,0		
		230,6		1	230,6				
		873,2	800,0	4		4			
Hendrina	Steam	1 071,0	1 000,0	5	214,2	5	200,0		
Sub-total		2 943,5	2 850,0	12					
H.Verwoerd	Hydro	—	160,0	—	—	2	80,0		
Group total		**2 943,5**	**3 010,0**	**12**		**14**			
Salt River No. 1	Steam	15,2	30,0	2	7,6	3	10,0		
		75,6	60,0	6	12,6	3	20,0		
			0,3					1	0,3
		90,8	90,3	8		6		1	
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		418,8	330,3	18		12		1	
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	6		5			
Group total		**588,8**	**450,3**	**24**		**17**		**1**	**0,3**
Colenso Nos. 1 and 2	Steam	50,4		2	25,2				
		40,4	60,0	4	10,1	5	12,0		
		60,8	75,0	8	7,6	3	25,0		
		133,5	30,0	5	22,7	1	30,0		
		265,1	165,0	19		9			
Ingagane	Steam	567,0	500,0	5	113,4	5	100,0		
Congella Nos. 1 and 2	Steam	201,6	24,0	8	25,2	2	12,0		
			20,0			1	20,0		
			120,0			3	40,0		
		201,6	164,0	8		6			
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	13		6			
Group total		**1 379,3**	**1 069,0**	**45**		**26**			
Grand total		**10 837,7**	**9 431,3**	**185**		**128**			

Border Undertaking

King William's Town	Steam	1,3	3,0	1	1,3	2	1,5		
		4,5		3	1,5				
Total		5,8	3,0	4		2			
West Bank No. 1	Steam	16,2	1,5	6	2,7	1	1,5		
		27,6	8,0	4	6,9	2	4,0		
			22,5			3	7,5		
Total		43,8	32,0	10		6			
West Bank No. 2	Steam	85,7	45,0	4	21,4	3	15,0		
		52,9	40,0	2	26,5	2	20,0		
		138,6	85,0	6		5			
Total 1 and 2		182,4	117,0	16		11			
Border total		**188,2**	**120,0**	**20**		**13**			
Total all Escom		**11 025,9**	**9 551,3**	**205**		**141**			

Transmission lines and cables

Circuit kilometres (excluding service connections on reticulation systems)
at 31st December, 1972

(A) Transmission lines

Undertaking	400 kV	275 kV	132 kV	88 kV	66 kV	42 kV	33 kV	22 kV 21 kV	11 kV	6,6 kV	3,3 kV	2,0 kV 2,1 kV 2,2 kV	380/220 V	Total
Border					289,17		57,47	437,19	1 192,77		5,72		145,06	2 127,38
Cape Eastern								208,46	209,31				14,29	432,06
Cape Northern		206,60	1 821,01		593,86			935,74	1 463,36				94,27	5 114,84
Cape Western		—	1 088,69		1 458,41		159,70	822,39	5 045,58	529,30			2 182,27	11 286,34
Eastern Transvaal		543,59	1 377,56	899,97	261,24			3 466,53	3 671,44	79,55	13,52	79,39	317,13	10 709,92
Natal		1 184,39	1 143,06	2 130,30			757,66	332,35	6 535,00	30,31		1,53	754,92	12 869,52
Orange River		—	384,57		572,23			485,63	66,27	—				1 508,70
Rand and O.F.S.	212,46	1 891,06	3 095,55	5 495,72	84,90	2 373,83		1 220,78	8 935,23	532,15			1 191,88	25 033,56
Central Generating	3 062,06		140,82											3 202,88
Totals A	3 274,52	3 825,64	9 051,26	8 525,99	3 259,81	2 373,83	974,83	7 909,07	27 118,96	1 171,31	19,24	80,92	4 699,82	72 285,20
	3 274,52	3 825,64	9 051,26		15 134,46					40 999,32				

(B) Underground cables

Border								0,02	27,55		2,54		28,12	58,23
Cape Eastern													1,52	1,52
Cape Northern					0,32				2,00	0,75			29,44	32,51
Cape Western			15,54		38,68		117,70	5,62	619,03	15,46	4,51		748,72	1 565,26
Eastern Transvaal								40,77	44,47	2,85	1,67	3,78	123,25	216,79
Natal				1,89			10,87	3,00	274,51	9,11	0,47	0,02	157,12	456,99
Orange River														
Rand and O.F.S.				14,04		119,88	0,33	167,15	237,94	571,42	0,23	0,33	299,22	1 410,54
Totals B			15,54	15,93	39,00	119,88	128,90	216,56	1 205,50	599,59	9,42	4,13	1 387,39	3 741,84
			15,54		303,71					3 422,59				

(C) Total lines and cables

A + B = C	1972	3 274,52	3 825,64	9 066,80	8 541,92	3 298,81	2 493,71	1 103,73	8 125,63	28 324,46	1 770,90	28,66	85,05	6 087,21	76 027,04
		3 274,52	3 825,64	9 066,80		15 438,17					44 421,91				
D	1971	2 503,39	3 175,44	7 600,83		15 191,49					40 658,59				69 129,74
Additions: C — D = E	1972	771,13	650,20	1 465,97		246,68					3 763,32				6 897,30

Capacity of transformers in service

at 31st December, 1972

Undertaking	Number		M.V.A	
	1971	1972	1971	1972
Border	927	992	172,525	183,130
Cape Eastern	429	457	12,055	12,940
Cape Northern	2 165	2 348	998,825	1 155,945
Cape Western	7 439	7 923	3 095,025	2 165,194
Eastern Transvaal	3 941	4 474	3 309,355	4 301,475
Natal	5 900	6 618	6 093,384	6 417,067
Orange River	54	82	606,280	612,670
Rand and Orange Free State	11 722	12 946	21 541,336	23 207,149
Compressor Stations Rand	24	24	145,030	145,030
Pooled Power Stations	738	—	11 837,046	—
Central Generating	—	1 064	—	13 824,179
Totals	33 339	36 928	47 810,861	52 024,779

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

Statement No. 2

(million units)

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

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, 1972

Statement No. 3

Undertakings	Traction			Bulk			Mining			Industrial			Domestic and street lighting			Total units sold		Total number of consumers
	Units	Traction per cent	Number cons.	Units	Bulk per cent	Number cons.	Units	Mining per cent	Number cons.	Units	Ind. per cent	Number cons.	Units	Dom and SL per cent	Number cons.	Units	Total units sold per cent	
Border				399 829 206	3,73	15				26 879 201	0,21	383	21 452 024	2,14	3 007	448 160 431	1,08	3 405
Cape Eastern				1 786 080	0,02	1				3 911 703	0,03	116	2 708 829	0,27	561	8 406 612	0,02	678
Cape Northern	203 045 040	7,30	3	190 239 500	1,78	17	369 365 067	2,55	77	108 926 795	0,86	628	24 193 894	2,42	3 172	895 770 296	2,15	3 897
Cape Western	424 254 138	15,25	6	968 388 212	9,04	42				1 042 088 396	8,24	7 818	336 559 516	33,64	51 568	2 771 290 262	6,65	59 434
Eastern Transvaal	327 051 248	11,75	7	364 283 605	3,40	27	1 483 458 448	10,22	89	3 028 803 083	23,96	2 945	31 057 236	3,10	4 070	5 234 653 620	12,57	7 138
Natal	893 522 841	32,12	14	3 950 383 918	36,86	30	163 233 710	1,13	31	1 805 911 577	14,29	4 529	124 924 184	12,49	18 212	6 937 976 230	16,66	22 816
Orange River				62 558 216	0,58	26				81 885 809	0,65	21	54 037	0,01	22	144 498 062	0,34	69
Rand and O.F.S.	934 365 824	33,58	2	4 778 654 273	44,59	152	12 492 507 342	86,10	102	6 543 118 810	51,76	2 060	459 517 026	45,93	27 905	25 208 163 275	60,53	30 221
Total Electricity	2 782 239 091	100,00	32	10 716 123 010	100,00	310	14 508 564 567	100,00	299	12 641 525 374	100,00	18 500	1 000 466 746	100,00	108 517	41 648 918 788	100,00	127 658
Per cent of Total		6,68			25,72			34,83			30,35			2,40			100,00	
Cape	592 799 178	21,31	8	1 650 884 242	15,41	89	363 097 007	2,50	70	1 260 504 115	9,97	8 928	382 915 167	38,27	58 003	4 250 199 709	10,20	67 098
Lesotho				16 634 095	0,16	2										16 634 095	0,04	2
Natal	774 821 991	27,85	12	3 849 368 718	35,92	21	163 233 710	1,13	31	1 737 239 301	13,74	4 090	115 920 325	11,59	16 490	6 640 584 045	15,95	20 644
O.F.S.	185 455 257	6,66	2	574 774 493	5,36	66	3 240 279 453	22,33	22	665 841 343	5,27	450	36 431 131	3,64	3 227	4 702 781 677	11,29	3 767
Mozambique				15 508 000	0,14	2										15 508 000	0,04	2
Transvaal	1 229 162 665	44,18	10	4 608 953 462	43,01	130	10 741 954 397	74,04	176	8 997 940 615	71,02	5 032	465 200 123	46,50	30 797	26 023 211 262	62,48	36 145
Total	2 782 239 091	100,00	32	10 716 123 010	100,00	310	14 508 564 567	100,00	299	12 641 525 374	100,00	18 500	1 000 466 746	100,00	108 517	41 648 918 788	100,00	127 658

Power station operating statistics year 1972

Statement No. 4

Undertaking and power station	Units generated	Units sent out	Maximum demands: Half hour (or hour) sent out kW	Maximum demands: Two minute peak kW	Station loss factor per cent sent out	Overall thermal efficiency per cent: Generated	Overall thermal efficiency per cent: Sent out	Coal burnt metric ton	Kg of coal: Per unit generated	Kg of coal: Per unit sent out	Calorific value of coal Mj per kg as received (weighted average)	Mj per unit: Generated	Mj per unit: Sent out	Coal cost: Total Rand	Coal cost: Per metric ton Rand	Coal cost: Per unit generated cent	Coal cost: Per unit sent out cent
Central Generating A																	
Camden	10 238 520 540	9 775 094 330	1 316 873	—	84,5	31,9	30,4	4 925 019	0,481	0,504	23,65	11,38	11,92	8 314 374	1,69	0,0812	0,0851
Highveld	2 254 839 629	2 096 167 478	447 457	—	53,3	29,2	27,2	1 236 809	0,549	0,590	22,37	12,28	13,20	2 661 216	2,15	0,1180	0,1270
Klip	1 486 324 786	1 357 622 632	396 631	—	39,0	20,9	19,1	1 269 197	0,884	0,971	20,17	17,83	19,59	3 666 253	2,89	0,2467	0,2700
Komati	6 564 632 149	6 086 015 289	924 186	—	75,0	30,9	28,6	3 098 979	0,472	0,509	24,69	11,65	12,57	4 639 211	1,50	0,0707	0,0762
Taaibos	2 332 037 572	2 144 906 921	453 176	—	53,9	27,1	24,9	1 359 643	0,583	0,634	22,72	13,25	14,40	2 798 381	2,06	0,1200	0,1305
Vaal	1 897 827 225	1 767 203 490	289 533	—	69,5	21,4	19,9	1 679 258	0,885	0,950	19,03	16,84	18,08	2 105 427	1,25	0,1109	0,1191
Vierfontein	2 023 874 461	1 874 966 131	336 595	—	63,4	23,0	21,3	1 580 912	0,781	0,843	20,06	15,67	16,91	2 922 975	1,85	0,1444	0,1559
Wilge	1 530 282 519	1 415 400 460	226 650	—	71,1	26,1	24,2	950 998	0,621	0,671	22,13	13,74	14,84	1 583 042	1,66	0,1034	0,1118
Total	**28 328 338 881**	**26 517 376 731**	—	—	—	—	—	**16 100 815**	**0,568**	**0,607**	**22,47**	—	—	**28 690 879**	**1,78**	**0,1013**	**0,1082**
D																	
Arnot	3 464 615 364	3 176 246 102	817 727	—	44,2	36,2	33,2	1 514 530	0,437	0,477	22,60	9,88	10,78	2 984 135	1,97	0,0861	0,0940
Grootvlei	3 936 459 462	3 731 317 264	770 867	—	55,1	34,0	32,2	1 992 423	0,506	0,534	20,87	10,63	11,21	4 170 753	2,09	0,1060	0,1118
Hendrina	4 325 390 295	4 105 330 281	797 999	—	58,6	32,8	31,1	2 009 930	0,465	0,490	23,56	11,07	11,68	3 796 365	1,89	0,0878	0,0925
Sub-total	11 726 465 121	11 012 893 647	—	—	—	—	—	5 516 883	0,470	0,501	22,32	—	—	10 951 253	1,99	0,0934	0,0994
H.Verwoerd Hydro	813 844 424	812 899 824	185 040	—	50,0	—	—	—	—	—	—	—	—	—	—	—	—
Total	**12 540 309 545**	**11 825 793 471**	—	—	—	—	—	**5 516 883**	—	—	—	—	—	—	—	—	—
B																	
Hex River	160 928 100	148 122 310	115 800	—	14,6	24,0	22,1	92 888	0,577	0,627	28,11	14,98	16,28	678 118	7,30	0,4214	0,4578
Salt River No. 1	1 689 790	875 700	49 700	54 000	0,2	12,7	6,6	1 180	1,049	2,025	27,08	28,41	54,83	3 948 223	7,46	0,3650	0,3863
Salt River No. 2	1 080 139 800	1 021 128 900	233 800	250 000	49,7	27,2	25,7	528 112	0,489	0,517	27,11	13,24	14,01				
Total	**1 242 757 690**	**1 170 126 910**	—	—	—	—	—	**622 180**	**0,501**	**0,532**	**27,26**	—	—	**4 626 341**	**7,44**	**0,3723**	**0,3954**
C																	
Colenso Nos. 1 and 2	309 134 000	285 676 000	149 550	163 000	21,7	19,5	18,0	224 231	0,725	0,785	25,51	18,49	20,03	1 050 266	4,68	0,3397	0,3676
Congella Nos. 1 and 2	408 136 900	372 206 270	137 240	150 000	30,9	21,3	19,4	279 289	0,684	0,750	24,68	16,88	18,51	1 626 282	5,82	0,3985	0,4369
Ingagane	3 253 346 500	3 058 736 000	491 000	523 000	70,9	32,0	30,1	1 460 094	0,449	0,477	25,07	11,26	11,96	4 414 889	3,02	0,1357	0,1443
Umgeni	844 724 200	783 068 800	218 400	239 000	40,8	23,7	22,0	486 376	0,576	0,621	26,39	15,20	16,39	2 956 861	6,08	0,3500	0,3776
Total	**4 815 341 600**	**4 499 687 070**	—	—	—	—	—	**2 449 990**	**0,509**	**0,544**	**25,33**	—	—	**10 048 298**	**4,10**	**0,2087**	**0,2233**
Grand total	**46 926 747 716**	**44 012 984 182**	—	—	—	—	—	**24 689 868**	**0,517**	**0,572**	**22,85**	—	—	**54 316 771**	**2,20**	**0,1157**	**0,1234**
Border Undertaking																	
King William's Town	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
West Bank Nos. 1 and 2	484 357 390	462 078 230	88 260	95 000	59,6	24,2	23,1	262 938	0,543	0,569	27,25	14,85	15,59	1 795 870	6,83	0,3708	0,3887
Total	**484 357 390**	**462 078 230**	—	—	—	—	—	**262 938**	**0,543**	**0,569**	**27,25**	**14,85**	**15,59**	**1 795 870**	**6,83**	**0,3708**	**0,3887**
Total all Escom	**47 411 105 106**	**44 475 062 412**	—	—	—	—	—	**24 952 806**	**0,526**	**0,561**	**22,89**	—	—	**56 112 641**	**2,25**	**0,1184**	**0,1262**

