



**ELECTRICITY SUPPLY COMMISSION—1955**

Left to right: Members: Mr. T. P. STRATTEN, Prof. Dr. R. L. STRASZACKER, Mr. W. H. ANDRAG, Dr. J. T. HATTINGH (Chairman), Mr. R. B. WATERSTON, Mr. G. R. D. HARDING (General Manager), Mr. R. H. GREGOR, Q.C. (Law Adviser and Secretary), Mr. H. M. TORR (Assistant Secretary).

[Photo: M. Karklin

MEMBERS OF THE

Electricity Supply Commission

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ROBERT BURNS WATERSTON

WALTER HEINRICH ANDRAG

Dr. REINART LUDWIG STRASZACKER

THOMAS PRICE STRATTEN

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# Electricity Supply Commission

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Escom House,

Rissik Street,

Johannesburg,

4th August, 1955.

**To the Honourable,**

**The Minister of Economic Affairs,**

**Pretoria.**

Sir,

As required by Section 14 of the Electricity Act, No. 42 of 1922, the Commission has the honour to present its thirty-second Annual Report, covering its work during the year ended at 31st December, 1954, together with brief references to important events up to 30th April, 1955.



## GENERAL REVIEW

The narrative and statistics relating to this year's activities may be introduced by a brief recapitulation of the task which Escom was called upon to undertake and the progress which has been made during post-war years.

In the Report for the year 1945 it was stated: "In South Africa the end of hostilities found the power supply industry severely handicapped by shortages of generating capacity and distribution equipment." In the Commission's undertakings its power stations were, for the greater part, operating at marginal capacity, so that there was little reserve to meet the numerous requests for new or increased supplies. In addition many inquiries had come from towns and villages remote from the existing power stations and supply systems, and Escom was called upon to supply the needs of large new areas in all provinces, including the newly discovered goldfield in the Odendaalsrus area and a number of towns in the northern Orange Free State. In some instances the need for major extensions to existing plants gave opportunities for the Commission to establish new undertakings in accordance with the intention and principles of the 1922 Act, as in the case of Border Undertaking and Cape Northern Undertaking.

In every undertaking the paramount task was to procure increased generating capacity. The magnitude of that task and the extent to which it has been accomplished to date are shown in the table on the following page.

**Rated Capacity of Generator Plant—**

	Installed 1945 (kW)	Installed 1954 (kW)	Under Construction or on order at 31/12/54 (kW)
<b>Cape Western Undertaking:</b>			
Caledon ... ..	140	—	—
Hex River Power Station ... ..	—	60,000	—
Salt River No. 1 Power Station ... ..	90,300	90,300	—
Salt River No. 2 Power Station ... ..	—	—	120,000
	90,440	150,300	120,000
<b>Cape Northern Undertaking:</b>			
Central Power Station, Kimberley (*Existing plant purchased in 1950)	20,000*	31,000	—
<b>Border Undertaking:</b>			
Alice Power Station ... ..	381**	—	—
King William's Town Power Station	3,500**	4,500	—
Westbank No. 1 Power Station ... ..	24,500**	32,000	—
Westbank No. 2 Power Station ... ..	—	—	30,000
	28,381**	36,500	30,000
(**Existing plant purchased in 1947 and 1948)			
<b>Natal Southern Undertaking:</b>			
Congella Power Station ... ..	98,000	206,000	—
South Coast Power Stations ... ..	1,566	3,400	—
Umgeni Power Station ... ..	—	30,000	60,000
	98,000	239,400	60,000
<b>Natal Central Undertaking:</b>			
Colenso Power Station ... ..	85,000	135,000	—
Volkstrust ... ..	500	500	—
	85,500	135,500	—
<b>Rand and O.F.S. Undertaking:</b>			
Brakpan Power Station ... ..	48,000†	48,000	—
Klip Power Station ... ..	424,000	424,000	—
Rosherville Power Station ... ..	48,000†	48,000	—
Simmerpan Power Station ... ..	40,000†	34,000	—
Taaibos Power Station ... ..	—	60,000	420,000
Vaal Power Station ... ..	66,000	318,000	—
Vereeniging Power Station ... ..	157,500†	157,500	—
Vierfontein Power Station ... ..	—	210,000	150,000
Wilge Power Station ... ..	—	30,000	150,000
	783,500	1,329,500	720,000

(†Existing plant purchased in 1948)

**Rated Capacity of Generator Plant—**

	Installed 1945 (kW)	Installed 1954 (kW)	Under Construction or on order at 31/12/54 (kW)
<b>Eastern Transvaal Undertaking:</b>			
Witbank Power Station ... ..	108,000	128,000	—
<b>Sabie Undertaking:</b>			
Gorge Power Station ... ..	1,350	1,350	—
<b>TOTAL—ALL UNDERTAKINGS</b> ...	<b>1,216,737</b>	<b>2,051,550</b>	<b>930,000</b>

The total resources of generating plant which were available at the end of the War to meet the requirements of consumers in the Commission's undertakings, as at present established, was 1,216,737 kW, including 335,881 kW of old plant which was taken over by the Commission after 1945.

Where possible, steps were taken to increase the capacity of the Commission's stations to the limits allowed by the site or other factors, and the table shows that up to 31st December, 1954, 451,374 kW capacity of new plant was installed in existing stations.

However, the new demands exceeded by far the additional capacity which could be added in this way, and the Commission was required to design and construct seven new power stations: Hex River, Salt River No. 2, Westbank No. 2, Umgeni, Taaibos, Vierfontein and Wilge Power Stations. The capacity of the turbo-generators installed and in service in these new stations at the end of 1954 amounted to 390,000 kW, and a further 120,000 kW of plant was commissioned in the period up to 30th April, 1955.

The net increase since 1945 was 834,813 kW or nearly 78 per cent.

The figure of 930,000 kW in the third column of the table indicates the further plant in various stages of construction or on order at the 31st December, 1954, and includes plant ordered during 1954 to meet future load requirements. The total includes the 30,000 kW turbo-generator (No. 3) and corresponding boilers which were ordered for Umgeni Power Station, as mentioned in the last Annual Report, and the following additions to power stations of the Rand and Orange Free State Undertaking:—

Taaibos Power Station—One 60,000 kW turbo-alternator (No. 8) and 580,000 lb./hr. boiler.

Vierfontein Power Station—Two 30,000 kW turbo-alternators (Nos. 11 and 12) and two 210,000 lb./hr. boilers.

Much preliminary work was done during the year in the design of the further new power station for the Rand and Orange Free State Undertaking, and in negotiations for water and coal supplies. Inquiries for plant to be installed at this station were sent out at the year end to manufacturers on the Continent, U.S.A. and Britain. The response was satisfactory and tenders were being adjudicated during April, 1955.

## Growth of Supplies to Local Authorities

Comment was made in the last Annual Report upon the large increase in the maximum demands of local authorities who take "bulk" supplies from the Commission. The demands of Bulk Consumers in 1954 was approximately three times the amount supplied to such consumers at the end of 1945.

Only a few local authorities have shown development as rapid as that; but most of the larger cities and towns have doubled or more than doubled their demands, as is shown in the following table:—

### Maximum demand in 1954 compared with maximum demand in 1945— Maximum demand taken in 1945=1·00

Paarl ... ..	2·60	Benoni ... ..	2·11
Stellenbosch ... ..	2·48	Boksburg ... ..	2·67
Worcester ... ..	5·00	Klerksdorp ... ..	2·75
Durban ... ..	1·90	Krugersdorp ... ..	2·24
Estcourt ... ..	8·74	Roodepoort-Maraisburg ... ..	2·60
Ladysmith ... ..	2·78	Springs ... ..	2·75
Pietermaritzburg ... ..	2·58	Vanderbijl Park ... ..	4·91
Kimberley (since 1948) ... ..	2·00	Vereeniging ... ..	2·93

While the requirements of the large consumers—mines, local authorities—make up the bulk of the load to be carried, the Commission has during this time given special attention to the needs of the smaller towns, especially in country districts, up to the limit of the resources available. The following local authorities have become Bulk Consumers of the Commission since 1945:—

#### Cape Province:

Adelaide  
Barkly West  
Bonnievale  
East London  
Fort Beaufort  
Hermanus  
Hopefield  
Kimberley  
Kleinmond  
Mafeking  
Montagu  
Moorreesburg  
Robertson  
Saldanha  
Somerset West  
Strand  
Swellendam

Tulbagh  
Villiersdorp  
Vredenburg  
Wolseley

#### Natal:

Greytown  
Utrecht

#### Orange Free State:

Allanridge  
Boshof  
Bothaville  
Heilbron  
Hennenman  
Koppies  
Kroonstad (partial supply)

Odendaalsrus  
Reitz  
Riebeeckstad  
Vrede

#### Transvaal:

Bethal  
Coligny  
Fochville  
Hartebeesfontein  
Lichtenburg  
Oberholzer  
Rensburg  
Rustenburg  
Standerton  
Ventersdorp  
Witbank  
Zeerust

## Development of Rural Supplies

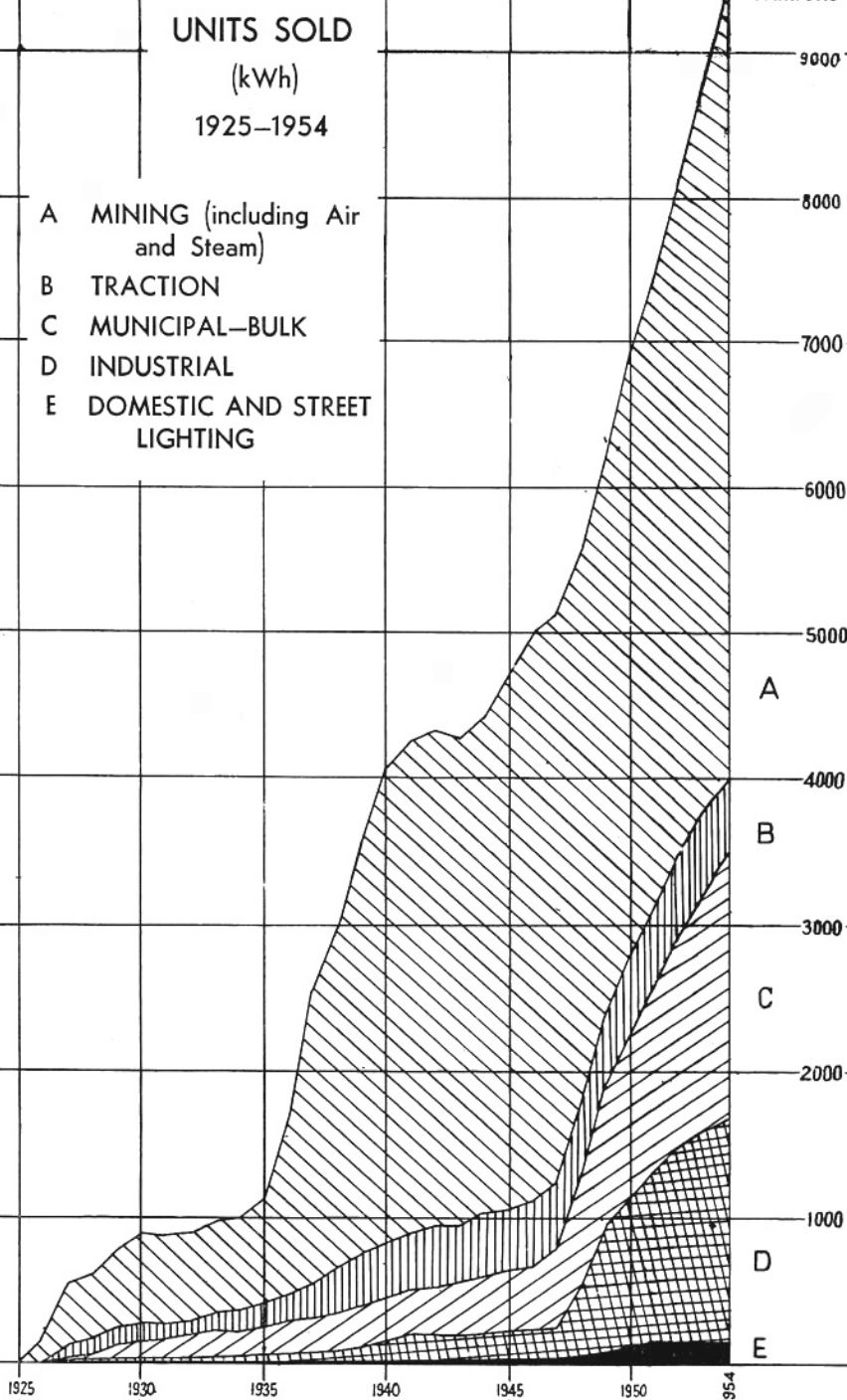
During the year the Commission connected up 655 rural consumers of whom 221 were farmers.

In the Cape Western Undertaking farm schemes at Kraaifontein, Durbanville, Klipheuwel, Muldersvlei and Malmesbury were developed to supply an additional 130 farms with electricity.

**UNITS SOLD**  
(kWh)  
1925-1954

- A MINING (including Air and Steam)
- B TRACTION
- C MUNICIPAL-BULK
- D INDUSTRIAL
- E DOMESTIC AND STREET LIGHTING

Millions



Distribution networks were also extended in Natal to connect up consumers on an additional 36 farms. In the area served by the Rand and Orange Free State Undertaking the number of farms supplied with electricity increased from 129 to 161.

In the Free State a bulk supply was given to Reitz, Viljoenskroon, Allanridge and Riebeeckstad.

## **“POOLING” OF GENERATION IN CERTAIN UNDERTAKINGS**

One of the consequences of the growth of load and the development of the new power stations and transmission systems was to bring about conditions in which important savings in capital and working costs could be secured by “pooling” of generation in certain undertakings.

The Eastern Transvaal Undertaking (formerly “Witbank Undertaking”) is an example where a large power station was erected to serve more than one undertaking and to the advantage of consumers of both undertakings.

On 14th October, 1954, application was made to the Electricity Control Board for amendments to the Witbank Licence, 1924, and the Rand Licence to extend the basis of co-ordination by “pooling” of generation between the Eastern Transvaal Undertaking and the Rand and Orange Free State Undertaking which had previously existed by virtue of certain agreements approved by the Control Board. This application was granted by the Board on 13th January, 1955. In terms of these amendments tariff adjustments were made effective from January, 1954.

During the year it became necessary also to consider the steps to be taken to meet the growth of load on the Cape Northern Undertaking, when the demands of existing and new consumers exceed the capacity of the Central Power Station, Kimberley. From the estimates of the cost of building and operating an independent small station in the Kimberley area, it was abundantly clear that the interests of the Cape Northern Undertaking and the country would be best served by the alternative of installing additional generating plant in one of the large new power stations of the Transvaal and Orange Free State “pool”, and a basis was agreed upon to enable the future requirements of the Cape Northern Undertaking to be supplied in this way, without detriment to consumers of the Rand and Orange Free State Undertaking. This proposal was embodied in the application of 14th October, 1954, made to the Electricity Control Board, and approved. Plans have now been made to draw power from Vierfontein Power Station to meet the growth of load on the Cape Northern Undertaking after September, 1958.

A third scheme of co-ordination has been established for Natal Southern Undertaking (formerly “Durban Undertaking”) and Natal Central Undertaking. While the load growth could be met in each undertaking by extending the original stations at Congella and Colenso, mutual assistance was given by exchange of units, when required; but, when the further growth of load involved the building of new power stations, important savings could be secured by closer working between these two undertakings. In this instance it was calculated that over the period of the next five years, “pooling” of generation in these two undertakings would result in a saving of capital expenditure of the order of

£4,500,000, that is, the capital outlay for the purchase of additional generating plant would be approximately £4,500,000 less for a "pooled" system than for two independent systems.

The Commission's applications dated 7th March, 1955, put forward proposals for "pooling" of generation and the major transmission lines on the Natal Undertakings. The applications were granted by the Board on the 28th April, 1955. In terms of the amendments to the licences "pooling" of generation was made effective from the 26th December, 1954, that is, from the commencement of the present financial year.



## **SALE OF SWARTKOPS POWER STATION TO PORT ELIZABETH MUNICIPALITY**

Escom's Swartkops Power Station, situated in the Municipality of Port Elizabeth, was erected in circumstances different from those in which other Escom Power Stations were built. All other power stations were built to supply a defined area under a licence granted by the Electricity Control Board. In the case of Swartkops no area of supply was applied for by Escom because at the time the station was planned the Port Elizabeth Municipality had such a large area of supply granted to it outside its municipal area, that it was thought that Swartkops Power Station would be required exclusively, or almost exclusively, for a bulk supply to Port Elizabeth Municipality. Escom therefore obtained a permit from the Control Board to give Port Elizabeth Municipality a bulk supply and Escom had no right to supply any other consumer from Swartkops Power Station.

Swartkops Power Station could not have been sold if it had been part of a licenced undertaking because it would then have been erected to serve a large number of consumers and the sale of a power station in those circumstances would be unthinkable.

In June, 1953, the Port Elizabeth Municipality expressed its wish to purchase Swartkops Power Station. As the Municipality was the only consumer, and as the hinterland that might become available to Escom was either being opened up by the Port Elizabeth Municipality or could be supplied by the Border Undertaking, Escom, after obtaining approval of the Hon. the Minister of Economic Affairs and the Hon. the Minister of Finance, agreed to sell the power station to Port Elizabeth Municipality at cost if the necessary consent could be obtained.

The sale was formally concluded in April, 1955.

## **PLANT CAPACITY**

The aggregate installed capacity of the Commission's power stations on the 31st December, 1954, including steam and compressed air stations, was 2,124,100 kW, an increase of 225,045 kW over the corresponding figure for the previous year.

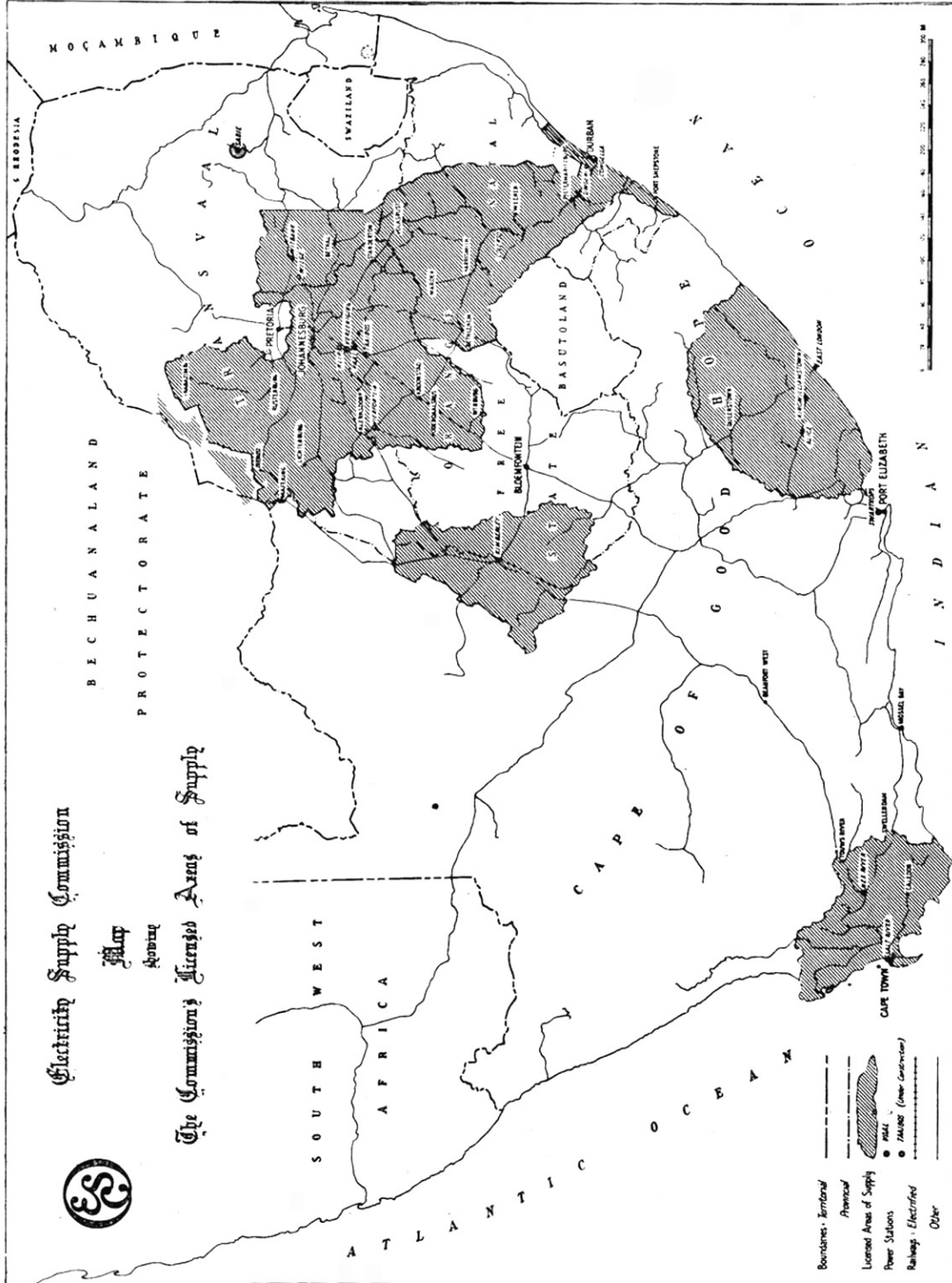
Details of the plant and equipment installed in the Commission's power stations at the 31st December, 1954, are given in Annexure B.

# Electricity Supply Commission



## The Commission's Licensed Areas of Supply

BECHUANALAND  
PROTECTORATE



## NEW POWER STATIONS AND EXTENSIONS TO EXISTING POWER STATIONS

The progress of construction work in the Commission's major power stations during the period under review was as follows:—

### Cape Western Undertaking

**Salt River No. 2 Power Station, Cape Town:** Although progress of construction work in general was satisfactory, delays occurred in the delivery of essential minor items and completion of the work was later than expected. The first boiler was placed in service on 3rd November, 1954, when it was available to supply steam to No. 1 Power Station. The erection of Nos. 2 and 3 boilers was well advanced. No. 1 turbo-generator in the new power station was ready for commissioning at the end of April, 1955.

### Cape Northern Undertaking

**Central Power Station, Kimberley:** The second of the four new 75,000 lb./hr. boilers (No. 9) was commissioned in April, 1954. No. 6 turbo-generator (rated at 5,500 kW) was completed in June. The work on the remaining two boilers (Nos. 11 and 12) was well advanced at the end of the year. Portion of the induced draught cooling tower was completed and in use during 1954.

### Border Undertaking

**West Bank No. 2 Power Station, East London:** Progress in the construction of No. 2 Power Station was retarded by shortages of material and labour. However, special steps were taken towards the end of the year to speed up the work and it was hoped that the first boiler in the new station would be ready for steaming in May, 1955, to give assistance to No. 1 Station. The first turbo-alternator in No. 2 Power Station is expected to be in service by October, 1955.

### Natal Southern Undertaking

**Congella Power Station, Durban:** The third of the new 200,000 lb./hr. boilers for Congella Power Station was commissioned in May, 1954. A report on the operating experience with this new plant is contained on page 38 of this Report.

**Umgeni Power Station, near Pinetown, Natal:** On the 2nd April, 1954, this new power station commenced generating power with one boiler and one turbo-alternator, and the second and third boilers were steamed on the 13th April and 17th August, respectively. The second turbo-alternator is expected to be in service in May, 1955.

To meet the growth of load orders were placed during 1954 for an additional 30,000 kW turbo-generator and the necessary boiler plant, and in April, 1955, it was decided to order a fourth machine with corresponding boiler plant for this station.

A report on the operating experience on the station is given on page 38.

### Rand and Orange Free State Undertaking

**Taabis Power Station, near Coalbrook, district Heilbron, O.F.S.:** The first set in this power station was run up on the 27th November, 1954, and was placed in commercial service from the 9th December, 1954. Good progress

was maintained in the construction of the further sets, and the second machine with its boiler was ready for commissioning at the end of April, 1955.

It has been decided to extend Taaibos Power Station by the addition of one further 60,000 kW set and corresponding boiler, making a total of eight 60,000 kW sets for this station. The additional set is expected to be in service about the end of 1957.

**Vereeniging Power Station, Vereeniging, Transvaal:** The additional boiler (No. 27) for the Vereeniging Power Station was brought into commercial operation in December, 1954.

**Vierfontein Power Station, district Viljoenskroon, O.F.S.:** The plant on load at 31st December, 1954, comprised nine boilers and seven turbo-generators each rated at 30,000 kW. The tenth boiler was commissioned on the 11th February 1955.

During the year it was decided to extend the station by the installation of two further boilers and two turbo-generators, to give an ultimate installed capacity of 360,000 kW.

The operating statistics relating to this new power station are given on page 48 of the Report.

**Wilge Power Station:** The first turbo-generator and two boilers at this power station were started up on the 16th July, 1954, and two further boilers were steamed on the 10th September, 1954, and the 1st October, 1954, respectively. The second turbo-generator was taken into service on the 9th March, 1955. The boilers at this power station have not been entirely satisfactory and modifications are being made to improve their efficiency and reliability.

Operating statistics for the year are given on page 48.

## AREAS OF SUPPLY AND TRANSMISSION SYSTEMS

During the period under review extensions of the Commission's areas of supply were granted in the Natal Central Undertaking, the Eastern Transvaal Undertaking and the Rand and Orange Free State Undertaking. Details of the additional areas are given in the review of the operation and development of the Commission's undertakings, and the new boundaries are shown on the plans printed in the section of the Report dealing with individual undertakings.

The total licensed area is now 117,100 square miles.

