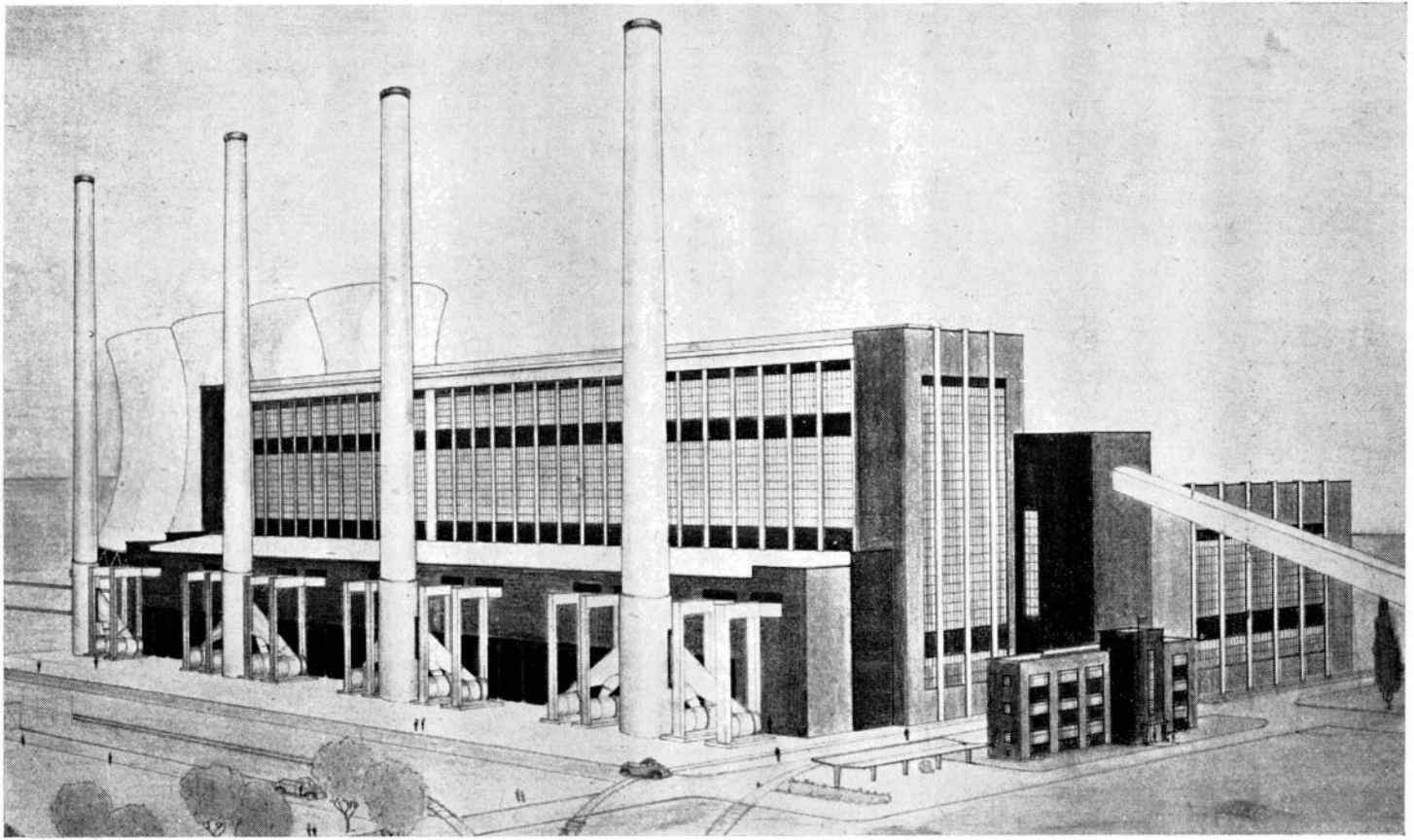


Perspective view of the projected
TAAIBOS POWER STATION.

MEMBERS OF THE

Electricity Supply Commission

Dr. JOHANNES THEOBALD HATTINGH (Chairman)

ROBERT BURNS WATERSTON

CALVIN STOWE McLEAN

WALTER HEINRICH ANDRAG

Dr. CECIL VIVIAN VON ABO

CONTENTS

Electricity Supply Commission

Escom House,
Rissik Street,
Johannesburg,

30th July, 1952.

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 twenty-ninth Annual Report, covering its operations for the year ended 31st December, 1951, together with a brief review of its activities up to 30th April, 1952.

The Commission desires to record its appreciation of the long and valuable services rendered by Mr. A. M. Jacobs, whose term of office as Chairman expired in January, 1952. Mr. Jacobs joined the Commission as an engineer in June, 1923, and was appointed a Commissioner in October, 1927. He became Chief Engineer in 1932 and Consulting Engineer in 1948. In February, 1949, he succeeded the late Dr. H. J. van der Bijl as Chairman.

The new Chairman, Dr. J. T. Hattingh, has also seen long service with the Commission, having joined as an engineer in the same month as Mr. Jacobs. Dr. Hattingh became Research Engineer in 1927, in 1931 he was appointed Technical Assistant to the late Dr. van der Bijl, and Consulting Engineer in 1938. His appointment as a Commissioner came in July, 1949, and he succeeded Mr. Jacobs as Chairman on 1st February, 1952.

DEMAND FOR ELECTRICITY

During 1951 the Commission sold 7,456·5 million units of electricity; an increase of 7·9 per cent over the 1950 figure of 6,910·6 million units, but despite the utmost efforts to increase output by the erection of new power stations and by the installation of additional plant in existing stations, the demand for power created by the rapid expansion of the country's mines and industries still exceeds the supply.

Details of the progress achieved during 1951 on the erection of eight major new power stations are given later in this Report. New plant will be coming into operation at intervals from June, 1952, onwards, and the fact that capital expenditure over the next six years, although confined to essential supplies, will amount to approximately £103 million, provides a measure of the magnitude of the plans involved.

Unfortunately, there is no short cut whereby supplies of power can be augmented to overtake demand, since the rate of growth of demand for plant and equipment still greatly exceeds the rate of production. Previous Reports have emphasised that the problem is world-wide. Many countries are still striving to overtake the back-log created by war destruction and the lack of normal plant replacements during the war years, at a time when manufacture is restricted by rearmament and the consequent reconversion from peace-time to war-time production of much of the world's heavy engineering resources.