1,2 Hydro electric

Statement No. 4 *continued*

Power station	Units generated	Units sent out	Maximum demand–kW Half hour sent out	Maximum demand–kW Two minutes generated	Station load factor sent out
H.Verwoerd	813 844 424	812 899 824	185 040	—	50,0
Totals	813 844 424	812 899 824	185 040	—	50,0

(3) Generation summary

Statement No. 4 *continued*

		Units generated	Units sent out	Coal burnt metric ton
Electricity total units	Steam	46 597 260 682	43 662 162 588	24 952 806
	Hydro	813 844 424	812 899 824	—
	Diesel	—	—	—
Sub-total		47 411 105 106	44 475 062 412	24 952 806
Power purchased		—	9 653 576	—
Grand total 1972		**47 411 105 106**	**44 484 715 988**	**24 952 806**
Total for 1971		43 472 521 686	40 747 718 092	23 416 164
Change on 1971 (units or tons)		3 938 583 420	3 736 997 896	1 536 642
Per cent		9,06	9,17	6,56

Power purchased from outside sources in 1972

Statement No. 5

Undertaking	Purchased from	Maximum demands	Units
Cape Eastern	Water Affairs Department (Paul Sauer dam)	—	2 986 020
	Port Elizabeth Municipality (Aloes)	1 770 kVA	5 706 956
	Port Elizabeth Municipality (Summit)	846 kVA	958 440
Rand and Orange Free State	Pretoria Municipality	—	2 160
Total units purchased		—	9 653 576
Total units sold		—	41 648 918 788
Purchased as percentage of sales		—	0,023 per cent

Foreign supplies 1972

Statement No. 6

Undertaking	Sold to	Maximum demand	Units
Eastern Transvaal	Directo Delegado (Sonefe)	—	14 710 000
Eastern Transvaal	Ressano Garcia (Sonefe)	—	798 000
Rand and Orange Free State	Lesotho	4 450 kVA	16 634 095
Total		—	32 142 095

Coal used at commission's power stations

Statement No. 7

average cost per metric ton

Power station		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
		R	R	R	R	R	R	R	R	R	R	R	R
Brakpan	1	1,95	2,01	2,03	—	—	—	—	—	—	—	—	—
Colenso	2	3,43	3,70	3,84	3,71	4,16	4,31	4,30	4,20	4,39	4,39	4,51	4,68
Congella	3	4,13	4,31	3,96	3,58	3,77	3,92	4,01	4,19	5,24	5,26	5,44	5,82
Hex River	4	5,25	5,43	5,74	5,70	5,88	6,14	6,38	6,22	6,36	6,43	7,35	7,30
Highveld	5	1,76	1,69	1,71	1,83	1,79	1,81	1,95	2,07	2,23	2,23	2,19	2,15
Ingagane	6	—	—	2,50	2,49	2,71	2,78	2,78	2,77	2,53	2,51	2,75	3,02
Kimberley Central	7	4,13	4,30	4,54	4,52	4,49	4,67	—	—	—	—	—	—
Klip	8	2,36	2,35	2,25	2,23	2,39	2,74	2,91	3,12	2,93	2,74	2,86	2,89
King William's Town	9	5,05	—	5,05	—	—	5,02	—	—	—	—	—	—
Komati	10	1,31	1,42	1,69	1,48	1,29	1,37	1,27	1,40	1,41	1,33	1,37	1,50
Rosherville	11	2,09	2,30	2,35	2,37	2,41	2,74	—	—	—	—	—	—
Salt River	12	5,35	5,54	5,91	5,86	5,97	6,23	6,56	6,48	6,64	6,61	7,01	7,46
Taaibos	13	2,18	1,93	1,87	1,74	1,72	1,82	1,96	2,05	2,11	2,04	1,92	2,06
Umgeni	14	4,42	4,72	4,82	4,76	5,00	5,31	5,61	5,58	5,45	5,57	5,84	6,08
Vaal	15	1,03	1,05	1,14	1,15	1,15	1,20	1,28	1,27	1,22	1,17	1,32	1,25
Vereeniging	16	1,06	1,12	1,18	1,16	1,17	1,46	1,42	1,45	1,01	—	—	—
Vierfontein	17	1,72	1,61	1,58	1,57	1,70	1,85	1,82	1,87	1,72	1,76	1,85	1,85
West Bank	18	5,03	5,26	5,53	5,52	5,62	5,75	5,85	5,84	6,04	6,13	6,31	6,83
Wilge	19	1,04	1,07	1,05	1,06	1,09	1,20	1,44	1,47	1,36	1,38	1,58	1,66
Witbank	20	1,16	1,26	1,27	1,28	1,40	1,51	1,50	1,55	1,76	1,57	—	—
Camden	21	—	—	—	—	—	—	2,00	1,55	1,79	1,82	1,69	1,69
Grootvlei	22	—	—	—	—	—	—	—	—	1,84	1,67	1,83	2,09
Hendrina	23	—	—	—	—	—	—	—	—	—	1,95	1,72	1,89
Arnot	24	—	—	—	—	—	—	—	—	—	—	1,67	1,97

Escom and Republic

Calendar year	Census year for national statistics	Escom				Units generated millions of kWh (gross)			Units sold or used millions of kWh		
		Total staff	Capital expenditure at cost thousands of Rand	Installed capacity MW	Coal burnt thousands of metric tons	Escom + V.F.P.	Republic of S.A.	g — h %	Escom	Escom + V.F.P.	Republic of S.A.
a	b	c	d	e	f	g	h	i	j	k	l
1925	1925-26	—	1 879	1,3	—	—	1 761	—	0,1	—	1 517
1926	1926-27	—	4 181	61,3	—	—	1 889	—	161,7	—	1 694
1927	1927-28	—	12 973	121,3	—	—	2 110	—	551,0	—	1 807
1928	1928-29	—	14 582	175,6	1 755,3	1 422,2	2 300	61,8	627,9	1 411,4	2 008
1929	1929-30	633	15 310	194,6	1 892,5	1 516,7	2 454	61,8	797,0	1 560,5	2 127
1930	NA	688	15 429	215,6	1 965,3	1 766,3	NA	—	889,6	1 632,4	NA
1931	NA	664	15 863	215,6	2 029,5	1 857,4	NA	—	867,1	1 689,5	NA
1932	NA	645	16 095	227,6	2 166,4	2 028,7	NA	—	890,7	1 814,2	NA
1933	1932-33	678	16 547	247,6	2 306,1	2 246,4	2 947	76,2	974,1	1 920,0	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	4 795,8	6 638
1944	1943-44	1 328	48 036	796,8	4 684,9	5 597,8	8 043	69,6	4 415,8	4 970,5	6 920
1945	1944-45	1 531	49 913	862,8	4 816,4	5 748,7	8 329	69,0	4 706,1	5 101,1	7 142
1946	1945-46	1 836	52 852	975,7	4 827,9	5 895,6	8 557	68,9	5 002,4	5 218,8	7 338
1947	1946-47	2 169	57 650	1 033,1	5 443,4	6 035,9	8 788	68,7	5 114,5	5 341,7	7 494
1948	1947-48	2 692	90 816	1 385,0	5 557,4	6 553,5	9 481	69,1	5 576,9	5 787,0	8 089
1949	1948-49	8 764	100 234	1 411,9	5 774,8	7 075,3	10 013	70,7	6 222,2	—	8 829
1950	1949-50	9 352	115 129	1 439,8	6 323,4	7 773,6	11 187	69,5	6 910,6	—	9 750
1951	1950-51	10 336	137 283	1 520,5	6 663,1	8 326,6	11 895	70,0	7 456,5	—	10 474
1952	1951-52	10 889	176 559	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	1957-58	13 421	377 265	2 826,7	10 220,5	14 638,8	20 133	72,7	12 763,1	—	17 321
1958	1958-59	14 312	417 701	3 036,5	10 784,1	15 582,6	21 165	73,6	13 602,2	—	18 132
1959	1959-60	13 947	453 130	3 289,4	11 548,7	16 926,5	22 561	75,0	14 724,5	—	19 334
1960	1960-61	14 654	491 471	3 408,9	12 512,6	18 543,3	24 365	76,1	16 094,1	—	20 968
1961	1961-62	15 441	529 565	3 558,9	13 194,8	19 575,4	25 699	76,2	17 013,2	—	22 066
1962	1962-63	16 467	581 579	3 758,9	13 955,5	20 805,5	26 969	77,1	18 121,0	—	23 706
1963	1963-64	16 804	637 076	4 175,9	14 721,1	22 312,4	29 399	75,9	19 500,0	—	25 257
1964	1964	17 172	679 193	4 499,6	15 654,7	24 355,3	32 020	76,1	21 247,5	—	NA
1965	1965	17 851	741 109	4 624,7	16 726,8	26 440,4	34 490	76,7	32 143,3	—	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	35 967,0	46 146	77,9	31 505,6	—	37 220
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	—	24 952,8	47 411,1	59 081	—	41 648,9	—	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 (i) are compiled by the Department of Statistics. The particulars shown in column (h) in respect of the years 1964, 1966 and 1968 to 1971 are estimates of the total electricity generated, calculated by Escom, based on the results of a sample survey conducted by the Department of Statistics.

Statement showing the price or rent of land or interests in or over land or other property acquired or hired by the Commission during the year 1972

Statement No. 9

see previous annual report for rights or interests in or over land acquired prior to 1970

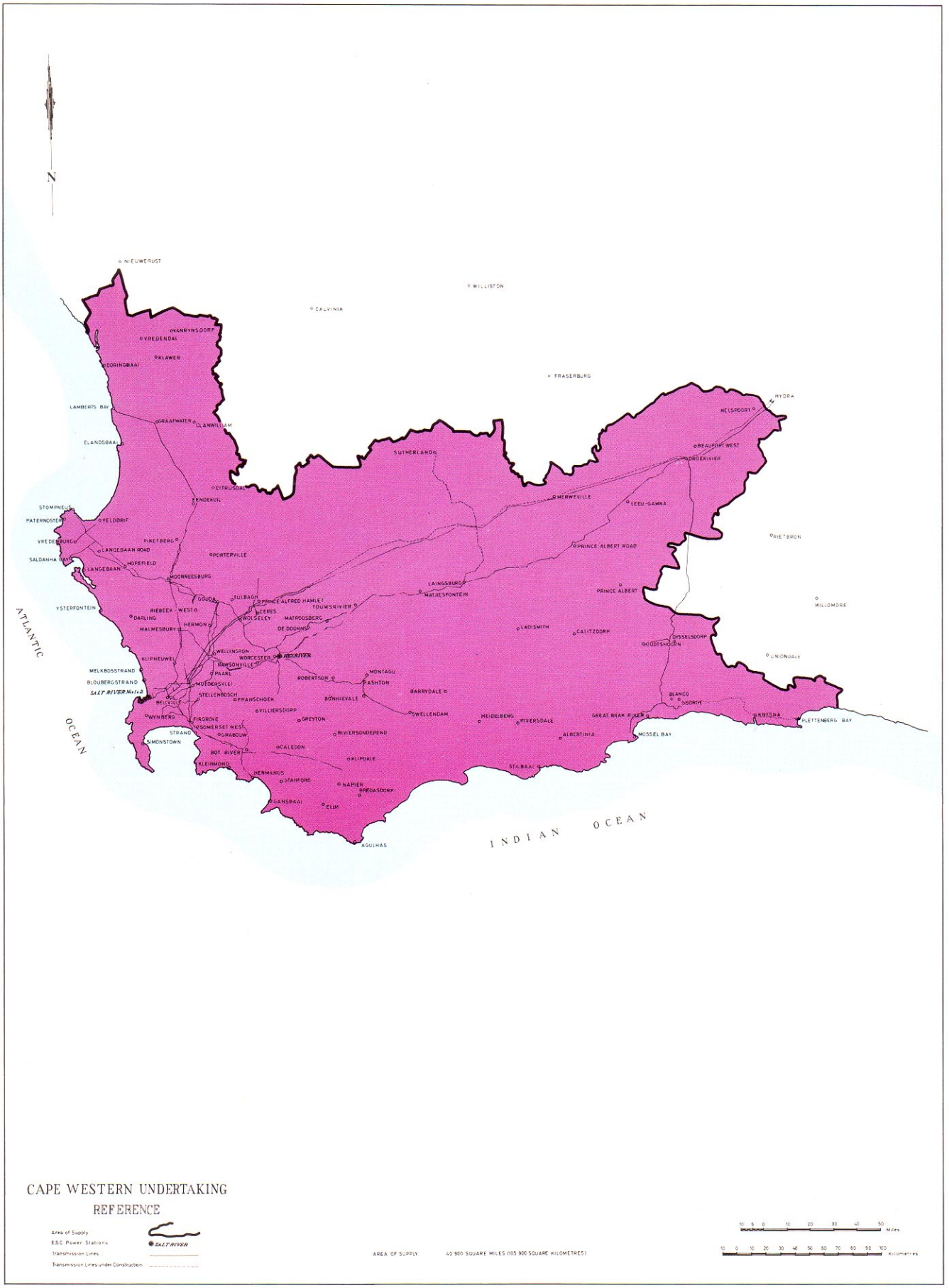
Cape Western Undertaking	
Immovable property acquired for considerations amounting to	R120 459,00
Servitudes acquired—capitalised payments amounting to	R31 580,09
Cape Northern Undertaking	
Immovable property acquired for considerations amounting to	R14 522,53
Servitudes acquired—capitalised payments amounting to	R35 225,26
Cape Eastern Undertaking	
Immovable property acquired for considerations amounting to	Nil
Servitudes acquired—capitalised payments amounting to	R718,12
Natal Undertaking	
Immovable property acquired for considerations amounting to	R103 165,00
Servitudes acquired—capitalised payments amounting to	R161 999,0
Eastern Transvaal Undertaking	
Immovable property acquired for considerations amounting to	R56 750,00
Servitudes acquired—capitalisation payments	R57 176,58
Border Undertaking	
Immovable property acquired for considerations amounting to	Nil
Servitudes acquired—capitalised payments amounting to	R43 334,17
Orange River Undertaking	
Immovable property acquired for considerations amounting to	R74 281,74
Servitudes acquired for capitalised payments amounting to	R68 283,87
Rand and Orange Free State Undertaking	
Immovable property acquired for considerations amounting to	R139 014,09
Servitudes acquired for capitalised payments amounting to	R736 121,89

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.

Cape Western Undertaking



The licensed area of supply of this Undertaking was increased during 1972 to enable Escom to provide a supply to the Sutherland Municipality, to the new observatory to be erected by the Council for Scientific and Industrial Research in the district of Sutherland, and to the towns of Lutzville, Vredendal and Van Rhynsdorp. The licensed area of supply including these extensions is shown on page 74.

During 1972, a total of 3 079 million units of electricity were supplied to this distribution undertaking by the Central Generating Undertaking. Of the total 1 170 million units, or 38 per cent 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 76, the total units sold in 1972 exceeded the corresponding total for 1971 by 11,1 per cent. While this is a high rate of growth, it does show a decrease compared with the exceptionally high growth rates of the past two years. This is true notwithstanding sustained growth of the bulk supplies to Cape Town Municipality. The diminished overall growth rate is due, in the main, to reduced rates of growth in the industrial sector and in bulk supplies to other municipalities.