Particulars of the extensions completed during the year on the major transmission and distribution systems are given in detail in the reports on the separate undertakings. Altogether the total circuit miles of transmission and distribution lines was increased from 8,472 circuit miles in 1953 to 8,836 circuit miles at the end of the year 1954.

The list on pages 15 and 16 describes some of the major transmission lines completed during 1954 or under construction or projected at the end of the year:—

**Completed in 1954:**

	kV	Circuit Miles
Colenso to Umgeni ... ..	132	114
Umgeni to Springfield ... ..	132	8 (double circuit)
Thornville to Richmond ... ..	88	12
Gouda-Moorreesburg-Koperfontein ... ..	66	22
Two Cable Feeders from Salt River Power Station to Oakdale Substation ... ..	66	24
Fort Beaufort to Adelaide ... ..	33	20
Harrismith to Warden, Vrede, Reitz ... ..	33	100
Bot River to Hermanus ... ..	66	16
Vaal to Vierfontein (turn-in to Taaibos) ... ..	132	13
Taaibos to Libanon ... ..	132	54
Alma to Grootkop ... ..	132	20
Grootkop to Balkfontein ... ..	132	25
Taaibos to West Wits (1st Line) ... ..	132	55
Turn-in to Wilge from Witbank/Brakpan line ... ..	132	38 (double circuit)
Turn-in to Struben from Witbank/Brakpan lines ... ..	132	10
Vierfontein to Balkfontein ... ..	132	25
Line to Wolmaransstad ... ..	88	36
Klerksdorp Area Extensions ... ..	88	40
Rosherville to Prospect (2nd Line) ... ..	88	5
Buccleuch via Lombardy to Rietfontein Consolidated ... ..	40	10
Ringling Sundry Distribution Stations ... ..	40	85

**Under Construction:**

Bethal-Ermelo ... ..	88	34
Bethal-Wildebees ... ..	88	25
Wildebees-Capital ... ..	88	10
Lourens River to Bot River ... ..	66	30
Hex River Power Station to Hugo (Touws River Line) Second North Line ... ..	66	44
East London to King William's Town ... ..	66	34
Riverton to Andalusia ... ..	66	35
Taaibos to Doornfontein Distribution Station ... ..	132	56
Taaibos to West Wits (2nd Line) ... ..	132	55
Wilge to Struben Distribution Station ... ..	132	41
Taaibos to Virginia (1st Line) ... ..	132	115
Vierfontein to Margaret Shaft via Hartebeesfontein No. 41 ... ..	88	30
Northam to Rooiberg ... ..	88	32
Grootkop Network ... ..	40	20

**Projected:**

Ermelo-Estancia ... ..	88	15
Grootpan-Wildebees ... ..	132	30
Kimberley to Riverton ... ..	66	18
Holpan to Union Lime Co. ... ..	66	41
Glencoe to Dundee ... ..	88	10
Premier Mine Ring ... ..	88	40

	kV	Circuit Miles
Virginia to Senekal (To operate at 40 kV) ...	88	48
Calcined Products to Westgate ... ..	88	4
Merriespruit-Winburg-Theunissen-Star Diamonds (To operate at 40 kV) ... ..	88	48
Heilbron to Frankfort ... ..	88	35
Frankfort to Villiers ... ..	88	24
Virginia Network ... ..	40	20
Nuffield Network ... ..	40	9
Rietfontein Consolidated to Kempton Park ...	40	4
Virginia to Whites ... ..	40	12
West Wits-Doornfontein Network ... ..	40	40
Diepsloot to Olifants ... ..	40	17
Diepsloot to Bryanston ... ..	40	12
Westgate-Rand Centre Network ... ..	40	25
Virginia to Hennenman ... ..	40	16
Simmerpan — Stepdown Rearrangement ...	40	22
Balfour to Greylingstad ... ..	40	14



## OUTPUT AND SALES

Units generated in the Commission's power stations increased by more than 1,200 million units, which is the largest annual increase achieved in any year and represents an increase of 12·815 per cent over the corresponding figure for 1953.

As was expected assistance from outside sources declined during the year. The total units purchased, including repurchases, was approximately 437 million units, which was about 113 million units less than the figure for 1953.

The total units sold by all undertakings increased by 10·815 per cent, which is the highest percentage increase since 1950.

Aggregate figures for all undertakings were:—

		1954	1953	Increase
Units generated ... ..		10,651,937,082	9,441,977,327	12·815%
Units purchased ... ..		437,332,210	550,408,980	(Decrease)
Units sold ... ..		9,676,579,993	8,732,200,018	10·815%

The following figures record units sold by individual undertakings:—

	1954	1953
Border ... ..	118,235,613	107,769,924
Cape Northern ... ..	70,672,192	67,093,059
Cape Western ... ..	436,207,788	375,545,917
Natal Southern ... ..	777,680,114	713,213,325
Natal Central ... ..	532,530,626	492,298,444
Rand and Orange Free State ... ..	7,465,237,018	6,559,943,424
Sabie ... ..	5,556,426	6,398,798
Eastern Transvaal ... ..	270,460,216*	409,937,127
	9,676,579,993	8,732,200,018

\*Units sold for traction purposes within the area of the Rand and Orange Free State Undertaking are included in sales of that undertaking.

Analysis of sales according to classes of consumers shows:—

						1954	1953
<b>Bulk Supplies:</b>							
Municipal	...	...	...	...	...	1,841,937,643	1,642,779,009
<b>Direct Supplies:</b>							
Traction	...	...	...	...	...	619,207,916	584,498,083
Mining	...	...	...	...	...	5,523,541,253	4,957,742,321
Industrial	...	...	...	...	...	1,549,680,831	1,412,245,775
Domestic	...	...	...	...	...	139,450,022	132,191,588
Street Lighting	...	...	...	...	...	2,762,328	2,743,242
						<hr/>	<hr/>
						9,676,579,993	8,732,200,018
						<hr/>	<hr/>

A chart showing annual sales of electricity appears on page 9. Statement No. 3 of Annexure B gives units sold to all consumers for the past 30 years, and the distribution of units sold is shown in Statement No. 4.

## COSTS AND TARIFFS

The year's accounts reflect again an upward trend of costs, and again the increase is due largely to the continued rise in the cost of coal and the high cost of new plant and equipment.

In the condition of steeply rising costs, upward adjustments of Escom's tariffs have been unavoidable. As the cost of coal and loan charges together represent about 60 per cent of Escom's production costs some idea of the relation between the increases in Escom's tariffs and the increases in costs may be gained from the following tables:—

### Cost of coal per ton

	Average 1939-43	1951	1952	1953	1954
Cape Western Undertaking (Salt River Power Station)	25/5	33/10	35/3	37/5	41/-
Natal Southern Undertaking (Congella Power Station)	15/1	20/-	23/6	25/4	27/2
Natal Central Undertaking (Colenso Power Station)	10/11	14/3	18/6	19/11	21/6
Rand and O.F.S. Undertaking (Average all power stations) ... ..	4/4	7/3	8/10	9/9	10/2

### Capital Expenditure on Plant and Works

	(£'s millions)					
	Total at 31/12/50	1951	1952	1953	1954	Total at 31/12/54
Cape Western Undertaking ...	6.79	2.50	2.13	*2.37	3.54	17.34
Cape Northern Undertaking ...	0.22	0.08	0.32	0.53	0.28	1.43
Border Undertaking ... ..	0.58	0.31	0.20	0.61	1.04	2.74
Natal Southern Undertaking ...	5.80	1.00	2.22	2.13	1.68	12.83
Natal Central Undertaking ...	6.75	0.74	1.06	*0.73	0.58	9.85
Eastern Transvaal Undertaking	3.26	0.29	0.46	Cr*0.10	0.22	4.13
Rand & O.F.S. Undertaking ...	33.63	5.87	12.30	*13.29	17.75	82.84
	57.03	10.79	18.69	*19.56	25.09	131.16

\*Net amounts after transferring £1.79 millions in respect of assets sold.

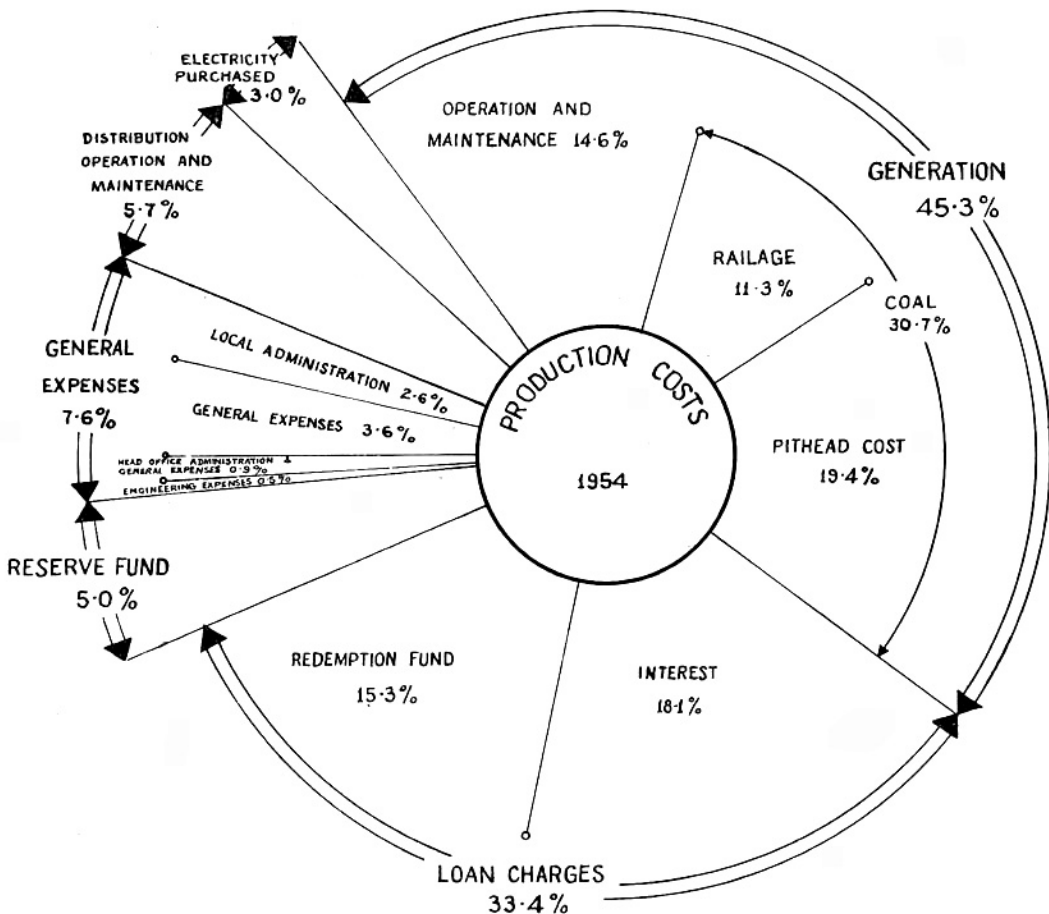
The following changes in tariffs were made during 1954 or in the period up to the end of April, 1955:—

**Cape Northern Undertaking:** The revised standard prices which were approved by the Electricity Control Board during 1953, were applied from 1st January, 1954.

**Natal Undertakings:** In order to cover the cost of new plant brought into commercial service, the tariffs for each undertaking were adjusted under Section 10 of the Act with effect from September, 1954, by a surcharge of 12½ per cent on the tariffs in force at that date.

As a consequence of the proposals for "pooling" of generation and the major transmission costs on the Natal Undertakings a revision of the standard tariffs was necessary, and the amendments to the licences granted by the Electricity Control Board on 7th March, 1955, included new Schedules of Standard Prices for each undertaking.

**Rand and Orange Free State Undertaking:** The tariffs for the Rand and Orange Free State Undertaking were adjusted for the year 1954 on the basis of the general discount being 8 per cent. A further reduction of the general discount to 2 per cent was made in January, 1955.



## STATISTICAL SUMMARY

Revenue, production costs, output and sales, and other figures relating to the operation of the Commission's undertakings during the year 1954, with the comparative figures for 1953, are as follows:—

	1954	1953	Increase
<b>Total Revenue</b> ... ..	<b>£18,513,220</b>	<b>£15,546,089</b>	<b>19·086%</b>
<b>Total Production Costs (including interest, redemption and reserve fund charges)</b> ... ..	<b>£18,428,977</b>	<b>£15,545,158</b>	<b>18·551%</b>
<b>Difference between Revenue and Production Costs</b> ...	<b>£84,243</b>	<b>£931</b>	<b>£83,312</b>
<b>Average price per unit sold</b>	<b>0·4569d.</b>	<b>0·4251d.</b>	<b>7·473%</b>
<b>Average revenue per unit sold (including Sundry Revenue)</b> ... ..	<b>0·4592d.</b>	<b>0·4273d.</b>	<b>7·464%</b>
<b>Average cost per unit sold</b>	<b>0·4571d.</b>	<b>0·4273d.</b>	<b>6·981%</b>
<b>Units generated</b> ... ..	<b>10,651,937,082</b>	<b>9,441,977,327</b>	<b>12·815%</b>
<b>Units sent out</b> ... ..	<b>10,972,439,386</b>	<b>8,952,598,382</b>	<b>12·509%</b>
<b>Units Purchased</b> ... ..	<b>437,332,210</b>	<b>550,408,980</b>	<b>Decrease</b>
<b>Units Sold</b> ... ..	<b>9,676,579,993</b>	<b>8,732,200,018</b>	<b>10·815%</b>
<b>Total cost of coal consumed (including railage)</b> ...	<b>£5,664,282</b>	<b>£4,930,802</b>	<b>14·875%</b>
<b>Railage on coal consumed</b>	<b>£2,084,895</b>	<b>£1,695,666</b>	<b>22·954%</b>
<b>Coal consumed (in tons of 2,000 lb.)</b> ... ..	<b>8,845,950</b>	<b>8,150,339</b>	<b>8·535%</b>

A diagram showing the subdivision of the Commission's total production costs for the year 1954 is reproduced on the preceding page.

## FINANCIAL

**Loan Capital:** During 1954 two local loans totalling £18,000,000 and one loan for £2,000,000 from Commonwealth Development Finance Company Limited were raised as follows:—

Date issued	Amount	Interest	Issue Price	Redeemable
26th February ...	£2,000,000	5%	£98½%	1954/68
5th April ...	£8,000,000	5%	£100%	31/ 5/71-74
21st September ...	£10,000,000	5%	£100%	31/10/71-75
	<u>£20,000,000</u>			

These loans were fully subscribed, but at the year end the amount received on account of the loan issued on the 21st September was £9,620,002. The balance of £379,998 payable not later than the 31st January, 1955, in terms of the prospectus—has since been received. The loans raised locally as Local Registered Stock totalled £111,750,000 at the year end, of which £2,500,000 had been repaid.

The loan of \$19,600,000 U.S.A. from the Export-Import Bank of Washington, equivalent to approximately £7,000,000, bears interest at 4 per cent per annum and is redeemable over 15 years by equal half-yearly instalments, including interest, from the 16th February, 1956. The loan is to be used for the provision of power from Wilge Power Station for uranium production and is to be taken up during the period ending the 30th June, 1956. The amount taken up to the 31st December, 1954, was \$11,732,941, equivalent to £4,187,438 South African currency.

The loan of \$30 million U.S.A. raised in 1953 from the International Bank for Reconstruction and Development, equivalent to approximately £10,750,000, bears interest at 4½ per cent per annum and is redeemable over 8½ years by equal half-yearly instalments, including interest, from the 15th September, 1955. The loan is to be used for the purchase of imported materials, mainly from the United Kingdom and is to be taken up during the period ending the 31st December, 1955. The amount taken up to the 31st December, 1954, was \$22,316,278, equivalent to £7,964,032 South African currency.

An agreement dated the 26th February, 1954, was entered into with the Commonwealth Development Finance Company Limited for a loan of £2,000,000 at £98½ per cent, for financing capital expenditure on the Rand and Orange Free State Undertaking. The loan bears interest at 5 per cent per annum and is redeemable over 15 years by half-yearly instalments, plus interest from the 30th June, 1954. The amount of the loan was received on the 26th February, 1954.

These amounts increased the Commission's loan capital at the date of the Balance Sheet to £133,172,553.

**Redemption Fund:** The amount in the Redemption Fund at 31st December, 1954, totalled £21,187,163, which in the aggregate exceeded the amounts required for the redemption of the loans over the maximum periods laid down in terms of issue, after taking into account the depreciation on the market value of invest-

# Assets and Liabilities for the Years 1923-1954

TOTAL ASSETS  
TOTAL LIABILITIES  
LOAN CAPITAL

1923 1925 1930 1935 1940 1945 1950 1954 1955

Millions Pounds

168

160

150

142

140

133

130

120

110

100

90

80

70

60

50

40

30

20

10



ments. The amounts in the Redemption Fund include the proceeds from the sales of assets and profits on realisation of investments.

**Reserve Fund:** The amount in the Reserve Fund at 31st December, 1954, was £2,946,846.

**Capital Expenditure:** Expenditure on Capital Account during the year amounted to £25,941,087, which increased the total capital expenditure at 31st December, 1954, to £135,310,624.

Expenditure on Capital Account will amount to approximately £214,500,000 on completion of all the works to which the Commission is committed and on projected works.

**Investments:** The book value of securities, representing investment in Government, Municipal and Electricity Supply Commission stocks, held by the Commission on behalf of the various funds at 31st December, 1954, was £23,448,535, the nominal value being £23,754,460. The market value of these investments at that date was £21,264,193.

**Assets and Liabilities:** The Commission's total assets at the 31st December, 1954, amounted to £167,620,371, and its total liabilities to £142,432,674, the excess of assets (as shown in the Balance Sheet) over liabilities being £25,187,697.

A graph showing the growth of assets and liabilities since 1923 is reproduced on the preceding page.

## STAFF

**Home Ownership Scheme:** The balance at 31st December, 1954, on loans granted to employees to enable them to acquire homes under the Commission's Home Ownership Scheme in terms of the 1941 amendment to the Electricity Act, was £582,134.

**Personnel:** The staff employed by the Commission at the 31st December, 1954, numbered 12,317 employees made up as follows:—

	1954	1953	
Europeans ... ..	4,366	4,071	Increase of 7·2 per cent
Non-Europeans ...	7,951	7,447	Increase of 6·8 per cent
	<hr/>	<hr/>	
	12,317	11,518	Increase of 6·9 per cent
	<hr/>	<hr/>	

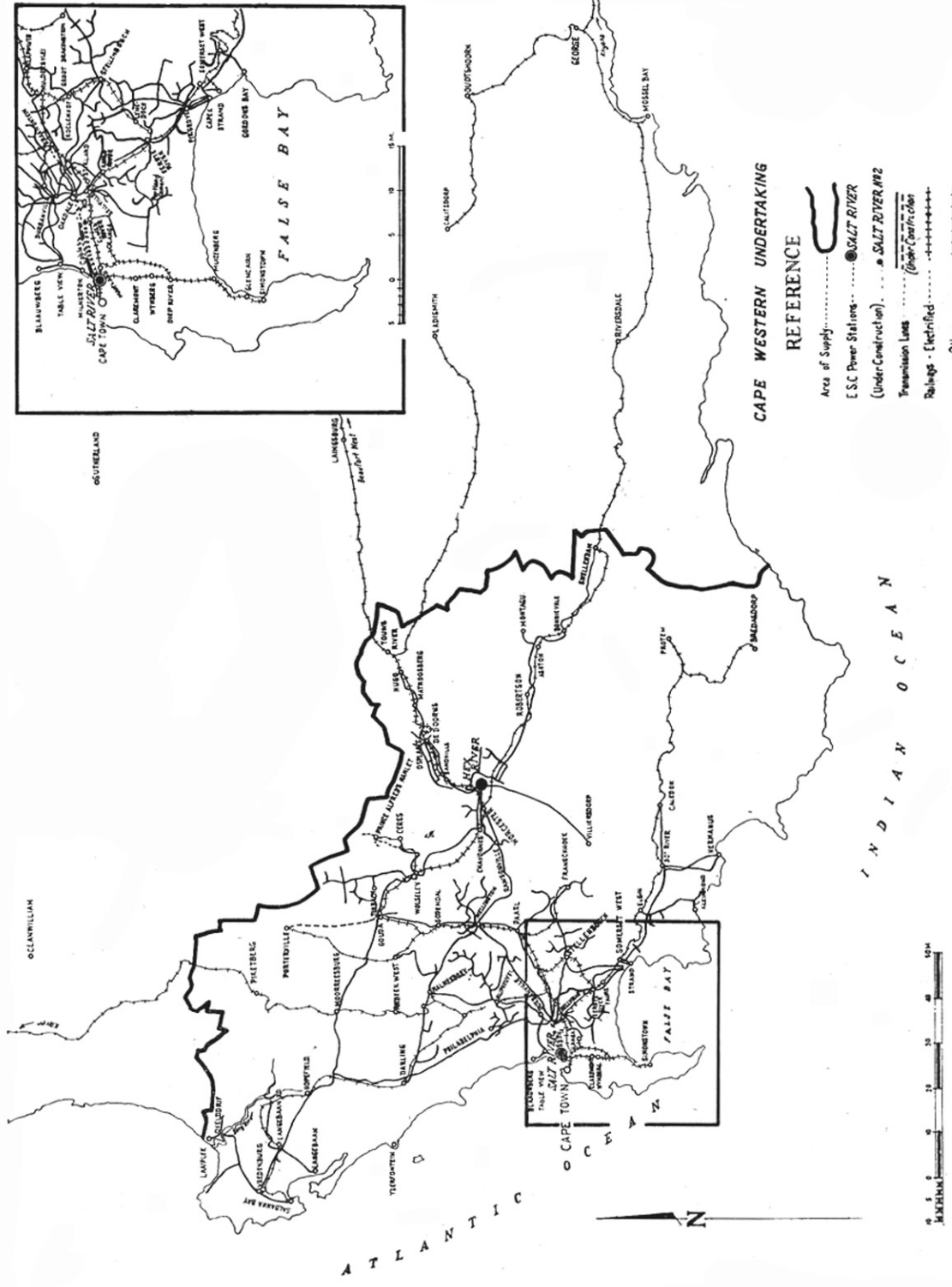
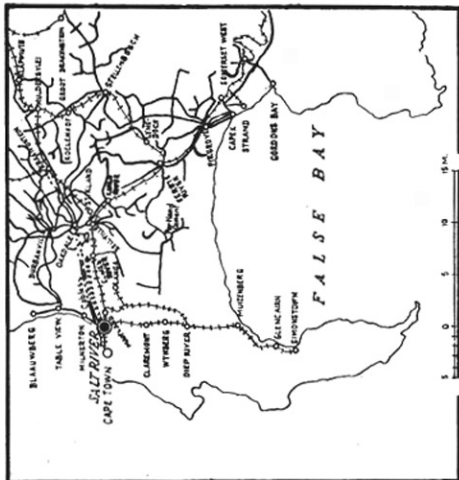
The Commission desires to express to all members of the staff its appreciation of their loyal and conscientious service under difficult conditions.

## THE COMMISSION'S UNDERTAKINGS

The operation and development of the individual Undertakings are reviewed in detail in the following pages.

General Note: "Working Costs" include interest charges and Redemption Fund contributions on loan capital and amounts set aside to Reserve Fund.





CAPE WESTERN UNDERTAKING

REFERENCE

- Area of Supply.....
- E.S.C. Power Stations.....
- (Under Construction).....
- Transmission Lines.....
- Railways - Electrified.....
- Other.....

INDIAN OCEAN

ATLANTIC



# CAPE WESTERN UNDERTAKING

CONSUMERS		SALES			Average Price per Unit Sold	
Class	Number	Increase		Revenue from Sales		
		Units	%			
Traction	2	105,393,557	49.363	£ 565,000	d	1.2299
Bulk	22	124,769,660	6.485	520,494	d	1.2880
Industrial	1,813	117,346,084	10.347	630,393	d	1.0012
Domestic and Lighting	21,431	88,698,487	8.872	565,967	d	1.2893
	23,268	436,207,788	16.153	2,282,454	d	1.5314
					d	1.2558
						1.1245
				1953	Accumulated to 31.12.54	
Total Revenue		£2,293,749		£1,769,562		
Working Costs		£2,151,206		£1,809,694		
Surplus		£142,543		—		
Deficit				£40,132		£9,295
Capital Expenditure		£3,541,136		£2,888,381		£17,335,124

Salt River Power Station No. 1		Hex River Power Station	
		1954	1953
Units Sent Out	1954	1953	
Maximum half-hour	140,959,908	140,252,269	163,090,540
Demand kW S.O.	52,270	46,500	45,500
Station Peak kW	58,100	51,500	47,800
Load Factor %	30.9	34.4	40.9
Thermal Efficiency % S.O.	17.19	17.20	23.05
		121,516	100,552
Coal Consumed—tons	115,488	1.640	1.233
Average per unit sent out—lb.	12,110	12,100	12,000
Calorific Value B.Th.U./lb	£236,865	£215,076	£177,575
Total Cost	41s.	37s. 5d.	35s. 4d.
Cost per ton		37s.	

**FUEL:**

Coal Consumed—tons	115,488	1.640
Average per unit sent out—lb.	12,110	12,000
Calorific Value B.Th.U./lb	£236,865	£177,575
Total Cost	41s.	35s. 4d.
Cost per ton		37s.

**General**—The year 1954 was a very busy one as regards construction work, both at Salt River No. 2 Power Station and on the distribution system. It was hoped to have had at least one of the new boilers steaming in Salt River No. 2 Power Station by the winter of 1954, but this was not possible, due to late delivery of certain materials. The first boiler was placed in service on the 3rd November, 1954.

A further report on Salt River No. 2 Power Station is given on page 13.