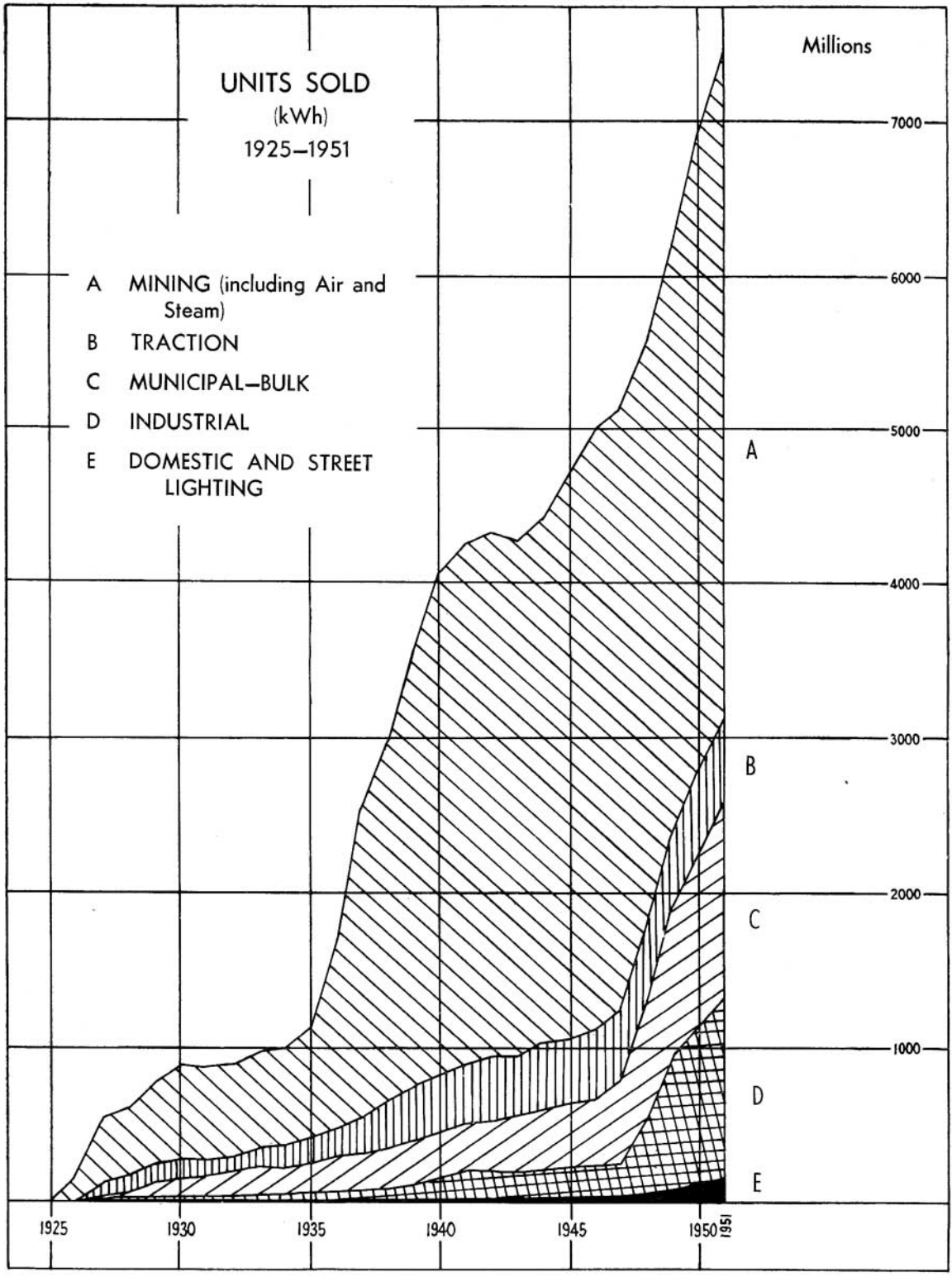
Every possible step is, however, being taken to ensure that South Africa shall have the maximum available resources of power with the minimum of delay. In this connection the Commission's Joint General Managers and Chief Engineers (Electrical and Mechanical) went overseas in October and November because of indications that the commissioning dates of plant for power stations being constructed or extended were likely to be set back, owing to difficulties encountered by manufacturers in respect of availability of materials or manufacturing resources, or both. The object of the visit was to ensure that any avoidable delays should be countered, and to enable unavoidable delays to be taken into account in the Commission's plans for the projects affected thereby.

The investigations undertaken were abundantly worth while, for personal representations proved more effective than protracted correspondence. In addition to progress investigations on the spot, meetings at a high level were held in connection with material supplies, particularly with regard to steel, and opportunities arose for the placing of contracts for additional plant and equipment, including two 30,000-kW turbo-generators. The arrangements made for augmented and expedited deliveries are being followed up by the Commission's London Representative and his staff.

Discussions were held with the atomic energy division of the British Ministry of Supply on the subject of uranium production in the Union, and the Ministry officials approved in principle the inclusion of certain items as priority equipment; for example, transformers and switchgear for extensions which will be involved in the transmission and distribution of power to mines concerned with uranium production. Sweden was visited in connection with purchasing negotiations, and the Commission was able to place there an order for 650 miles of steel-cored aluminium conductor, for delivery at least a year earlier than this material could have been obtained elsewhere.

From the foregoing, and from details of planned expansion given later in this Report, it will be seen that power resources in the Union will increase very considerably over the next few years, provided no unforeseen setbacks are encountered.

Meanwhile, restrictions are and will be necessary in some areas. Last year's Report referred to arrangements made for the equitable sharing of load restrictions by consumers within the area of the Rand Undertaking. During 1951 33,000 kW was added to the generating capacty of the Rand Undertaking, and arrangements were made for the purchase of power from outside sources. But notwithstanding these efforts, and the Commission's requirement in some cases that consumers who were able to do so should continue to operate generating plant which in the normal course would have been dismantled, the plans introduced at the close of the year 1950, for regulating the amount of power which may be taken by consumers and for postponing new connections unless they are for essential services or their acceptance would be in the national interest, have had to be brought into full effect.


UNITS SOLD
(kWh)
1925–1951
A MINING (including Air and Steam)
B TRACTION
C MUNICIPAL–BULK
D INDUSTRIAL
E DOMESTIC AND STREET LIGHTING
Millions
7000
6000
5000
4000
3000
2000
1000
A
B
C
D
E
1925
1930
1935
1940
1945
1950
1951

These restrictions having been imposed upon maximum demands, but not upon the number of units which may be taken, have resulted in a substantial improvement in the loading of the system. The load during the afternoon and evening period now approximates to the full capacity of the system, and, as may be noted from the comments on page 46 of this Report, plant is now being operated to give an output which is very close to the theoretical maximum. Thus there can be no prospect of alleviating these restrictions until substantial additions of new plant are brought into commercial service.

At the Cape Western Undertaking, where the capacity of the Commission's and the Cape Town City Council's generating plant is pooled, the load demands on a number of occasions during April, 1952, exceeded the available capacity of the pooled stations, owing to the breakdown of certain generating plant in the City Council's Table Bay Power Station, coupled with a reduction in the output of the Commission's Salt River Power Station due to strain imposed on plant by the heavy and increasing load in recent years and the difficulty experienced from time to time in obtaining the grade of coal for which the boilers were designed.

To minimise the unavoidable inconvenience entailed by the shortage of supply, a scheme of rationing was introduced whereby consumers in certain sections of the Commission's and the City Council's areas were in rotation liable to disconnection at times which were notified in advance. Voluntary co-operation on the part of consumers in the Commission's area contributed considerably to the effectiveness of the scheme.

The engagement of competent staff for the eight new power stations already mentioned, and the concurrent expansion of distribution systems, constitutes a serious problem. It has been decided that enquiries shall be made by the Commission's London Representative with a view to engaging artisans from overseas to supplement local recruitment.

Without repeating the figures given in previous Reports illustrating the greatly increased cost of constructing and equipping power stations, it can be stated that the upward trend of nearly all prices involved in the generation and distribution of electricity still continues. The impact of these rising prices differs somewhat as between the various undertakings, but in general it must be expected that charges to consumers will have to be increased, in some cases substantially, over the next few years.

PLANT AND EQUIPMENT

Plant commissioned during 1951 included a 40,000-kW set at Congella Power Station and a 33,000-kW set at Vaal. A 7,500-kW turbo-generator and two 55,000-lb/hr boilers were commissioned at West Bank No. 1 Power Station, East London.

Major plant under erection at the year's end included the following:

Congella: three 200,000-lb/hr boilers.
Hex River: three 20,000-kW turbo-generators; four 200,000-lb/hr boilers.
Umgeni: two 180,000-lb/hr boilers.
Vaal: three 33,000-kW turbo-generators; eight 190,000-lb/hr boilers.
Vierfontein: three 210,000-lb/hr boilers.
Witbank: one 20,000-kW turbo-generator; two 80,000-lb/hr boilers.

A summary of the principal plant and equipment in course of installation or on order at 31st December, 1951, will be found in Annexure B to this Report. Altogether 59 boilers, ranging from 75,000 to 580,000-lb/hr of steam, and 36 turbo-generators, with a total capacity of 1,103,000 kW, were on order or under erection at the year's end. Since then four 400,000-lb/hr boilers and one 60,000-kW turbo-generator have been been ordered for the new Wilge Power Station, and tenders for a second 60,000-kW turbo-generator are under consideration.

PLANT CAPACITY

The aggregate installed capacity in the Commission's power stations at 31st December, 1951, was 1,594,580 kW, an increase of 80,605 kW over the corresponding figure for the previous year. Plant under erection or on order will bring the total to 2,637,580 kW.