The following graph indicates the increase in sales of electricity over the period 1963 to 1972, the red line indicating the average price per unit sold:

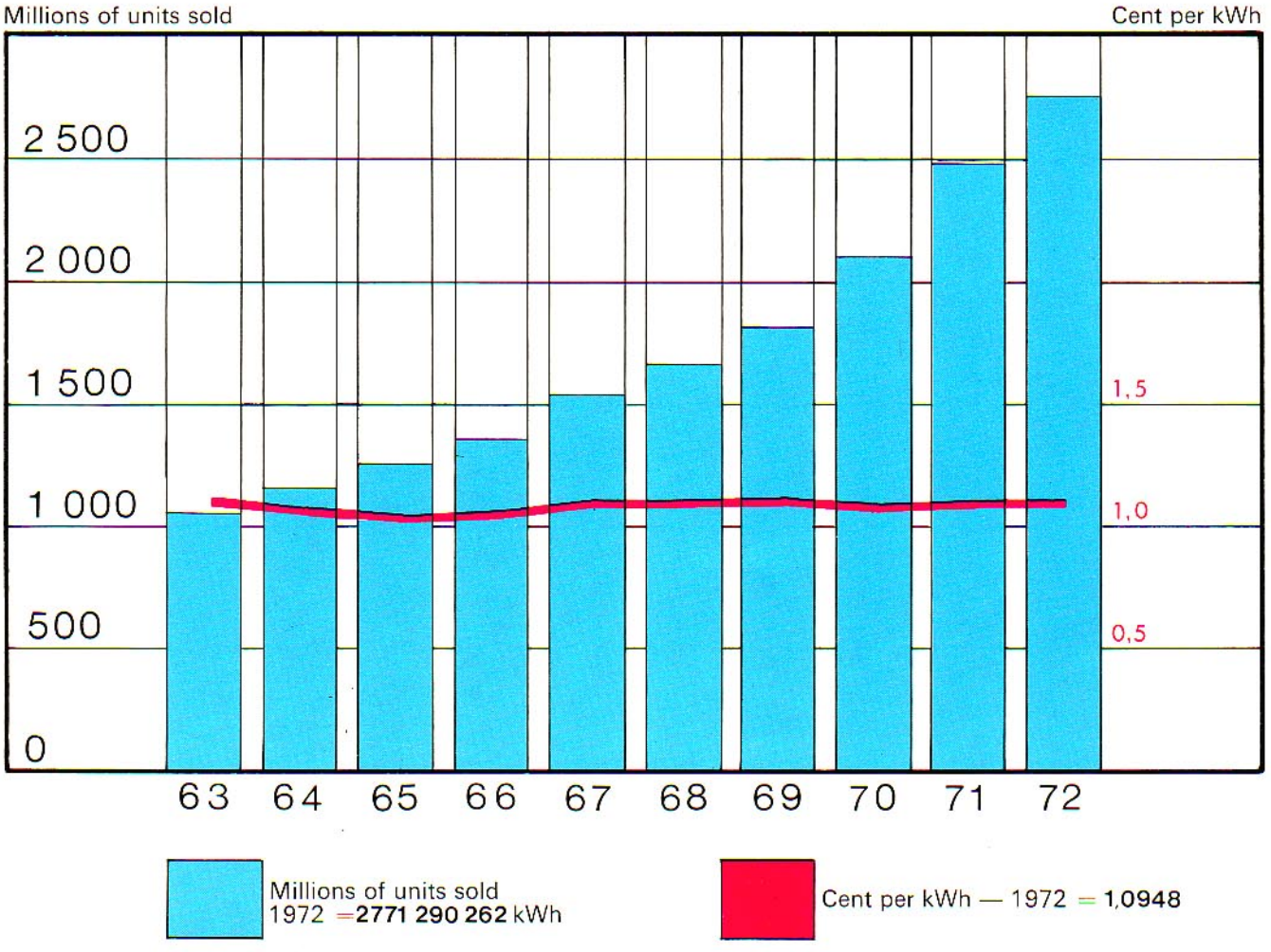
Development of the undertaking

No additional 400 kV transmission equipment was placed in service in the undertaking in 1972, but during 1973 it is planned to have the second line from Hydra through Droërivier to Muldersvlei completed and in service. To provide a supply to the Southern Cape, the 132 kV transmission line from Droërivier to Blanco (near George), with a branch to Oudtshoorn, was placed in service early in 1973.

Transmission lines at 66 kV from Blanco to Mossel Bay and from Blanco to George were placed in service early in 1973, making supplies available to these two towns. Substations constructed at Mossel Bay, George and Knysna were completed early in 1973, and the necessary 66 kV lines between George and Knysna and Knysna and Plettenberg Bay, as well as 66 kV extensions from Mossel Bay westwards to Albertinia, Stilbaai, Riversdale and Heidelberg, will be placed in service during 1973.

Two 22 kV lines from Droërivier to Beaufort West were completed in 1972, and a start was made on the construction of a 66 kV line from Laingsburg to Sutherland. This work was about 25 per cent complete by the end of 1972, and is planned for completion in 1973.

Survey work was carried out in 1972 for a double-circuit



66 kV line from Blackheath to a new substation to be constructed during 1973 in the Philippi area, called Vlakte, enabling supplies to be given to industries in the area.

To reinforce the 33 kV system in Bellville, the erection and commissioning of a 132/33 kV addition to Acacia distribution station, comprising two 80 MVA transformers and outgoing 33 kV cable feeders, was commenced in 1972 and is planned for completion in 1973.

During 1972, increased supplies were provided to a number of industries, including the Consolidated Glass Works, for example, which doubled its demand. The provision of supplies to new townships continued in 1972, and appears unlikely to slacken in 1973. Supplies were provided by means of 22 and 11 kV lines to several remote Post Office microwave repeater stations on the Cape Town/Beaufort West link in 1972. During 1973 the remaining repeater station, situated near Nelspoort, will be supplied by means of an extension from the 22 kV supply to Beaufort West.

Development of rural electrification

The total number of farming supplies furnished by the undertaking increased from 5 805 at the end of 1971 to 5 866 at the end of 1972. New transmission lines, 229 km in length, were erected to provide the additional supplies. Apart from the new consumers who were connected to existing schemes operated by the undertaking, increased supplies were also given to 220 established rural consumers. No new schemes for farm supplies were commenced in 1972. It has been pointed out, in an earlier report, that electrical reticulation has already been fully developed in the more intensively-farmed areas of the Western Cape, and that new schemes must be developed in areas where the farms are larger. In these areas, however, there is usually not such a potential for the use of electricity. The higher charges resulting from the longer lengths of line required in these areas have an adverse effect on the acceptability of Escom's terms of supply.

The regions of greatest activity in rural electrification were Rawsonville/Tulbagh/Wolseley, Malmesbury/Hopefield/Darling, and Eendekuil/Piketberg/Citrusdal. 75 km of new lines were erected in these regions.

The commencement of construction in 1973 of a 60 km line for the supply of electricity to the sanatorium and microwave station at Nelspoort will enable the undertaking to negotiate supplies for farmers in that vicinity.

Financial

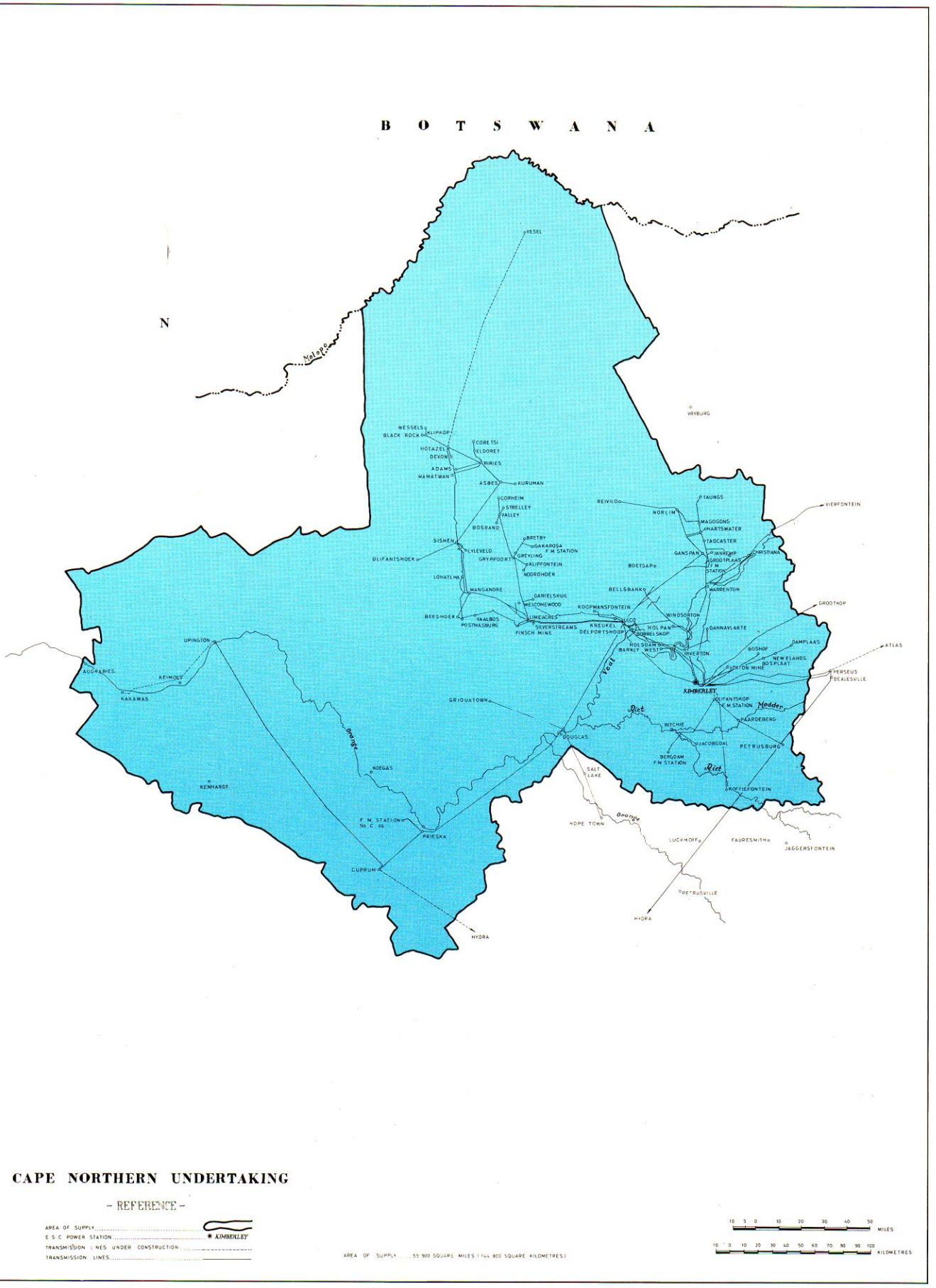
Details of the units sold to the different classes of consumers, the total revenue derived therefrom, and the working costs are shown in the table below. The average price per unit sold during 1972 of 1,094 8 cents is 1,25 per cent higher than the figure for 1971. Total sales revenue for the year amounted to R30 338 913 and exceeded the corresponding figure for 1971 by 12,5 per cent.

Cape Western Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	6	6	16,85	15,31	420 210 776	424 254 138	+ 1,83	+ 0,96	4 641 207	4 870 235	1,104 5	1,148 0
Bulk	40	42	31,59	34,94	788 135 682	968 388 212	+49,92	+22,87	6 344 566	7 872 389	0,805 0	0,812 9
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	7,015	7 818	38,87	37,61	969 688 681	1 042 088 396	+11,21	+ 7,47	11 250 234	12 433 538	1,160 2	1,193 1
Domestic	52 231	51 524	12,34	11,81	307 730 990	327 370 278	+ 8,85	+ 6,38	4 522 605	4 921 784	1,469 7	1,503 4
Street lighting	44	44	0,35	0,33	8 706 349	9 189 238	+ 8,92	+ 5,55	214 174	240 967	2,460 0	2,622 3
Total	59 336	59 434	100,00	100,00	2 494 472 478	2 771 290 262	+18,73	+11,10	26 972 786	30 338 913	1,081 3	1,094 8

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	26 972 786	30 338 913	
Working costs	26 874 099	31 075 601	
Surplus	98 687	—	
Deficit	—	736 688	1 049 673

Cape Northern Undertaking



CAPE NORTHERN UNDERTAKING

- REFERENCE -

AREA OF SUPPLY
E.S.C. POWER STATION ✱ KIMBERLEY
TRANSMISSION LINES UNDER CONSTRUCTION
TRANSMISSION LINES

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

10 5 0 10 20 30 40 50 MILES

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

The licensed area of supply of the Cape Northern Undertaking was increased during 1972 to enable Escom to supply the towns of Upington, Keimoes, Kakamas, Prieska, Marydale, and Kenhardt, and also to furnish supplies to mines and farms in the vicinity of these towns, and in the area east of Boshoff. Early in 1973, a further extension 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.

The licensed area of supply of the undertaking including these extensions, is shown on the map on page 77.

Sales of electricity

The table on page 79 compares the electricity sales for 1972 with those of the previous year. During the year under review, sales increased by 13,43 per cent to 896 million units. As in 1971, the mining industry continues to represent the undertaking's largest consumer group, with the new Prieska copper mine an important contributor towards the exceptionally high growth rate of 26,25 per cent attained in the mining sector in 1972. Sales in the traction category showed a slight decrease as against 1971.

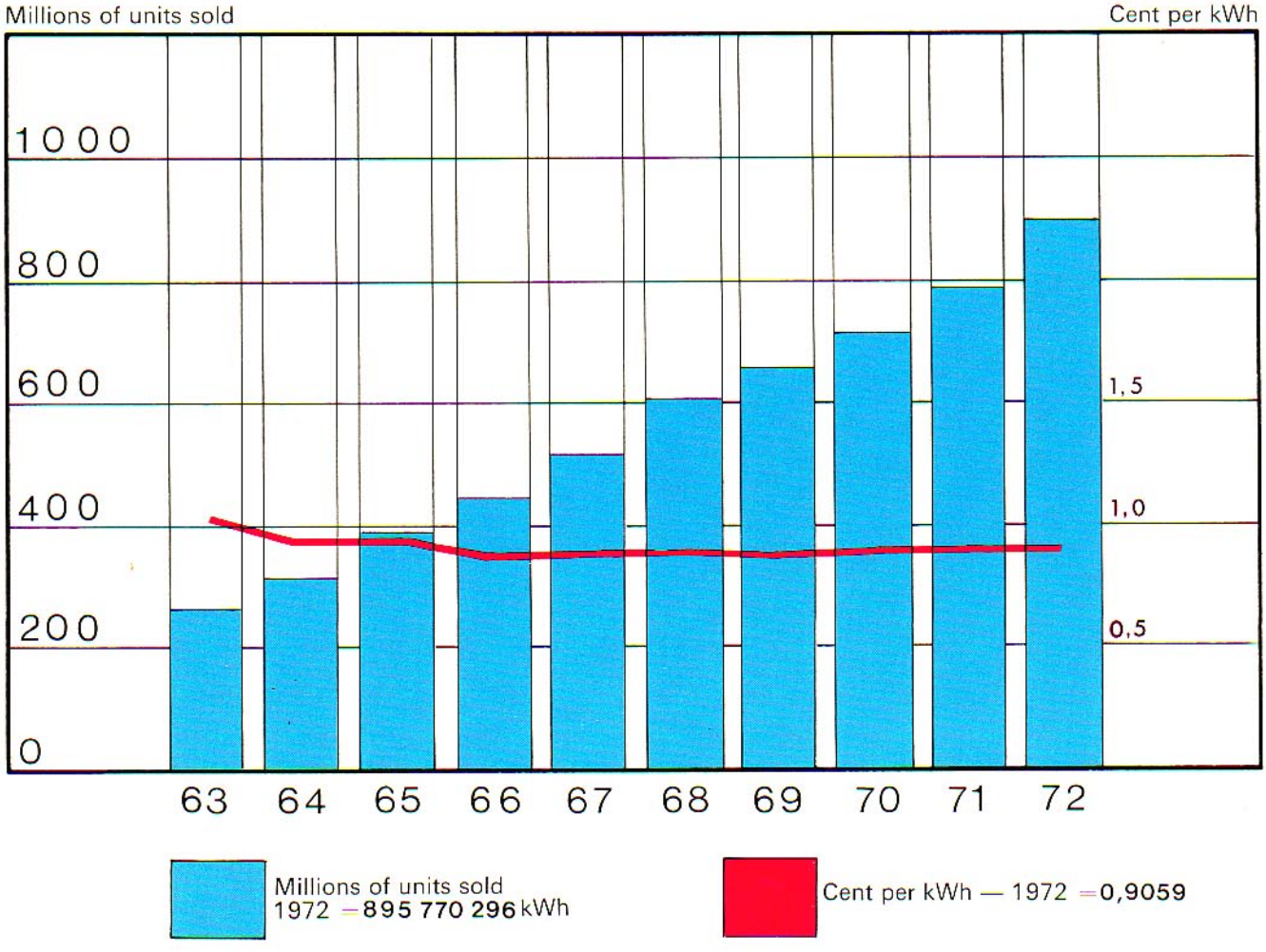
The following graph indicates the increase in sales over the period 1963 to 1972, and the change in the average price per unit sold.