Pooled operation of Salt River No. 1 Power Station and the Cape Town City Council's Table Bay and Dock Road Stations continued during the year, in accordance with the 1932 agreement, and, by arrangement with the City Council, one machine at Hex River Power Station was run throughout the year as support for the pooled power stations. In order to give additional assistance to meet system peaks during the winter months a further arrangement was made, at the request of the City Council, whereby the third machine at Hex River Power Station could be called upon as required on a day-to-day basis, and this assistance was rendered to the pool on seven days during the winter.

Load shedding was not necessary at any time during the year under review, and no interruption occurred to any supply due to power station plant failure.

**Output and Sales**—Total sales for the year were 436,207,788 units, an increase of 16.15 per cent over the sales for the previous year. This is the largest annual increase recorded on the undertaking, the main factor being the growth of traction load by nearly 50 per cent due to the electrification of the section of railway line to Touws River. Growth of supplies to other consumers was at the rate of 8.5 per cent which confirms that there has been a return to a normal rate of growth.

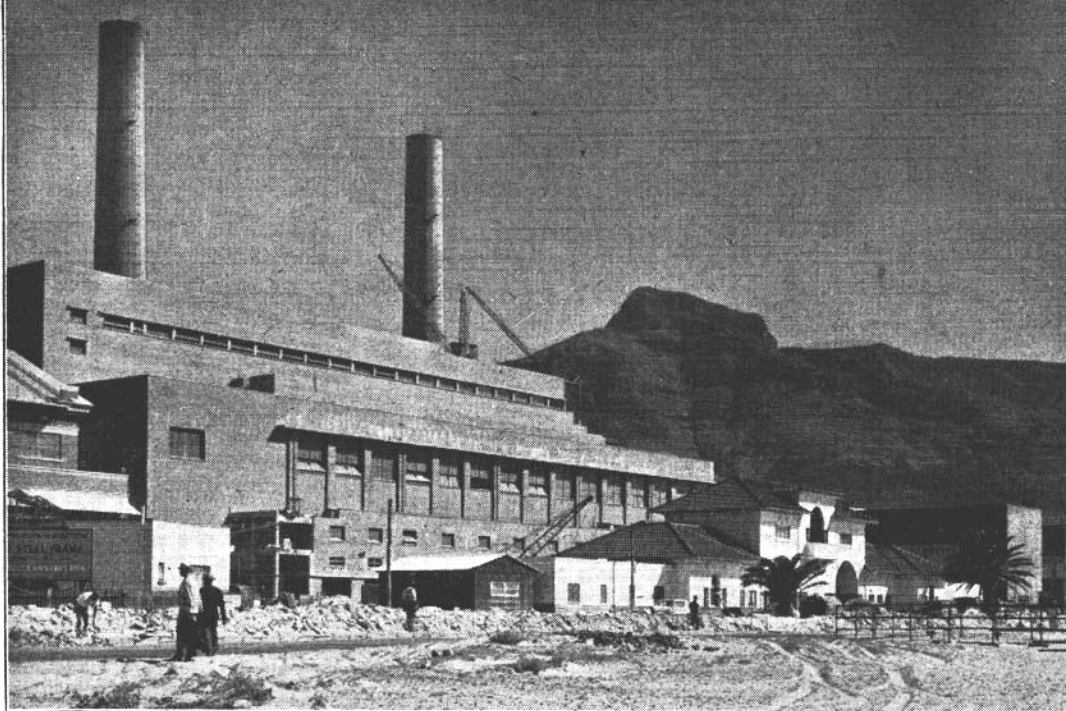
It is significant also that there was better use of the plant installed in the pooled power stations as shown by the improvement in the system load factor from 47.6 per cent in 1953 to 52.6 per cent in 1954.

**Coal**—The year started with adequate coal stocks at the pooled power stations, but from February until about mid-August coal deliveries were below the burning rate, resulting in a steady decline in coal reserves. Coincident with the fall in system loading after the end of August, the coal stocks began to increase slightly until by the end of the year the total reserves at the pooled stations were again adequate at 40,000 tons.

At Salt River Power Station, arrangements were made to recover some of the storage ground which had been taken up by contractors during construction of the new coal yard, and by the end of the year space for reserve coal was available up to 18,000 tons.

Supplies to Hex River Power Station were adequate and regular, and stocks were maintained at a high level until the last two months of the year when supplies were below the burning rate.

**Salt River No. 1 Power Station**—In addition to carrying out routine maintenance, the programme of overhaul and modification of the boiler plant at this station, and the installation of grit collectors, was practically completed by the year-end. The modifications to the boilers will off-set to some extent the reduction in efficiency caused by the deterioration that has taken place in recent years in the quality of coal supplied.



#### **SALT RIVER No. 2 POWER STATION**

**The first 30,000 kW turbo-alternator in this station has been commissioned.**

**Hex River Power Station**—Most of the outstanding construction work was completed during the year and the station is now well settled to routine operation. An investigation into the high steam consumption of the turbines is being carried out by the suppliers, and a number of minor items have yet to be rectified by contractors.

**Major Transmission System**—The 66 kV line between Hex River Power Station and Touws River was completed towards the end of January, 1954, and supplies were available at the traction substations in February and March. The Administration commenced taking power for the new section in May.

A second line between Hex River Power Station and Touws River is to be constructed to ensure reliability of the electric traction over this section of railway.

Construction of the Gouda-Moorreesburg 66 kV line was completed in March, 1954, and the Municipality of Moorreesburg was connected to this feeder.

The Moorreesburg-Koperfontein 33 kV line was rebuilt for 66 kV and the fisheries load was transferred from the old Langebaan 33 kV line ex Oakdale to the new 66 kV feeder ex Gouda. Voltage conditions were much improved by this rearrangement.

The Stellenbosch-Capex 66 kV transmission line and a 66 kV line between Bot River and Hermanus were completed. Steps have also been taken to connect

to the Lourens River substation the Stellenbosch-Capex-Eerste River 66 kV loop. Up to the end of the year this network continued to be operated at 33 kV but the change-over to 66 kV working will be made when the necessary transformer and switchgear equipment is available towards the middle of 1955.

The 66 kV underground cables between Oakdale and Salt River have been laid except for two short sections.

**Bulk Supplies and Industrial Consumers**—No new bulk supply was given in 1954, so that the increase of 6·5 per cent in the units sold to bulk consumers represents the year's development within existing towns and villages. The supply to the Ceres Municipality was commenced at the end of the year.

During the year 22 industrial consumers in the "large user" category having a total load of 1,690 kVA were connected to the system.

**Development of Urban Distribution**—The demand for electricity in the urban areas of Goodwood, Parow and Bellville increased steadily during the year, the highest maximum demand recorded being 26·4 MVA, which is an increase of 10·7 per cent over that for 1953 as compared with 8·2 per cent for the previous year.

**Development of Rural Supplies**—Over the year extensions to the rural networks continued, and 475 connections were made which included 130 farmers.

There still remain large areas where farmers are interested in obtaining supplies of electricity; but in sparsely populated areas the costs per consumer are relatively high and the number of applicants who accepted the terms offered was less than in the years 1951-53.

**Land and Buildings**—Four substation sites were purchased in the urban area and nine in rural areas. One of the latter will be used for the purpose of erecting a store and native quarters near Vredenburg.

The new office block in Bellville and two houses at Oakdale Depot were completed during the year.

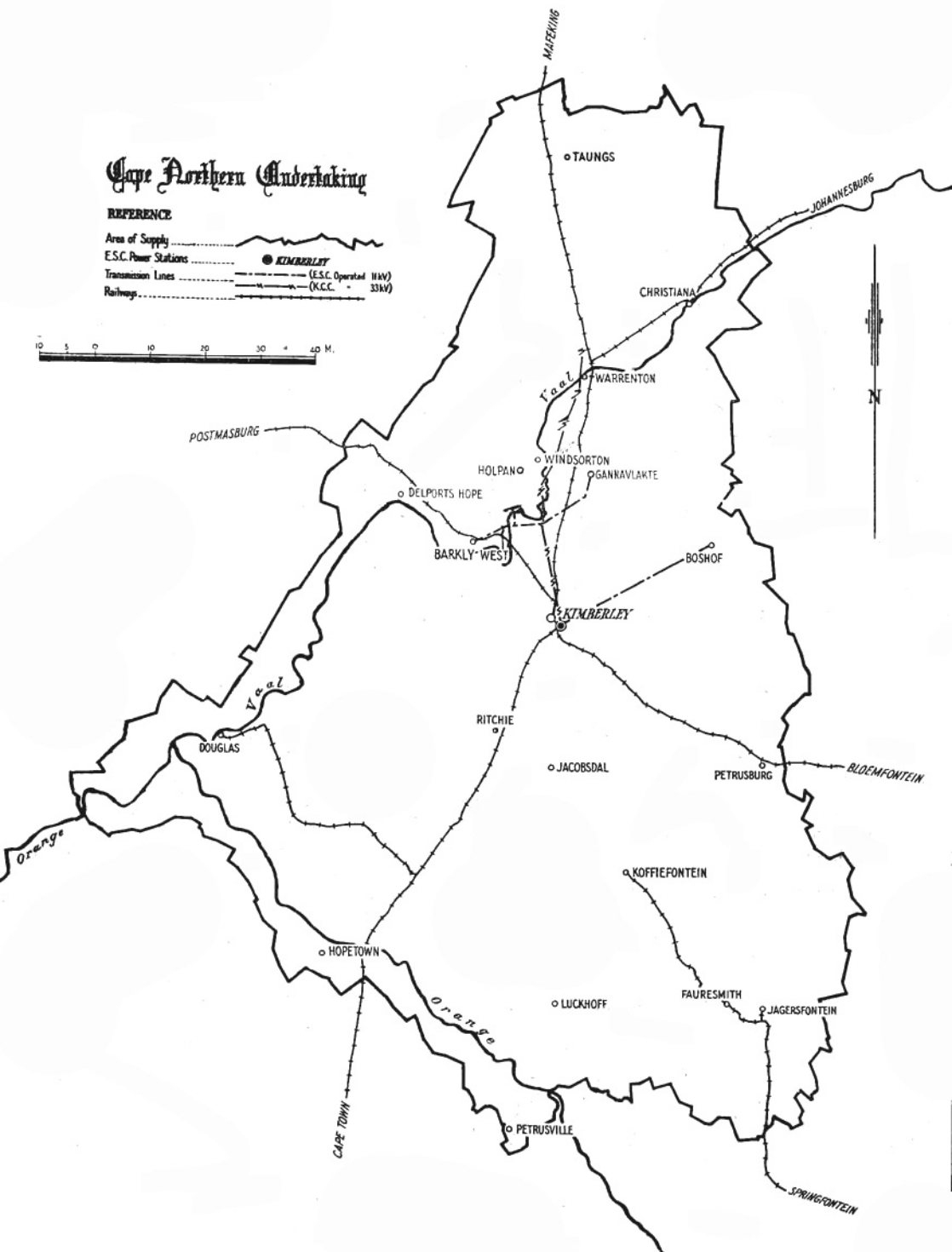
A large number of servitudes were successfully obtained on the basis of a lump sum payment of compensation.

**Financial**—The revised tariffs which were approved by the Electricity Control Board in August, 1953, were in force for the full year, and there was a surplus on the year's working of £142,543. This is the first annual surplus achieved since 1948, and the accumulated deficit which had reached £151,838 at the end of 1953 was thus reduced to £9,295.

# Cape Northern Undertaking

## REFERENCE

- Area of Supply
- E.S.C. Power Stations **KIMBERLEY**
- Transmission Lines (E.S.C. Operated 11kV)
- (K.C.C. - 33kV)
- Railways



## CAPE NORTHERN UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase		1954	1953
			%	£	d	d
Bulk ... ..	3	45,175,224	6·012	178,038	0·9459	0·7090
Mining ... ..	3	24,559,229	3·871	122,933	1·2013	0·8380
Industrial ... ..	35	842,511	10·445	10,132	2·8863	2·7475
Domestic and Lighting	38	95,228	30·716	984	2·4806	1·9950
	79	70,672,192*	5·335	312,087	1·0598	0·7791

	1954	1953	Accumulated to 31/12/54
Total Revenue ... ..	£313,633	£218,287	
Working Costs ... ..	£307,677	£213,197	
Surplus ... ..	£5,956	£5,090	£2,108
Capital Expenditure ... ..	£280,612	£527,606	£1,425,645

CENTRAL POWER STATION—			
Units Sent Out ... ..	68,254,599	65,394,477	
Maximum half-hour Demand kW S.O. } ... ..	17,960	16,150	
Station Peak kW ... ..	19,300	16,900	
Load Factor % ... ..	43·3	46·70	
Thermal Efficiency % Sent Out ...	12·32	12·70	

COAL:			
Consumption—tons ... ..	77,471	71,672	
Average per unit sent out—lb ...	2·270	2·192	
Calorific Value B.Th.U./lb ...	12,200	12,260	
Total Cost ... ..	£112,699	£99,517	
Cost per ton ... ..	29s. 1d.	27s. 9d.	

\*This total includes sales of units re-purchased.

**Output and Sales**—Units sold in 1954 show an increase of 5·3 per cent. The supply to Barkly West Municipality showed an increase of 35 per cent, due to connecting up a new cheese factory, and there were appreciable increases in the supplies given to consumers mining gypsum in the Kimberley and Boshoff districts.

In the table "industrial" supplies means supplies given on the "large users" or "industrial" tariff. The bulk of these units were supplied to farmers for irrigation purposes in the Barkly West and Riverton areas.

**New Developments**—In May, 1954, work commenced on the building of a 66 kV transmission line Riverton-Warrenton-Andalusia and secondary 11 kV distribution lines for supplies to the Warrenton Municipality, the Virginian Cheese



## CENTRAL POWER STATION, KIMBERLEY

The construction of the induced-draught cooling tower is nearly completed

[Photo: Brian Eaton]



factory and to consumers in the Vaalhartz irrigation settlement, including the Central Workshops of the Irrigation Department.

Applications were also received from established lime and cement companies at Silverstreams and Delports Hope, and from diamond mining companies near Smith's Mine. These applications had to be dealt with in two stages: firstly additional requirements which were in excess of the capacity of consumers' own existing generating resources, and secondly, supplies which would enable consumers to shut down their generators completely. Efforts are being made to supply the additional demands for power which cannot be met from consumers' existing plants. Supplies which can be satisfied from consumers' own plants cannot be undertaken until additional power is made available for the Cape Northern Undertaking from Vierfontein Power Station, which is estimated to be in approximately 1958.

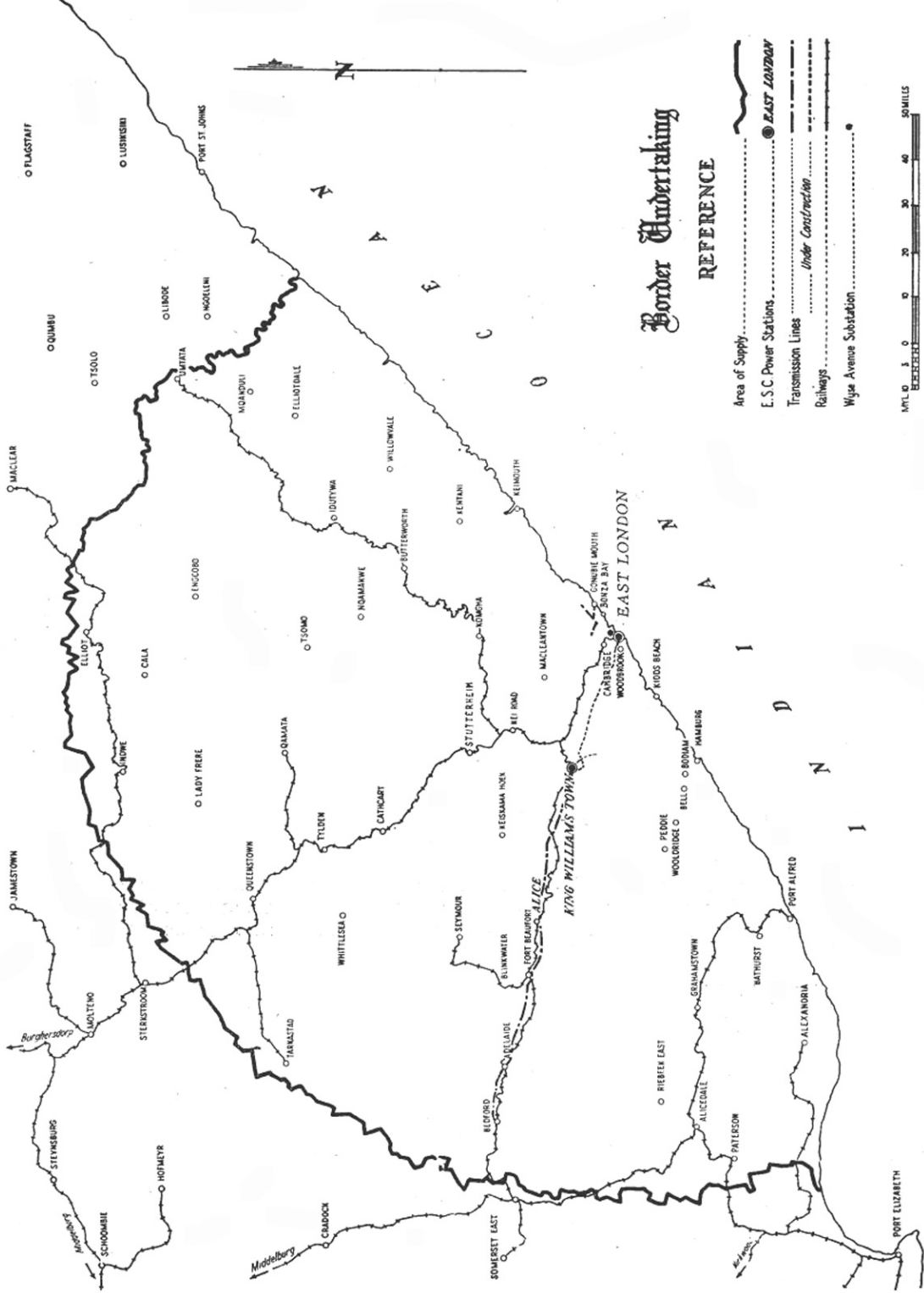
Negotiations are also in progress with the Douglas Municipality and a large number of farmers along the Vaal River in the vicinity of Douglas as well as the farmers along the Riet River who pump water for irrigation purposes. It seems likely that a rural reticulation scheme to supply pumping installations in this district will be possible. The aggregate requirement may be as much as 4,000 h.p.

**Power Station**—There was an improvement in operating conditions in 1954 due to the good rains which maintained the water supply in Blankenberg vlei and the commissioning of the additional boiler in April and No. 6 generator in June. The station was able to meet a peak demand of 17,960 kW S.O., which was an increase of 11.2 per cent over the peak output in 1953.

The induced draught cooling tower was completed in part and in use for generators Nos. 5 and 6. The complete cooling system is expected to be in operation during 1955.

**Financial**—The increase in tariffs made from January, 1954, was adequate to cover the increased costs, and the annual account showed a small surplus of £5,956.





# Border Undertaking

## REFERENCE

- Area of Supply .....
- E.S.C. Power Stations .....
- Transmission Lines .....
- Railways .....
- Wye Avenue Substation .....

● EAST LONDON

Under Construction



# BORDER UNDERTAKING

CONSUMERS		SALES			Average Price per Unit Sold	
Class	Number	Units	Increase	Revenue from Sales		
				1954	1953	
Bulk ...	4	106,429,968	10·018 %	£ 330,746	0·7458 d	1953 1953
Industrial ...	104	3,757,316	5·394	32,076	2·0488	2·0911
Domestic and Lighting ...	2,153	7,814,575	7·664	63,857	1·9612	2·0180
Steam—Industrial ...	2	233,754	12·277	980	1·0061	0·9835
	2,263	118,235,613*	9·711	427,659	0·8681	0·8316
		1954		1953	Accumulated to 31.12.54	
Total Revenue ...	...	£427,898		£373,894		
Working Costs ...	...	£466,039		£389,442		
Deficit ...	...	£38,141		£15,548	£104,856	
Capital Expenditure ...	...	£1,041,090		£607,551	£2,742,064	
King William's Town						
		1954		1953	1954	1953
Units Sent Out ...	12,501,090	10,007,669		85,505	26,119	
Maximum Half-hour Demand kw S.O. ...	3,618	2,930		In parallel with steam plant		
Load Factor % ...	59·7	39·10				
Thermal Efficiency % ... S.O.	13·29	13·28				
East London						
		1954		1953	1954	1953
Units Sent Out ...	105,255,930	96,941,320		15,345		
Maximum Half-hour Demand kw S.O. ...	23,250	21,790		0·588		
Load Factor % ...	51·6	50·8				
Thermal Efficiency % ... S.O.	14·00	15·26				
FUEL:						
Coal Consumed—tons ...	106,115	90,849		10,281+		
Average per Unit Sent Out	2·016	1·874		2·013		
Calorific Value B.Th.U./lb	12,090	11,930		12,760		
Total Cost	£200,782	£160,324		£20,446		
Cost per ton ...	37s. 10d.	35s. 4d.		39s. 9d.		
Fuel Oil consumed—lb	12,862†	2,019		49,011		
Fuel Oil per unit S.O.—lb	2·016	1·874		0·573		

\*This total includes sales of units repurchased.

†Includes 210 tons for Live Steam Supply.

‡Includes 243 tons for Live Steam Supply.

**Development of the Undertaking**—In past years it was appropriate to divide the report into the three sections East London, King William's Town and Alice, and thereby to show the position of the three electricity concerns which compose the Border Undertaking. This sub-division has not yet lost its significance; but the Border Undertaking is now being consolidated, and the report and statistics are to be read in the light of these developments.

It was stated in the last annual report that the first section of the 33 kV transmission line between King William's Town and Alice was completed and commissioned in August, 1953, and the generation of electricity by the diesel plant in the Alice Power Station was discontinued. The operating experience on the 33 kV line during 1954 was highly satisfactory—there were only two interruptions of supply, one for ten minutes and one six minutes, which were caused by storms. The bulk of the Alice Power Station plant has now been sold.

The section of 33 kV line between Alice and Fort Beaufort was completed in January, 1954, and the bulk supply to Fort Beaufort Municipality was commenced on 16th January, 1954. The section, Fort Beaufort-Adelaide, was erected in May, and the supply to Adelaide Municipality was given on 28th June, 1954. A fourteen mile extension at 11 kV was built to Bedford, and this line was commissioned in January, 1955.

The supplies given to Alice, Fort Beaufort and Adelaide are shown in the figures of output of the King William's Town Power Station, and it will be seen that there has been an increase of approximately 25 per cent during the year.

The Town Council of Stutterheim have agreed to take a supply in bulk; and the Village Management Boards of Berlin and Kidds Beach are discussing a supply of electricity with the Commission.

Steady progress was made on the erection of the 66 kV double circuit transmission line between East London and King William's Town.

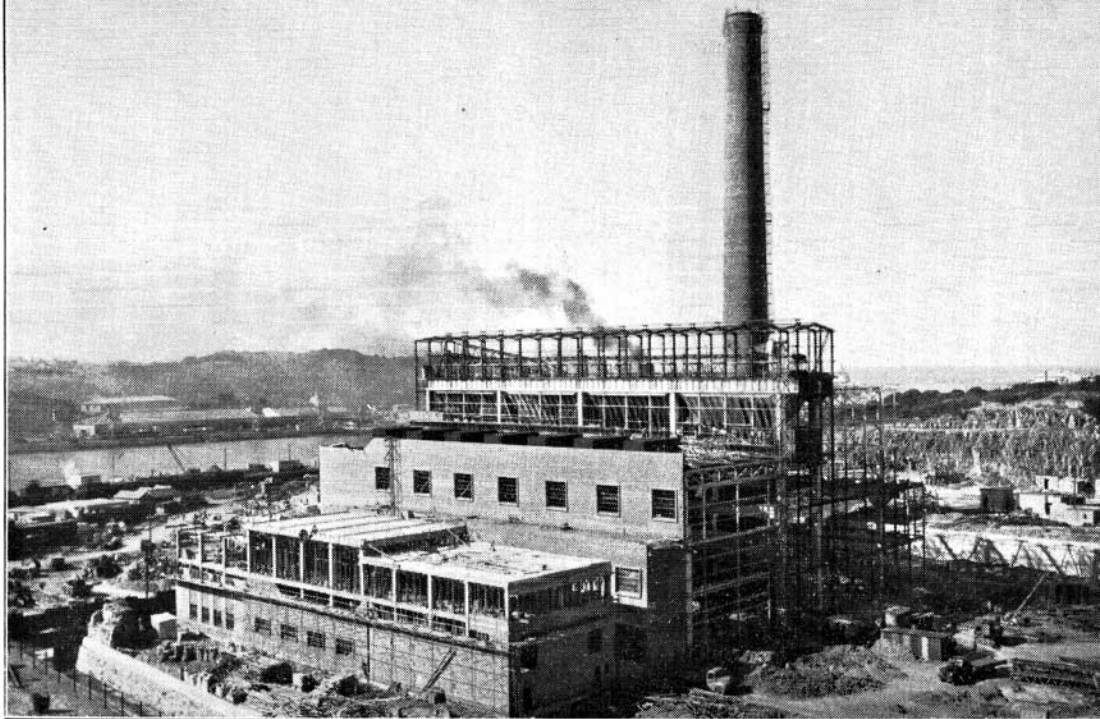
**Output and Sales**—The total sales for the Undertaking in 1954 were 9·7 per cent higher than the corresponding figure for 1953. The increases in the different areas were: East London, 8·6 per cent; King William's Town, 20·0 per cent; and Alice, 18·7 per cent.

**East London**—Considerable trouble was experienced with the boilers in this station, due to heavy load on West Bank No. 1 Power Station, which might have been avoided had the planned steaming date for the first boiler in the new station come up to expectations, and shedding of load occurred during the latter half of July and the first week of August. Special steps were taken to maintain boiler output, but it will not be possible to carry out any extensive overhaul of these boilers until West Bank No. 2 Power Station is in service.