Details of plant and equipment installed in each of the Commission's power stations are given in Annexure B to this Report.

NEW POWER STATIONS

Although delayed by the serious shortage of steel required for construction work and by late deliveries of plant and equipment, work proceeded throughout the year on the heavy programme of expansion undertaken by the Commission, and good progress was made. The Commission's Head Office engineering staff is responsible for the design of the Hex River, Swartkops, Taaibos, Vierfontein and Wilge Power Stations, and the Commission's consulting engineers, Messrs. Merz and McLellan, are responsible for the design of the Salt River No. 2, Umgeni and West Bank No. 2 Stations.

Where estimates of capital expenditure are given, the estimates are based on prices ruling at the time of placing the relative contracts, which provide that any subsequent variations in the cost of materials and/or labour shall be for the Commission's account. In most cases increases must be expected.

Hex River: This station, at Worcester, is planned for seven 200,000-lb/hr boilers and five 20,000-kW turbo-generators, to meet the expanding needs of the northern section of the Cape Western system and to provide the power needed for the electrification of the railway main line from Bellville to Touws River. The initial installation of four 200,000-lb/hr boilers and three 20,000-kW turbo-generators is estimated to cost £3,593,000, including civil works. Non-delivery of essential materials delayed the commissioning of the first boiler and turbo-generator until June, 1952. By the end of 1951 boilers Nos. 3 and 4 had been inspected, and No. 3 turbo-generator was almost complete. The coal staith had been completed and the workshop erected, and the office and switchhouse buildings were nearing completion. Erection of the second cooling tower had reached the final stages. The outdoor 11/66-kV step-up switchyard steelwork was completed during August, but delay was experienced in installation of the control circuit cabling.

Salt River No. 2: This new station is being constructed on a site adjoining the existing Salt River Station, to meet the increasing demands for power on the Cape Western system. It is planned for eight 260,000-lb/hr boilers and six

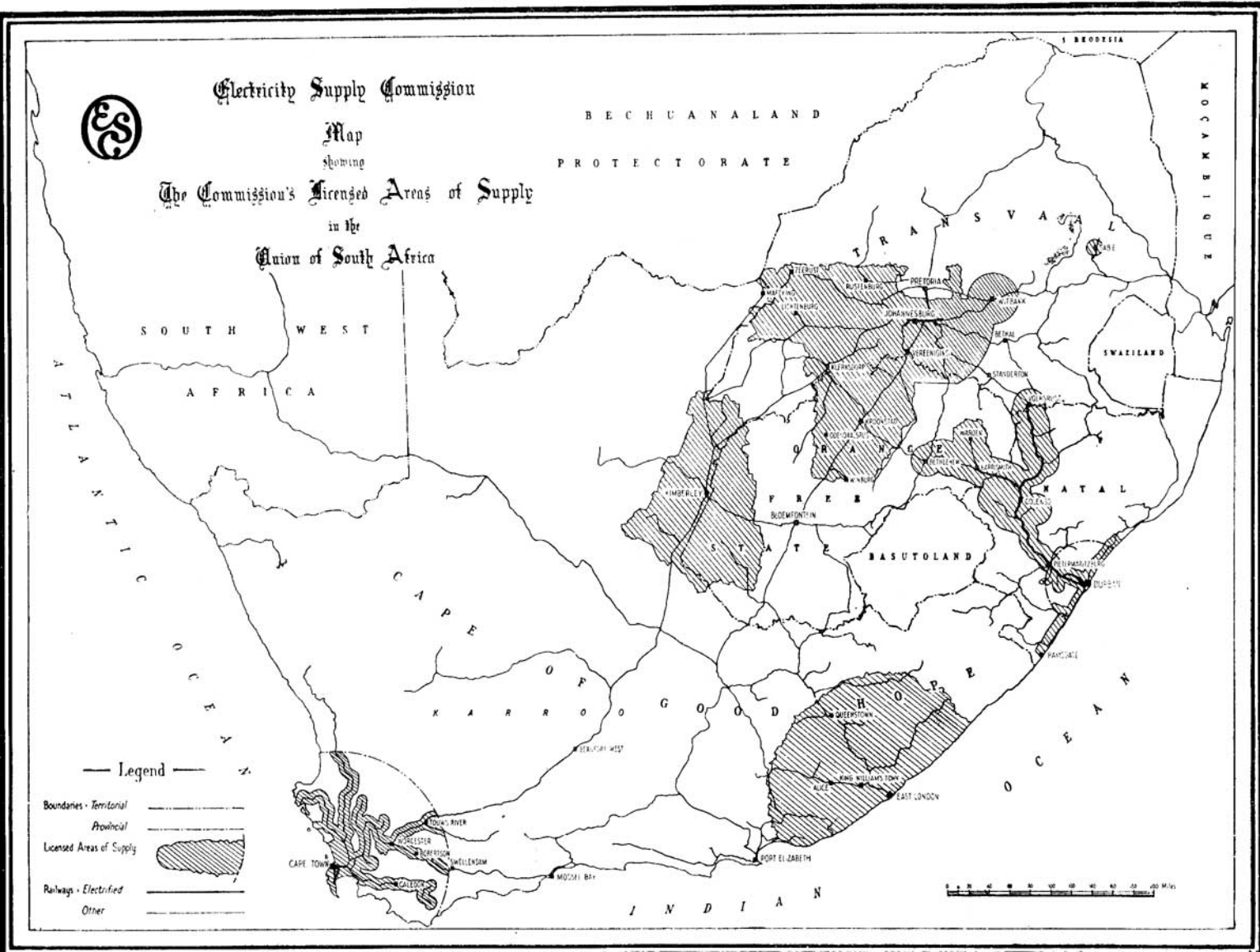
30,000-kW turbo-generators. Orders have been placed for the initial installation, comprising four boilers and two turbo-generators, and negotiations are proceeding with a view to ordering a further two turbo-generators and their associated boiler plant. Two boilers and one turbo-generator are expected to be in operation by the middle of 1954. Work is proceeding on pile-driving for the main station buildings and for the cooling-water canals, and by the end of last year the new workshops were nearing completion. The estimated cost of the initial installation, including civil works, is £5,464,100.

Swartkops: To augment supplies of power for Port Elizabeth and its vicinity, this new station is being constructed by the Commission to operate in conjunction with the existing municipal station. Terracing of the site for the main station buildings, and the foundations of the boiler house, were completed in 1951. Work is proceeding on excavations for the turbine house foundations and the construction of cooling-water culverts and cable tunnel. Railway tracks are being laid and ballasted. Orders were placed in 1950 for two 210,000-lb/hr boilers and two 20,000-kW turbo-generators, and the first set is expected to be in service during the latter part of 1953. To this stage the cost of plant and station is estimated at £3,142,000. It is designed for three 20,000-kW turbo-generators, and thereafter 30,000-kW sets as required.

Taaibos: Orders were placed in 1950 and 1951 for the main installation, comprising six 580,000-lb/hr boilers and six 60,000-kW turbo-generators, at an estimated cost of £15,959,000, which includes civil works. It is being built on a site adjoining Clydesdale Colliery, near Coalbrook in the Orange Free State, with the main object of supplying additional power for goldfields and industry. It will be interconnected with Vaal and Vierfontein, and will be the centre of a 132-kV transmission system. Terracing of the site has been completed, but shortage of steel is delaying construction of the main station building; it is now hoped to start construction about October, 1952. Work is in progress on the Vaal River pump-house and the pipe line. The first turbo-generator should be ready for service during the second half of 1954. It is expected that orders will shortly be placed for No. 7 boiler and turbo-generator, following discussions which are now taking place.

Umgeni: The purpose of this station, sited near Pinetown, will be to meet the increasing demand of the Durban Corporation and all classes of consumers, and to ensure adequate supply for the electrified railway system. By the year's end the foundations for the main station building and the boiler house were nearly completed, as well as the sub-foundations for the turbo-generators. Good progress was made with steelwork for the boiler house, and No. 1 boiler drums were in position. The railway siding has been completed and is in service. Four 180,000-lb/hr boilers and two 30,000-kW turbo-generators are on order; the first set is expected to be erected towards the end of 1953 and the second early in 1954. At this stage the estimated cost of the station is £4,918,288. Ultimate plans provide for a further twelve boilers and six turbo-generators of similar capacity to those already ordered.