Development of the undertaking

The 132 kV transmission line from Cuprum to Gordonia to supply the town of Upington is complete, the substation having been commissioned in November 1972. The 220 kV wood-pole transmission line between Hydra distribution station and Cuprum is progressing favourably and it is expected that this line will be placed in service by August 1973. The construction of a duplicate 275 kV transmission line between Perseus distribution station and the Kimberley distribution station was completed and the line placed in service in December 1972. The 132 kV transmission lines to supply the Pomfret asbestos mine north-west of Vryburg, as well as the towns Keimoes and Kakamas, south-west of Upington, are planned for commencement in 1973 and completion during 1973 and 1974.

Major substation extensions are planned at Sishen, Hotazel, and Silverstreams to cater for the immediate future requirements of Iscor, S.A. Manganese, and the Northern Lime Company respectively, as well as the building of a new 66 kV substation near Kuruman, which will cater for the future development of Kuruman itself.

To handle the increasing rail traffic in the Northern Cape,



the South African Railways have requested seven additional 132 kV substations to be provided in the traction line between Kimberley and Wildhoen near Bloemhof. Three of these substations are to be commissioned during 1973 and the remaining four during 1974. Twelve additional substations are required in the traction line between Kimberley and Sishen, and are planned for completion during 1974.

Development of rural electrification

The undertaking continued to develop rural supplies in areas where the potential for farmers to use electricity permits acceptable financial terms to be offered. The scheme to supply the Riet river irrigation scheme plots between Modder river and Jacobsdal was completed. The small schemes to supply the consumers at Salt Lake, south of Douglas, as well as a group of river-pumping farmers on the upper Vaal river, north of Douglas, were also completed.

The scheme to supply the farmers along the Modder river, east of Perdeberg, is under construction, and it is expected to be complete by mid-1973.

Investigations are at present in hand to establish the viability of schemes to supply the farms in the areas on the Modder river, west of the existing Perdeberg West farmers, the Plooysberg area, along the Modder river, north-east of Douglas, as well as the Straussberg and Melkstroom areas, north of Upington, and the area between Upington and Aughrabies.

The total number of farming supplies furnished by the undertaking increased from 1 777 at the end of 1971 to 2 033 at the end of 1972.

Financial

Details of the number of units sold to consumers in different categories, revenue received, and operating cost are shown for the years 1971 and 1972 in the table below.

The average price per unit sold increased slightly from 0,899 3 cent/kWh in 1971 to 0,905 9 cent/kWh in 1972. Total sales revenue for the year amounted to R8 114 802 and exceeded the corresponding figure for 1971 by 14,3 per cent.

Cape Northern Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	3	3	25,78	22,67	203 606 016	203 045 040	+ 14,19	— 0,28	1 753 827	1 853 588	0,861 4	0,912 9
Bulk	15	17	21,68	21,24	171 190 300	190 239 500	+ 7,27	+ 11,13	1 270 361	1 455 278	0,742 1	0,765 0
Mining	78	77	37,05	41,23	292 559 567	369 365 067	+ 10,65	+ 26,25	2 807 770	3 341 266	0,959 7	0,904 6
Industrial	563	628	12,73	12,16	100 494 987	108 926 795	+ 7,23	+ 8,39	937 954	1 090 244	0,933 3	1,000 9
Domestic	2 924	3 159	2,73	2,67	21 547 900	23 919 231	+ 15,56	+ 11,00	324 466	367 702	1,505 8	1,537 3
Street lighting	13	13	0,03	0,03	278 916	274 663	+ 23,23	— 1,52	7 159	6 724	2,566 7	2,448 2
Total	3 596	3 897	100,00	100,00	789 677 686	895 770 296	+10,46	+13,43	7 101 537	8 114 802	0,899 3	0,905 9

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	7 101 537	8 114 802	
Working costs	7 199 249	8 373 487	
Surplus	—	—	304 248
Deficit	97 712	258 685	

Cape Eastern Undertaking

CAPE EASTERN UNDERTAKING

REFERENCE

Area of Supply

Border Undertaking

Transmission Lines

Transmission Lines Under Construction

Substation Site ○ S/S

10 5 0 10 20 30 40 50 Kilometres

10 5 0 10 20 30 40 50 MILES

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

The licensed area of supply of this undertaking was increased during 1972 to enable Escom to provide for large and small power supplies and for domestic supplies at Kareedouw, as well as farm supplies in the Zuur Anys and Tsitsikamma areas. The licensed area of supply, including these extensions, is shown on the map on page 80.

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. Electricity is, however, not continuously available from this source, as its generation is dependent upon the release of water for irrigation. When the hydro-electric power station is not operating, Escom purchases electricity from the Port Elizabeth Municipality at Summit substation. When the output from the hydro-electric power station exceeds the demand of Escom's network in this valley, the surplus power is taken by the Port Elizabeth Municipality. Electricity for the network in the Sundays River valley is purchased from the Port Elizabeth Municipality at Aloes substation.

During 1973 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.

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 red 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 the Port Elizabeth Municipality at Summit substation when the hydro-electric power generated at the Paul Sauer dam exceeds the needs of Escom's network in the Gamtoos valley.

In 1972, 8,407 million units of electricity were sold to consumers in the licensed area of the Cape Eastern Undertaking, and this shows an increase of 18,32 per cent over the corresponding figure for 1971.

Development of the undertaking

It was possible to operate the hydro-electric power station at the Paul Sauer dam for most of the time in 1972, except for periods when auxiliary circuit modifications and mechanical overhauls had to be carried out. The power generated beyond the needs of the Gamtoos Valley was exported to Port Elizabeth Municipality.

A supply was made available to the Kareedouw village in mid-November 1972, and by the end of the year 59 consumers, comprising domestic and small power users, had been connected to the system.

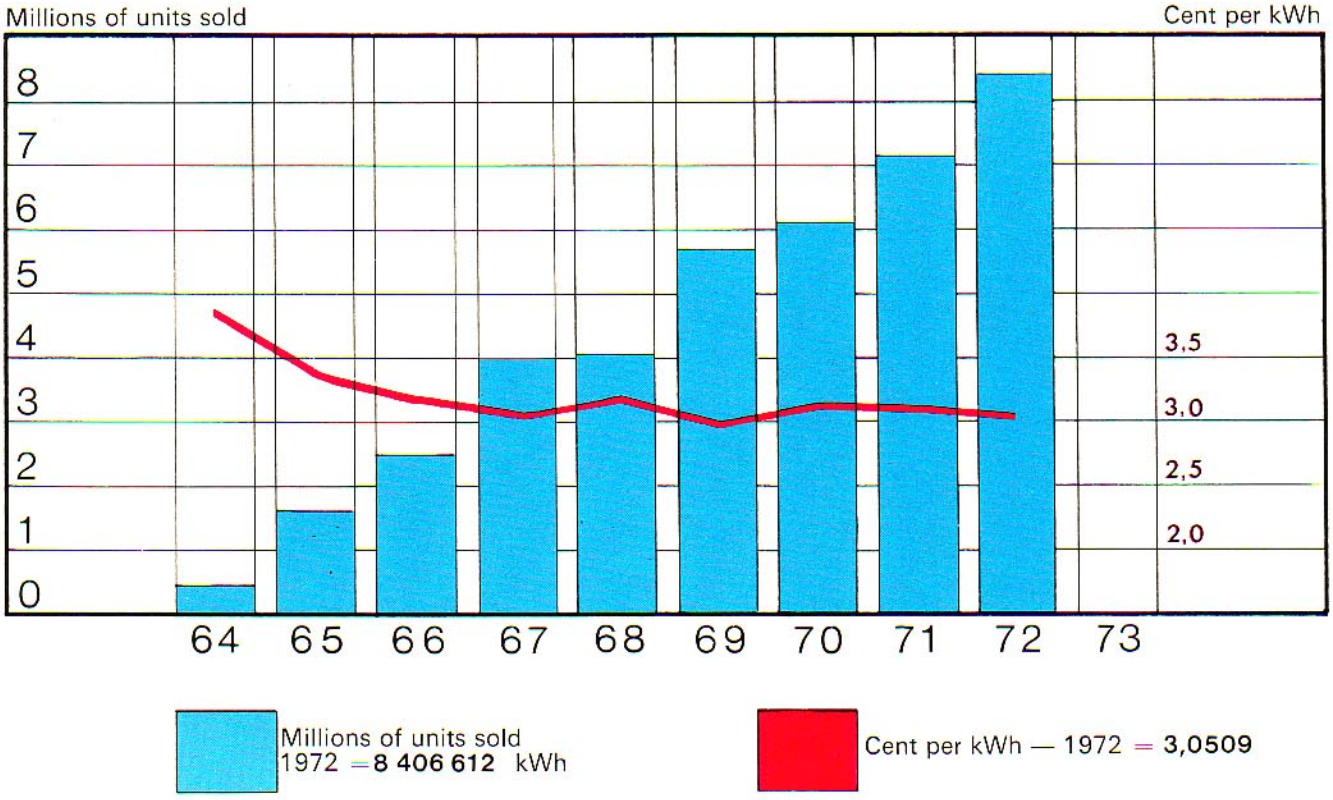
Development of other existing networks continued during the year, and the total number of consumers connected, including Kareedouw village, increased from 584 in 1971 to 678 in 1972.

Development of rural electrification

The whole system of the Cape Eastern Undertaking is effectively a rural network. However, probably as an aftermath of the severe drought of 1970 and the floods of 1971, only one of the 94 new consumers connected in 1972 utilised his supply purely for farming purposes.

Financial

The table on page 82 gives details of the units sold to the



various classes of consumers, the total income received, and the total operating 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 operating 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 dropped slightly from 3,114 8 cent per kWh sold in 1971 to 3,050 9 cent per kWh sold in 1972. Total sales revenue for the year amounted to R256 480 as compared with R221 309 for 1971.

Cape Eastern Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	--	—	—	—	—	--	--	—	—	—	—	—
Bulk	1	1	21,67	21,25	1 539 720	1 786 080	+ 17,59	+16,00	29 479	32 366	1,914 6	1,812 1
Mining	--	—	—	—	—	—	--	--	—	—	—	—
Industrial	111	116	46,38	46,53	3 295 634	3 911 703	+ 17,30	+18,69	113 940	133 518	3,457 3	3,413 3
Domestic	470	558	31,62	31,91	2 246 331	2 682 889	+ 13,64	+19,43	76 680	89 250	3,413 6	3,326 6
Street lighting	2	3	0,33	0,31	23 508	25 940	— 8,71	+ 10,35	1 210	1 346	5,147 2	5,188 9
Total	584	678	100,00	100,00	7 105 193	8 406 612	+16,15	+18,32	221 309	256 480	3,114 8	3,050 9

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	221 309	256 480	
Working costs	266 208	299 080	
Surplus	—	—	
Deficit	44 899	42 600	184 065

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.

Border Undertaking

BORDER UNDERTAKING

REFERENCE

Area of Supply

E. S. C. Power Stations ● EAST LONDON

Transmission Lines

" " Under Construction

Ducat's Outspan Substation ●

AREA OF SUPPLY

21,500 SQUARE MILES (55,700 SQUARE KILOMETRES)

10 5 0 10 20 30 40 50 MILES

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

The licensed area of supply of the Border Undertaking is shown on the map on page 83. The electricity required in this Undertaking is generated at West Bank power station, which has not yet been taken over by the Central Generating Undertaking. It is planned to augment the power resources of the Border Undertaking in 1973 by interconnection with the national 400 kV transmission network, and the West Bank power station will then also be taken over by the Central Generating Undertaking.

Sales of electricity

As shown in the table on page 85, the total units of electricity sold in the Border Undertaking in 1972 exceeded the corresponding total for 1971 by 12,06 per cent. This rate of growth experienced during 1972 is higher than the average annual increase of 9,04 per cent during the ten-year period ended in 1972. Significant contributors to the growth during 1972 were the increased supplies to the Good Hope Textile Corporation near King William's Town and increased bulk supplies to East London Municipality. The graph below indicates the increase in sales of electricity over the period 1963 to 1972, and the change during this period in the average price per unit sold:

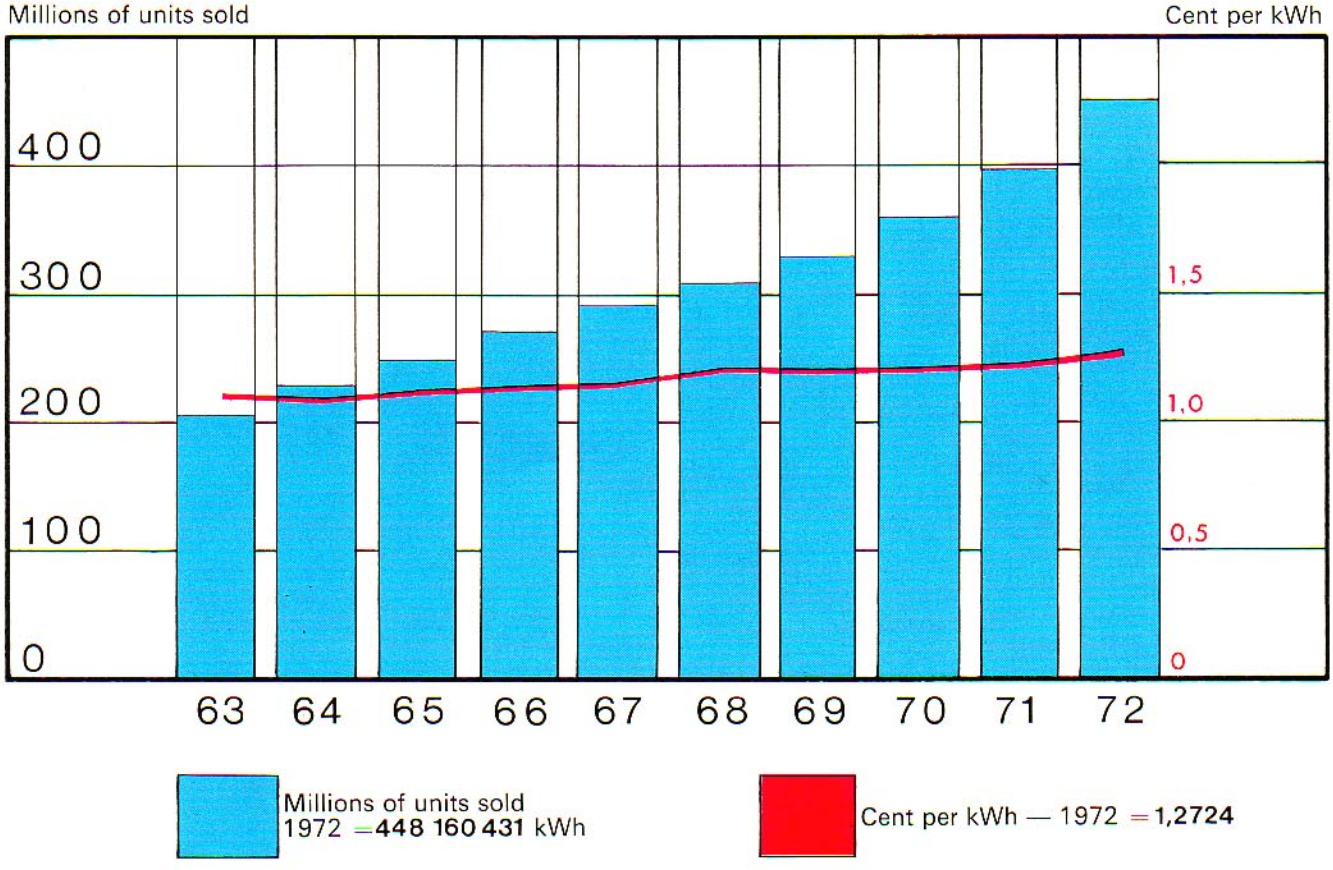
Development of the undertaking

Erection of the 220 kV transmission line from Poseidon distribution station near Cookhouse to Pembroke distribution station near Berlin continued in 1972. Good progress was made with the construction of Pembroke distribution station, which will be the main point of supply to Border Undertaking from the national transmission network. This distribution station is to be placed in service in 1973. The construction of Buffalo distribution station, which is to be the new 132 kV point of supply for East London Municipality, is proceeding and is planned for completion in 1973. Riverview substation, through which West Bank power station will be connected to the 66 kV transmission system, is in course of construction, and is planned for completion towards the end of 1973.