It was hoped that the first boiler in the new station would be ready for steaming in May, 1955, to give assistance to No. 1 Power Station during the coming winter.

A report on the progress of construction at No. 2 Station is given on page 13.

The supply taken by the East London Municipality during 1954 exceeded 100 million units, the increase being 8·6 per cent over the figure for 1953.



#### WEST BANK No. 2 POWER STATION

Power for the Border Undertaking is expected to be available from this station in October.

[Photo: City Photo Services]

In the Gonubie and Bonza Bay areas the maximum demand increased to 480 kVA. Forty-six new consumers were connected to the system, bringing the total to 287.

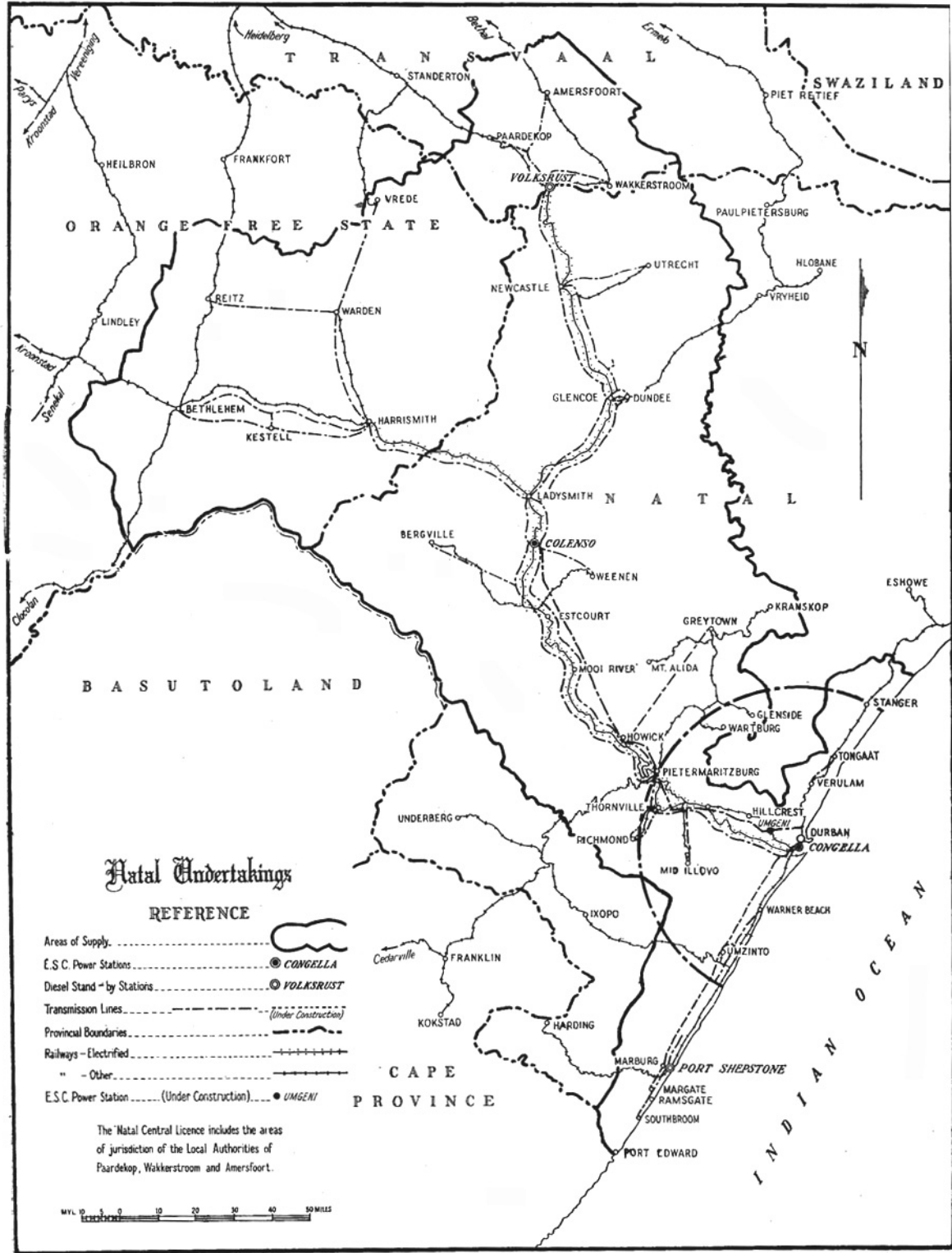
**King William's Town**—An additional 47 consumers were connected to the reticulation system within King William's Town, and several sections of the system were reconstructed. In the main street sections of underground cable were laid to replace the existing overhead lines.

An extension at 11 kV from the Good Hope Textile Corporation, Ltd., to Mount Coke Mission was completed.

**Alice**—There were 27 additional consumers connected to the Alice reticulation system, and units sold increased by 18·7 per cent.

**Financial**—The development of the undertaking brought about an improvement in the financial results for both Alice and King William's Town. As a result of the closing down of the Alice Power Station, there was a small surplus on the year's accounts on the Alice section and the King William's Town section was operated at a smaller deficit than in 1953.

As East London maintenance cost on the West Bank No. 1 Power Station was unusually heavy owing to irregular supplies of coal of the quality for which the boilers were designed, a deficit was incurred on the year's working. The undertaking showed a deficit of £38,141 for the year and the accumulated deficit for the whole undertaking now stands at £104,856.



## Natal Undertakings

### REFERENCE

- Areas of Supply .....
- E.S.C. Power Stations ..... **CONGELLA**
- Diesel Stand-by Stations ..... **VOLKSRUST**
- Transmission Lines ..... (Under Construction)
- Provincial Boundaries .....
- Railways - Electrified .....
- " - Other .....
- E.S.C. Power Station (Under Construction) ..... **UMGENI**

The Natal Central Licence includes the areas of jurisdiction of the Local Authorities of Paardekop, Wakkerstroom and Amersfoort.



**NATAL SOUTHERN UNDERTAKING**  
(Formerly Durban Undertaking)

CONSUMERS		SALES			Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase or Decrease	1954		1953	
			%	£	d	d	
Traction ... ..	1	41,736,525	- 6.647	97,156	0.5587	0.4855	
Bulk ... ..	2	695,029,164	+10.248	1,540,004	0.5318	0.4786	
Industrial ... ..	217	23,378,194	+ 2.666	77,598	0.7966	0.6483	
Domestic and Lighting	3,900	17,536,231	+14.548	130,139	1.7811	1.6776	
	4,120	777,680,114*	+ 9.039	1,844,897	0.5694	0.5102	

	1954	1953	Accumulated to 31.12.54
Total Revenue ... ..	£1,889,498	£1,526,231	
Working Costs ... ..	£1,938,676	£1,508,990	
Surplus ... ..	—	£17,241	
Deficit ... ..	£49,178	—	£60,075
Capital Expenditure ... ..	£1,675,039	£2,129,018	£12,827,215

	Congella Power Station Nos. 1 and 2		Umgeni Power Station (from 2/4/54)	Port Shepstone Power Station	
	1954	1953	1954	1954	1953
Units Sent Out ...	750,538,540	720,697,340	83,068,541	96,930	162,221
Maximum half-hour Demand kW S.O. }	168,896	170,436	31,200	3,138	3,020
Station Peak kW ...	189,000	190,000	34,200	3,305	3,175
Load Factor % ...	50.7	48.30	40.6		0.6
Thermal Efficiency % S.O. ... ..	20.48	20.55	21.06		
<b>FUEL:</b>					
Coal Consumed ...	533,914	498,252	30,081†		
Average per unit sent out ... ..	1.423	1.383	1.356		
Calorific Value B.Th.U./lb	11,710	12,000	11,950		
Total Cost ... ..	£725,378	£631,641	£46,233		
Cost per ton ... ..	27s. 2d.	25s. 4d.	30s. 9d.		
Fuel Oil consumed—lb				57,495	105,909
Fuel Oil per unit sent out—lb ... ..				0.593	0.653

\*This total excludes interchange, but includes sales of units repurchased.

†Tonnage of coal charged to Revenue Account.

**Change of Name**—In an amendment of the licence granted by the Electricity Control Board on 28th April, 1955, the name of the Durban Undertaking was changed to the "Natal Southern Undertaking".

The other important alterations to the licence which provide for pooling of generation on the Natal Undertakings and the introduction of revised tariffs are dealt with on page 18 of this Report.

**Output and Sales**—The units sold by the undertaking, omitting the units supplied to the Natal Central Undertaking on interchange, amounted to 777,680,114 kWh, which is an increase of 9.04 per cent over the sales for the previous year.

On interchange between the undertakings, Natal Southern Undertaking received 6,163,747 units from, and transmitted 56,387,723 units for Natal Central Undertaking, a net export of 50,223,976 units.

**Congella Power Station**—The third of the new 200,000 lb.-hr. boilers was commissioned in May, 1954. This completed the "D" Extensions at this power station.

The new plant, with the plant at Umgeni Power Station, has enabled the undertaking to meet the demands for power made upon it, but developed minor troubles in the initial years of operation. During the year it was necessary to carry out slight modifications and adjustments to the boilers and certain auxiliary plant; and further trouble was experienced with defective bearings on the 40 MW turbo-alternators, which made it necessary at times to run the machines at reduced output. The operating staff are giving special attention to the bearings on these machines, so as to establish the cause of the failures and as a precaution to maintain the best possible plant availability.

The maximum half-hourly demand recorded at the power station was 168,896 kW S.O., which is a little lower than the figure for 1953; but the energy output was higher by approximately 4 per cent.

The supply of coal to power stations continues to be a cause of anxiety. During the year the coal stock at Congella Power Station rarely exceeded 4,000 tons. It was down to approximately 1,500 tons in February and on several occasions during the period April to July, and in the first week of July the available coal was as low as 1,150 tons. With the power station burning some 1,500 tons of coal during a normal working day, coal reserves at these figures cannot be regarded as satisfactory.

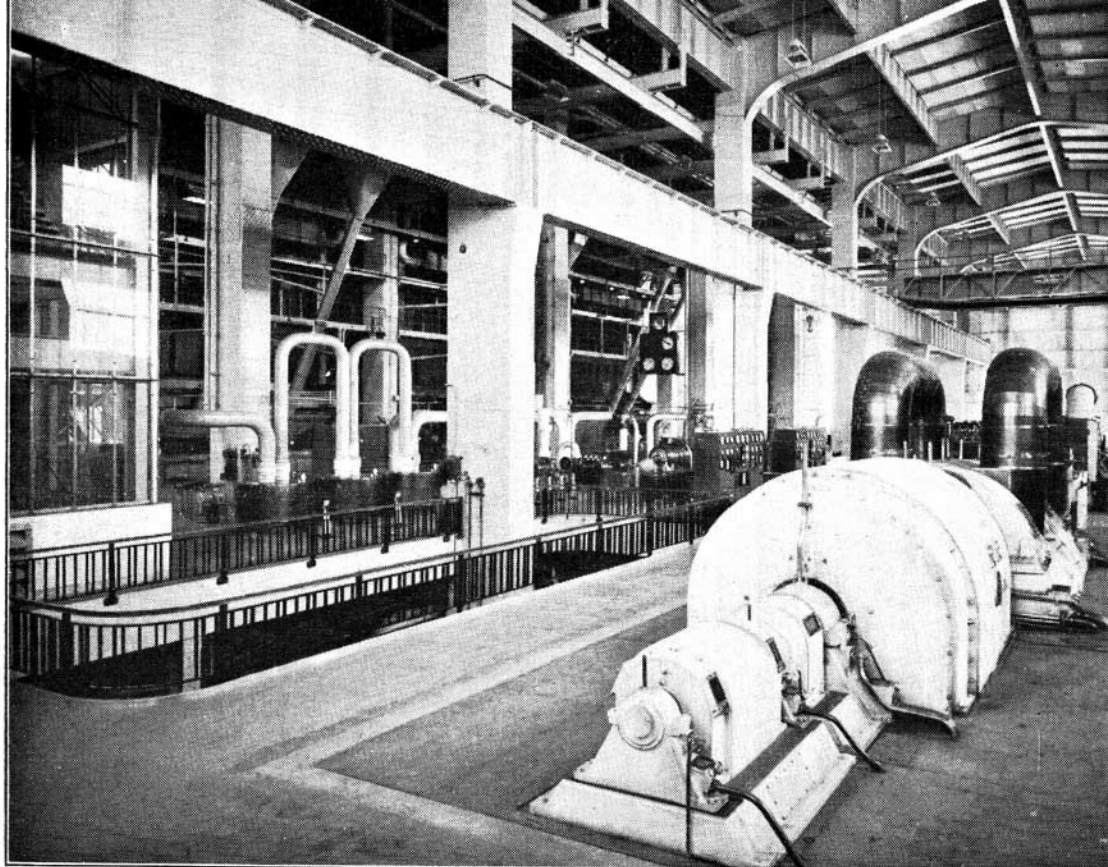
**Umgeni Power Station**—This new power station was started up on the 2nd April, 1954, and a report on the progress of construction is given on page 13.

The output of 83,068,541 units and the average load factor for the period covered by the Report is low; but the plant was out of service for long periods during the first three months of operating for the purpose of making adjustments to the boilers and the turbo-generator.

**Distribution System**—The 132 kV transmission line Colenso-Umgeni Power Station was energised in March, 1954.

Supply to the Durban Corporation at 33 kV ex Umgeni Power Station was commenced on 11th May, 1954. The new Springfield Substation, which is also for supply to the Corporation, was energised in September, and the two 132 kV





### UMGENI POWER STATION

View of the turbine room showing 30,000 kW turbo-alternator No. 1 in the foreground.

[Photo: Whysalls (Pty.) Ltd.]

lines between Umgeni Power Station and Springfield Substation, together with the two banks of step-down transformers, were completed in October.

On the South Coast an 88 kV substation at Umkomaas was connected up in April and the permanent 88/11 kV substation at Margate was completed and taken into service in December, 1954. The maximum demand on the South Coast network increased to the new peak of 7,800 kW, compared with the figure of 6,600 kW in 1953.

During the year 280 new consumers, including rural consumers, were connected to the system: 214 were in the South Coast area, 35 in the Durban inland areas and 31 on the North Coast.

**Financial**—The year's accounts again show increased costs, largely due to the high cost of the new plant in Congella Power Station and Umgeni Power Station and the new transmission and distribution systems required to deal with the expansion of the undertaking.

Owing to the large amount of new plant which was brought into commercial service during the year it became necessary to adjust the prices for electricity in terms of Section 10 of the Act, and from the month of September, 1954, a surcharge of 12½ per cent was introduced on the tariffs in force at that date. In spite of this adjustment the year's accounts showed a loss of £49,178, and there was thus an accumulated deficit at the year-end of £60,075.



## NATAL CENTRAL UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase		1954	1953
			%	£	d	d
Traction .. .. .	1	278,010,265	3·601	635,570	0·5487	0·5015
Bulk ... .. .	15	181,929,164	13·785	517,528	0·6827	0·6077
Mining ... .. .	12	26,120,501	14·540	87,428	0·8033	0·7474
Industrial ... .. .	501	33,932,808	13·708	126,196	0·8926	0·8045
Domestic and Lighting	4,020	12,537,888	9·815	104,131	1·9933	1·8792
	4,549	532,530,626*	8·172	1,470,853	0·6629	0·5977
		1954	1953	Accumulated to 31.12.54		
Total Revenue ... .. .		£1,492,150	£1,241,126			
Working Costs ... .. .		£1,495,080	£1,229,600			
Surplus ... .. .		—	£11,526			
Deficit ... .. .		£2,930	—	£11,545		
Capital Expenditure ... .. .		£575,759	£1,207,267	£9,852,766		
COLENSO POWER STATION—						
Units Sent Out ... .. .		519,526,650	512,154,210			
Maximum half-hour } Demand kW S.O. {		109,680	96,230			
Station Peak kW ... .. .		121,000	115,000			
Load Factor % ... .. .		54·1	60·80			
Thermal Efficiency % Sent Out ...		19·13	18·74			
COAL:						
Consumption—tons ... .. .		382,650	382,785			
Average per unit sent out—lb		1·473	1·495			
Calorific Value B.Th.U./lb ...		12,110	12,180			
Total Cost ... .. .		£410,595	£381,455			
Cost per ton ... .. .		21s. 6d.	19s. 11d.			

\*This total includes sales of the balance of units taken on interchange.

**Output and Sales**—The total units sold increased by 8·2 per cent, as compared with the increase of 8·4 per cent in 1953. The increases in the main categories of consumers are shown in the table, and it is significant that while the increase in traction supplies was only 3·6 per cent for the year, the increase in units sold to other consumers was at the high rate of 13·6 per cent.

In the first year (1927) the energy supplied to the Railways Administration for traction purposes exceeded 100 million units and represented 96·4 per cent of sales. Since that time the traction load has increased to nearly three times, but the development of the system to serve the towns and other consumers in

Natal and the eastern Orange Free State has been at an even greater rate. Although the Railways Administration is still the largest consumer of the undertaking, supply for traction is now only 52.2 per cent of total sales.

During the year the increase in the notified demands of consumers other than the Railways Administration was 15.3 per cent compared with the increase of 13 per cent in the previous year, so that these demands have continued to increase at the high rates that have been a feature during the past five years.

The Natal Central Undertaking received 56,387,723 units from the Natal Southern Undertaking and transmitted 6,163,747 units to that undertaking, the net interchange being 50,223,976 units.

**Area of Supply**—During the year the area of supply was, with the approval of the Electricity Control Board, extended to include areas which were within economic reach of the existing main transmission system.

**Colenso Power Station**—The Colenso "C" Extensions were completed during the year when No. 15 boiler, the last to be erected under the contract, was taken into service in April. However, the new turbo-alternator (No. 8) developed minor troubles in September, 1954, and was out of service until April, 1955.

The station's two-minute peak was 121,000 kW, which was recorded when assisting Natal Southern Undertaking. The peak, when supplying Natal Central Undertaking only, was 108,000 kW.

**Distribution System**—During the year approximately 235 miles of transmission and distribution lines of 11 kV and above were erected and energised. The Colenso/Ungeni Power Station 132 kV transmission line was commissioned in March, 1954. The Mason's Mill 132/88 kV substation at Pietermaritzburg together with the 88 kV line between this substation and the Pietermaritzburg 88 kV substation was commissioned in April, 1955.

The construction of the new 88 kV substation at Ballengeich was well advanced at the end of the year.

The erection of the Thornville/Richmond 88 kV line was completed in December and portion of the line was energised at 11 kV pending the completion of the terminal substations.

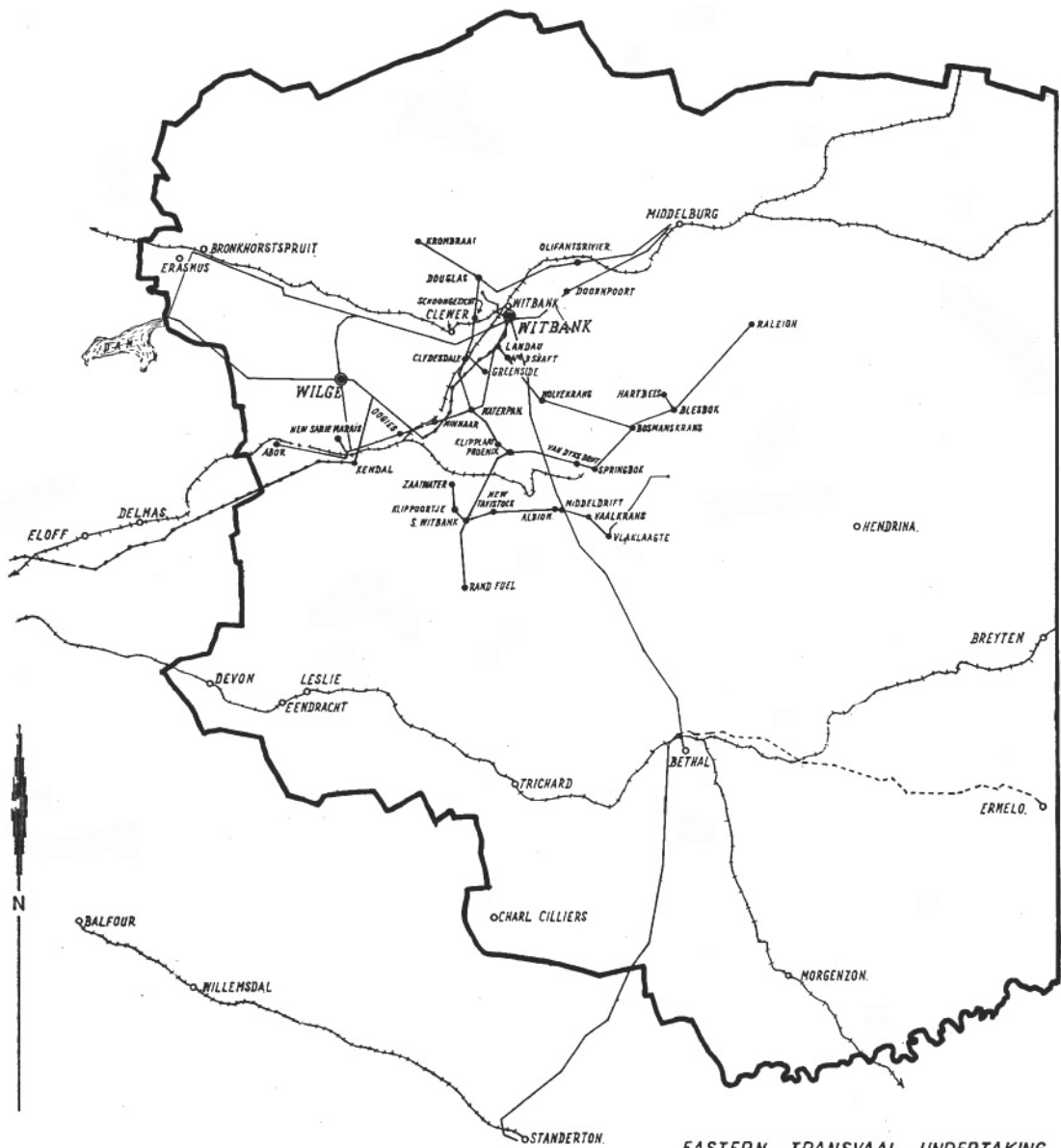
The Harrismith/Warden/Vrede/Reitz 33 kV system was completed, except for the permanent substations at Eeram and Warden, and the bulk supply to Reitz Municipality was commenced on 18th March, 1954.

During the year 31 new consumers in the large user category were connected on this Undertaking.

**Rural Supplies**—The first section of the Eston/Mid-Illovo farmers' scheme was completed early in the year, and work on the second portion is proceeding.








The Bergville rural scheme is nearing completion and the first supplies were made available in January, 1955. Work was started on the scheme to supply farms in the Bethlehem/Wolhuterskop/Asrivier area and line erection is proceeding. Progress on the Assegaai Kraal rural scheme has been temporarily delayed due to difficulties in obtaining rights-of-way. A total of 45 new rural consumers were connected.

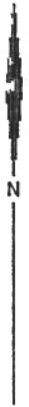
**Financial**—Again the year's accounts show the upward trend of costs, particularly the increase in financial charges for the new plant installed in Colenso Power Station and the extensions of the distribution system required to meet the rapid development of the towns, mines and industries served by this undertaking. It was therefore necessary to adjust the Commission's charges for electricity in accordance with Section 10 of the Act, and from September, 1954, a surcharge of 12½ per cent was imposed on the tariffs in force at that date. The year's working resulted in a small loss of £2,930, and the accumulated deficit at the end of the year was therefore £11,545.



**EASTERN TRANSVAAL UNDERTAKING**

**REFERENCE**

- Area of Supply..... 
- ESC Power Stations..... 
- Transmission Lines..... 
- Railways..... 
- Collieries..... 
- Transmission Lines under construction..... 
- Interconnector (132 kV Line)..... 



## EASTERN TRANSVAAL UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase or Decrease		1954	1953
			%	£	d.	d.
Traction ... ..	1	16,797,519*	- 9.052	30,280	0.4326	0.4024
Bulk ... ..	3	19,070,684	+ 136.991	38,232	0.4811	0.5983
Mining ... ..	29	88,190,569	+ 11.504	199,128	0.5419	0.5536
Industrial ... ..	51	144,955,535	+ 25.768	212,515	0.3519	0.3442
Domestic and Lighting	682	1,445,909	- 78.290	12,553	2.0836	1.2263
	766	270,460,216	- 34.024	492,708	0.4372	0.4324
		1954		1953	Accumulated to 31.12.54	
Total Revenue ... ..		£1,200,129		£1,136,395		
Working Costs ... ..		£1,172,518		£1,141,747		
Surplus ... ..		£27,611		—	£15,009	
Deficit ... ..		—		£5,352	—	
Capital Expenditure ... ..		£219,769		£370,519	£4,126,963	
<b>WITBANK POWER STATION:</b>						
Units Sent Out ... ..		792,101,994		778,299,834		
Maximum one hour } Demand kW S.O. }		114,817		112,973		
Load Factor % ... ..		78.8		78.6		
Thermal Efficiency % Sent Out		16.44		16.44		
<b>COAL:</b>						
Consumption—tons ... ..		731,410		735,330		
Average per unit sent out—lb ...		1.847		1.890		
Calorific Value B.Th.U./lb. ...		11,240		10,980		
Total Cost ... ..		£256,491		£255,803		
Cost per ton ... ..		7s.		6s. 11d.		

\*Units purchased for Traction from Pretoria Municipality (compared with similar figure for 1953).

**Area of Supply and Name of the Undertaking**—In January, 1955, the Electricity Control Board approved the Commission's application for enlarging the area of supply of the undertaking, which now extends southwards to the Vaal River and eastwards to the meridian 30°E. The new areas include the towns and villages of Bronkhorstspuit, Bethal, Ermelo, Breyton, Hendrina, and Morgenzen. The extension of the licensed area is under consideration.