Vierfontein: This power station is being constructed on a coalfield about eight miles south of the Vaal River, to assist in meeting the heavy demand for power which is expected from the Orange Free State goldfields. Twelve 210,000-lb/hr boilers and seven 30,000-kW turbo-generators have been ordered, and with this equipment and the civil works involved, the estimated cost is £11,010,000; it is


Electricity Supply Commission
Map
showing
The Commission's Licensed Areas of Supply
in the
Union of South Africa
BECHUANALAND
PROTECTORATE
S RHODESIA
MOCAMBIQUE
SOUTH WEST
AFRICA
TRANSVAAL
SWAZILAND
ORANGE
FREE
STATE
NATAL
BASUTOLAND
CAPE OF GOOD HOPE
KARROO
ATLANTIC OCEAN
INDIAN OCEAN
PRETORIA
JOHANNESBURG
VEREENIGING
KIMBERLEY
BLOEMFONTEIN
QUEENSTOWN
KING WILLIAMS TOWN
EAST LONDON
PORT ELIZABETH
CAPE TOWN
MOSSEL BAY
DURBAN
Legend
Boundaries - Territorial
Provincial
Licensed Areas of Supply
Railways - Electrified
Other

expected that the first set will operate early in 1953. Turbine house steelwork for the first three sets was erected during 1951, and work is proceeding on the erection of the first three boilers. At the end of the year No. 1 cooling tower was nearing completion. Fifty-six dwelling houses, a block of single quarters, a guest house and a boarding house have been built, and additional houses are under erection. The pump-house on the Vaal River, with $8\frac{1}{2}$ miles of 18in. pipe line to the power station, came into operation early in 1952 with a temporary pump. Negotiations have reached an advanced stage for the ordering of an additional five boilers and three turbo-generators, to bring the total station capacity to 300,000 kW.

West Bank No. 2: Two 170,000-lb/hr boilers and two 15,000-kW turbo-generators are on order for this station, which will adjoin the existing (West Bank No. 1) station at East London. To this stage the estimated cost is £2,362,600. Erection of steelwork has been delayed by shortage of material. Erection of boilers is due to begin early in 1953 and to be completed by the middle of 1954, and the first turbo-generator is expected to be operating during the second half of 1954. The new station is designed for an ultimate capacity of 90,000 kW.

Wilge: During 1951 it became apparent that the proposed extensions to Rosherville Power Station, mentioned in last year's Report, would be inadequate to meet the additional loads subsequently notified, and that the site would be unsuitable for the installation of the additional plant which would be required. It was therefore decided to abandon the Rosherville extension project and to transfer the plant on order to the site of a new power station, to be known as Wilge, which will be constructed near the New Largo Colliery, near Kendal, Transvaal. The planned capacity of the station is 180,000 kW, comprising two 30,000-kW and two 60,000-kW turbo-generators with four 150,000-lb/hr and four 400,000-lb/hr boilers, and it is estimated to cost £10,327,000. The initial installation of one 30,000-kW turbo-generator and two 150,000-lb/hr boilers is due to be in operation by September, 1953, with the second 30,000-kW set and two additional 150,000-lb/hr boilers ready by August, 1954. It is planned to have the station completed by the end of 1955.

TRANSMISSION SYSTEM AND AREA OF SUPPLY

The transmission system was extended from 6,636 route miles at the end of 1950 to 7,413 route miles at the end of 1951. The Commission's licensed area of supply remained unchanged at 88,000 square miles. Applications to the Electricity Control Board for additional areas are pending.

The following statement shows some of the major lines completed during 1951, and under construction or projected at the year's end:

Completed in 1951:

	kV	Route Miles
Vaal to Dunnottar	88	50
Rustenburg to Thabazimbi	88	80
Bethal to Standerton	88	45
Klip to Rosherville and North Rand	88	43
Wellington to Worcester via Tulbagh Kloof ...	66	63
Freddies North to De Erf and Wit. Extensions	40	11

Under Construction:

	kV	Route Miles	
Colenso to Umgeni	132	114	
Umgeni to Springfield	132	8	(double circuit)
Vaal to Vierfontein	132	80	
Vierfontein to Alma	132	60	(two lines)
Montclair to Marburg	88	74	
Slurry to Zeerust*	88	26	
Greenlands to Heilbron	88	27	

*Completed February, 1952

Projected:

Vaal to Vierfontein (turn-in to Taaibos) ...	132	13	
Taaibos to Virginia	132	113	(two lines)
Alma to Virginia	132	20	(two lines)
Alma to Grootkop, Balkfontein and Vierfontein	132	72	
Taaibos to Libanon	132	55	
Vierfontein to Western Reefs	88	15	
Vaal to Taaibos (duplicate)	88	17	
Supply to Rand Water Board, Zuikerbos ...	88	14	
Klip to E.R.P.M.	88	40	
North Rand to Pretoria (new section)	88	13	
Transfer, Vlakfontein E. & W. from Vereeniging to Vaal	88	26	
Worcester to Touws River	66	39	
Oakdale to Stellenbosch	66	15	
Oakdale to Paarl via Muldersvlei	66	25	
Salt River Power Station to Oakdale Substation	66 (cable)	12	(double circuit)
East London to King William's Town	66	36	
Salt River Power Station to Elsies River Substation	33 (cable)	6	(third circuit)
King William's Town to Adelaide	33	82	
Cedara to Greytown	33	60	
Harrismith to Warden and Vrede to Reitz ...	33	100	

OUTPUT AND SALES

Units generated by and sold from the Commission's power stations again achieved new records in 1951, and all undertakings except Sabie record increases in sales. The total number of consumers rose from 38,093 in 1950 to 41,218 in 1951, and there was a rise in consumption by every class of consumer. Mining consumption accounted for 58 per cent of the Commission's total sales.

Aggregate figures for all undertakings were:

	1951	1950	Increase
Units generated	8,326,567,811	7,773,576,519	7·114%
Units sold	7,456,490,147	6,910,583,902	7·900%

The following figures record units sold by individual undertakings:

	1951	1950
Border	88,065,643	79,886,071
Cape Northern	58,521,002	53,922,202
Cape Western	303,476,376	271,902,774
Durban	616,953,244	561,767,317
Natal Central	433,384,649	406,523,502
Rand	5,563,180,420	5,151,772,083
Sabie	6,081,087	6,303,229
Witbank	386,827,726	378,506,724
	7,456,490,147	6,910,583,902

Analysis of sales by classes of consumers is:

	1951	1950
Bulk Supplies:		
Municipal	1,263,436,842	1,109,158,650
Direct Supplies:		
Traction	539,366,602	524,024,643
Mining	4,359,570,645	4,162,768,417
Industrial	1,159,707,191	1,000,686,054
Domestic	131,097,302	110,852,285
Street Lighting	3,311,565	3,093,853
	7,456,490,147	6,910,583,902