Erection of 66 kV lines is continuing in the Arnoldton-Westbank locality, between the Riverview, Gately and Buffalo substations. The transmission and ancillary equipment being provided for permanent 66 kV supplies to the Good Hope Textile Corporation near King William's Town is planned for completion early in 1973.

To provide increased supplies to the Transkei, a 132 kV line being erected from Pembroke to Butterworth is planned for completion by the middle of 1973. Associated with this project, the construction of a 66/22 kV substation near Butterworth is also planned for completion in the second half of 1973. A 132 kV line is to be erected between Butterworth and Umtata by the end of 1973.

To cater for rapid growth in the North Coast area, supplies to that area are being strengthened. The South Coast system is to be strengthened by the erection of a 22 kV line from the Buffalo distribution station at Arnoldton to the Prospect substation, a 22/11 kV substation near Kidds Beach. Further strengthening of supplies to the Grahamstown-Port Alfred area is being planned. The 11 kV



lines and substations for supplies to the Department of Water Affairs pumping stations at Laing Dam, Zwelitsha and Berlin Flats have been completed.

The new office block, to be named Escom House, in East London was completed by March 1973. The East London office of the undertaking was transferred to the lower floors of the new building in June 1972.

Development of rural electrification

Experience over the past few years in the undertaking has shown that most of the new farm connections were made as extensions to existing schemes, or in areas close to existing networks. It is difficult to offer attractive terms to new consumers with the high costs at present of erecting rural networks.

Nevertheless, the existing schemes have not yet reached a saturation point, and during 1972 the undertaking connected 46 new farm supplies to networks already in existence in rural areas. These supplies to farms necessitated the erection of 34 km of lines.

During 1973, the undertaking expects to provide supplies to a further 29 individual farmers at various points, while 17 other non-farming consumers have co-operated to form a supply scheme.

Financial

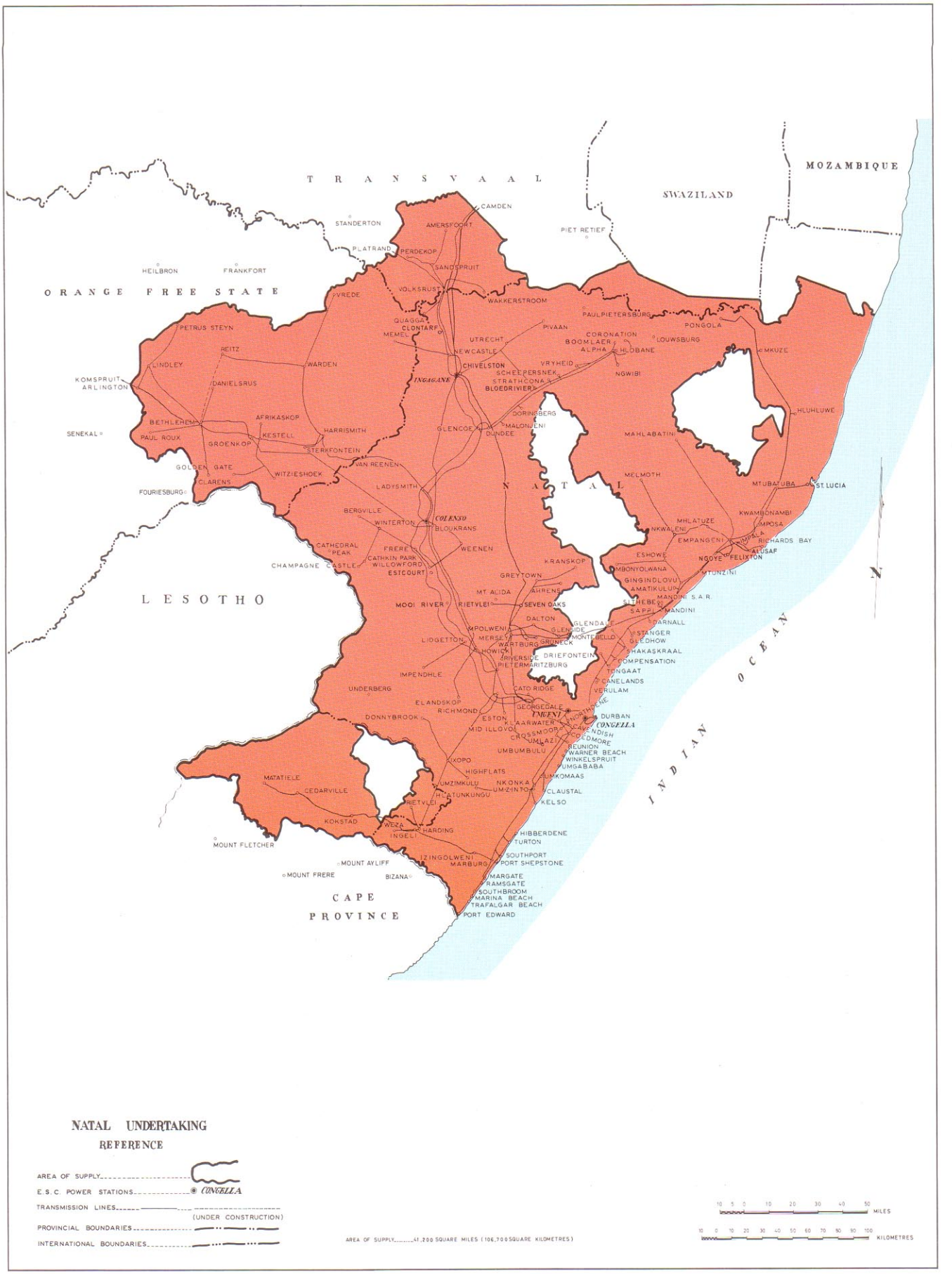
Details of revenue and cost are given in the table below. The average price per unit sold increased by 5 per cent from 1,211 7 cent per kWh in 1971 to 1,272 4 cent per kWh in 1972, largely due to increased coal costs. Total sales revenue for the year amounted to R5 702 393 and exceeded the corresponding figure for 1971 by 17,7 per cent.

Border Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk	16	15	91,34	89,22	365 264 691	399 829 206	+18,56	+ 9,46	4 054 331	4 653 669	1,110 0	1,163 9
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	358	383	3,96	6,00	15 817 784	26 879 201	−35,64	+69,93	400 683	590 190	2,533 1	2,195 7
Domestic	2 771	2 999	4,65	4,73	18 597 961	21 189 628	−31,26	+13,94	380 682	447 137	2,046 9	2,110 2
Street lighting	8	8	0,05	0,05	235 103	262 396	−63,60	+11,61	10 084	11 397	4,289 2	4,343 4
Total	3 153	3 405	100,00	100,00	399 915 539	448 160 431	+10,98	+ 12,06	4 845 780	5 702 393	1,211 7	1,272 4

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	4 845 781	5 702 393	
Working costs	4 905 352	5 467 674	
Surplus	—	234 719	
Deficit	59 571	—	168 952

Natal Undertaking



NATAL UNDERTAKING
REFERENCE

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

AREA OF SUPPLY 41,200 SQUARE MILES (106,700 SQUARE KILOMETRES)

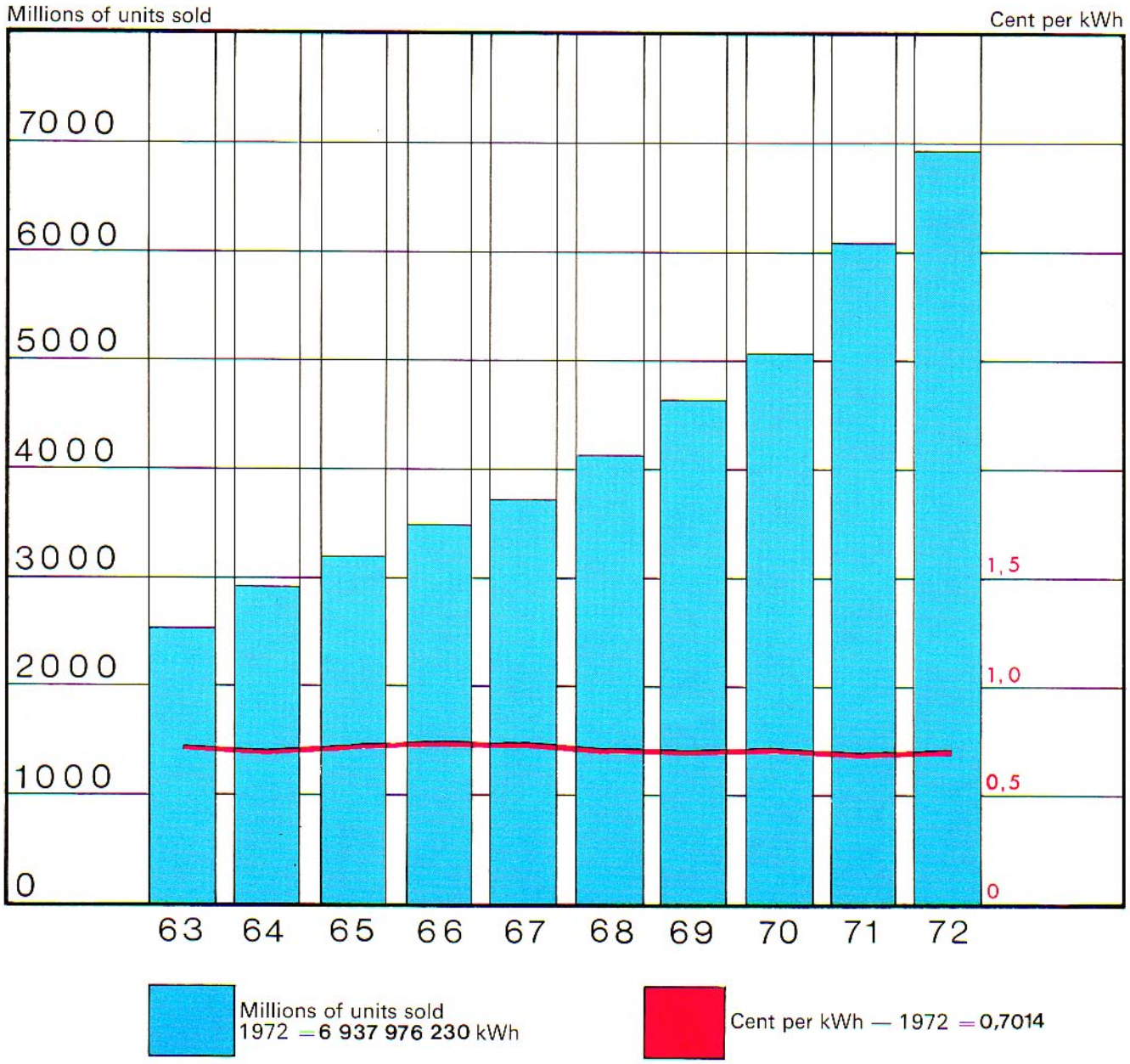
The licensed area of supply of the Natal Undertaking, which combines the areas of supply of the Natal Central Licence and the Natal Southern Licence, is as shown on the map on page 86. The Natal Southern Licence was amended during the year to include the whole of the magisterial district of Matatiele. The Natal Central Licence was amended by the excision of a small area around Fouriesburg in the Orange Free State, which can be more economically supplied from the Rand and Orange Free State network.

Interconnection of the power stations situated in Natal—Congella and Umgeni near Durban, Colenso in the Midlands, and Ingagane in Northern Natal—with the large pithead power stations in the Transvaal was taken a stage further in 1972, with the completion, in September, of the second 400 kV line from Camden to Chivelston. This has facilitated the import of power from the Transvaal power stations, thereby enabling the older and less economic power stations in Natal to operate at reduced output.

Sales of electricity

The graph below indicates the increase in sales of electricity over the period 1963 to 1972, and the change, during this period, in the average price per unit sold.

Total sales of electricity in the undertaking increased from 6 072,3 million units in 1971 to 6 938,0 million units in 1972—an increase of 14,26 per cent. While not as high as the exceptional rate of growth of 19,69 per cent achieved during 1971—the year of commissioning the first Alusaf smelter at Richards Bay—the remarkable increase of 14,26 per cent in 1972 is still largely due to the sustained supplies to Alusaf. Disregarding the supplies to Alusaf, the remaining sales of electricity exceeded the corresponding figure for 1971 by 9,2 per cent. The equivalent figure for 1970/71 was 9,9 per cent. There



were reductions—understood to be of a temporary nature—in the supplies during 1972 to two large users in the undertaking: Feralloys and South African Pulp and Paper Industries. Bulk supplies to municipalities in 1972 showed an increase of 11,8 per cent over 1971. The Durban Corporation purchased 78,0 per cent of these units, its consumption rising by 11,7 per cent over the 1971 figure. Sales to the South African Railways for traction purposes rose by 9,0 per cent, to 893,5 million units.

Development of the undertaking

The capacities of the interconnections between the national transmission network and Congella and Colenso power stations were increased during the year to enable these stations to reduce generation. At Congella, a new 88/33 kV interconnector substation was completed, and at Colenso the interconnection between the 88 kV and 132 kV systems is to be strengthened by means of an additional 80 MVA transformer and remodelling of the existing 132/88 kV substation, scheduled for completion during 1973.

At Newcastle, a start was made with the construction of the new 400/132 kV Incandu substation for a supply to the S.A. Iron and Steel Industrial Corporation and an increased supply to the municipality. This work is planned for completion by July 1973.

The construction of a 275/88 kV substation, Bloedrivier, near Vryheid was started in 1972, to cater for load growth in the area extending from Newcastle through Dundee to Vryheid. By 1974, the 275 kV portion of the Bloedrivier substation is expected to be complete, together with a new incoming 275 kV line from Ingagane. At Vryheid, a firm supply to the municipality is to be provided from a new 88/11 kV substation planned for completion early in 1973.

The 132 kV line from Impala substation near Richards Bay to Pongola was completed late in 1972, enabling supplies to be provided progressively to numbers of consumers connected to rural networks in the Pongola, Mtubatuba, and Hluhluwe areas. These initial supply schemes are planned for completion in 1973. A scheme for supplying the industrial township of Sithebe near Mandini, sponsored by the Bantu Investment Corporation, involving a 132 kV tee line and 132/11 kV substation and township reticulation, is planned for completion early in 1973.

Work is due to commence early in 1973 on a scheme for supplies to the pump stations at Driel and Jagersrust in connection with the Tugela-Vaal water pumping project. The construction of the Tugela 275/132 kV substation near Bergville and associated 275 kV and 132 kV lines, and the 132/11 kV step-down substations at the pump stations are planned for completion in stages by early 1974.