In order to express the extended scope of the undertaking it was decided to change the name to "Eastern Transvaal Undertaking".

**New Developments**—The figures of sales for the year show increased mining and industrial activity. The developments include a new colliery opened to supply the coal requirements of Wilge Power Station, and increased supplies to industrialists.

In 1955, the existence of a new goldfield near Bethal was made known. The Commission has taken its part in planning the power requirements of this new goldfield.

These new developments and changes in operating conditions made it necessary to review the working arrangement between the Eastern Transvaal Undertaking and the Rand and Orange Free State Undertaking. Witbank Power Station continues to be operated as one of the stations in the "pool" of generating stations which serves the two undertakings; but the Eastern Transvaal Undertaking is now authorised to draw power from the "pool" from any convenient power station.

**Output and Sales.**—The sales figures contained in the tables on the preceding page require explanation.

The large increase in bulk sales and reduction in domestic and lighting sales reflect the change reported in the last Annual Report. After January, 1954, Witbank Municipality took over the reticulation of certain supplies within the municipal area and became a bulk consumer.

**Distribution System**—On the 88 kV system two 4,000 kVA transformers are being installed in the Middeldrift substation, and the capacity of the Bethal step-down substation was increased by an additional 750 kVA transformer unit. Construction is proceeding on the 88 kV line between Bethal and Ermelo and the Ermelo substation.

On the 21 kV network the construction of two heavy-duty lines from Witbank Power Station to the works of Messrs. Ferrometals, Limited, was well advanced.

At Wilge Power Station short 21 kV lines were built to couple the existing network to this source of supply.

New substations were erected and commissioned at Sarie Marais Colliery, "B" Winning Shaft of New Largo Colliery and Heuningkrans. Alterations or additions were made to the following substations: Bronkhorstspuit Dam, Kromdraai Colliery and Bronkhorstspuit Town.

Forty-two new domestic consumers were connected to the undertaking's reticulation, including eight supplies for farming purposes.

**Financial**—There was no alteration to standard prices during the period under review. The revenue account shows a surplus of £27,611 for the year.



## RAND AND ORANGE FREE STATE UNDERTAKING

CONSUMERS		SALES			Revenue from Sales	Average Price per Unit Sold	
		Number	Units	Increase or Decrease		1954	1953
<b>ELECTRICITY:</b>							
Traction	...	1	177,270,050*	- 2.819	£ 317,947	d.	d.
Bulk	...	59	666,607,086	+13.925	1,139,665	0.4305	—
Mining	...	100	5,172,396,453	+12.333	7,535,846	0.4103	0.3855
Industrial	...	368	1,215,673,866	+ 8.196	1,899,016	0.3496	0.3309
Domestic and Lighting	...	1,653	14,084,032	+10.490	64,298	0.3749	0.3504
		2,181	7,246,031,487†	+14.544		1.0957	1.1214
<b>AIR AND STEAM:</b>							
Bulk	...	1	2,926,693	+ 5.750	624,671	0.6839	0.6471
Mining	...	13	206,718,075	- 6.580	11,581,443	0.3723	0.3519
Industrial	...	26	9,560,763	- 3.542			
		40	219,205,531	- 6.305			
		2,221	7,465,237,018	+13.800			
						Accumulated to 31.12.54	
						1953	
Revenue	...	...	...	...	£9,966,236		
Working Costs	...	...	...	...	£9,938,070		
Surplus	...	...	...	...	£28,166		
Deficit	...	...	...	...	—		£275,608
Capital Expenditure	...	...	...	...	£13,670,017		£382,844,986

\*Compared with similar figure Witbank Undertaking last year (182,412,755).

†Includes sales of units purchased and units supplied to Eastern Transvaal Undertaking.

RAND AND ORANGE FREE STATE UNDERTAKING—(continued)

	Brakpan Power Station		Klip Power Station	
	1954	1953	1954	1953
Electricity Units Sent Out ...	152,007,706	186,661,706	2,686,107,251	2,674,869,718
Maximum Load ...	42,966	44,187	388,237	363,695
One-hour kW S.O. ...	40.4	48.2	79.0	84.0
Load Factor % ...	13.28	12.74	21.21	20.88
Thermal Efficiency % Sent Out ...				
<b>COAL:</b>				
Consumption—tons ...	195,950	269,886	2,240,951	2,256,980
Average per unit sent out—lb ...	2.578	2.892	1.669	1.688
Calorific Value B.Th.U./lb ...	9,970	9,260	9,640	9,680
Total Cost ...	£139,766*	£144,358	£1,463,554	£1,303,779
Cost per Ton ...	13s. 4d.	10s. 1d.	13s. 1d.	11s. 7d.

	Rosherville Power Station		Simmerpan Power Station	
	1954	1953	1954	1953
Electricity Units Sent Out ...	170,514,091	215,906,690	94,141,510	126,740,358
Maximum Load ...	47,696	48,446	34,742	34,169
One-hour kW S.O. ...	40.8	50.9	30.9	42.3
Load Factor % ...	10.33	10.51	9.99	9.94
Thermal Efficiency % Sent Out ...				
<b>COAL:</b>				
Consumption—tons ...	289,089	353,729	167,321	238,399
Average per unit sent out—lb ...	3.391	3.277	3.555	3.762
Calorific Value B.Th.U./lb ...	9,740	9,910	9,610	9,120
Total Cost ...	£359,604*	£393,308	£129,458	£134,139
Cost per Ton ...	15s. 6d.	15s. 0d.	15s. 6d.	11s. 3d.

\*Includes cost of coal for compressed air.



RAND AND ORANGE FREE STATE UNDERTAKING—(continued)

	Vaal Power Station		Taaibos Power Station 1954 (from 27.11.54)	Wilge Power Station 1954 (from 16.7.54)
	1954	1953		
Electricity Units Sent Out ...	2,194,841,997	1,942,727,085	29,044,071	71,210,257
Maximum Load	291,388	284,825	57,608	30,367
One-hour kW S.O. } ...	86.0	77.90	—	82.0
Load Factor % } ...	22.90	22.43	24.83	22.54
Thermal Efficiency % } Sent Out ...				
<b>COAL:</b>				
Consumption—tons ...	1,820,296	1,645,170	22,325	56,042
Average per unit sent out—lb ...	1.659	1.694	1.537	1.574
Calorific Value B.Th.U./lb ...	8,980	8,980	8,940	9,620
Total Cost ...	£618,643	£559,101	£9,966	£22,658
Cost per Ton ...	6s. 10d.	6s. 10d.	8s. 11d.	8s. 1d.

	Vereeniging Power Station		Vierfontein Power Station	
	1954	1953	1954	1953
Electricity Units Sent Out ...	803,490,582	824,607,667	959,341,981	245,353,679
Maximum Load—One-hour kW S.O. ...	119,658	131,378	147,546	84,684
Load Factor % ...	76.7	71.70	74.2	51.00
Thermal Efficiency % Sent Out ...	16.14	15.98	22.58	21.13
<b>COAL:</b>				
Consumption—tons ...	950,758	975,730	775,016	217,006
Average per Unit Sent Out—lb ...	2.367	2.367	1.619	1.769
Calorific Value B.Th.U./lb ...	8,930	9,020	9,330	9,130
Total Cost ...	£363,277	£352,374	£316,243	£101,906
Cost per ton ...	7s. 8d.	7s. 3d.	8s. 2d.	9s. 5d.

RAND AND ORANGE FREE STATE UNDERTAKING—(continued)

	Brakpan Power Station		Rosherville Power Station	
	1954	1953	1954	1953
Compressed Air Units Sent out ... ..				
Steam Units Sent Out ... ..	8,969,490	9,419,000	122,938,700	124,894,400
COAL:				
Consumption—tons ... ..	14,296	16,839	176,164	171,906
Average per unit sent out—lb. ... ..	3.188	3.576	2.866	2.753
Calorific Value B.Th.U./lb ... ..	9,970	9,260	9,740	9,910

	Canada Dam Compressor Station		Robinson Compressor Station	
	1954	1953	1954	1953
Compressed Air Units Sent Out ... ..	40,306,600	44,578,400	45,966,200	54,091,800
Electric Input—kWh exc. Trans. losses ... ..	48,456,572	53,361,177	59,265,744	67,720,253
Air Units Sent Out kWh per cent. ... ..	83.18	83.54	77.56	79.88

	Modder B and New Modder Compressor Stations	
	1954	1953
Units Sent Out ... ..	8,729,990	8,503,527
Electric Input kWh ... ..	10,141,900	9,949,765
Air Units Sent out kWh per cent. ... ..	86.08	85.46

COMPRESSED AIR:

Units Sent Out ... ..	8,729,990	8,503,527
Electric Input kWh ... ..	10,141,900	9,949,765
Air Units Sent out kWh per cent. ... ..	86.08	85.46

**Area of Supply and Name of the Undertaking**—In October, 1954, an application was made to the Electricity Control Board for extension of the area of supply to include the towns and environs of Wolmaransstad, Maquassi, Leeudoringstad and Senekal in the Orange Free State, and at the same time, in order to express the full extent of this undertaking, it was proposed to alter the name of the undertaking to "Rand and Orange Free State Undertaking." These proposals were approved by the Board in January, 1955.

The development which has already taken place in the Orange Free State province is seen in the figure of 1,067,484,157 units sold to consumers in that province during 1954, equivalent to approximately 15 per cent of the sales of electricity by the undertaking.

**Output and Sales**—The total figure of sales of electricity, 7,246,031,487 units, shows an increase of 920,045,031 units over the figure published in the last Annual Report. These figures include the units supplied to the South African Railways for traction purposes within the area of the Rand Licences so that the net increase was 737,632,276 units, equivalent to an increase of 11.3 per cent. Sales of compressed air and steam were approximately 6 per cent over the similar figure for 1953.

The features of the statistical tables relating to the power stations are: the increase in the output of Vaal Power Station by approximately 252,000,000 units, the increase in the output of Vierfontein Power Station by approximately 714,000,000 units and the starting up of two new power stations, Wilge Power Station and Taaibos Power Station, which added 90 MW to the capacity of the system and contributed over 100,000,000 units to the year's output.

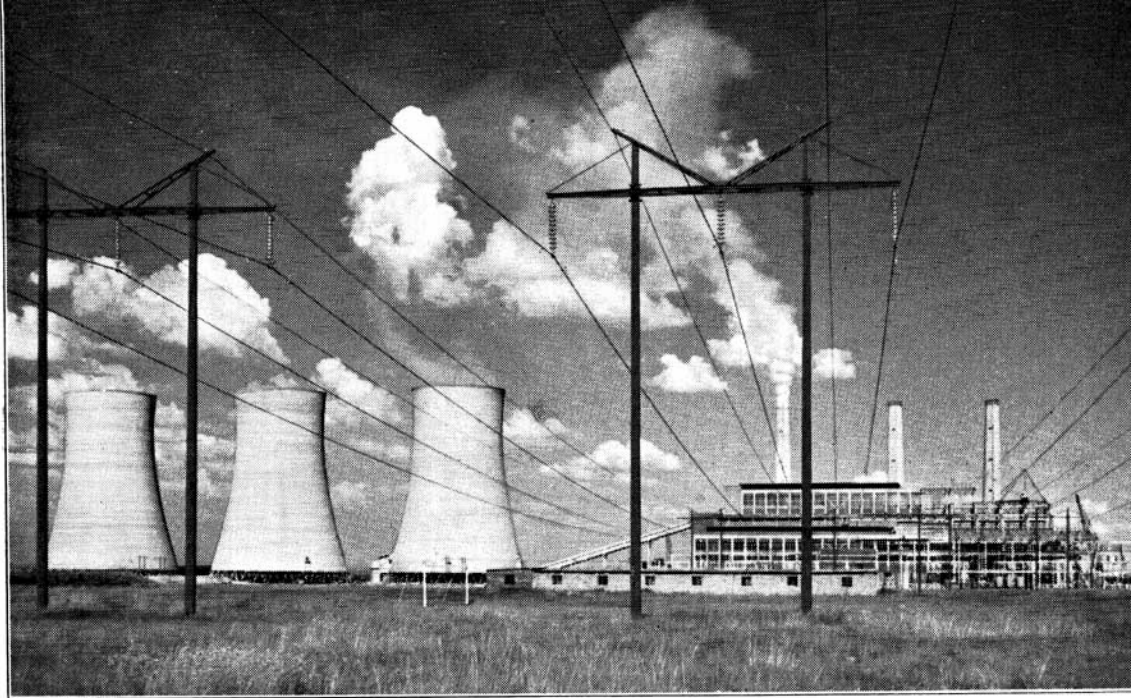
The commissioning of new plant made it possible to reduce the hours of working of the old power stations on the Reef, and the Rosherville, Brakpan and Simmerpan Power Stations were used only as peak load stations.

**Generating Plant Capacity**—Details of the progress of construction in the new power stations of the undertaking are given on pages 13 and 14 of this Report.

The maximum load on the electric system during 1954 was 1,202,580 kW, and the highest load recorded up to the end of April, 1955, was 1,290,041 kW. The maximum demands of the two undertakings in 1954 were: Rand and Orange Free State Undertaking, 1,153,254 kW; Eastern Transvaal Undertaking, 50,121 kW.

As a result of additional generating plant being available to the system during 1954, operating conditions were more flexible than they have been for some years and the number of occasions upon which it was necessary to call upon consumers to reduce load was substantially reduced. Although it was not possible to abandon control of the maximum demands that may be taken by consumers, the indications are that load restrictions will be less onerous in 1955 than in 1954.

**Supply in the Orange Free State**—Much work was done to reinforce and add to the transmission and distribution networks in the Orange Free State. The two distribution stations at Grootkop and Virginia were placed in service and



### TAAIBOS POWER STATION

A striking view of the station where two 60,000 kW sets are operating.

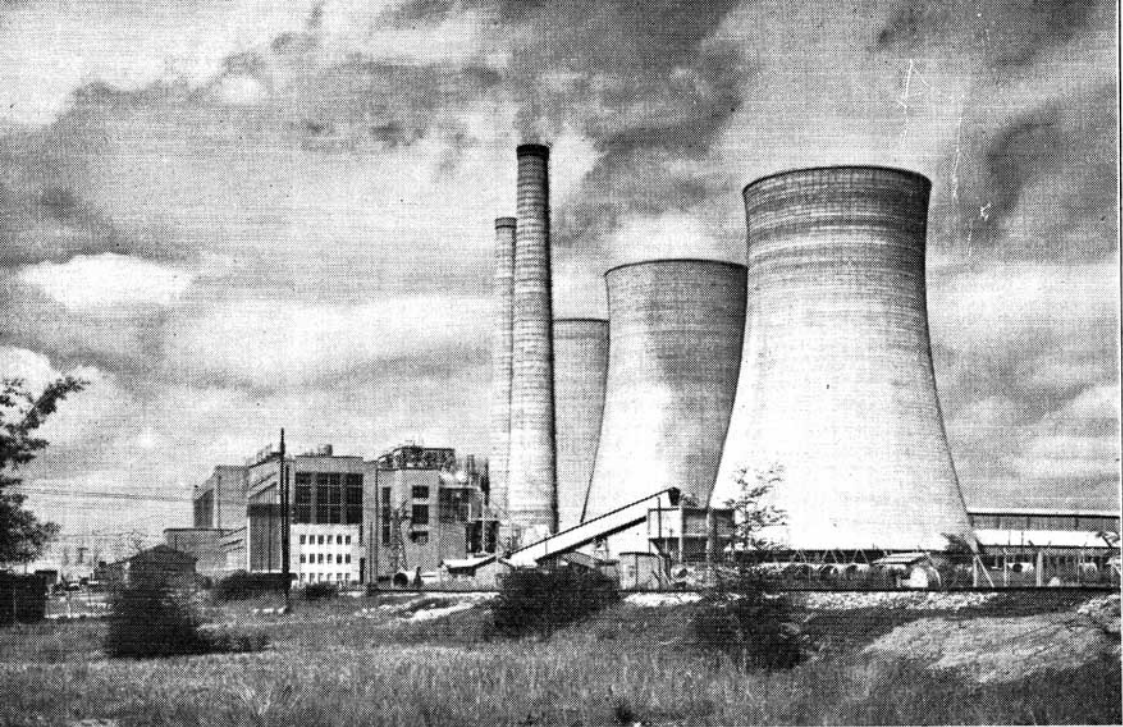
[Photo A. J. van der Walt

network re-arrangements based upon these two distribution stations are being carried out to meet growing loads of the mines as they come into production.

An 88 kV interconnection was established between Vaal Power Station and Taaibos Power Station and Taaibos is now connected directly to Vierfontein Power Station via the 132 kV interconnector. Additional 132 kV transmission lines were installed between Taaibos Power Station and Virginia distribution station and between Vierfontein Power Station and Alma distribution station, the latter transmission line being routed via the Irrigation Department's pumping station at Balkfontein and Grootkop distribution station. A 132 kV transmission line has also been built between Virginia distribution station and Alma distribution station and a second similar interconnector is under construction. Altogether, in the Orange Free State area, 173 miles of 132 kV line, 27 miles of 88 kV line and 46 miles of 40 kV line were completed and put into service.

**Distribution System**—New distribution stations at Struben (Springs) and Libanon (West Rand) were put into operation, while the station at Nuffield (Springs) is nearing completion. A switching station just south of Pretoria, for the supplies to and from Pretoria Municipality and to Premier Diamond Mine is under construction.

Extensions to the distribution station at West Wits. were completed and commissioned in part. These extensions and the Libanon distribution station draw power from the Taaibos Power Station for the West Witwatersrand and



### WILGE POWER STATION

Power for the Rand "pool" is now being supplied from two turbo-alternators in this station.

[Photo: R. H. Scrimgeour (Pty.) Ltd.]

Western Transvaal areas. Further west a distribution station at Doornfontein Mine is under construction, and this will likewise draw power from Taaibos.

A re-arrangement of the network in the Western Reefs (Klerksdorp) area has been carried out to provide for the notified requirements of developing mines in that area as well as the growth of load of existing mines and municipalities. Electricity supply in the Potchefstroom and Klerksdorp areas is now based wholly upon Vierfontein Power Station, and the original transmission lines which served these areas from Vaal Power Station have been dismantled for use elsewhere.

Power lines which were completed and put into commission during the year, other than those in the Orange Free State area, comprise 207 miles of 132 kV, 143 miles of 88 kV and 111 miles of 40 kV circuit, making a total for all areas of 380 miles of 132 kV, 170 miles of 88 kV and 157 miles of 40 kV.

**Financial**—The accounts for the year show a small deficit of £1,549.

In order to reduce the accumulated deficit and to cover the increased costs of new plant it was necessary to adjust tariffs in terms of Section 10 of the Act with effect from January, 1955. The general discount which was fixed at 8 per cent in 1954 was reduced to 2 per cent for the year 1955.

### SABIE UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase		1954	1953
			%	£	d	d
Mining ... ..	1	5,556,426	13·165	9,048	0·3908	0·6186
		1954	1953	Accumulated to 31.12.54		
Total Revenue ... ..		£9,048	£16,493			
Working Costs ... ..		£9,117	£16,553			
Surplus ... ..		—	—	£75		
Deficit ... ..		£69	£60	—		
Capital Expenditure ... ..		—	—	£96,170		
<b>SABIE POWER STATION—</b>						
Units Sent Out ... ..		5,673,700	6,562,400			
Maximum half-hour Demand kW S.O. } ... ..		1,100	1,300			
Station Peak kW ... ..		1,200	1,320			
Load Factor ... ..		58·9	57·6			
<b>RAINFALL at Power Station:</b>						
Inches ... ..		48·16	58·09			
Millimetres ... ..		1,223	1,475			

The Sabie Hydro Electric power station continued to give satisfactory service during the year. The full output of the station was taken by the one existing consumer at cost.

## MUNICIPAL ELECTRICITY SUPPLY SCHEMES—1954

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

### TRANSVAAL:

#### New Schemes

Orkney  
Tzaneen

#### Extensions

Barberton  
Bloemhof  
Carletonville  
Johannesburg  
Klerksdorp  
Leeudoringstad  
Lydenburg  
Maquassi

Messina  
Nelspruit  
Nylstroom  
Oberholzer  
Rodeon  
Warmbaths  
White River  
Wolmaransstad

#### Tenders

Bloemhof  
Evaton (2)  
Lydenburg  
Potchefstroom

### ORANGE FREE STATE:

#### Extensions

Bloemfontein  
Hennenman  
Petrusburg  
Zastron

#### Tenders

Bloemfontein (7)  
Edenburg  
Fouriesburg (2)  
Ladybrand  
Viljoenskroon

### NATAL:

#### Extensions

Empangeni  
Glencoe

### CAPE:

#### New Schemes

Krakeel Rivier (2)

#### Extensions

Alexandria  
Douglas  
Garies  
Lusikisiki  
Mossel Bay  
Postmasburg  
Riviersonderend  
Sutherland  
Upington  
Warrenton  
Williston  
Willowmore

#### Tenders

Cradock (2)  
Kongha  
Kuruman  
Oudtshoorn  
Postmasburg  
Prince Albert  
Queenstown  
Willowmore

### SOUTH WEST AFRICA:

#### Extensions

Gobabis

#### Tenders

Luderitz  
Omaruru

Up to the 31st December, 1954, a total of 1,424 reports on Municipal Electricity Supply Schemes had been submitted by the Commission. Of these, 239 were in respect of new schemes, 682 were in respect of extension schemes and 503 were reports on tenders.

## ANNEXURES

The Commission submits for the year 1954 with this Report:

### ANNEXURE A—AUDITORS' REPORT AND ACCOUNTS

The Report of the Auditors

Balance Sheet

Schedule No. 1—Expenditure on Capital Account

Schedule No. 2—Investments of the Redemption Fund

Schedule No. 3—Loan Capital and Sundry Loans and Amounts Outstanding for Rights Acquired

Account No. 1—Redemption Fund Account

Account No. 2—Reserve Fund Account

Revenue Accounts in respect of:

Account No. 3—Cape Western Undertaking

Statement of Pooled Costs, Cape Town

Account No. 4—Cape Northern Undertaking

Account No. 5—Border Undertaking

Account No. 6—Durban Undertaking

Account No. 7—Natal Central Undertaking

Account No. 8—Eastern Transvaal Undertaking

Account No. 9—Rand and Orange Free State Undertaking

Account No. 10—Sabie Undertaking

### ANNEXURE B—STATISTICAL AND OTHER STATEMENTS

Statement No. 1—Summary of principal plant and equipment installed at the Commission's several undertakings as at 31st December, 1954.

Statement No. 2—Summary of principal plant and equipment in course of installation or on order as at 31st December, 1954.

Statement No. 3—Units sold to all consumers during the past thirty years.

Statement No. 4—Units sold and number of consumers, 1954.

Statement No. 5—Power Station Statistics, 1954.

Statement No. 6—Power purchased, 1954.

Statement No. 7—Water consumed by power stations, 1954.

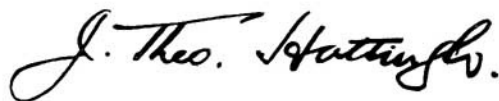
Statement No. 8—Showing the price or rent of land or rights or interests in or over land or other property acquired or hired by the Commission during the year 1954.

Statement No. 9—Coal used at the Commission's steam-raising power stations.

### ANNEXURE C—UNION STATISTICS

Diagrams illustrating the production and distribution of electricity, incorporating information supplied by courtesy of the Bureau of Census and Statistics, (Pretoria).

Yours faithfully,



J. THEO HATTINGH,

Chairman.



**ANNEXURE A****THE REPORT OF THE AUDITORS**

Johannesburg.

27th May, 1955.

*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, 1954.

**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 to provide for the redemption of the loans issued by the Commission.

In the records of the Commission the Redemption Fund is divided into sections corresponding to the loans. The Commission has invested the moneys accruing to each section of the Fund in the investments prescribed in the Schedule to the Act and in valuing the Fund at 31st December, 1954, we have taken into account the market value of the investments at that date.

In the aggregate the value of the Fund at 31st December, 1954, was in excess of the sum required to provide for the redemption of the respective loans in terms of the Schedule to the Electricity Act (as amended).

The Minister has fixed the dates from which provision for redemption of Loans Nos. 21 and 22 commenced at 1st May, 1954, and 1st March, 1955, respectively.

We understand that application will be made, within the prescribed period, to the Minister to fix the dates from which provision for redemption of subsequent loans must be made. Provision has been made, however, for the redemption of moneys expended out of such loans on works which had come into commercial operation before 31st December, 1954.

### **LOAN FROM COMMONWEALTH DEVELOPMENT FINANCE COMPANY LIMITED**

The Commission entered into an Agreement dated 26th February, 1954, to borrow from the Company the sum of £2,000,000, bearing interest at 5 per cent. per annum. The principal is repayable over 15 years in equal half-yearly instalments of £65,000, with a final instalment, on 31st December, 1968, of £115,000. The loan is secured on all the assets and revenues of the Commission.

### **VERIFICATION OF LANDED PROPERTIES, RIGHTS AND INVESTMENTS**

We have verified the existence of the Titles to the landed properties and of the rights and investments as shown in the records of the Commission with the exception of a small number of documents which are in course of registration.

### **HEAD OFFICE ADMINISTRATION, ENGINEERING AND GENERAL EXPENSES, INCLUDING PUBLICITY**

The net expenditure under this heading, after crediting Fees for reporting on Power Schemes of Local Authorities and amounts chargeable to Revenue Accounts under other headings, has been allocated to:—

- (a) Capital and Reserve Fund Expenditure.
- (b) Revenue Accounts of all Undertakings in commercial operation.

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

## REVENUE ACCOUNTS

The following is a summary of the operations of the Commission's undertakings for 1953 and 1954.