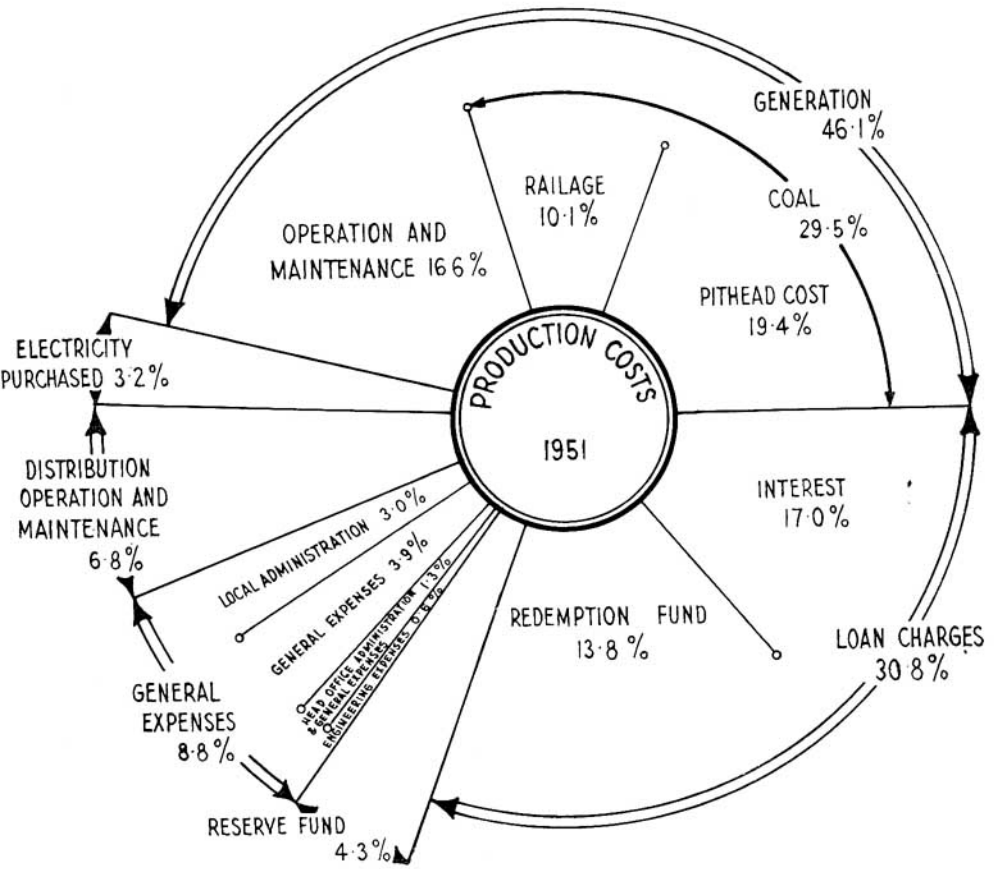
A chart showing annual sales of electricity is on page 7. Statement No, 3 of Annexure B gives units sold to all consumers for the past 27 years, and the distribution of units sold is shown in Statement No. 4.

COSTS AND TARIFFS

The continued steep rise in the cost of power production has already been mentioned, with an intimation that higher costs must entail higher charges for electricity suppled. During 1951 it became necessary to raise charges to consumers on the Witbank Supply System, and from 1st January, 1952, charges had to be increased in the Alice section of the Border Undertaking. The position regarding revision of tariff charges to Rand Undertaking consumers is dealt with on page 48.

From the figures on page 16 it will be seen that while the Commission's revenue rose by 15 per cent to £10,955,565, production costs rose by nearly 16 per cent to £11,102,484; thus the year's operations resulted in a deficit of £146,919. Working costs were increased by capital charges on the cost of plant and equipment brought into commission, and there was an increase of £625,746 in the cost of coal consumed, including railage. While consumption of coal increased by 5·4 per cent, its cost, including railage, increased by 23·6 per cent.

Surpluses or deficits on the year's working at Undertakings are commented upon in the Auditor's Report and in sections of this Report dealing with the various Undertakings.



The standard prices for the supply of electricity from the Commission's Undertakings and the conditions attaching thereto are embodied in the licenses and permits granted to the Commission by the Electricity Control Board. These prices are subject to adjustment from time to time in terms of the Electricity Act, 1922, and the standard prices are subject, where necessary, to variation in terms of Section 26 of the Act, dependent upon the situation, extent and characteristics of consumers' loads.

STATISTICAL SUMMARY

Revenue, production costs, output, sales, and other figures relating to the operation of the Commission's Undertakings during the year 1951, with the comparative figures for 1950, are as follows:—

	1951	1950	Increase
Total Revenue	**£10,955,565**	**£9,526,071**	**15·01%**
Total Production Costs (including interest, redemption and reserve fund charges)	**£11,102,484**	**£9,579,968**	**15·89%**
Difference between Revenue and Production Costs ...	**Dr. £146,919**	**Dr. £53,897**	**Dr. £93,022**
Average price per unit sold	**0·3506d.**	**0·3289d.**	**6·60%**
Average revenue per unit sold (including Sundry Revenue)	**0·3526d.**	**0·3308d.**	**6·59%**
Average cost per unit sold	**0·3574d.**	**0·3327d.**	**7·41%**
Units generated	**8,326,567,811**	**7,773,576,519**	**7·114%**
Units sent out	**7,806,653,518**	**7,286,452,668**	**7·139%**
Units sold	**7,456,490,147**	**6,910,583,902**	**7·900%**
Total cost of coal consumed (including railage) ...	**£3,276,709**	**£2,650,963**	**23·60%**
Railage on coal consumed	**£1,120,602**	**£867,042**	**29·24%***
Coal consumed (in tons of 2,000 lb)	**7,344,771**	**6,970,414**	**5·37%.**

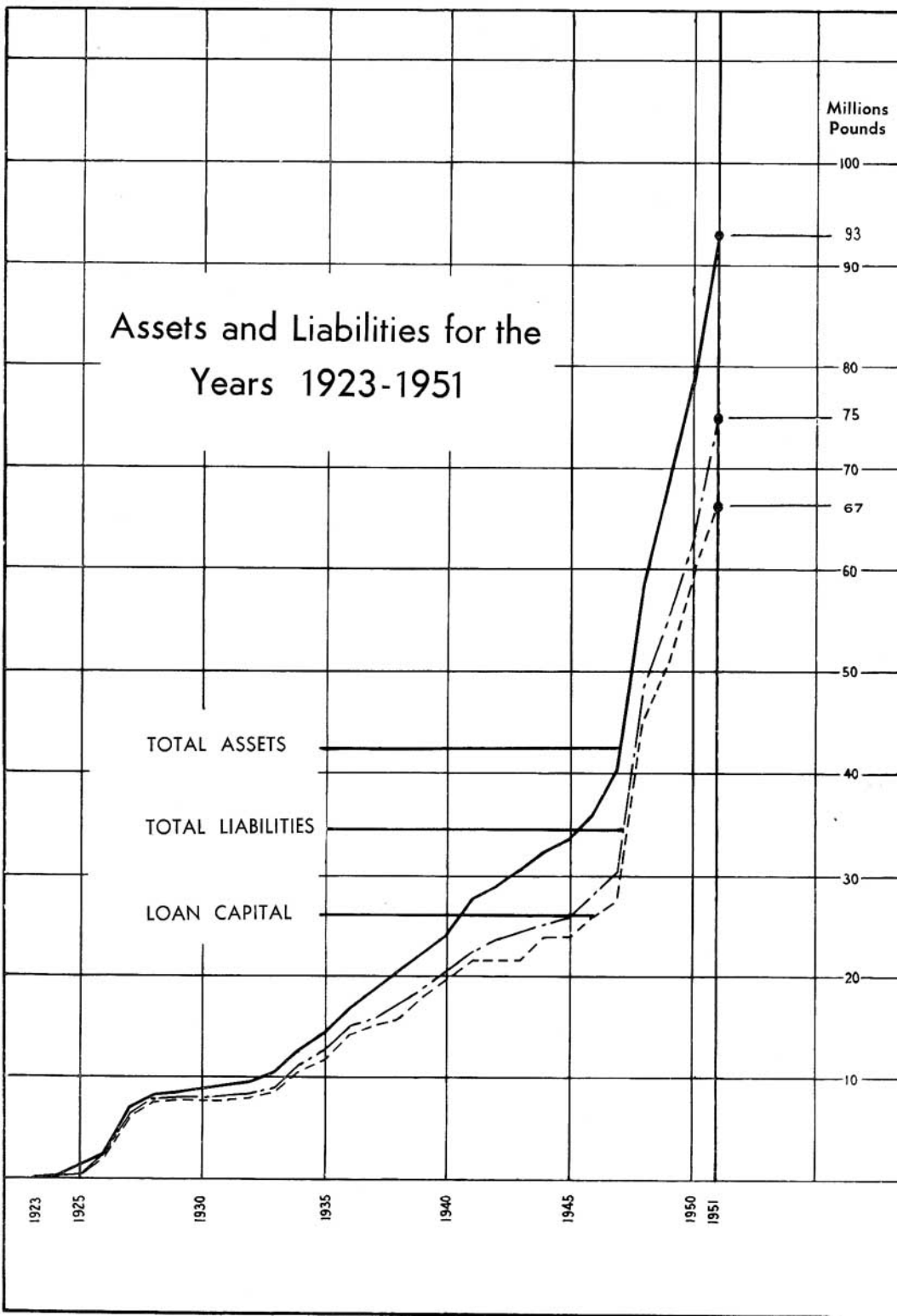
***Increase in railage rates 22·66%**

A diagram showing the subdivision of the Commission's total production costs for the year 1951 is reproduced on page 15.