Duplication of the supply to Bethlehem by means of a second 88 kV line is expected to be complete early in 1973, on bringing the new Jordan 132/88/33 kV substation into service. From this substation, an 88 kV line, energised initially at 33 kV, is to be provided to Reitz in 1973 to strengthen the Orange Free State network.

To cater for increased loading in the Greytown area, the

Natal Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	13	14	13,50	12,88	819 663 695	893 522 841	+ 9,06	+ 9,01	6 364 437	7 140 174	0,776 5	0,799 1
Bulk	29	30	58,17	56,94	3 532 529 278	3 950 383 918	+10,35	+11,83	22 353 724	25 500 457	0,632 8	0,645 5
Mining	32	31	2,66	2,35	161 514 728	163 233 710	+ 4,97	+ 1,06	1 306 600	1 356 131	0,809 0	0,830 8
Industrial	4 032	4 529	23,83	26,03	1 446 713 524	1 805 911 577	+65,91	+24,83	10 251 381	12 739 915	0,708 6	0,705 5
Domestic	16 270	18 136	1,81	1,77	109 815 114	122 761 635	+17,95	+11,79	1 626 609	1 880 184	1,481 2	1,531 6
Street lighting	68	76	0,03	0,03	2 082 221	2 162 549	+ 6,90	+ 3,86	41 127	47 381	1,975 2	2,190 9
Total	20 444	22 816	100,00	100,00	6 072 318 560	6 937 976 230	+19,69	+14,26	41 943 878	48 664 242	0,690 7	0,701 4

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	41 943 878	48 664 242	
Working costs	41 195 675	51 271 272	
Surplus	748 203	—	
Deficit	—	2 607 030	94 980

system is to be strengthened during 1973 by means of a 132 kV line from Mersey substation near Pietermaritzburg, energised initially at 33 kV. At a later stage, the line will be energised at 132 kV and a step-down substation provided near Greytown.

Following a decision by the South African Railways to postpone electrification of the new Vryheid-Richards Bay railway line, the traction supplies will not be provided as originally planned; initially, signalling supplies only will be provided at a number of points along the line from 88/11 kV substations. Work is planned to commence in 1973, continuing to 1974. New traction substation supplies, all at 88 kV, are to be provided during 1973 at Hudley, Port Durnford and Empangeni in Zululand, and at Booth and Shallcross in the Durban area. Supplies to a number of future traction substations required within the next two or three years by the South African Railways between Newcastle and Platrand and at Richards Bay are at present in the planning stage.

Development of rural electrification

Considerable progress is still being maintained with rural development which has taken place over a wide area in Natal. A total of 592 new farm supplies, involving the erection of 489 km of transmission lines, were made available during the year. In addition, 342 other rural consumers were connected.

With the completion of the 132 kV line to Pongola, a considerable number of farm supplies were made available in the Empangeni-Mtubatuba-Pongola area. Construction work is continuing in the Pongola area, where 76 farming supplies awaited connection by the end of the year. A scheme to supply 6 farms in the Hluhluwe area is progressing, and connection is planned early in 1973. In addition, the towns of Melmoth, Kwambonambi, Mtubatuba, and St. Lucia were also connected to the transmission network, whilst a bulk supply will shortly be made available to Pongola town. With Escom power now available in Northern Zululand, it is anticipated that considerable electrical growth will take place in this area.

A scheme to provide supplies to 33 farms in the Rietvlei-Mount Alida area, involving the erection of approximately 54 km of line, was completed at the end of the year. Construction is in progress on a scheme to supply 7 farms in the Balgowan area.

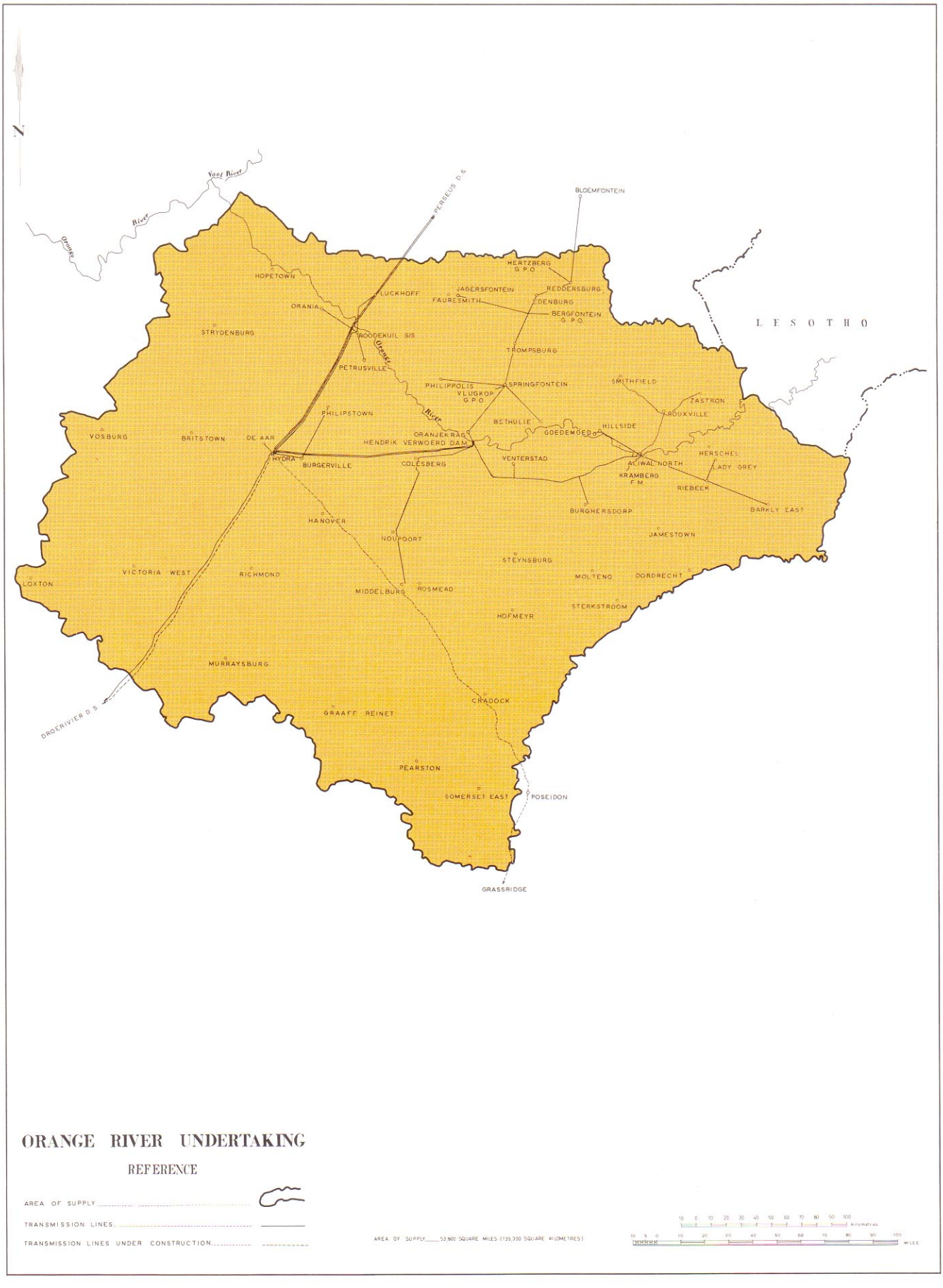
Terms have been quoted for a supply to a large consumer in the Bulwer area. If this supply eventuates, it will open up the area for supplies to the Bulwer, Underberg, and Himeville villages, and numerous farmers as far as Sani Pass.

During the year 1972, a total of 939 rural consumers accepted Escom's terms for supply of electricity. Terms have been quoted for a large number of other rural schemes, with 751 quotations awaiting replies at the end of the year.

Financial

Details of units sold to the various classes of consumers, the total revenue and the operating costs for 1972 are given in the table on page 88. The revenue from electricity sales increased by 16,0 per cent to R48 664 242 and the average price per unit increased slightly from 0,690 7 cent per kWh in 1971 to 0,701 4 cent per kWh in 1972.

Orange River Undertaking



ORANGE RIVER UNDERTAKING

REFERENCE

AREA OF SUPPLY

TRANSMISSION LINES

TRANSMISSION LINES UNDER CONSTRUCTION

AREA OF SUPPLY 53,800 SQUARE MILES (139,300 SQUARE KILOMETRES)

The licensed area of supply of the Orange River Undertaking is shown on the map on page 90. This undertaking took over the management and control of the Cape Eastern Undertaking on 1st August 1972. Subject to the approval of the Electricity Control Board, the extension of the area of the Orange River Undertaking to include Port Elizabeth, and the amalgamation of this undertaking with the Cape Eastern Undertaking, will take place in 1973.

Following the taking over by Escom of the distribution network of the Suid-Vrystaatse Elektrisiteitvoorsiening Utiliteitsmaatskappy (SEVUM) in 1971, this 66 kV network was used, for about three months during the winter of 1972, for the supply of power to Bloemfontein Municipality.

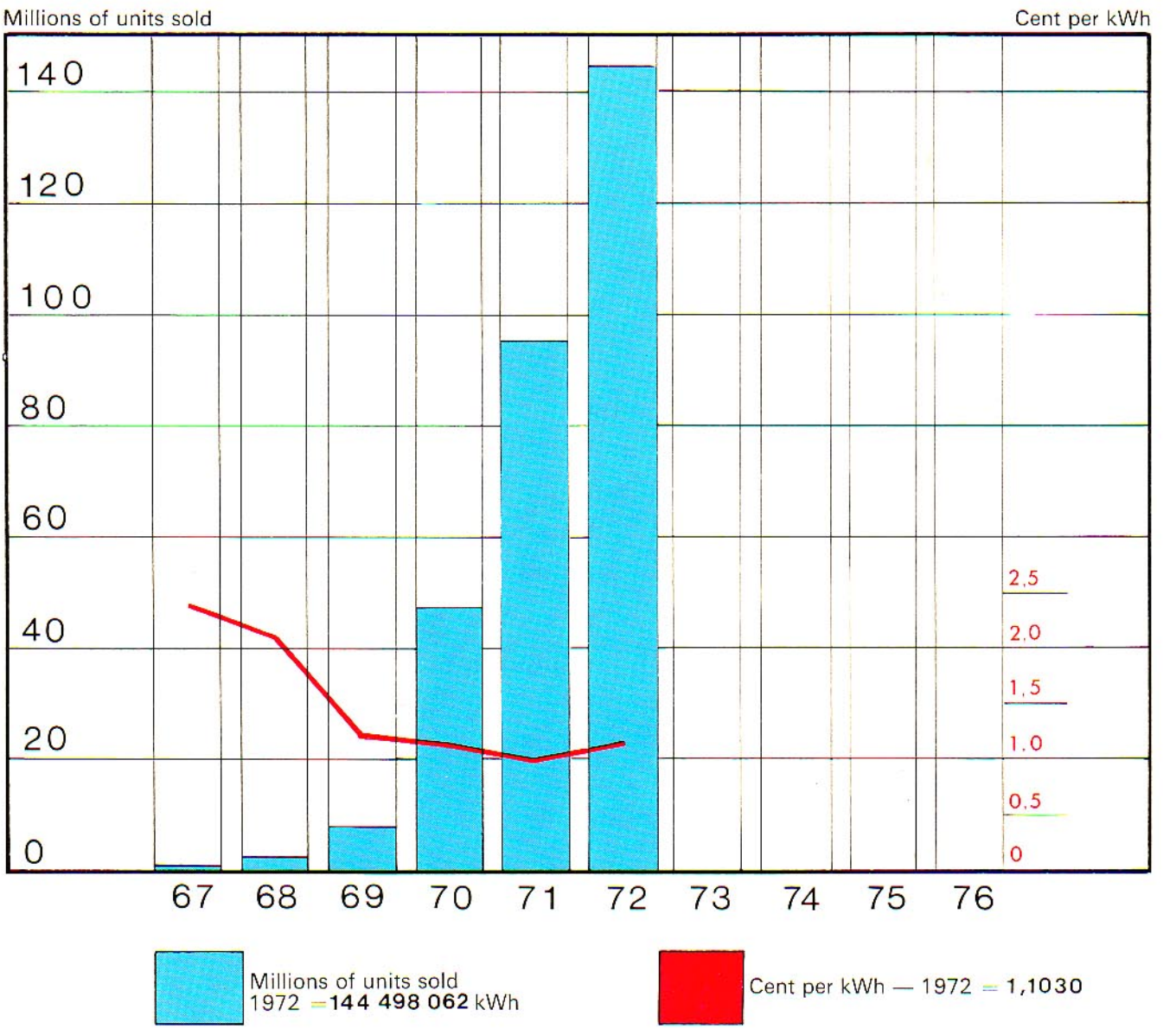
Sales of electricity

The undertaking continues to show the high growth rate which is characteristic of newly-established undertakings during the initial stages of their development. The number of units sold in 1972 totalled 144,5 million, which is 52 per cent more than the figure for 1971.

Sales of electricity since the undertaking went into operation are shown by the following graph, which also indicates the change during this period in the average price per unit sold:

Development of the undertaking

The second 400 kV line from Perseus distribution station near Dealesville to Hydra distribution station near De Aar was completed and placed in service in December. The extension of the national transmission system to supply electricity to Port Elizabeth Municipality is progressing satisfactorily. By the end of 1972, the 400 kV line from Hydra distribution station to Poseidon distribution station near Bedford was 70 per cent complete. The 220 kV line from Poseidon distribution station to Grassridge distribution station near Couga was complete, and the two 132 kV lines from Grassridge distribution station to the Chatty substation near Despatch were almost complete by the



end of the year. Work was in progress at all the distribution stations, with Poseidon 60 per cent, Grassridge 35 per cent, and Chatty 55 per cent complete.

The 22 kV line to Barkly East was completed and supply was given to this town in April 1972. The 22 kV lines from Hydra distribution station to De Aar were tapped for a 22 kV spur to supply De Aar Stone Crushers in August 1972. In October, Philipstown received a supply over a 22 kV line constructed from Hydra distribution station via Burgerville. In December the 22 kV line from Roodekuil near the P. K. le Roux dam to Luckhoff was completed to provide a supply to this town. A 22 kV line was also completed from Roodekuil to the Department of Water Affairs construction township at Orania to provide a supply to this township in July.

By the end of May 1972, all three of the Orange-Fish tunnel contractors were receiving supplies, when power for construction purposes was made available to the contractors engaged on the outlet section of the tunnel. The Orange Free State province took over the Oranjekrag village reticulation network, receiving a large user supply from Escom in July, when this network was separated from the Department of Water Affairs network.

A line was constructed from Reddersburg and a supply given to the Post Office repeater station at Hertzberg in March.

Development of rural electrification

In this new undertaking a start had been made in 1971 with rural electrification, a total of four farm supplies having been connected during that year. More progress was made in 1972, when a total of 21 additional farming supplies were connected.