	Surplus/Deficit		Amounts Set Aside to Reserve Fund	
	1953	1954	1953	1954
Cape Western ... ..	- £40,132	+ £142,543	£54,898	£110,306
Cape Northern ... ..	+ 5,090	+ 5,956	6,000	11,000
Border ... ..	- 15,548	- 38,141	3,000	11,000
Durban ... ..	+ 17,241	- 49,178	20,000	100,000
Natal Central ... ..	+ 11,526	- 2,930	20,000	70,000
Eastern Transvaal (formerly Witbank)	- 5,352	+ 27,611	5,000	58,680
Rand and O.F.S. ...	+ 28,166	- 1,549	373,376	559,745
Sabie ... ..	- 60	- 69	—	—
	+ 931	+ 84,243	£482,274	£920,731
Accumulated Deficit on Municipal Supply System recovered from Witbank Municipality ... ..		+ 17,072		
		+ 101,315		
Carried forward from pre- vious year ... ..	- 546,433	- 545,502		
Accumulated Deficit at end of year ... ..	- £545,502	- £444,187		

While the summary reflects an overall surplus on Revenue Account of £84,243 after setting aside substantially increased amounts to Reserve Fund, there have been material deficits at Border and Durban Undertakings and Rand Undertaking had an accumulated deficit of £275,608 at 31st December, 1954.

We are informed that a revision of tariffs for Border Undertaking is at present in hand, and that increased charges are now in force at Durban and Rand Undertakings, with the object of extinguishing the accumulated deficits at these undertakings during the course of the next few years.

**GENERAL**

As the result of our audit of the books and accounts of the Commission for the year 1954 and, subject to the foregoing remarks, in terms of Clause 13 (4) of the Electricity Act 1922, we certify as follows:—

- (a) We have found the Accounts of the Commission to be in order.
- (b) The Accounts issued present a true and correct view of the financial position of the Commission and its transactions and of the result of trading.
- (c) Due provision has been made for the redemption and repayment of moneys borrowed.
- (d) As formerly, the Land and Rights, Buildings and Civil Works and Machinery and Plant are set out in the Balance Sheet as on a cost basis. The value of the other assets of the Commission is correctly stated.
- (e) Sums fixed by the Commission have been set aside to the Reserve Fund under Section 9 as prescribed.
- (f) All our requirements as Auditors have been complied with and carried out.

Yours faithfully,

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

# Electricity Supply Commission.

Incorporated under the Electricity Act, 1922.

## BALANCE SHEET at 31st DECEMBER, 1954.

<b>Loan Capital</b> ... ..	£133,172,553
(As per Schedule No. 3) ... ..	
<b>Creditors and Credit Balances</b> ... ..	9,260,121
Current Liabilities and Provisions ... ..	£8,062,223
Interest Accrued on Loan Capital ... ..	943,318
Deferred Liabilities for Assets and Rights Acquired ... ..	188,580
Amount Received on account of the sale of Escom House ... ..	66,000
<b>Redemption Fund</b> (as per Account No. 1) ... ..	21,187,163
<b>Sinking Fund</b> ... ..	6,089
<b>Reserve Fund</b> ... ..	2,946,846
(As per Account No. 2) ... ..	
<b>Loan Capital and Deferred Liabilities Repaid, less Assets Sold</b> ... ..	1,491,786
Loan Capital (as per Schedule No. 3) ... ..	3,081,341
Deferred Liabilities ... ..	265,187
	3,346,528
<i>Less</i> —Cost of Assets Sold, proceeds of which have been paid into the Redemption Fund ... ..	1,854,742

**NOTE—**

In addition to the liabilities shown above the Commission is committed to the extent of approximately £54,100,000 for expenditure on Capital Account and £629,000 chargeable against Reserve Fund.

In addition to the annual contributions the Commission is committed to pay £65,102 annually to the Electricity Supply Commission Pension and Provident Fund for the period ending 31st December, 1969, and £11,027 during 1970.

The Commission is committed to purchase £1,000,000 Electricity Supply Commission 5 per cent. Local Registered Stock 1967/70, from a stockholder at par during the period 1956 to 1958.

The cost of Escom House, Johannesburg, sold under deed of sale dated the 16th August, 1954, for £800,000 is included in the expenditure on Capital Account, as this property will be transferred to the purchaser only when occupation is given in terms of the deed of sale.

£168,064,558

<b>Expenditure on Capital Account</b> (excluding Cost of Assets Sold) ... ..	£135,310,624
(As per Schedule No. 1) ... ..	
Land and Rights ... ..	£1,338,951
Buildings and Civil Works ... ..	30,324,906
Machinery and Plant ... ..	103,646,767
<b>Movable Plant and Equipment</b> (less depreciation) ... ..	850,005
Workshop Equipment, Instruments, Tools and Loose Plant ... ..	430,454
Transportation Equipment ... ..	251,245
Furniture and Office Equipment ... ..	168,306
<b>Stores and Materials</b> ... ..	5,098,698
<b>Debtors and Debit Balances</b> ... ..	2,661,930
Current Debtors less Reserves ... ..	2,024,605
Entire Share Capital of the Rand Mines Power Supply Company, Limited ... ..	600
Expenditure on Investigations in terms of Section 3(b) of the Act and Payments in Advance ... ..	58,842
Housing Loans to Employees Secured by First Mortgages, less Reserve ... ..	577,883
<b>Cash on Current Account</b> ... ..	250,579
<b>Investment of Redemption Fund</b> (as per Schedule No. 2) ... ..	20,706,727
(Market Value £18,695,875) ... ..	
<b>Investment of Sinking Fund</b> ... ..	6,749
Amount invested in Stocks of Electricity Supply Commission, the Government of the Union of South Africa and Municipalities, including Interest Accrued. (Market Value £6,260) ... ..	
<b>Investment of Reserve Fund</b> ... ..	2,735,059
Amount invested in Stocks and Securities of Electricity Supply Commission, the Government of the Union of South Africa and Municipalities, including Interest Accrued. (Market Value £2,562,058) ... ..	
<b>Balance on Revenue Accounts</b> (as per Accounts Nos. 3 to 10) ... ..	444,187
Cape Western Undertaking ... ..	9,295
Cape Northern Undertaking ... ..	Cr. 2,108
Border Undertaking ... ..	104,856
Durban Undertaking ... ..	60,075
Natal Central Undertaking ... ..	11,545
Eastern Transvaal Undertaking ... ..	Cr. 15,009
Rand and Orange Free State Undertaking ... ..	275,608
Sabie Undertaking ... ..	Cr. 75

£168,064,558

Referred to in our Report of 27th May, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER.  
Registered Accountants and Auditors.

Johannesburg,  
22nd April, 1955.

J. THEO. HATTINGH, Chairman.  
J. VAN NIEKERK, Chief Accountant.

## Electricity Supply Commission.

SCHEDULE No. 1

## Schedule of Expenditure on Capital Account at 31st December, 1954.

Expenditure in connection with Electricity Undertakings.	Total at 31st December, 1953	Year ended 31st December, 1954	Total at 31st December, 1954
<b>RAND AND ORANGE FREE STATE UNDERTAKING:</b>			
<b>Rand.</b>			
Land and Rights ... ..	£247,754	£89,232	£336,986
Buildings and Civil Works ... ..	2,257,192	263,808	2,521,000
Machinery and Plant ... ..	13,661,422	1,323,363	14,984,785
	<b>£16,166,368</b>	<b>£1,676,403</b>	<b>£17,842,771</b>
<b>Klip Power Station.</b>			
Land and Rights ... ..	£128,325	—	£128,325
Buildings and Civil Works ... ..	1,653,067	£19,555	1,672,622
Machinery and Plant ... ..	4,894,990	Cr. 408	4,894,582
	<b>£6,676,382</b>	<b>£19,147</b>	<b>£6,695,529</b>
<b>Vaal Power Station.</b>			
Land and Rights ... ..	£5,347	—	£5,347
Buildings and Civil Works ... ..	2,241,484	£36,337	2,278,421
Machinery and Plant ... ..	8,217,687	191,244	8,408,931
	<b>£10,464,518</b>	<b>£228,181</b>	<b>£10,692,699</b>
<b>Vierfontein Power Station.</b>			
Land and Rights ... ..	£31,358	£2,849	£34,207
Buildings and Civil Works ... ..	3,407,095	736,062	4,143,157
Machinery and Plant ... ..	6,292,113	3,376,398	9,668,511
	<b>£9,730,566</b>	<b>£4,115,309</b>	<b>£13,845,875</b>
<b>Taaibos Power Station.</b>			
Land and Rights ... ..	£3,639	£8,765	£12,404
Buildings and Civil Works ... ..	2,750,172	1,341,803	4,091,975
Machinery and Plant ... ..	2,110,925	4,082,214	6,193,139
	<b>£4,864,736</b>	<b>£5,432,782</b>	<b>£10,297,518</b>
<b>Wilge Power Station.</b>			
Land and Rights ... ..	£351	£3,703	£4,054
Buildings and Civil Works ... ..	1,480,897	795,022	2,275,919
Machinery and Plant ... ..	3,402,952	1,976,628	5,379,580
	<b>£4,884,200</b>	<b>£2,775,353</b>	<b>£7,659,553</b>
<b>Rand Extension.</b>			
Land and Rights ... ..	£47,665	£15,465	£63,130
Buildings and Civil Works ... ..	434,742	Cr. 71,503	363,239
Machinery and Plant ... ..	6,139,461	1,693,286	7,832,747
	<b>£6,621,868</b>	<b>£1,637,248</b>	<b>£8,259,116</b>
<b>Greater Rand Extension and Orange Free State.</b>			
Land and Rights ... ..	£15,722	Cr. £2,349	£13,373
Buildings and Civil Works ... ..	424,444	140,614	565,058
Machinery and Plant ... ..	5,246,171	1,727,323	6,973,494
	<b>£5,686,337</b>	<b>£1,365,588</b>	<b>£7,551,925</b>
<b>TOTAL RAND AND ORANGE FREE STATE UNDERTAKING:</b>			
Land and Rights ... ..	£480,161	£117,665	£597,826
Buildings and Civil Works ... ..	14,649,093	3,262,298	17,911,391
Machinery and Plant ... ..	49,965,721	14,370,948	64,335,769
	<b>£65,094,975</b>	<b>£17,750,911</b>	<b>£82,844,986</b>
<b>CAPE WESTERN UNDERTAKING:</b>			
Land and Rights ... ..	£83,320	£6,032	£89,352
Buildings and Civil Works ... ..	3,420,653	592,782	4,013,435
Machinery and Plant ... ..	10,290,015	2,942,322	13,232,337
	<b>£13,793,988</b>	<b>£3,541,136</b>	<b>£17,335,124</b>

Expenditure in connection with Electricity Undertakings.	Total at 31st December, 1953	Year ended 31st December, 1954	Total at 31st December, 1954
<b>CAPE NORTHERN UNDERTAKING:</b>			
Land and Rights ... ..	£2,294	—	£2,294
Buildings and Civil Works ... ..	180,184	£24,009	204,193
Machinery and Plant ... ..	962,555	256,603	1,219,158
	<b>£1,145,033</b>	<b>£280,612</b>	<b>£1,425,645</b>
<b>SWARTKOPS RIVER UNDERTAKING:</b>			
Land and Rights ... ..	£17,382	£43,498	£60,880
Buildings and Civil Works ... ..	1,096,787	175,563	1,272,350
Machinery and Plant ... ..	1,682,335	380,518	2,062,853
	<b>£2,796,504</b>	<b>£599,579</b>	<b>£3,396,083</b>
<b>BORDER UNDERTAKING:</b>			
Land and Rights ... ..	£7,631	£36	£7,667
Buildings and Civil Works ... ..	610,306	33,060	643,366
Machinery and Plant ... ..	1,083,037	1,007,994	2,091,031
	<b>£1,700,974</b>	<b>£1,041,090</b>	<b>£2,742,064</b>
<b>DURBAN UNDERTAKING:</b>			
Land and Rights ... ..	£131,206	£10,316	£141,522
Buildings and Civil Works ... ..	3,051,753	311,431	3,363,184
Machinery and Plant ... ..	7,969,217	1,353,292	9,322,509
	<b>£11,152,176</b>	<b>£1,675,039</b>	<b>£12,827,215</b>
<b>NATAL CENTRAL UNDERTAKING:</b>			
Land and Rights ... ..	£47,489	£44,958	£92,447
Buildings and Civil Works ... ..	1,559,218	46,098	1,605,316
Machinery and Plant ... ..	7,670,300	484,703	8,155,003
	<b>£9,277,007</b>	<b>£575,759</b>	<b>£9,852,766</b>
<b>EASTERN TRANSVAAL UNDERTAKING:</b>			
Land and Rights ... ..	£23,262	£3,768	£27,030
Buildings and Civil Works ... ..	947,049	Cr. 40,054	906,995
Machinery and Plant ... ..	2,936,883	256,055	3,192,938
	<b>£3,907,194</b>	<b>£219,769</b>	<b>£4,126,963</b>
<b>SABIE UNDERTAKING:</b>			
Land and Rights ... ..	£510	—	£510
Buildings and Civil Works ... ..	60,491	—	60,491
Machinery and Plant ... ..	35,169	—	35,169
	<b>£96,170</b>	<b>—</b>	<b>£96,170</b>
<b>HEAD OFFICE:</b>			
Land ... ..	£61,685	£257,738	£319,423
Buildings and Equipment ... ..	343,831	354	344,185
	<b>£405,516</b>	<b>£258,092</b>	<b>£663,608</b>
<b>SUMMARY:</b>			
Land and Rights ... ..	£854,940	£484,011	£1,338,951
Buildings and Civil Works ... ..	25,919,365	4,405,541	30,324,906
Machinery and Plant ... ..	82,595,232	21,051,535	103,646,767
	<b>£109,369,537</b>	<b>£25,941,087</b>	<b>£135,310,624</b>

## Schedule of Investments of the Redemption Fund at 31st December, 1954.

## INVESTMENTS.

## LOCAL REGISTERED STOCKS.

	Nominal Value	Book Value
<b>Electricity Supply Commission—</b>		
4½ per cent. 1953/63	£108,475	£108,475
3½ per cent. 1954/64	896,781	896,033
3½ per cent. 1959/64	196,397	195,273
3½ per cent. 1956/66	346,050	321,002
3½ per cent. 1957/67	355,677	336,327
3½ per cent. 1959/64	521,310	500,021
3½ per cent. 1960/65	443,400	428,509
3½ per cent. 1961/66	515,900	490,688
3½ per cent. 1965/70	553,500	535,560
3 per cent. 1967/73	641,050	612,887
3 per cent. 1968/74	1,142,000	1,116,741
3½ per cent. 1968/73	6,627,000	6,589,178
3½ per cent. 1969/74	296,300	285,509
3½ per cent. 1969/74	42,700	41,846
3½ per cent. 1965/67	50,000	48,500
3½ per cent. 1964/67	600,000	588,000
3½ per cent. 1964/68	100,000	98,000
4½ per cent. 1964/67	500,000	486,250
5 per cent. 1964/67	324,850	318,081
5 per cent. 1966/68	350,050	345,675
5 per cent. 1967/69	425,800	420,477
5 per cent. 1968/70	195,220	190,235
5 per cent. 1967/70	1,180,300	1,165,550
5 per cent. 1971/74	731,950	722,801
5 per cent. 1971/75	1,449,000	1,434,510
<b>The Government of the Union of South Africa—</b>		
3½ per cent. 1953/58	25,000	24,824
3½ per cent. 1955/65	2,300	2,300
3 per cent. 1956/61	40,000	39,289
3 per cent. 1957/66	535,000	522,722
3 per cent. 1958/68	15,000	14,849
3 per cent. 1959/69	100,000	94,751
3 per cent. 1960/70	343,700	331,746
<b>Municipal—</b>		
<b>Johannesburg:</b>		
3½ per cent. 1956/66	1,600	1,600
3½ per cent. 1959	6,200	6,200
3½ per cent. 1960/65	20,000	19,056
3½ per cent. 1962/67	129,000	119,245
3½ per cent. 1965	1,200	1,200
3½ per cent. 1965/70	294,000	284,895
3 per cent. 1967/77	30,000	30,000
<b>Cape Town:</b>		
3½ per cent. 1960/65	2,000	2,000
3½ per cent. 1962/67	225,000	222,568
3 per cent. 1976	100,000	95,588
<b>Durban:</b>		
3½ per cent. 1962/72	115,500	90,090
3½ per cent. 1965/75	45,000	41,484
3½ per cent. 1966/76	50,000	50,000
3 per cent. 1967/77	334,000	320,320
	21,008,210	20,590,855
<b>Interest Accrued</b>		115,872
	<u>£21,008,210</u>	<u>£20,706,727</u>
<b>Market Value</b>		<u>£18,695,875</u>

## ALLOCATION OF INVESTMENTS TO LOANS.

Loan No.	Local Registered Stocks.	Nominal Value	Book Value including Interest Accrued
3	£500,000 4½ per cent. 1953/63	£497,025	£495,878
5	£6,750,000 3½ per cent. 1954/64	4,870,931	4,847,950
6	£2,500,000 3½ per cent. 1959/64	1,655,997	1,649,858
7	£2,000,000 3½ per cent. 1956/66	1,265,550	1,246,398
8	£2,000,000 3½ per cent. 1957/67	1,139,977	1,123,385
9	£2,000,000 3½ per cent. 1959/64	1,079,010	1,068,594
10	£1,500,000 3½ per cent. 1960/65	729,500	721,285
11	£2,000,000 3½ per cent. 1961/66	882,000	859,258
12	£2,500,000 3½ per cent. 1965/70	894,100	865,422
13	£3,000,000 3 per cent. 1967/73	712,050	677,806
14	£3,000,000 3 per cent. 1968/74	549,700	519,674
15	£15,000,000 3½ per cent. 1968/73	4,111,000	4,037,377
16	£3,000,000 3½ per cent. 1969/74	445,000	435,632
17	£3,000,000 3½ per cent. 1969/74	380,000	377,680
18	£5,250,000 3½ per cent. 1965/67	493,900	484,001
19	£3,000,000 3½ per cent. 1964/67	265,000	259,817
21	£5,000,000 3½ per cent. 1964/68	269,000	268,501
22	£4,500,000 4½ per cent. 1964/67	148,350	148,229
23	£5,000,000 5 per cent. 1964/67	163,500	163,494
25	£3,500,000 5 per cent. 1966/68	73,050	73,139
26	£4,000,000 5 per cent. 1967/69	98,950	98,803
27	£4,250,000 5 per cent. 1968/70	51,220	50,768
29	£8,000,000 5 per cent. 1967/70	62,300	62,428
31	£8,000,000 5 per cent. 1971/74	9,000	9,036
	Future—not yet raised	163,000	162,314
		<u>£21,008,210</u>	<u>£20,706,727</u>



# Electricity Supply Commission.

**SCHEDULE No. 3.**
**LOAN CAPITAL AT 31st DECEMBER, 1954.**

Loans Nos. 1 and 2, £8,000,000, repaid out of subsequent loans.

**LOCAL REGISTERED STOCKS.**

				Outstanding	Repaid
Loan No. 3:	£500,000	4½ per cent.	1953/63	£500,000	
Loan No. 4:	£2,500,000	4½ per cent.	1953		£2,500,000
Loan No. 5:	£6,750,000	3¾ per cent.	1954/64	6,750,000	
Loan No. 6:	£2,500,000	3½ per cent.	1959/64	2,500,000	
Loan No. 7:	£2,000,000	3¼ per cent.	1956/66	2,000,000	
Loan No. 8:	£2,000,000	3½ per cent.	1957/67	2,000,000	
Loan No. 9:	£2,000,000	3¾ per cent.	1959/64	2,000,000	
Loan No. 10:	£1,500,000	3¾ per cent.	1960/65	1,500,000	
Loan No. 11:	£2,000,000	3¼ per cent.	1961/66	2,000,000	
Loan No. 12:	£2,500,000	3¼ per cent.	1965/70	2,500,000	
Loan No. 13:	£3,000,000	3 per cent.	1967/73	3,000,000	
Loan No. 14:	£3,000,000	3 per cent.	1968/74	3,000,000	
Loan No. 15:	£15,000,000	3½ per cent.	1968/73	15,000,000	
Loan No. 16:	£3,000,000	3½ per cent.	1969/74	3,000,000	
Loan No. 17:	£3,000,000	3¼ per cent.	1969/74	3,000,000	
Loan No. 18:	£5,250,000	3¾ per cent.	1965/67	5,250,000	
Loan No. 19:	£3,000,000	3¾ per cent.	1964/67	3,000,000	
Loan No. 21:	£5,000,000	3¾ per cent.	1964/68	5,000,000	
Loan No. 22:	£4,500,000	4¼ per cent.	1964/67	4,500,000	
Loan No. 23:	£5,000,000	5 per cent.	1964/67	5,000,000	
Loan No. 25:	£3,500,000	5 per cent.	1966/68	3,500,000	
Loan No. 26:	£4,000,000	5 per cent.	1967/69	4,000,000	
Loan No. 27:	£4,250,000	5 per cent.	1968/70	4,250,000	
Loan No. 29:	£8,000,000	5 per cent.	1967/70	8,000,000	
Loan No. 31:	£8,000,000	5 per cent.	1971/74	8,000,000	
Loan No. 32:	£10,000,000	5 per cent.	1971/75		
			(Payable in full not later than the 31st January, 1955, in terms of the Prospectus)		
			Fully Paid	£9,309,250	
			Partly Paid	310,752	
				9,620,002	
	£111,750,000	Total Local Registered Stocks		£108,870,002	£2,500,000

**INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT.**

Loan No. 20:	£10,732,422	\$30,000,000	4 per cent.	1954/70	10,281,081	451,341
Loan No. 28:	£10,750,000	\$30,000,000	4¾ per cent.	(to be taken up during the period ending 31st December, 1955)		
				Amount received to 31st December, 1954	7,964,032	

**EXPORT-IMPORT BANK OF WASHINGTON.**

Loan No. 24:	£7,000,000	\$19,600,000	4 per cent.	(to be taken up during the period ending 30th June, 1955)		
				Amount received to 31st December, 1954	4,187,438	

**COMMONWEALTH DEVELOPMENT FINANCE COMPANY LIMITED.**

Loan No. 30:	£2,000,000	5 per cent.	1954/68	1,870,000	130,000
	£142,232,422			£133,172,553	£3,081,341



# Electricity Supply Commission.

Dr.

## Redemption Fund Account for the

Year ended 31st December, 1954.

Cr.

To Balance as per Balance Sheet	£21,187,163
Cape Western Undertaking	£2,885,682
Cape Northern Undertaking	64,205
Border Undertaking	91,591
Durban Undertaking	1,550,736
Natal Central Undertaking	3,346,250
Eastern Transvaal Undertaking	1,363,919
Rand and Orange Free State Undertaking	11,621,746
Sabie Undertaking	25,637
Head Office	237,397
	£21,187,163

Loan No.	Local Registered Stocks.	
3	£500,000 4½ per cent. 1953/63	£486,983
5	£6,750,000 3¾ per cent. 1954/64	4,977,821
6	£2,500,000 3½ per cent. 1959/64	1,647,091
7	£2,000,000 3¼ per cent. 1956/66	1,280,823
8	£2,000,000 3½ per cent. 1957/67	1,148,442
9	£2,000,000 3¼ per cent. 1959/64	1,075,237
10	£1,500,000 3¾ per cent. 1960/65	728,787
11	£2,000,000 3¼ per cent. 1961/66	873,402
12	£2,500,000 3½ per cent. 1965/70	869,869
13	£3,000,000 3 per cent. 1967/73	688,189
14	£3,000,000 3 per cent. 1968/74	534,289
15	£15,000,000 3½ per cent. 1968/73	4,050,404
16	£3,000,000 3½ per cent. 1969/74	464,576
17	£3,000,000 3¾ per cent. 1969/74	412,252
18	£5,250,000 3¾ per cent. 1965/67	537,874
19	£3,000,000 3¾ per cent. 1964/67	283,391
21	£5,000,000 3¾ per cent. 1964/68	304,410
22	£4,500,000 4½ per cent. 1964/67	170,849
23	£5,000,000 5 per cent. 1964/67	178,667
25	£3,500,000 5 per cent. 1966/68	83,658
26	£4,000,000 5 per cent. 1967/69	76,675
27	£4,250,000 5 per cent. 1968/70	71,672
29	£8,000,000 5 per cent. 1967/70	107,163
31	£8,000,000 5 per cent. 1971/74	96,042
32	£10,000,000 5 per cent. 1971/75	7,803
	Future—not yet raised	30,794
		£21,187,163

By Balance at 31st December, 1953, brought forward	£18,219,521
Cape Western Undertaking	£2,510,193
Cape Northern Undertaking	29,812
Border Undertaking	63,491
Durban Undertaking	1,306,998
Natal Central Undertaking	3,036,392
Eastern Transvaal Undertaking	1,240,794
Rand and Orange Free State Undertaking	9,789,907
Sabie Undertaking	25,637
Head Office	216,297
	£18,219,521

Loan No.	
3	£463,105
5	4,668,100
6	1,524,761
7	1,198,852
8	1,039,074
9	1,014,078
10	678,525
11	793,166
12	768,195
13	561,590
14	415,539
15	3,423,609
16	362,224
17	302,157
18	361,209
19	192,411
21	162,379
22	76,261
23	87,672
25	38,892
26	39,353
27	21,199
29	3,470
Future	23,700

£18,219,521

„ Amounts contributed during the year as per Revenue Accounts	2,223,092
Cape Western Undertaking	272,493
Cape Northern Undertaking	32,662
Border Undertaking	24,686
Durban Undertaking	184,482
Natal Central Undertaking	195,914
Eastern Transvaal Undertaking	52,273
Rand and Orange Free State Undertaking	1,461,465
Sabie Undertaking	883
Other Contributions	16,778
Net Proceeds of Sales of Fixed Property	42,845
Net Interest earned on Investments	684,927
	£21,187,163

J. VAN NIEKERK, Chief Accountant.

We hereby certify that we are satisfied as to the correctness of the Accounts and Books of the Redemption Fund and as to the maintenance of the Fund at the amount required by the Schedule to the Electricity Act 1922, subject to the remarks contained in our report dated 27th May, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,  
Registered Accountants and Auditors.