FINANCIAL

Loan Capital—A loan of £5,000,000 bearing interest at 3¾ per cent per annum, redeemable on 31st October, 1964/68, was raised at £99% on 10th May, 1951. The loan was fully subscribed and the lists were closed on the day of issue.

As a result of negotiations during the latter half of 1950 between representatives of the International Bank for Reconstruction and Development and the Commission, an agreement was signed on the 23rd January, 1951, whereby the Bank granted the Commission a loan of $30,000,000 U.S.A. at par, at 4 per cent per annum interest for a period of twenty years, repayable in equal half-yearly instalments, including interest, from the 15th May, 1954. The loan is to be used only for the purchase of imported materials, mainly from the United Kingdom, and is to be taken up during the period ending 31st December, 1953. The amount


Assets and Liabilities for the Years 1923-1951
Millions Pounds
100
93
90
80
75
70
67
60
50
40
30
20
10
TOTAL ASSETS
TOTAL LIABILITIES
LOAN CAPITAL
1923
1925
1930
1935
1940
1945
1950
1951

taken up to the 31st December, 1951, was $6,883,110, equivalent to £2,468,170 South African currency. This is the Commission's first external loan, as all other loans have been raised in South Africa. These amounts increased the Commission's loan capital at the date of the Balance Sheet to £66,968,170.

Reserve and Redemption Funds—The amount in the Reserve Fund at 31st December, 1951, stood at £2,271,059, and the Redemption Fund at that date amounted to £15,733,451, which 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 investments. The amounts in the Fund include the proceeds from the sales of assets and profits on realisation of investments.

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, 1951, was £17,675,152, the nominal value being £17,702,013. The market value of these investments at that date was £15,931,472.

Capital Expenditure—Expenditure on Capital Account during the year amounted to £11,077,317, which brought the total capital expenditure at 31st December, 1951, to £68,641,577. Expenditure on Capital Account will amount to approximately £171,200,000 on completion of all the works to which the Commission is committed and on projected works.

Assets and Liabilities—The Commission's total assets at 31st December, 1951, amounted to £93,124,315, and its total liabilities to £75,048,542, the excess of assets (as shown in the Balance Sheet) over liabilities being £18,075,773. A graph showing the growth of assets and liabilities since 1923 is reproduced on page 17.

STAFF

Home Ownership Scheme—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, totalled £272,801 at 31st December, 1951, of which amount £67,713 had been repaid at that date.

Personnel—The staff employed by the Commission at the 31st December, 1951, numbered 10,336, made up as follows:

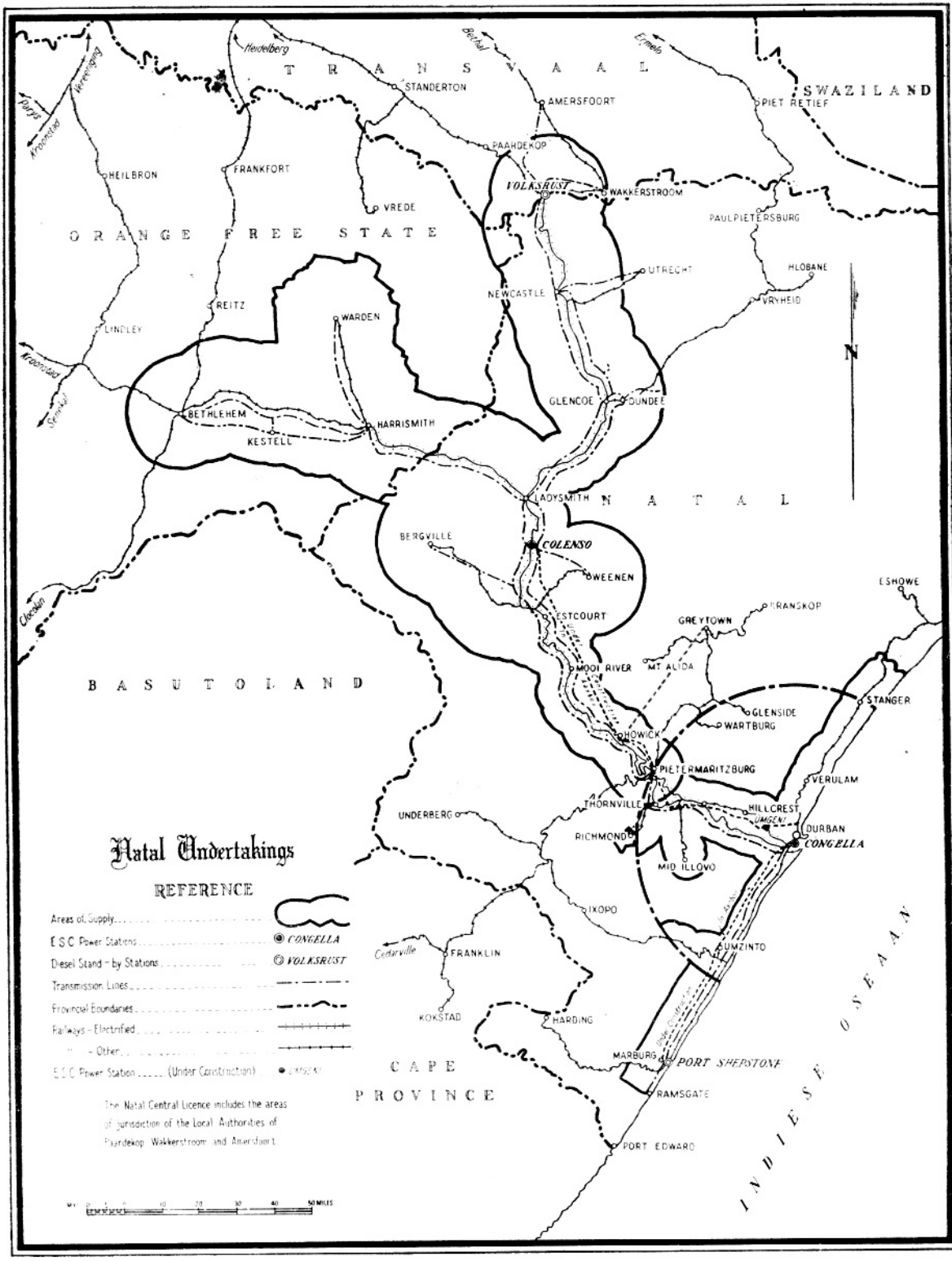
Europeans increased from	3,286	to	3,571
Non-Europeans increased from	6,066	to	6,765
	9,352		10,336

The Commission desires to express to all members of the staff its appreciation of their loyal and conscientious efforts, which have contributed so largely to the achievements recorded herein.

COMMISSION'S UNDERTAKINGS

The operations and developments of the individual Undertakings are reviewed in detail in the following pages.

General Note applicable to all Undertakings: The expression "Working Costs" includes interest charges and Redemption Fund contributions on loan capital and amounts set aside to Reserve Fund.