Financial

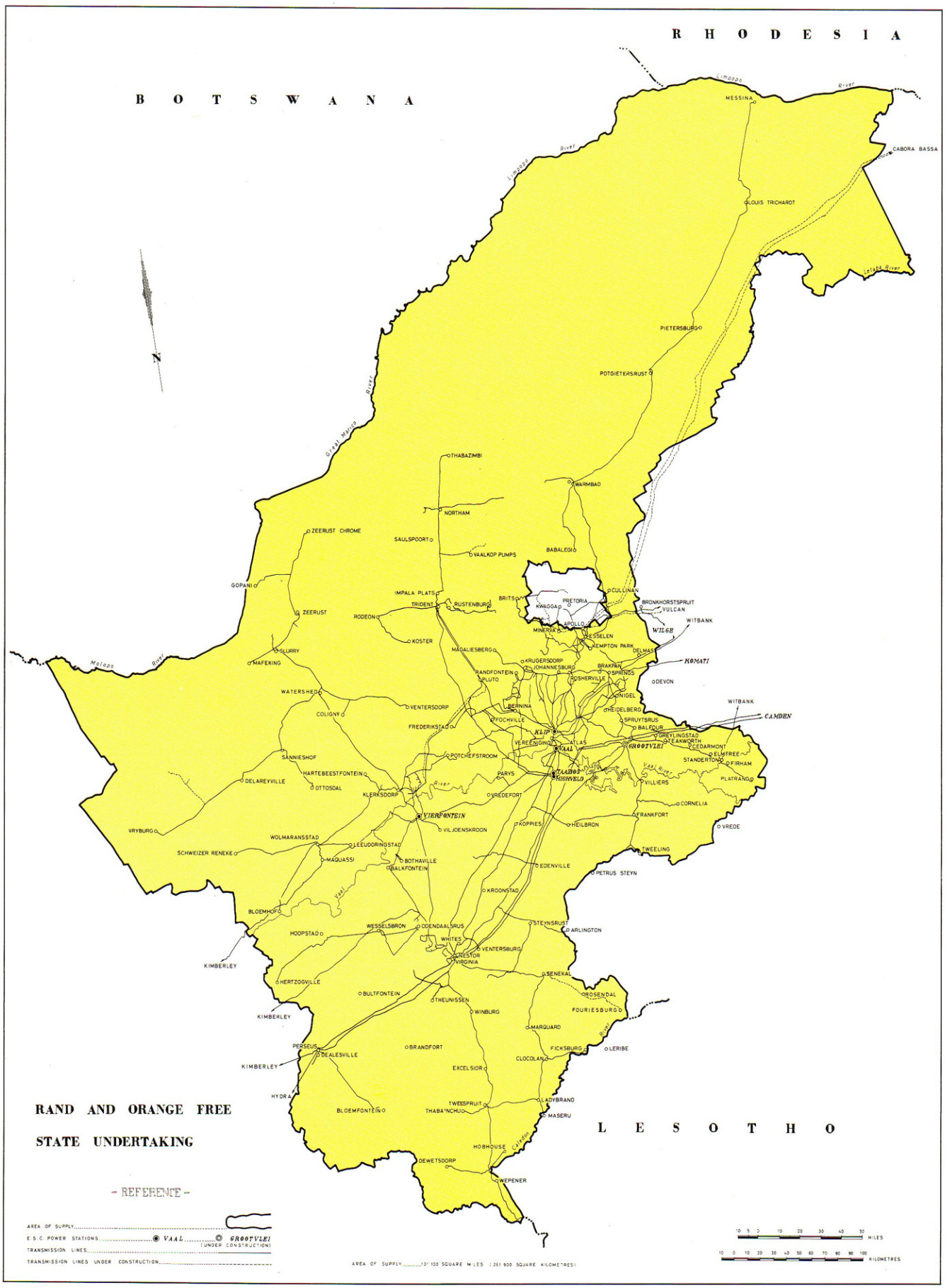
Details of revenue and cost are given in the table below. The average price per unit sold increased from 0,986 4 cent per kWh in 1971 to 1,103 0 cent per kWh in 1972. The reason for this increase is partly the fact that the new supplies to the Department of Water Affairs at the P. K. le Roux dam had not yet been fully utilised in 1972; and partly the fact that many of the new consumers connected in 1972 were in remote areas necessitating relatively high expenditure on transmission extensions. Total sales revenue for the year amounted to R1 593 816 and exceeded the corresponding figure for 1971 by 70 per cent.

Orange River Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	—	—	—	—	—	—	—	—	—	—	—	—
Bulk	20	26	51,58	43,29	49 034 810	62 558 216	+ 25,73	+ 27,58	491 436	693 536	1,002 2	1,108 6
Mining	—	—	—	—	—	—	—	—	—	—	—	—
Industrial	14	21	48,42	56,67	46 024 305	81 885 809	+ 456,48	+ 77,92	446 258	897 797	0,969 6	1,096 4
Domestic	1	22	0,01	0,04	4	54 037	—	—	5	2 483	—	4,595 0
Street lighting	—	—	—	—	—	—	—	—	—	—	—	—
Total	35	69	100,00	100,00	95 059 119	144 498 062	+ 101,10	+ 52,01	937 699	1 593 816	0,986 4	1,103 0

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	937 699	1 593 816	
Working costs	1 057 741	1 571 844	
Surplus	—	21 972	
Deficit	120 042	—	268 936

Rand and Orange Free State Undertaking



The licensed area of supply of the Rand and Orange Free State Undertaking was increased during the year as follows:

(a) In the central Orange Free State, to provide supplies to the City of Bloemfontein, the towns of Hertzogville and Dealesville, and farms in that area.

(b) In the Northern Transvaal, to provide supplies to the towns of Louis Trichardt and Messina, to mines in that area, to the Department of Bantu Administration and Development for its Sibasa Bantu Area, and to the Rhodesian Electricity Supply Commission in the vicinity of Messina.

(c) In the Western Transvaal, to supply farms north of Zeerust to the Botswana border, and in the Mafeking district.

(d) In the eastern Orange Free State, to provide supplies to the towns of Fouriesburg and Rosendal and to farms in their vicinity—an area excised from the Natal Central Licence.

The licensed area of supply including these extensions is shown on the map on page 93.

Sales of electricity

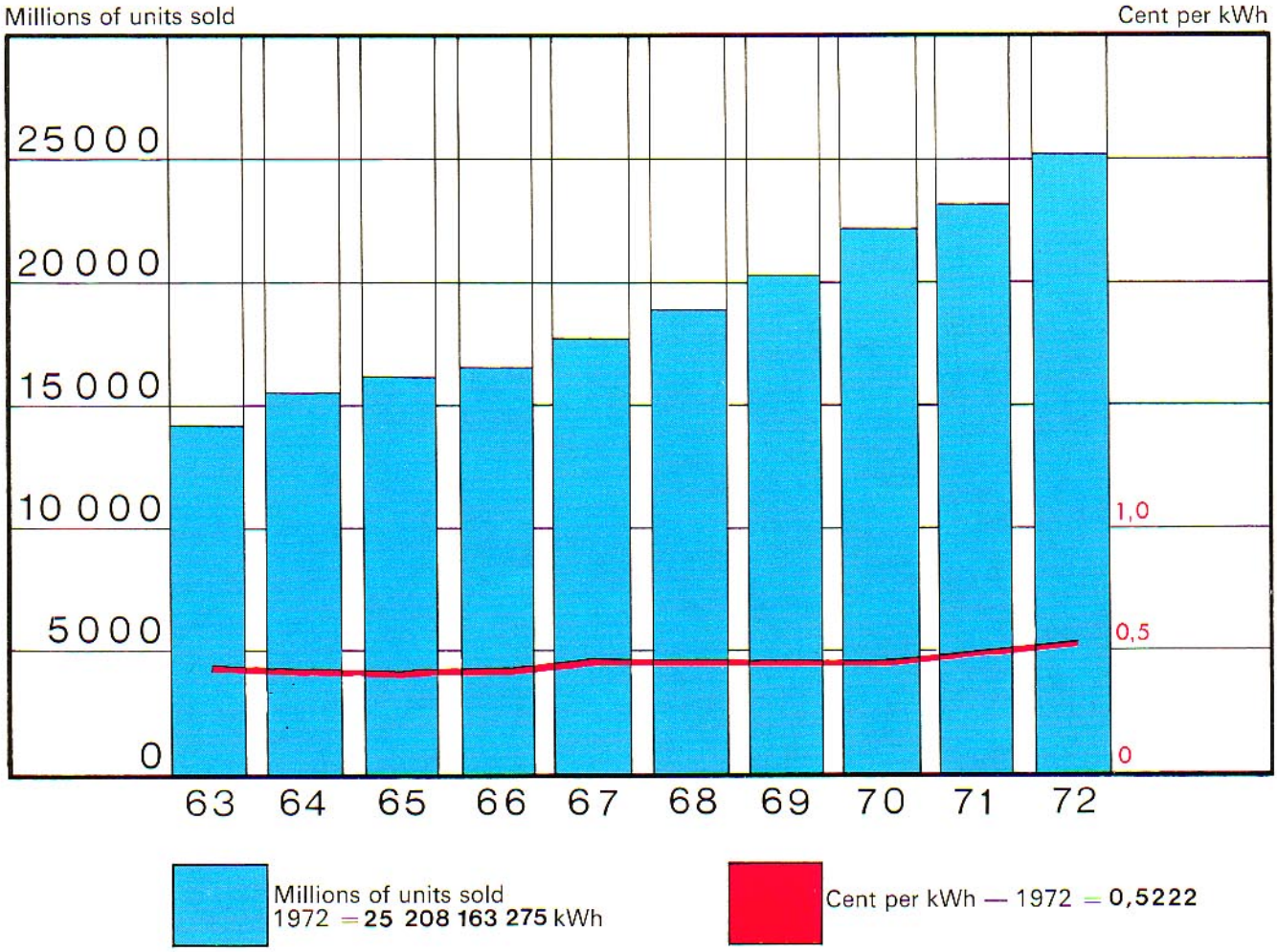
The rate of growth in respect of units of electricity sold, which had been 5,95 per cent from 1970 to 1971 increased to 6,72 per cent from 1971 to 1972, with a total of 25 208 million units sold in 1972. As will be noted from the table on page 95, the increased overall rate of growth is attributable essentially to bulk supplies to municipalities, the 4 051 million units of bulk supplies in 1971 having increased to 4 762 million units during 1972—an increase of 17,54 per cent. The corresponding growth rate in 1971 over the previous year was 12,00 per cent.

The mining sector was still by far the largest consumer in 1972, although the units sold to this sector increased only 1,26 per cent over the 1971 figure. The corresponding rate of increase in 1971 over the previous year was slightly higher, at 1,55 per cent.

The graph below indicates the increase in sales of electricity over the period 1963 to 1972 and the change, during this period, in the average price per unit sold:

Development of the undertaking

With the completion of the first stage of the Jupiter 275/88 kV distribution station in the Johannesburg area, and the Apollo/Esselen/Jupiter 275 kV lines in February 1972, an important input point to the central reef area was established. The Jupiter distribution station supplies loads previously based on the Klip 88 kV network, and after completion of the two 275 kV lines between Jupiter and the Johannesburg Municipality's Fordsburg station, it will also supply Johannesburg. These lines are to operate



initially at 88 kV. To reinforce the network in the Germiston area, a new distribution station was established at Simmerpan in April 1972. Two 88 kV lines were constructed between this new station and Jupiter, and the main input point to Germiston Municipality was transferred from the 42 kV network to the 88 kV network based on the new distribution station at Simmerpan.

A 132 kV supply was given to Pretoria Municipality at the Kwagga substation in May 1972. This supply is to be converted to 275 kV as soon as Pretoria's 275/132 kV step-down station is completed.

The development of the Bantu Investment Corporation's Babalegi industrial township near Hammanskraal is continuing, and a further 22 consumers were connected during the course of the year.

A section of the 400 kV line from the Pluto distribution station near Tarlton to the Hermes distribution station near Stilfontein was completed in September 1972, and is being operated temporarily at 132 kV to relieve the loading on the Vierfontein-Carrdell network. After completion of the Hermes and Pluto distribution stations—planned for December 1973—the line is to be operated at 400 kV.

To cater for growth of load, new points of supply were provided to the Bothaville, Brakpan, and Randfontein Municipalities. New supplies are also to be given to Stella, Rosendal and Fouriesburg early in 1973.

A 132 kV supply was made available to Bloemfontein at the Harvard 275/132 kV distribution station in August 1972. This station is supplied by means of one 275 kV line from Perseus distribution station near Dealesville.

The 132 kV network in the Northern Transvaal was extended from Louis Trichardt to Messina, where an 11 kV supply was made available to the Messina (Tvl.) Development Company in November 1972. Negotiations are expected to reach finality early in 1973 for a supply to the Rhodesian Electricity Supply Commission at Beit Bridge.

Additional supplies to the South African Railways are to be provided during 1973 to reinforce the traction system between Klerksdorp and Kimberley. Applications have been received from the South African Railways for additional traction supply points on the Union-Volksrust and Union-Klerksdorp lines, and for new supplies on the Bronkhorstspruit-Eerste Fabrieke and Kroonstad-Bloemfontein lines. These supplies are to commence during 1974.

The recent revival in the demand for platinum has resulted in several applications for major supplies to existing and new mines. Two 275 kV lines from Trident distribution station near Rustenburg are at present being constructed to the future Spitskop distribution station near Northam and Marikana distribution station. The lines are to be operated initially at 88 kV and ultimately at 275 kV.

Development of rural electrification

This undertaking continued to make progress during 1972 with supplies to farmers, and the additional supplies in this category totalled 851 consumers—an increase of 12,7 per cent of the total number of farming supplies in 1971. The undertaking erected 1175 km of transmission lines to provide these supplies.

As in 1971, the provision of these supplies by the undertaking was encumbered not so much by shortages of

Rand and Orange Free State Undertaking

Consumer			Sales						Revenue from sales		Average price per kWh sold	
Class	Number		Proportion %		kWh		% Change		Rand	Rand	Cents	Cents
	1971	1972	1971	1972	1971	1972	71/70	72/71	1971	1972	1971	1972
Traction	2	2	3,70	3,71	873 682 739	934 365 824	+ 9,64	+ 6,95	5 134 115	5 835 307	0,587 6	0,624 5
Bulk	141	150	17,15	18,89	4 051 254 402	4 762 020 178	+12,00	+17,54	20 632 462	25 811 327	0,509 3	0,542 0
Foreign (Lesotho)	2	2	0,05	0,06	12 259 196	16 634 095	+38,92	+35,69	79 530	105 464	0,648 7	0,634 0
Mining	105	102	52,23	49,56	12 337 353 415	12 492 507 342	+ 1,55	+ 1,26	55 632 556	61 462 906	0,450 9	0,492 0
Industrial	2 243	2 060	25,13	25,95	5 937 037 796	6 543 118 810	+10,37	+10,21	27 681 789	32 817 202	0,466 3	0,501 6
Domestic	28 167	27 900	1,73	1,82	408 263 602	459 438 287	+19,17	+12,53	4 698 410	5 596 192	1,150 8	1,218 1
Street lighting	7	5	0,01	0,01	111 979	78 739	+ 8,59	−29,68	2 281	1 003	2,037 0	1,273 8
Total	30 667	30 221	100,00	100,00	23 619 963 129	25 208 163 275	+ 5,95	+ 6,72	113 861 143	131 629 401	0,482 1	0,522 2

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	114 280 608	131 629 401	
Working costs	114 216 373	130 310 616	
Surplus	64 235	1 820 179	
Deficit	—	—	2 197 111

materials as by problems of recruiting the necessary skilled labour to deal with the steadily increasing volume of construction work.