# Electricity Supply Commission.

Dr.

## Reserve Fund Account for the Year ended 31st December, 1954.

Cr.

<b>To Expenditure during the year on Replacements and Betterment</b>	£370,073	<b>By Balance at 31st December, 1953, brought forward</b> ... ..	£2,304,382
Cape Western Undertaking ... ..	£70,670	Cape Western Undertaking ... ..	£397,160
Cape Northern Undertaking ... ..	388	Cape Northern Undertaking ... ..	21,937
Border Undertaking ... ..	10,885	Border Undertaking ... ..	Dr. 4,187
Durban Undertaking ... ..	33,330	Durban Undertaking ... ..	90,498
Natal Central Undertaking ... ..	34,652	Natal Central Undertaking ... ..	569,033
Eastern Transvaal Undertaking ... ..	31,392	Eastern Transvaal Undertaking ... ..	129,887
Rand and Orange Free State Undertaking ... ..	188,756	Rand and Orange Free State Undertaking ... ..	1,088,345
		Sabie Undertaking ... ..	11,709
<b>„ Balance as per Balance Sheet</b> ... ..	2,946,846	<b>„ Amounts set aside during the year as per Revenue Accounts</b>	920,731
Cape Western Undertaking ... ..	451,763	Cape Western Undertaking ... ..	110,306
Cape Northern Undertaking ... ..	33,447	Cape Northern Undertaking ... ..	11,000
Border Undertaking ... ..	Dr. 4,164	Border Undertaking ... ..	11,000
Durban Undertaking ... ..	161,217	Durban Undertaking ... ..	100,000
Natal Central Undertaking ... ..	625,382	Natal Central Undertaking ... ..	70,000
Eastern Transvaal Undertaking ... ..	162,265	Eastern Transvaal Undertaking ... ..	58,680
Rand and Orange Free State Undertaking ... ..	1,504,805	Rand and Orange Free State Undertaking ... ..	559,745
Sabie Undertaking ... ..	12,131		
		<b>„ Interest earned on Investments</b> ... ..	91,806
	<u>£3,316,919</u>		<u>£3,316,919</u>

# Electricity Supply Commission.

## CAPE WESTERN UNDERTAKING.

**Dr. Revenue Account for the Year ended 31st December, 1954. Cr.**

<b>Generation of Electricity.</b>		
To Proportion of Pooled Costs (as per attached Statement) ...		£605,390
„ Other Operation and Maintenance Costs Operation—		
Fuel ... ..	224,777	
Water, Oil, Waste and Stores ... ..	13,730	
Salaries and Wages ... ..	29,791	
Other Expenses ... ..	757	
„ Maintenance—		
Stores ... ..	2,505	
Salaries and Wages ... ..	20,468	
Other Expenses ... ..	2,318	
	£899,736	
<b>Distribution of Electricity.</b>		
„ Operation and Maintenance—		
Stores ... ..	19,238	
Salaries and Wages ... ..	160,285	
Other Expenses ... ..	23,045	
	202,568	
<b>General Expenses.</b>		
„ Local Administration and Technical Management ... ..	92,334	
„ General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	130,183	
„ Head Office Administration and General Expenses, including Publicity ... ..	25,101	
„ Engineering Expenses ... ..	15,106	
	262,724	
Less—Charged to Pooled Costs ... ..	16,645	
	246,079	
	1,348,383	
„ Interest ... ..	460,286	
„ Redemption Fund ... ..	272,493	
„ Provision for Repayment of Overseas Loan ... ..	53,293	
„ Instalments and Provision for Repayment of Deferred Liabilities for Assets Acquired ... ..	1,810	
„ Amount set aside to Reserve Fund ... ..	110,306	
	898,188	
Less—Charged to Pooled Costs ... ..	95,365	
	802,823	
„ Balance carried down ... ..	142,543	
	£2,293,749	
To Balance at 31st December, 1953, brought forward ... ..	£151,838	
	£151,838	

J. VAN NIEKERK, Chief Accountant.

Johannesburg,  
22nd April, 1955.

<b>By Sales of Electricity—</b>		
Traction Supplies ... ..	£565,600	
Bulk Supplies ... ..	520,494	
Industrial Supplies ... ..	630,393	
Domestic and Lighting Supplies ... ..	565,967	
	£2,282,454	
„ Other Revenue ... ..		11,295
		£2,293,749
By Balance brought down ... ..		£142,543
„ Balance as per Balance Sheet ... ..		9,295
		£151,838

Referred to in our Report of 27th May, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,  
Registered Accountants and Auditors.

# Electricity Supply Commission and City of Cape Town.

**Dr. Statement of Pooled Costs for the Year ended 31st December, 1954, and Allocation thereof. Cr.**

### Pooled Generation of Electricity.

To Operation and Maintenance—

Fuel ... ..	£1,197,784
Water, Oil, Waste and Stores ... ..	95,635
Salaries, Wages and Other Expenses ... ..	436,684
	£1,730,103

„ General Expenses (including Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	44,712
„ Interest ... ..	184,080
„ Redemption Fund ... ..	187,415
„ Provision for Repayment of Overseas Loan ... ..	16,269
„ Reserve Fund ... ..	54,655

£2,217,234

### By Allocation of Pooled Costs in terms of Agreement—

Electricity Supply Commission ... ..	£605,390	
City of Cape Town ... ..	1,604,820	
	£2,210,210	
„ Sundry Revenue ... ..		7,024

£2,217,234

# Electricity Supply Commission.

## CAPE NORTHERN UNDERTAKING.

### Dr. Revenue Account for the Year ended 31st December, 1954. Cr.

<b>Generation of Electricity.</b>					
To Operation—					
Fuel ... ..	£112,699				
Water, Oil, Waste and Stores ... ..	11,632				
Salaries and Wages ... ..	26,017				
Other Expenses ... ..	10,830				
„ Maintenance—					
Stores ... ..	3,871				
Salaries and Wages ... ..	13,013				
Other Expenses ... ..	1,056				
„ Electricity Purchased ... ..		£179,118			
		13,709			
<b>Distribution of Electricity.</b>					
„ Operation and Maintenance—					
Stores ... ..	316				
Salaries and Wages ... ..	1,738				
Other Expenses ... ..	367				
		2,421			
<b>General Expenses.</b>					
„ Local Administration and Technical Management ... ..	9,289				
„ General Expenses (including Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	6,656				
„ Head Office Administration and General Expenses, including Publicity ... ..	2,469				
„ Engineering Expenses ... ..	1,486				
		19,900			
„ Interest ... ..		215,148			
„ Redemption Fund ... ..		48,436			
„ Instalments and Provision for Payment of Deferred Liabilities for Assets Acquired ... ..		32,662			
„ Amount set aside to Reserve Fund ... ..		431			
„ Balance carried down ... ..		11,000			
		5,956			
		£313,633			
To Balance at 31st December, 1953, brought forward ... ..	£3,848				
„ Balance as per Balance Sheet ... ..	2,108				
		£5,956			
<b>By Sales of Electricity—</b>					
Bulk Supplies ... ..	£178,038				
Mining Supplies ... ..	122,933				
Industrial Supplies ... ..	10,132				
Domestic Supplies ... ..	984				
		£312,087			
„ Other Revenue ... ..					1,546

J. VAN NIEKERK, Chief Accountant.

Referred to in our Report of 27th May, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,  
Registered Accountants and Auditors.

# Electricity Supply Commission.

## BORDER UNDERTAKING.

Dr. Revenue Account for the Year ended 31st December, 1954. Cr.

<b>Generation of Electricity.</b>				
To Operation—				
Fuel ... ..	£228,620			
Water, Oil, Waste and Stores ... ..	5,564			
Salaries and Wages ... ..	40,259			
Other Expenses ... ..	2,488			
„ Maintenance—				
Stores ... ..	7,232			
Salaries and Wages ... ..	21,395			
Other Expenses ... ..	2,694			
„ Electricity Purchased ... ..		£308,252		
		6,275		
<b>Distribution of Electricity.</b>				
„ Operation and Maintenance—				
Stores ... ..	1,449			
Salaries and Wages ... ..	10,515			
Other Expenses ... ..	2,055			
		14,019		
<b>General Expenses.</b>				
„ Local Administration and Technical Management ... ..	19,855			
„ General Expenses (including Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	17,474			
„ Head Office Administration and General Expenses, including Publicity ... ..	6,172			
„ Engineering Expenses ... ..	3,715			
		47,216		
		375,762		
„ Interest ... ..		47,499		
„ Redemption Fund ... ..		24,686		
„ Instalments and Provision for Payments of Deferred Liabilities for Assets Acquired ... ..		7,092		
„ Amount set aside to Reserve Fund ... ..		11,000		
		£466,039		
To Balance at 31st December, 1953, brought forward ... ..	£66,715			
„ Balance brought down ... ..	38,141			
	£104,856			
				£466,039
<b>By Sales of Electricity—</b>				
Bulk Supplies ... ..	£330,746			
Industrial Supplies ... ..	32,076			
Domestic and Lighting Supplies ... ..	63,857			
				£426,679
„ Sales of Steam ... ..				980
„ Other Revenue ... ..				239
„ Balance carried down ... ..				38,141
				£104,856
				£104,856

J. VAN NIEKERK, Chief Accountant.

Referred to in our Report of 27th May, 1955.

Johannesburg,  
22nd April, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER.  
Registered Accountants and Auditors.

# Electricity Supply Commission.

## DURBAN UNDERTAKING.

### Dr. Revenue Account for the Year ended 31st December, 1954. Cr.

<b>Generation of Electricity.</b>			
To Operation—			
Fuel ... ..	£772,200		
Water, Oil, Waste and Stores ... ..	35,143		
Salaries and Wages ... ..	95,016		
Other Expenses ... ..	24,889		
„ Maintenance—			
Stores ... ..	55,686		
Salaries and Wages ... ..	118,248		
Other Expenses ... ..	12,336		
„ Electricity Purchased ... ..		£1,113,518	
„ Electricity supplied by Natal Central Undertaking ... ..		7,685	
		4,494	
<b>Distribution of Electricity.</b>			
„ Operation and Maintenance—			
Stores ... ..	10,891		
Salaries and Wages ... ..	33,678		
Other Expenses ... ..	9,820		
		54,389	
<b>General Expenses.</b>			
„ Local Administration and Technical Management ... ..	41,638		
„ General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	53,524		
„ Head Office Administration and General Expenses, including Publicity ... ..	19,751		
„ Engineering Expenses ... ..	11,887		
		126,800	
„ Deferred Payment Scheme, including Propaganda and Show-room Expenses ... ..		544	
		1,307,430	
„ Interest ... ..		277,013	
„ Redemption Fund ... ..		184,482	
„ Provision for Repayment of Overseas Loan ... ..		69,631	
„ Sinking Fund ... ..		120	
„ Amount set aside to Reserve Fund ... ..		100,000	
		£1,938,676	
To Balance at 31st December, 1953, brought forward ... ..		£10,897	
„ Balance brought down ... ..		49,178	
		£60,075	
<b>By Sales of Electricity—</b>			
Traction Supplies ... ..		£97,156	
Bulk Supplies ... ..		1,540,004	
Industrial Supplies ... ..		77,598	
Domestic and Lighting Supplies ... ..		130,139	
		£1,844,897	
„ Electricity supplied to Natal Central Undertaking ... ..			41,116
„ Other Revenue ... ..			3,485
„ Balance carried down ... ..			49,178
			£1,938,676
To Balance at 31st December, 1953, brought forward ... ..		£10,897	
„ Balance brought down ... ..		49,178	
		£60,075	
By Balance as per Balance Sheet ... ..			£60,075
			£60,075

J. VAN NIEKERK, Chief Accountant.

Referred to in our Report of 27th May, 1955.

HAISEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER.  
Registered Accountants and Auditors.

# Electricity Supply Commission.

## NATAL CENTRAL UNDERTAKING.

Dr.	Revenue Account for the Year ended 31st December, 1954.	Cr.
<b>Generation of Electricity.</b>		
To Operation—		
Fuel ... ..	£410,638	
Water, Oil, Waste and Stores ... ..	4,901	
Salaries and Wages ... ..	68,858	
Other Expenses ... ..	1,818	
„ Maintenance—		
Stores ... ..	21,233	
Salaries and Wages ... ..	48,741	
Other Expenses ... ..	6,266	
„ Electricity supplied by Durban Undertaking ... ..	£562,455	
	41,116	
<b>Distribution of Electricity.</b>		
„ Operation and Maintenance—		
Stores ... ..	24,826	
Salaries and Wages ... ..	78,593	
Other Expenses ... ..	13,960	
	117,379	
<b>General Expenses.</b>		
„ Local Administration and Technical Management ... ..	50,584	
„ General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	66,554	
„ Head Office Administration and General Expenses, including Publicity ... ..	29,215	
„ Engineering Expenses ... ..	17,583	
	163,936	
	884,886	
	318,012	
„ Interest ... ..	195,914	
„ Redemption Fund ... ..	24,617	
„ Provision for Repayment of Overseas Loan ... ..	1,651	
„ Instalments on Deferred Liability for Assets Acquired ... ..	70,000	
„ Amount set aside to Reserve Fund ... ..	70,000	
	£1,495,080	
To Balance at 31st December, 1953, brought forward ... ..	£8,615	
„ Balance brought down ... ..	2,930	
	£11,545	
	£11,545	
<b>By Sales of Electricity—</b>		
Traction Supplies ... ..		£635,570
Bulk Supplies ... ..		517,528
Mining Supplies ... ..		87,428
Industrial Supplies ... ..		126,196
Domestic and Lighting Supplies ... ..		104,131
		£1,470,853
„ Electricity supplied to Durban Undertaking ... ..		4,494
„ Other Revenue ... ..		16,803
„ Balance carried down ... ..		2,930
		£1,495,080
		£1,495,080
	By Balance as per Balance Sheet ... ..	£11,545
		£11,545

J. VAN NIEKERK, Chief Accountant.

Referred to in our Report of 27th May, 1955.

Johannesburg,  
22nd April, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,  
Registered Accountants and Auditors.



# Electricity Supply Commission.

## EASTERN TRANSVAAL UNDERTAKING.

### Revenue Account for the Year ended 31st December, 1954.

Dr.

Cr.

#### Generation of Electricity.

To Operation—		
Fuel ... ..	£256,491	
Water, Oil, Waste and Stores ... ..	15,584	
Salaries and Wages ... ..	74,241	
Other Expenses ... ..	3,915	
„ Maintenance—		
Stores ... ..	32,077	
Salaries and Wages ... ..	49,020	
Other Expenses ... ..	42,288	
„ Electricity Purchased ... ..	£473,616	
„ Electricity Supplied by Rand and Orange Free State Under- taking ... ..	30,123	
	310,889	

#### Distribution of Electricity.

„ Operation and Maintenance—		
Stores ... ..	3,303	
Salaries and Wages ... ..	14,234	
Other Expenses ... ..	1,509	
	19,046	

#### General Expenses.

„ Local Administration and Technical Management ... ..	28,805	
„ General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	37,301	
„ Head Office Administration and General Expenses, including Publicity ... ..	23,455	
„ Engineering Expenses ... ..	14,116	
	103,677	
	937,351	
„ Interest ... ..	110,033	
„ Redemption Fund ... ..	52,273	
„ Provision for Repayment of Overseas Loan ... ..	14,181	
„ Amount set aside to Reserve Fund ... ..	58,680	
„ Balance carried down ... ..	27,611	
	£1,200,129	

To Balance at 31st December, 1953, brought forward ... ..	£29,674	
„ Balance as per Balance Sheet ... ..	15,009	
	£44,683	

#### By Sales of Electricity—

Traction Supplies ... ..	£30,280	
Bulk Supplies ... ..	38,232	
Mining Supplies ... ..	199,128	
Industrial Supplies ... ..	212,515	
Domestic and Lighting Supplies ... ..	12,553	
	£492,708	
„ Electricity supplied to Rand and Orange Free State Under- taking ... ..		703,774
„ Other Revenue ... ..		3,647

By Balance brought down ... ..	£27,611
„ Accumulated Deficit in respect of Witbank Reticulation Scheme Recovered from Witbank Municipality ... ..	17,072
	£44,683

J. VAN NIEKERK, Chief Accountant.

Referred to in our Report of 27th May, 1955.

Johannesburg,  
22nd April, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,  
Registered Accountants and Auditors.

# Electricity Supply Commission.

## RAND AND ORANGE FREE STATE UNDERTAKING

### Revenue Account for the Year ended 31st December, 1954.

Dr.

Cr.

<b>Generation.</b>		
To Operation—		
Fuel ... ..	£3,423,582	
Water, Oil, Waste and Stores ... ..	93,201	
Salaries and Wages ... ..	643,910	
Other Expenses ... ..	26,436	
„ Maintenance—		
Stores ... ..	220,900	
Salaries and Wages ... ..	455,599	
Other Expenses ... ..	73,903	
„ Electricity Purchased ... ..	£4,937,531	
„ Electricity supplied by Eastern Transvaal Undertaking ... ..	481,313	
	703,774	
<b>Distribution.</b>		
„ Operation and Maintenance—		
Stores ... ..	134,685	
Salaries and Wages ... ..	483,558	
Other Expenses ... ..	17,312	
	635,555	
<b>General Expenses.</b>		
„ Local Administration and Technical Management ... ..	229,169	
„ General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.) ... ..	353,065	
„ Head Office Administration and General Expenses, including Publicity ... ..	57,532	
„ Engineering Expenses ... ..	34,624	
	674,390	
„ Interest ... ..	7,432,563	
„ Redemption Fund ... ..	2,068,196	
„ Provision for Repayment of Overseas Loan ... ..	1,461,465	
„ Instalment and Provision for Payment of Deferred Liability for Rights Acquired ... ..	422,156	
„ Amount set aside to Reserve Fund ... ..	4,812	
	559,745	
	£11,948,937	
To Balance at 31st December, 1953, brought forward ... ..	£274,059	
„ Balance brought down ... ..	1,549	
	£275,608	

By Sales of Electricity—		
Traction Supplies ... ..	£317,947	
Bulk Supplies ... ..	1,139,665	
Mining Supplies ... ..	7,535,846	
Industrial Supplies ... ..	1,899,016	
Domestic and Lighting Supplies ... ..	64,298	
	£10,956,772	
„ Sales of Air and Steam ... ..		624,671
„ Electricity supplied to Eastern Transvaal Undertaking ... ..		310,889
„ Other Revenue ... ..		55,056
„ Balance carried down ... ..		1,549
		£11,948,937
By Balance as per Balance Sheet ... ..		£275,608
		£275,608

J. VAN NIEKERK, Chief Accountant.

Referred to in our Report of 27th May, 1955.

HALSEY, BUTTON & PERRY.  
ALEX. AIKEN & CARTER.  
Registered Accountants and Auditors.

# Electricity Supply Commission.

## SABIE UNDERTAKING.

### Dr. Revenue Account for the Year ended 31st December, 1954. Cr.

Dr.		Cr.	
<b>Generation of Electricity.</b>			
To Operation—			
Water, Oil, Waste and Stores ... ..	£82		
Salaries and Wages ... ..	5,001		
Other Expenses ... ..	1		
„ Maintenance—			
Stores ... ..	40		
Salaries and Wages ... ..	290		
Other Expenses ... ..	30		
	£5,444		
<b>Distribution of Electricity.</b>			
„ Operation and Maintenance—			
Stores ... ..	91		
Salaries and Wages ... ..	603		
Other Expenses ... ..	126		
	820		
<b>General Expenses.</b>			
„ Local Administration and Technical Management ... ..	385		
„ General Expenses (including Maintenance of Quarters, Insurance, Pension Fund Contributions, etc.) ... ..	978		
„ Head Office Administration and General Expenses, including Publicity ... ..	899		
„ Engineering Expenses ... ..	541		
	2,803		
	9,067		
„ Interest ... ..	933		
„ Redemption Fund ... ..	883	Cr.	
	£9,117		
To Balance brought down ... ..	£69		
.. Balance as per Balance Sheet ... ..	75		
	£144		
	£9,117		
<b>By Sales of Electricity—</b>			
Mining Supplies ... ..			£9,048
„ Balance carried down ... ..			69
			£9,117
			£144
			£144

J. VAN NIEKERK, Chief Accountant.

Johannesburg,  
22nd April, 1955.

Referred to in our Report of 27th May, 1955.

HALSEY, BUTTON & PERRY,  
ALEX. AIKEN & CARTER,  
Registered Accountants and Auditors.

## ANNEXURE B

## Electricity Supply Commission

## POWER STATIONS: PRINCIPAL EQUIPMENT INSTALLED AS AT 31st DECEMBER, 1954.

Undertaking and Area (Square Miles)	Electric Power-Station	Type	Station Capacity MW	BOILERS		MAIN GENERATORS		HOUSE SETS		
				No.	Continuous Maximum Rating, Each, thousand lb/hr	No.	Normal Rating Each MW	No.	Normal Rating Each MW	
Border 21,500	Alice	Oil	0.16	—	—	2	0.230			
	King William's Town	Steam	4.5	1	10.0	2	1.5			
		Oil		3	12.0	1	0.5			
	West Bank No. 1	Steam	32.0	6	21.5	1	1.5			
				4	55.0	2	4.0			
						3	7.5			
Cape Northern 14,800	Central, Kimberley	Steam	31.0	8	30.0	1	3.0			
				2	75.0	1	5.0			
						2	5.5			
						2	6.0			
Cape Western 12,600	Salt River No. 1	Steam	90.3	{	60.0	{	10.0	}	1	
	Salt River No. 2	Steam	—		100.0		3			20.0
	Hex River	Steam	60.0		1		260.0			—
				4	200.0	3	20.0			
Durban 1,900	Congella Nos. 1 and 2	Steam	206.0	6	60.0	3	12.0			
				4	100.0	1	20.0			
				8	200.0	1	30.0			
	Port Shepstone	Oil	3.4	—	—	—	2	0.7		
							2	1.0		
Ungeni	Steam	30.0	3	180.0	1	30.0				
Eastern Transvaal 6,000	Witbank	Steam	128.0	20	70.0	6	20.0	1	8.0	
				2	80.0					

Natal Central 11,300	Colenso Nos. 1 and 2	Steam	135-0	8 4 5	60-0 80-0 180-0	5 3	12-0 25-0		
	Volkstrust	Oil	0-5	—	—	2	0-25		
Rand 39,300	Brakpan	Steam	48-0	8	28-0	1	3-0	4	7-0
				10	45-0	2	12-5		
				1	70-0	1	20-0		
	Klip	Steam	424-0	24	180-0	12	33-0		
				32	38-0	5	9-6		
	Rosherville	Steam	48-0	8	48-0				
	Simmerpan	Steam	34-0	4	20-0	4	3-0	3	7-0
				11	25-0	2	11-0		
	Taaibos	Steam	60-0	1	580-0	1	60-0		
18				190-0	9	33-0			
Vereeniging	Steam	157-5	20	45-0	3	20-0			
			2	60-0	3	32-5			
			6	180-0					
Vierfontein	Steam	210-0	9	210-0	7	30-0			
Wilge	Steam	30-0	4	150-0	1	30-0			
Sabie 200	Sabie Gorge	Hydro	1-35	—	—	3	0-45		

**SUMMARY:**

Total Number of Boilers	...	...	...	...	...	...	263
Total Boiler House Rating	...	...	...	...	...	...	24,718,000 lb./hr.
Total Number of Main Generators	...	...	...	...	...	...	110 Capacity 1,994-71 MW
Total Number of House Sets	...	...	...	...	...	...	9 Capacity 57-30 MW
Total Plant Capacity (Electricity	...	...	...	...	...	...	2,052-01 MW

**Major Items of Plant Commissioned 1954**

Umgeni	...	...	...	1-30 MW Generator
Taaibos	...	...	...	1-60 MW Generator
Vierfontein	...	...	...	4-30 MW Generators
Wilge	...	...	...	1-30 MW Generator

## Statement No. 1—(continued)

## COMPRESSED AIR POWER STATIONS: RAND UNDERTAKING

Name of Station	Number of Sets	Type	Compressor Output, h.p.	
			Each	Total
<i>Electric Driven</i>				
Canada Dam Compressor Station	1	Turbo	3,000	} 22,200
	4	Turbo	4,800	
Robinson Compressor Station	3	Turbo	2,000	} 14,000
	1	Turbo	2,150	
	1	Turbo	2,850	
	1	Turbo	3,000	
At New Modder Mine ...	1	Recip.	380	} 1,080
	1	Recip.	700	
At Modder B Mine ...	1	Recip.	270	} 5,500
	1	Recip.	380	
	2	Recip.	700	
	1	Recip.	1,300	
	1	Turbo	2,150	
<i>Steam Driven</i>				
Brakpan Power Station ...	3	Recip.	800	} 5,050
	1	Turbo	2,650	
Rosherville Power Station ...	1	Turbo	2,500	} 48,800
	1	Turbo	4,400	
	3	Turbo	6,000	
	2	Turbo	7,100	
	1	Turbo	9,700	
Total Compressed Air Power Stations ...	31	—	—	96,630 = 72,090 kW

## CAPACITY OF TRANSFORMERS IN SERVICE AT 31st DECEMBER, 1954.

Undertaking	Number	MVA
Border ... ..	126	40·6
Cape Northern ... ..	65	48·3
Cape Western ... ..	2,135	433·6
Durban ... ..	556	329·8
Eastern Transvaal ... ..	396	398·3
Natal Central ... ..	1,237	480·2
Rand ... ..	2,610	7,576·6
Sabie ... ..	13	3·6
At Compressor Stations, Rand ... ..	48	352·0
TOTALS ... ..	7,186	9,663·0

- (1) Transmission Lines and Cables: Circuit Miles (excludes Service Connections on Reticulation Systems).  
 (2) Telephone and Pilot Cables: Circuit Miles.