Heidelberg
TRANSVAAL
Bethal
Ermelo
SWAZILAND
PIET RETIEF
STANDERTON
AMERSFOORT
PAARDEKOP
VOLKSRUST
WAKKERSTROOM
PAULPIETERSBURG
Vereeniging
Parys
Kroonstad
HEILBRON
FRANKFORT
VREDE
ORANGE FREE STATE
UTRECHT
HLOBANE
NEWCASTLE
VRYHEID
REITZ
WARDEN
LINDLEY
N
Kroonstad
Senekal
GLENCOE
DUNDEE
BETHLEHEM
HARRISMITH
KESTELL
LADYSMITH
NATAL
BERGVILLE
COLENSO
WEENEN
ESHOWE
Clocolan
ESTCOURT
GREYTOWN
KRANSKOP
MOOI RIVER
MT ALIDA
BASUTOLAND
GLENSIDE
STANGER
HOWICK
WARTBURG
PIETERMARITZBURG
VERULAM
THORNVILLE
HILLCREST
UMGENI
UNDERBERG
DURBAN
RICHMOND
CONGELLA
MID ILLOVO
IXOPO
UMZINTO
Cedarville
FRANKLIN
KOKSTAD
HARDING
MARBURG
PORT SHEPSTONE
CAPE
PROVINCE
RAMSGATE
PORT EDWARD
INDIESE OSEAAN
Natal Undertakings
REFERENCE
Areas of Supply
E S C Power Stations
CONGELLA
Diesel Stand - by Stations
VOLKSRUST
Transmission Lines
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.
0 10 20 30 40 50 MILES

NATAL CENTRAL UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase		1951	1950
			%	£	d	d
Traction	1	256,805,513	3·381	471,262	0·4404	0·4359
Bulk	12	126,903,898	12·144	289,019	0·5466	0·5339
Mining	8	17,790,135	15·753	51,037	0·6885	0·6622
Industrial	406	23,364,230	5·988	78,024	0·8015	0·7856
Domestic and Lighting	3,400	8,520,873	12·981	69,724	1·9638	1·9805
	3,827	433,384,649	6·608	959,066	0·5311	0·5193

	1951	1950	Accumulated to 31.12.51
Total Revenue	£975,887	£894,218	
Working Costs	£965,650	£893,067	
Surplus	£10,237	£1,151	£169
Capital Expenditure	£737,248	£505,541	£7,490,751
COLENSO POWER STATION—			
Units Sent Out	471,475,920	439,517,520	
Maximum half-hour Demand kW S.O.	87,990	85,000	
Station Peak kW	108,000	100,000	
Load Factor %	61·2	59·0	
Thermal Efficiency % Sent Out ...	19·09	19·19	
COAL:			
Consumption—tons	345,444	317·320	
Average per unit sent out—lb	1·465	1·444	
Calorific Value B.Th.U./lb ...	12,200	12,310	
Total Cost	£246,513	£208,404	
Cost per ton	14s 3d	13s 2d	

Output and Sales—The demand from all classes of consumers continues to increase. Units sold record an increase of 6·6 per cent over the previous year, and the number of consumers rose from 3,557 in 1950 to 3,827 in 1951.

Colenso Power Station—In view of the continued increase in demand for power, the delays in delivery of much-needed plant are unfortunate. Material for three 180,000-lb/hr boilers started to arrive in March, 1952, and foundation work is in progress. They are due to steam in April, July and October, 1953. No. 8 turbo-generator, 25,000-kW, is now expected to be commissioned during the first half of 1953.

Continuity of supply was well maintained throughout the year, there being only one failure, of short duration.

Supplies of coal continued to be precarious. At no time did stocks amount to a fortnight's requirements, and there were occasions when stocks fell to about one day's usage.

Distribution System—Construction of the 132-kV interconnector between Colenso and Springfield (Durban) has proceeded well, 86 of the 122 miles having been erected, but, owing to difficulties in obtaining servitudes and thus determining the exact route, it was not possible to order towers to enable erection to be completed in one operation. Construction gangs were therefore released towards the end of the year, to be recalled when steel towers arrive. Despite delay in erection of the 132-kV substations, the line should be in commission by the end of 1952.

Work has been almost completed at the main substations referred to in last year's Report: Cedara, Newcastle, Dannhauser, Wessels Nek, Ladysmith, Estcourt and Pietermaritzburg.

Agreements for supply have been signed by the municipalities of Greytown, Vrede and Reitz. The engineering of this work, which will entail the construction of about 160 miles of 33-kV line, is in hand, and orders have been placed for most of the material required. Work on the Greytown line is to begin in April, 1952, and is due for completion by April, 1953.

Work has begun on servitudes and survey for the supply to Reitz and Vrede.

A project has been approved for the construction of a 33-kV line from Thornville to Richmond, to strengthen supply in that area.

Rural Supplies—Owing to shortage of materials it is still impossible to meet in full the demand for electricity in rural areas, but during the year 51 miles of 11-kV line were constructed to supply the Winterton Farmers' scheme, and by the year's end 13 of the 44 farms were connected. Altogether 69 new rural consumers were connected during 1951.

Housing—Erection of the twelve houses at Colenso referred to in last year's Report has been completed, and an additional house has been purchased.

Financial—A surplus of £10,237 on the year's working converted an accumulated deficit of £10,068 at the end of 1950 to an accumulated surplus of £169 at the end of 1951.

WITBANK UNDERTAKING

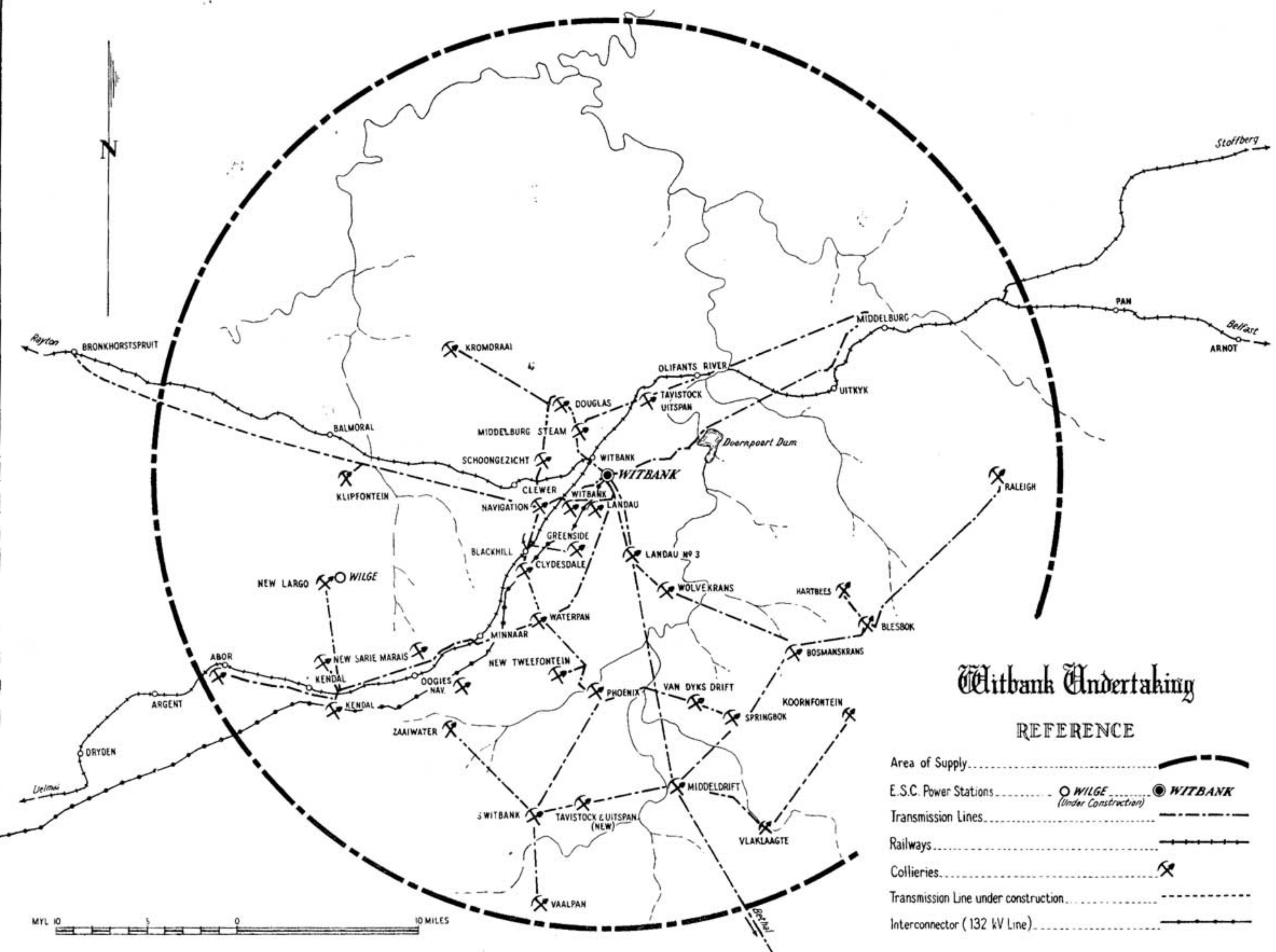
CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase or Decrease		1951	1950
			%	£	d	d
Traction	1	181,216,771*	+ 3·068	255,227	0·3380	0·3364
Bulk	3	6,225,900†	+ 7·427	16,552	0·6380	0·5355
Mining	32	75,647,358	+ 5·068	149,436	0·4741	0·4171
Industrial	91	118,831,482	− 1·455	134,473	0·2716	0·2242
Domestic and Lighting	1,675	4,906,215	+13·998	25,088	1·2272	1·0991
	1,802	386,827,726†	+ 2·198	580,776	0·3603	0·3278