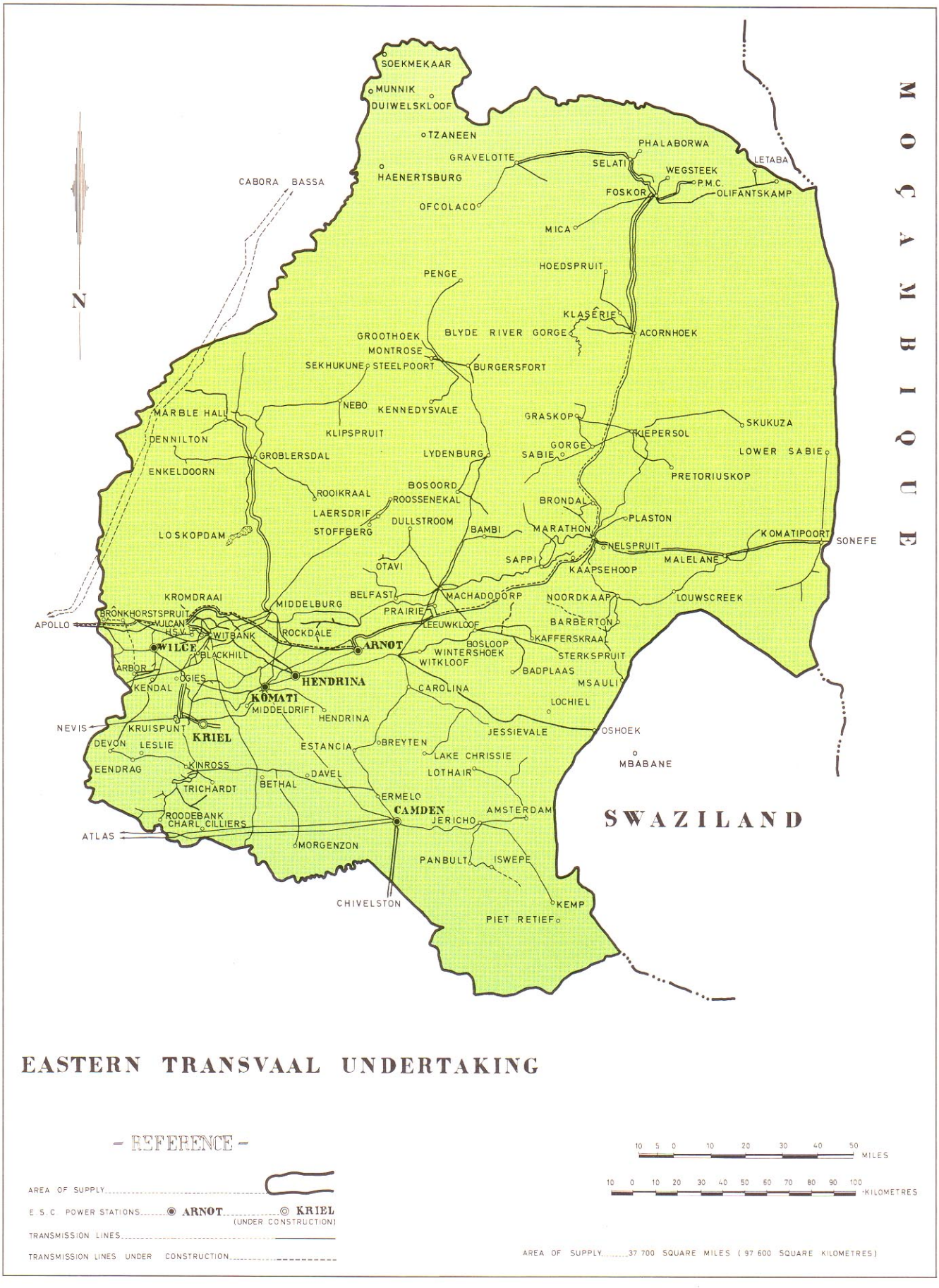
Of the additional supplies, 223 were provided from schemes which are not yet completed. These schemes included the Rayton Scheme extensions (Cullinan area), Thabazimbi-South, Hennenman, Syferbult (west of the Magaliesburg), Schoonspruit scheme extensions (north and north-east of Klerksdorp), Villiers vicinity, Sannieshof, Janpan (area north of Theunissen), and the Farmers' Co-operative to the north-west of Bultfontein. Three new schemes approved during the year included an area north-east of Cullinan, an area west of Bloemhof, and the Vaal river-Wolwehoek area.

Negotiations are in progress for possible new schemes throughout the undertaking. A number of these have been accepted for commencement during 1973.

Financial

Details of units sold to the various classes of consumers, the total revenue, and the operating costs for 1972 are given in the table on page 95. The average price per unit sold increased by 8,3 per cent from 0,482 1 cent per kWh in 1971 to 0,522 2 cent per kWh in 1972. Total sales revenue for the year amounted to R131 629 401 and exceeded the corresponding figure for 1971 by 15,6 per cent.

Eastern Transvaal Undertaking



EASTERN TRANSVAAL UNDERTAKING

- REFERENCE -

AREA OF SUPPLY

E.S.C. POWER STATIONS ◉ ARNOT ◎ KRIEL (UNDER CONSTRUCTION)

TRANSMISSION LINES

TRANSMISSION LINES UNDER CONSTRUCTION

10 5 0 10 20 30 40 50 MILES

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

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

The licensed area of supply of the Eastern Transvaal Undertaking was increased during the year to enable Escom to provide a supply to the Tzaneen Municipality and its vicinity. The licensed area of supply, including this extension, is shown on the map on page 97.

Sales of electricity

The 5 235 million units sold during 1972 represented an increase of 14,76 per cent over the figure for 1971. In 1971 the corresponding rate of growth had been 6,22 per cent. The chief contributors to the increase in units sold during 1972 were industrial consumers, in particular Rand Carbide and Ferrometals in the Witbank area and Feralloys at Machadodorp.

To see the rate of growth of foreign supplies during 1972 in proper perspective, it should be pointed out that a 275 kV supply was made available to Lourenço Marques during the last quarter of 1972; previously, a small supply only had been taken at Ressano Garcia. Further increases in foreign supplies can be expected in 1973—not only to Moçambique but also to Swaziland.

The units sold for domestic and street-lighting purposes decreased during 1972, mainly because the Evander reticulation network was taken over in late 1971 by the Transvaal Board for the Development of Peri-urban Areas. The decrease, however, is compensated by increased bulk sales to the municipalities.

Units sold in the mining sector still form an important portion of total sales in the undertaking, although the rate of increase during 1972 was modest at 3,33 per cent.

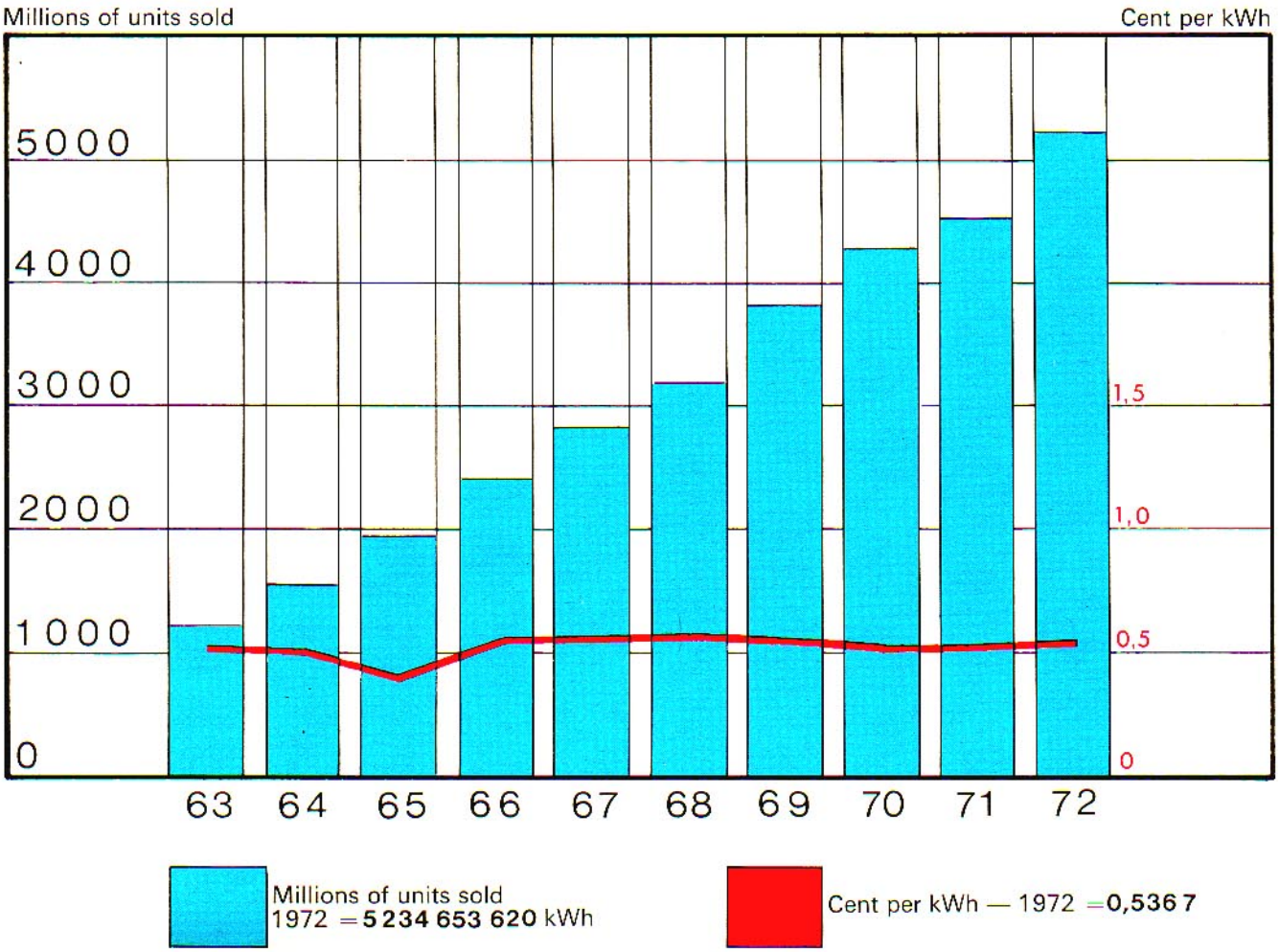
The graph below indicates the increase in sales of electricity over the period 1963 to 1972, and the change in the average price per unit sold.

Development of the undertaking

The second 400 kV line between Hendrina power station and Vulcan distribution station near Witbank was completed early in 1972. Unfortunately, the delivery of vital equipment for this large 400/132 kV distribution station was delayed, with the result that it could not be placed in service by the end of the year as planned. Commissioning of this distribution station is now scheduled for the first quarter of 1973.

The single 400 kV line between Arnot and Hendrina power stations was completed and energised early in the year, easing the load on the undertaking's 275 kV system. Towards the end of the year, the erection of the first 400 kV line between Arnot power station and Vulcan distribution station was started.

The second stage in the construction of Prairie distribution station near Machadodorp was completed towards the end of the year. In 1971, the 132 kV section had been placed on load to supply the initial requirements of a large steelworks, and in 1972 the 275 kV section, with two 275/132 kV step-down transformers, was completed and



placed in service—not only to supply the increased requirements of the steelworks, but also to reinforce a large portion of the undertaking's 132 kV network.

Good progress was made during the year with the erection of a new 275/132 kV distribution station at Komatipoort. This station will strengthen the 132 kV supplies in the Lowveld, particularly as far as traction supplies are concerned, and will improve switching and protection arrangements on the 275 kV system for the supply to Lourenço Marques.

The first major supply beyond the borders of South Africa was made available in the last quarter of the year, when a new 275 kV line from Marathon distribution station near Nelspruit to Komatipoort was energised and coupled to a 275 kV line belonging to Sonefe, the Moçambique Electricity Supply Authority, for a supply to Lourenço Marques.

Work on the second major foreign supply—to Swaziland—was almost completed by the end of the year. A 132 kV line is being erected from Witkloof distribution station, near Carolina, to the Swaziland border at Oshoek, where connection is to be made to a 132 kV line of the Swaziland Electricity Board.

To reinforce supplies to the Lowveld, preliminary work commenced towards the end of the year on the second 275 kV line from Arnot power station to Prairie distribution station near Machadodorp, Marathon distribution station near Nelspruit, and to the Acornhoek distribution station.

To provide supplies to a large steelworks, and to provide also for other large loads in the Witbank area from the 400/132 kV Vulcan distribution station, a new distribution station known as Churchill was placed in service during the year. Two 132 kV lines from Vulcan to Churchill, one 132 kV line from Vulcan to Carbide distribution station, and one 132 kV line between Churchill and Carbide distribution stations were all completed during the year. The taking into service of Carbide 132/22 kV distribution station has provided increased supplies to a large chemical plant and a steelworks on the outskirts of Witbank. Two 45 MVA 132/22 kV transformers have been placed in service and a third remains to be commissioned.

In the Phalaborwa area, the Chemie 132/11 kV distribution station is being extended for additional supplies to fertilizer factories and for reorienting the supplies to a large chemical plant, mine, and works.

At Gravelotte, the extension and conversion of the existing 66/11 kV distribution station to a 132/66/22/11 kV supply point is planned for completion during 1973. At Nelspruit, civil work had made good progress by the end of the year on a new 132/33 kV distribution station to be known as Delta. This station is intended, initially, to supply a new chemical plant at Nelspruit and ultimately also to supply Nelspruit Municipality. Development in and around Bronkhorstspruit is taking place so rapidly that the existing 22 kV supplies are no longer adequate. Towards the end of the year, the construction of a new 88/22 kV distribution station near Bronkhorstspruit, to be named Erasmus was commenced, and the erection of a new 88 kV line from Arbor, a traction substation for the South African Railways, is planned for 1973.

Development of rural electrification

The demand for electricity on farms in the Eastern Transvaal

Eastern Transvaal Undertaking

Class	Consumer: Number 1971	Consumer: Number 1972	Sales: Proportion % 1971	Sales: Proportion % 1972	Sales: kWh 1971	Sales: kWh 1972	Sales: % Change 71/70	Sales: % Change 72/71	Revenue from sales: Rand 1971	Revenue from sales: Rand 1972	Average price per kWh sold: Cents 1971	Average price per kWh sold: Cents 1972
Traction	7	7	6,55	6,25	299 168 204	327 051 248	+10,67	+ 9,32	2 068 338	2 315 028	0,691 4	0,707 8
Bulk	24	25	6,41	6,66	292 507 688	348 775 605	+18,58	+19,24	1 614 497	1 999 379	0,552 0	0,573 3
Foreign L.M.	1	2	0,02	0,30	786 800	15 508 000	+36,41	+971,02	9 228	97 709	1,172 9	0,630 1
Mining	82	89	31,48	28,34	1 435 638 689	1 483 458 448	+ 3,96	+ 3,33	7 349 732	7 887 836	0,511 9	0,531 7
Industrial	2 591	2 945	54,70	57,86	2 494 713 946	3 028 803 083	+ 5,92	+21,41	12 066 901	15 244 269	0,483 7	0,503 3
Domestic	3 685	4 047	0,83	0,58	38 047 151	30 485 146	− 3,40	−19,88	569 616	531 645	1,497 1	1,743 9
Street lighting	23	23	0,01	0,01	646 670	572 090	−13,56	−11,53	22 176	17 664	3,429 3	3,087 6
Total	6 413	7 138	100,00	100,00	4 561 509 148	5 234 653 620	+ 6,22	+14,76	23 700 488	28 093 530	0,519 6	0,536 7

	1971	1972	Accumulated to 31/12/72
	R	R	R
Total revenue	23 700 488	28 093 530	
Working costs	24 344 274	30 145 942	
Surplus	—	—	943 632
Deficit	643 786	2 052 412	

continues to grow, but with the exception of intensively farmed districts such as Groblersdal, the terms offered to new consumers are unfortunately sometimes rendered unattractive by the high costs of power line extensions.

A total of 470 new farming supplies were connected during the year 1972, bringing the total of such supplies to 3 187. Most of the new connections were made from extensions to existing schemes and approximately 600 km of circuit extensions were erected during the year to provide the new supplies.

The schemes completed during 1972 were in the Arnot area, Burgersfort, Marlin-Granite area, Middelburg, and Blyde river area. Schemes at present under construction comprise Panbult, Bracken South, Wales (east of Graskop), and Kalkkloof. A number of further schemes are under negotiation.

Financial

Details of units sold to the various classes of consumers, and the total revenue and total operating costs for the year 1972, are given in the table on page 99. The average price per unit sold increased by 3,3 per cent during the year, from 0,519 6 cent per kWh in 1971 to 0,536 7 cent per kWh in 1972. Total sales revenue for the year amounted to R28 093 530 and exceeded the corresponding figure for 1971 by 18,5 per cent.