## (1) OVERHEAD TRANSMISSION LINES

Undertaking	132 kV	88 kV	66 kV	33 kV and 40 kV	10 kV to 22 kV	2.0 kV to 6.6 kV	525 V 380/220	Totals
Border	—	—	—	67	37	4	53	161
Cape Northern	—	—	—	—	83	—	—	83
Cape Western	—	—	333	242	683	252	440	1,950
Durban	—	123	—	11	199	42	150	525
Eastern Transvaal	—	86	—	—	254	38	29	407
Natal Central	132	600	—	198	610	169	144	1,853
Rand	525	1,654	—	830	216	118	66	3,409
Sabie	—	—	—	—	7	—	1	8
Totals	657	2,463	333	1,348	2,089	623	883	8,396

## UNDERGROUND CABLES

Border	—	—	—	—	16	2	—	18
Cape Western	—	—	—	62	58	2	30	152
Durban	—	—	—	2	3	—	3	8
Eastern Transvaal	—	—	—	—	22	1	—	23
Natal Central	—	—	—	—	2	5	3	10
Rand	—	—	—	—	99	117	12	228
Totals	—	—	—	64	200	127	48	439

TOTAL OVERHEAD LINES AND UNDERGROUND CABLES: 8,835 CIRCUIT MILES.

## (2) TELEPHONE AND PILOT CABLES

Cape Western	...	...	...	106
Rand	...	...	...	976
Witbank	...	...	...	12

} 1,094 circuit miles.

## POWER STATIONS: PRINCIPAL EQUIPMENT ON ORDER AS AT 31st DECEMBER, 1954

Undertaking	Electric Power-Station	BOILERS		GENERATORS		TRANSFORMERS		
		No.	Continuous Maximum Rating Each, thousand lb/hr	No.	Normal Rating Each MW	Trans-mission Lines Circuit Miles	No.	Total Capacity MVA
Border ... ..	West Bank No. 2	2	170	2	15.0	49	6	7
Cape Northern ... ..	Central, Kimberley	2	75	—	—	55	5	6
Cape Western ... ..	Salt River No. 2	5	260	4	30.0	61	64	250
Durban ... ..	Umgeni	4	180	2	30.0	—	5	39
Eastern Transvaal ... ..	Witbank	—	—	—	—	3	1	25
Natal Central ... ..	Taaibos	7	580	7	60.0	—	61	3
Rand ... ..	Vierfontein	10	210	5	30.0	274	163	2,112
	Wilge	4	400	1 2	30.0 60.0			

## SUMMARY:

Number of Boilers ... ..	34	...	...	...	C.M.R. 10,270,000 lb/hr
Number of Generators ... ..	23	...	...	...	Total Rating 930.0 MW
Transmission Lines ... ..	...	...	...	...	442 Circuit Miles
Transformer ... ..	310	...	...	...	Rating 2,442 MVA



## STATEMENT No. 3

## UNITS SOLD BY UNDERTAKINGS TO ALL CONSUMERS DURING THE PAST THIRTY YEARS

Million Units

Year	Border	Cape Northern	Cape Western	Durban	Eastern Transvaal	Klip	Natal Central	Rand	Sabie	Vaal	Totals
1925			0.3		160.0		0.7		0.08		0.08
1926			5.8		439.1		104.2		0.7		161.7
1927			31.0	15.6	464.3		114.2		1.9		551.0
1928			47.9	78.9	543.1		123.9		2.8		627.9
1929			49.8	99.1	619.0		117.1		3.2		797.0
1930			52.1	103.9	603.4		101.1		4.6		889.6
1931			64.2	109.8	610.3		100.3		6.6		867.1
1932			100.7	118.5	639.4		109.2		6.1		890.7
1933			73.6	131.1	648.3		124.9		6.3		974.1
1934			80.0	149.8	727.9		154.3		7.3		985.2
1935			85.8	170.4	696.4		171.5		7.2		1,119.2
1936			94.0	189.4	684.5	557.0	210.6		6.9		1,688.0
1937			98.8	209.5	768.1	1,349.9	234.9		7.2		2,535.6
1938			106.5	233.7	767.7	1,666.9	266.2		7.2		2,985.4
1939			119.8	242.7	853.3	2,566.6	281.1		6.4		3,573.7
1940			136.2	270.3	862.6	2,675.9	302.4		6.7		4,070.2
1941			151.8	273.8	873.4	2,707.8	307.7		6.6		4,254.0
1942			145.7	293.4	849.1	2,669.1	312.4		5.9		4,320.8
1943			158.7	321.6	889.2	2,703.6	336.0		6.7	377.9	4,415.8
1944			165.9	348.8	830.7	2,643.0	333.2		6.6	582.5	4,275.6
1945			184.6	369.7	896.9	2,614.3	347.0		7.4	608.6	4,706.1
1946			198.6	402.6	887.7	2,547.2	346.0		7.6	435.1	5,002.4
1947	56.2		222.4	448.7	633.2	1,207.4	367.9	2,185.7	7.3		5,576.9
1948	69.2		249.5	513.0	358.3		371.8	4,653.9	7.0		6,222.2
1949	68.7		271.9	561.8	378.5		406.5	5,151.8	6.3		6,910.6
1950	88.0	53.9	303.5	617.0	386.8		433.4	5,563.2	6.1		7,456.5
1951	97.7	58.5	341.2	655.6	425.0		454.0	6,039.6	6.1		8,080.5
1952	107.8	61.3	375.5	713.2	409.9		492.3	6,560.0	6.4		8,732.2
1953	118.2	67.1	436.2	777.7	270.5		532.5	7,465.2	5.6		9,676.6

Notes.—(1) The units sold at Cape Western since 1934 do not include the units supplied to Cape Town City Council under the Pooling Agreement.  
(2) The units purchased from Durban Corporation for sale down the South Coast are included in the Durban Undertaking figures above.  
(3) The decreases of Klip, Vaal and Witbank are due to the E.S.C. taking over the V.F.P. at 00.00 hours on 1st July, 1948, since when Klip and Vaal became part of the Rand Undertaking, whilst Witbank now interchanges to Rand Undertaking.  
(4) The Witbank Undertaking became the Eastern Transvaal Undertaking with effect from 1st January, 1954; traction supplies to the Rand area are now included under Rand Undertaking.

## UNITS SOLD AND NUMBER OF CONSUMERS, 1954 (Electricity, Air and Steam)

By use:—  
ELECTRICITY

Undertaking	TRACTION			BULK			MINING	
	Units	Per cent. Traction	No. Cons.	Units	Per cent. Bulk	No. Cons.	Units	Per cent. Mining
Border ... ..				106,429,968	5·787	4		
Cape Northern ..				45,175,224	2·456	3	24,559,229	0·462
Cape Western ...	105,393,557	17·021	2	124,769,660	6·785	22		
Durban ... ..	41,736,525	6·740	1	695,029,164	37·794	2		
E. Transvaal ...	16,797,519	2·713	1	19,070,684	1·037	3	88,190,569	1·658
Natal Central ...	278,010,265	44·898	1	181,929,164	9·893	15	26,120,501	0·491
Rand and O.F.S.: Sabie ... ..	177,270,050	28·628	1	666,607,086	36·248	59	5,172,396,453	97·284
							5,556,426	0·105
<b>Total Electricity ...</b>	<b>619,207,916</b>	<b>100·000</b>	<b>6</b>	<b>1,839,010,950</b>	<b>100·000</b>	<b>108</b>	<b>5,316,823,178</b>	<b>100·000</b>
Per cent. ...	6·548			19·446			56·220	

No. Cons.	INDUSTRIAL			DOMESTIC AND STREET LIGHTING			TOTAL UNITS SOLD		Total Number Consumers
	Units	Per cent. Industrial	No. Cons.	Units	Per cent. Domestic and Lighting	No. Cons.	Units	Per cent. Total Units Sold	
	3,757,316	0·244	104	7,814,575	5·495	2,153	118,001,859	1·248	2,261
3	842,511	0·055	35	95,228	0·067	38	70,672,192	0·747	79
	117,346,084	7·620	1,813	88,698,487	62·370	21,431	436,207,788	4·612	23,268
	23,378,194	1·518	217	17,536,231	12·331	3,900	777,680,114	8·223	4,120
29	144,955,535	9·413	51	1,445,909	1·017	682	270,460,216	2·860	766
12	34,932,808	2·204	501	12,537,888	8·816	4,020	532,530,626	5·631	4,549
100	2,225,673,866	78·946	368	14,084,032	9·904	1,653	7,246,031,487	76·620	2,181
1							5,556,426	0·059	1
<b>145</b>	<b>1,539,886,314</b>	<b>100·000</b>	<b>3,089</b>	<b>142,212,350</b>	<b>100·000</b>	<b>33,877</b>	<b>9,457,140,708</b>	<b>100·000</b>	<b>37,225</b>
	16·282			1·504			100·000		

## AIR AND STEAM

Border: Steam ..								
Rand and O.F.S. Air ... ..				2,926,693		1	197,748,585	95·661
Steam ... ..							8,969,490	4·339
<b>Total Air and Steam</b>				<b>2,926,693</b>		<b>1</b>	<b>206,718,075</b>	<b>100·000</b>
Per cent. of Total				1·334			94·203	

	233,754	2·387	2				233,754	0·107	2
12	9,560,763	97·613	26				210,236,041	95·806	39
1							8,969,490	4·087	1
<b>13</b>	<b>9,794,518</b>	<b>100·000</b>	<b>28</b>				<b>219,439,285</b>	<b>100·000</b>	
	4·463						100·000		

## ELECTRICITY, AIR AND STEAM

Grand Total, all Sales	619,207,916		6	1,841,937,643		109	5,523,541,253	
Per cent. of Grand Total	6·339			19·035			57·081	

158	1,549,680,831		3,117	142,212,350		33,877	9,676,579,993		37,267
	16·015			1·470			100·000		

## By Province:—

Cape ... ..	105,393,557	17·021	2	284,422,741	15·442	31	24,559,229	0·445
Natal ... ..	312,276,055	50·432	1	856,266,850	46·487	13	26,120,501	0·473
O.F.S. ... ..	7,470,735	1·206	1	82,767,064	4·493	17	936,093,373	16·947
<b>Transvaal ...</b>	<b>194,067,569</b>	<b>31·341</b>	<b>2</b>	<b>618,480,988</b>	<b>33·578</b>	<b>48</b>	<b>4,536,768,150</b>	<b>82·135</b>

3	122,179,665	7·884	1,954	96,608,290	67·932	23,622	633,163,482	6·543	25,612
12	55,689,507	3·594	592	26,223,031	18·439	6,097	1,276,575,944	13·192	6,715
15	69,571,124	4·489	74	986,781	0·694	511	1,096,889,077	11·336	618
<b>128</b>	<b>1,302,240,535</b>	<b>84·033</b>	<b>497</b>	<b>18,394,248</b>	<b>12·935</b>	<b>3,647</b>	<b>6,669,951,490</b>	<b>68·929</b>	<b>4,322</b>

Electricity — 97·732 }  
Air and Steam — 2·268 } per cent. of total sales.

## POWER STATION OPERATING

## STEAM ELECTRIC:

Power Station	Units Generated	Units Sent Out	MAXIMUM DEMANDS		Station Load Factor % Sent Out
			½ Hour (or Hour) Sent Out kW	Peak kW	
Brakpan ... ..	165,078,792	152,007,706	Hour 42,966	—	40.4
Central, Kimberley ...	17,315,841	68,254,599	17,960	19,300	43.3
Colenso No. 1 and No. 2 ...	550,288,150	519,526,650	109,680	121,000	54.1
Congella No. 1 and No. 2 ...	810,598,900	750,538,540	168,896	189,000	50.7
Hex River ... ..	217,235,800	206,519,260	48,450	52,000	48.8
King William's Town ...	13,273,290	12,501,090	3,618*	3,738	39.7
Klip ... ..	2,870,842,201	2,686,107,251	Hour 388,237	—	79.0
Rosherville ... ..	190,082,167	170,514,091	Hour 47,696	—	40.8
Salt River No. 1 ... ..	152,259,622	140,959,908	52,270	58,100	30.9
Simmerpan ... ..	99,645,502	94,141,510	Hour 34,742	—	30.9
Taaibos (from 27/21/54) ...	31,434,560	29,044,071	Hour 57,608	—	—
Umgeni (from 2/4/54) ...	89,672,800	83,068,541	31,200	34,200	40.6
Vaal ... ..	2,325,722,058	2,194,841,997	Hour 291,388	—	86.0
Vereeniging ... ..	857,519,283	803,490,582	Hour 119,658	—	76.7
Vierfontein ... ..	1,026,520,441	959,341,981	Hour 147,546	—	74.2
West Bank, East London ...	111,079,580	105,255,930	23,250	24,700	51.6
Wilge (from 16/7/54) ...	76,817,672	71,210,257	Hour 30,367	—	82.0
Witbank ... ..	851,045,033	792,101,994	Hour 114,817	—	78.8
Grand Totals	10,513,431,692	9,839,425,958			

\* Includes Diesel Plant.

## HYDRO ELECTRIC:

Power Station	Units Generated	Units Sent Out	Maximum Demand kW		Station Load Factor Sent Out	Rain	
			½ Hr. Sent Out	2 Mins. Generated		Inches	mm.
Sabie ...	5,827,400	5,673,700	1,100	1,200	58.9	48.16	1,223.4

## STATISTICS: YEAR, 1953.

Coal Burned Tons (2,000 lb)	LB OF COAL		Calorific Value of Coal B.Th.U. as Recd. (Weighted Average)	B.Th.U. PER UNIT		OVERALL THERMAL EFFICIENCY %	
	Per Unit Generated	Per Unit Sent Out		Generated	Sent Out	Generated	Sent Out
195,950	2.374	2.578	9,970	23,670	25,700	14.42	13.28
77,471	2.085	2.270	12,200	25,440	27,690	13.41	12.32
382,650	1.391	1.473	12,110	16,850	17,840	20.25	19.13
533,914	1.317	1.423	11,710	15,420	16,660	22.13	20.48
121,516	1.119	1.177	11,910	13,330	14,020	25.60	24.34
12,619	1.901	2.019	12,770	24,280	25,780	14.10	13.29
2,240,951	1.561	1.669	9,640	15,050	16,090	22.67	21.21
289,089	3.042	3.391	9,740	29,630	33,930	11.52	10.33
115,488	1.517	1.639	12,110	18,370	19,850	18.57	17.19
167,321	3.358	3.555	9,610	32,270	34,160	10.57	9.99
22,325	1.420	1.537	8,940	12,690	13,740	26.89	24.83
56,316	1.256	1.356	11,950	15,010	16,200	22.73	21.06
1,820,296	1.565	1.659	8,980	14,050	14,900	24.29	22.90
950,758	2.217	2.367	8,930	19,800	21,140	17.23	16.14
775,016	1.513	1.619	9,330	14,120	15,110	24.17	22.58
106,115	1.911	2.016	12,090	23,100	24,370	14.77	14.00
56,042	1.459	1.574	9,620	14,040	15,140	24.30	22.54
731,410	1.719	1.847	11,240	19,320	20,760	17.66	16.44
8,655,247							

## STEAM GENERATION:

Station	Units Generated	Units Sent Out	Coal Burned Tons of 2,000 lb.	lb. Coal Per Units Sent Out	Max. Sustained Load over 1 Hour kW	Load Factor %
Brakpan ... ..	9,036,870	8,969,490	14,296	3.188	3.538	28.9
King William's Town	233,754	233,754	243			
Total Steam	9,270,624	9,203,244	14,539			

## POWER STATION OPERATING STATISTICS: YEAR 1954

## DIESEL ELECTRIC:

Power Station	Units Generated	Units Sent Out	Maximum Demands kW		Fuel Consumed		Lab. Oil Gall.
			½ Hour	2 Mins.	Total lb	Per kWh Sent Out	
Alice ...	4,671	4,439	—	—	4,270	—	11
*King William's Town ...	85,505	85,505	3,618	3,738	49,011	0.573	38
Port Shepstone ...	98,070	96,930	3,138	3,305	57,495	0.593	—
Volkstrust ...	8,120	8,120	—	—	5,084	0.626	21
<b>TOTALS</b>	196,366	194,994			115,860	0.594	70

## COMPRESSED AIR GENERATION:

\* In parallel with Steam Plant.

Station	Type*	Air Units Generated	Air Units Sent Out		Coal Burned		Electric Input		Max. Sustained Load over One Hour	Load Factor %
			Units	%	Total Tons	lb Coal/Units Sent Out	Total kWh excluding Losses	Units Sent Out/kWh %		
Central Rand Compressed Air System:—										
Rosherville ...	Steam	123,211,000	122,938,700	52.8	176,164	2.866	59,265,744	77.56	} 67,200	35.5
Robinson ...	Electric	45,966,200	45,966,200	22.0	—	—	48,456,572	83.18		
Canada Dam ...	Electric	40,306,600	40,306,600	19.2	—	—	—	—		
<b>Air Pipe-line Totals</b>		209,483,800	209,211,500		176,164		107,722,316			
Other Air Stations:—										
Modder B and New Modder	Electric	8,729,990	8,729,990				10,141,900	86.08		
<b>Total Air ...</b>		218,213,790	217,941,490		176,164		117,864,216			

\* Electrically Driven Compressors are fed from the Electricity Distribution System of the Rand Undertaking.

## GENERATION SUMMARY:

**TOTAL COAL BURNED**  
 = Steam Driven Generating Stations + Compressed Air Steam Driven Stations + Steam Sales.  
 = 8,655,247 + 176,164 + 14,539.  
 = 8,845,950 tons of 2,000 lb. (Increase of 695,611 over 1953 or 8.535%.)

## TOTAL UNITS GENERATED

= Electricity (Steam + Hydro + Diesel) + Air Units Generated at Steam Driven Stations + Steam Units Generated  
 = Steam 10,513,431.692 }  
 = Hydro 5,827,400 } 10,519,455,458 + 123,211,000 + 9,270,624.  
 = Diesel 196,566 }  
 = 10,651,937,082 (increase of 1,209,959,755 or 12.815% over 1953).

## POWER PURCHASED.

Under-taking	Purchased From	Maximum Demand	UNITS	
Border	East London, Municipality of ...	499 kVA		1,380,488
Cape Northern	Kimberley, City of ... ..	940 kVA		2,562,000
Durban	Durban, City of At Canelands ... .. At Warner Beach ... ..	690 kW 1,350 kW	1,825,545 424,650	2,250,195
Eastern Transvaal		—		16,884,908
Rand and O.F.S.	Johannesburg, City of ex Orlando at Bantjes Substation at Rosherville Switching Station Middle Witwatersrand (Western Areas), Ltd. ... .. Pretoria, City of at North Rand ... .. Pretoria Portland Cement Co., at Slurry ... .. Rand Water Board at Vereeniging ... .. The Randfontein Estates G.M. Co. (W) Ltd. ... ..	*70,320 kW 2,000 kW Terminated March 45,000 kW 2,000 kW January only 4,540 kW 10,570 kW	136,723,182 35,511,419 3,856,603 216,807,000 1,711,367 5,848,943 13,796,105	172,234,601 414,254,619

\*Simultaneous Demand.

TOTAL UNITS PURCHASED

437,332,210

(4.519% of Units Sold)

Note re Cape Western Undertaking:

Under the Pooling Agreement, the E.S.C. received 273,083,548 Units from the Pool, which includes 140,959,908 Units sent out from Salt River Power Station.

## STATEMENT No. 7

**WATER (OTHER THAN SEA WATER) CONSUMED BY POWER STATIONS FOR THE YEAR 1954**  
(Millions of Gallons)

Undertaking	Potable Water	Crude River Water	Water from Other Sources including Bore-holes, Dams and Sewage
Border ... ..	20		14
Cape Northern ... ..	59		180
Cape Western ... ..	28	153	
Durban ... ..	187		
Natal Central ... ..	30	181	
Rand (including Witbank Power Station)	308	8,481	753

NOTE—No deduction has been made for water disposed of as blow-down from cooling tower ponds.

**STATEMENT No. 8****STATEMENT SHOWING THE PRICE OR RENT OF LAND OR INTERESTS IN OR OVER LAND OR OTHER PROPERTY ACQUIRED OR HIRED BY THE COMMISSION DURING THE YEAR 1954**

(See previous Annual Reports for Rights or Interests in or over land acquired prior to 1954.)

**Cape Western Undertaking**

Immovable property acquired for considerations amounting to	£16,425	1	0
Servitudes acquired—capitalised payments amounting to ...	1,261	16	4
Property hired on Lease—annual rentals amounting to ...	497	16	0

**Natal Central Undertaking**

Servitudes acquired—capitalised payments amounting to ...	4,299	3	9
Property hired on Lease—annual rentals amounting to ...	10	0	0

**Natal Southern Undertaking**

Immovable property acquired for considerations amounting to	4,150	0	0
Servitudes acquired—capitalised payments amounting to ...	5,652	19	2

**Eastern Transvaal Undertaking**

Servitudes acquired—capitalised payments amounting to ...	609	8	2
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**Border Undertaking**

Immovable property acquired for considerations amounting to	85	0	0
Property hired on lease—annual rentals amounting to ...	120	0	0

**Swartkops Power Station**

Immovable property acquired for considerations amounting to	1,000	0	0
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**Rand and Orange Free State Undertaking**

Immovable property acquired for considerations amounting to	115,961	9	0
Servitudes acquired—capitalised payments amounting to ...	2,457	6	9
Servitudes acquired—option moneys paid amounting ...	1,131	4	3
Industrial Stands acquired—licence moneys paid amounting to	657	0	0
Property hired on Lease—annual rentals amounting to ...	1,569	15	0

**Head Office**

Immovable property acquired for considerations amounting to	246,000	0	0
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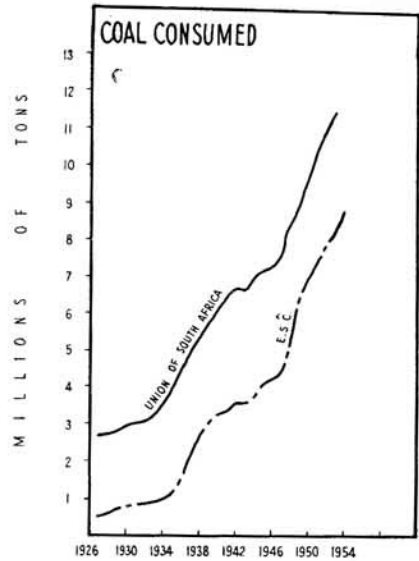
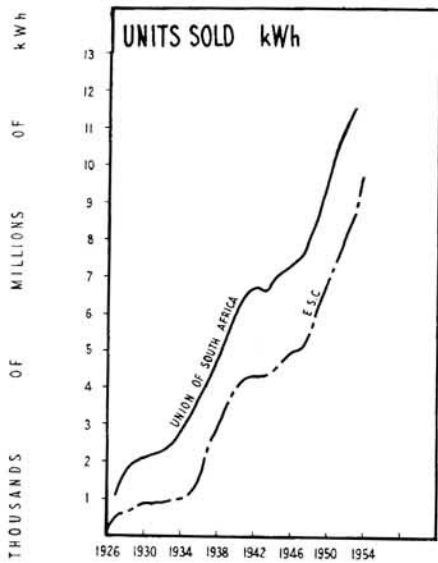
## COAL USED AT COMMISSION'S STEAM-RAISING POWER STATIONS

Average Cost per ton (2,000 lb)

Power Station	1945		1946		1947		1948		1949		1950		1951		1952		1953		1954	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Brakpan ... ..	—	—	—	—	—	—	7	9	7	8	8	9	8	10	9	7	10	1	13	4
Coleenso ... ..	10	8	10	11	11	4	11	6	12	9	13	2	14	3	18	6	19	11	21	6
Congella ... ..	15	4	15	7	16	4	16	4	18	0	19	5	20	0	23	6	25	4	27	2
East London ...	—	—	—	—	26	7	26	11	28	6	30	5	31	6	34	0	35	4	37	10
Hex River ... ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32	10	35	4	37	0
Kimberley, Central	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	4	27	9	29	1
Klip ... ..	4	2	4	4	4	5	4	1	4	7	5	0	7	7	9	8	11	7	13	1
King William's Town	—	—	—	—	—	—	27	10	29	6	31	8	33	1	37	2	39	9	42	5
Rosherville ...	—	—	—	—	—	—	8	3	8	5	9	5	10	7	12	9	15	0	15	6
Salt River ... ..	25	4	25	9	28	1	28	5	29	6	32	5	33	10	35	3	37	5	41	0
Simmerpan ... ..	—	—	—	—	—	—	8	4	8	3	9	6	9	9	10	9	11	3	15	6
Faafbos ... ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	11
Ungeni ... ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	9
Vaal ... ..	5	10	6	0	5	7	4	11	4	9	5	4	5	11	6	8	6	10	6	10
Vereeniging ...	—	—	—	—	—	—	4	11	4	10	5	5	5	9	6	9	7	3	7	8
Vierfontein ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	5	8	2
Wilge ... ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	1
Wilbank ... ..	2	4	2	9	3	4	4	0	3	9	4	2	4	6	5	10	6	11	7	0



# ANNEXURE C



STATISTICS RELATING TO THE PRODUCTION AND SUPPLY OF ELECTRICITY IN THE UNION OF SOUTH AFRICA WITH E.S.C. STATISTICS SUPERIMPOSED.