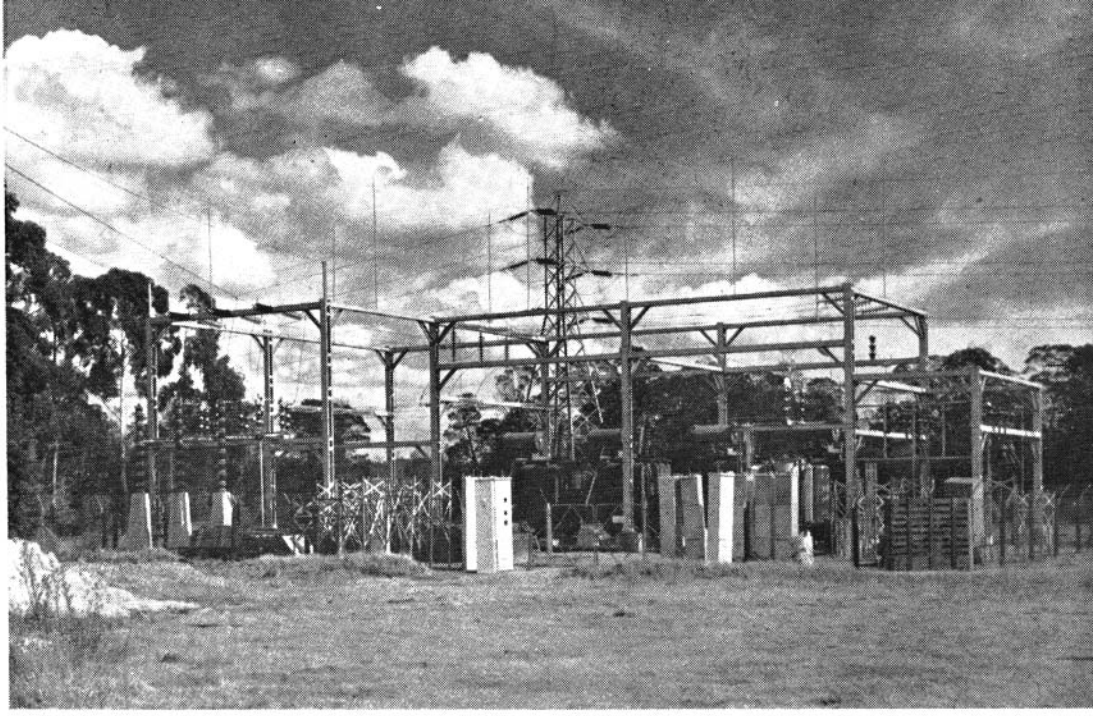
	1951	1950	Accumulated to 31.12.51
Total Revenue	£885,116	£819,311	
Working Costs	£876,059	£839,125	
Surplus	£9,057	—	
Deficit	—	£19,814	£9.287
Capital Expenditure	£285,651	£163,056	£3,545,612
WITBANK POWER STATION—			
Units Sent Out	795,147,419	779,947,554	
Maximum one hour Demand kW S.O.	105,126	103,089	
Load Factor %	86·3	86·4	
Thermal Efficiency % Sent Out ...	16·88	16·21	
COAL:			
Consumption—tons	740,740	748,370	
Average per unit sent out—lb ...	1·863	1·919	
Calorific Value B.Th.U./lb ...	10,850	10,970	
Total Cost	£165,285	£156,129	
Cost per ton	4s 6d	4s 2d	

* Units purchased and interchanged.
† 579,567,578 units sent to Rand Undertaking and not included.

The preceding statistics include sales by the Witbank Local Supply System to the towns of Bethal, Witbank, Middelburg and Bronkhorstspruit, to adjacent electro-chemical and other smaller industries, to coal mines and to domestic and lighting consumers. These sales amounted to 205,610,955 units in 1951, an increase of 1·444 per cent over the 1950 figure.

Output and Sales—Operating statistics for the Undertaking again record a steady increase in output and sales. Units supplied to the Rand Undertaking system rose from 573·1 million in 1950 to 579·6 million in 1951.


Witbank Undertaking
REFERENCE
Area of Supply
E.S.C. Power Stations
WILGE (Under Construction)
WITBANK
Transmission Lines
Railways
Collieries
Transmission Line under construction
Interconnector (132 kV Line)
N
MYL 10
5
0
10 MILES
Stoffberg
Belfast
ARNOT
PAN
Rayton
BRONKHORSTSPRUIT
BALMORAL
KLIPFONTEIN
KROMDRAAI
DOUGLAS
MIDDELBURG STEAM
SCHOONGEZICHT
CLEWER
NAVIGATION
WITBANK
LANDAU
GREENSIDE
BLACKHILL
CLYDESDALE
OLIFANTS RIVER
TAVISTOCK
UITSPAN
MIDDELBURG
UITKYK
Doornpoort Dam
RALEIGH
LANDAU No 3
WOLVEKRANS
HARTBEES
BLESBOK
BOSMANSKRANS
NEW LARGO
WILGE
WATERPAN
MINNAAR
NEW SARIE MARAIS
KENDAL
ABOR
ARGENT
DRYDEN
Delmas
OOGIES
NAV.
NEW TWEEFONTEIN
PHOENIX
VAN DYKS DRIFT
SPRINGBOK
KOORNFONTEIN
ZAAIWATER
MIDDELDRIFT
S. WITBANK
TAVISTOCK & UITSPAN (NEW)
VLAKLAAGTE
VAALPAN
Bethal



WITBANK: 88 kV stepup substation

[Photo B.R.S. Photographers

Plant shortage necessitated restriction of supply during peak hours to consumers on the Witbank Supply System, involving the interruption of supply to sections of Witbank Township for periods of about 15 minutes at a time on a number of evenings during the winter of 1951. It was also necessary to request collieries to reduce their loads.

To meet expanding demand, two 80,000-lb/hr boilers and a 20,000-kW turbo-generator are under erection at Witbank Power Station. It is expected that the new set will be commissioned during February, 1953, and that the new boilers will come into operation during 1953. No. 6 spraypond, to meet the requirements of the new generator, has been completed.

Distribution System—The 44 mile, 88-kV line from Bethal to Standerton was commenced and completed during 1951 and will be commissioned in 1952, on completion of the step-down substation at Standerton. This line is the first at that voltage constructed by the Commission utilising wooden poles and cross-arms. The 88-kV circuit-breaker for the transformers at Middeldrift substation was under erection early in 1952, but the Petersen coil and auxiliary equipment, urgently required for the 88-kV step-up substation at Witbank, had not yet been delivered. Interruptions in supply to consumers resulted from this delay in delivery. The line feeds into a Rand Undertaking substation at the Standerton terminal.

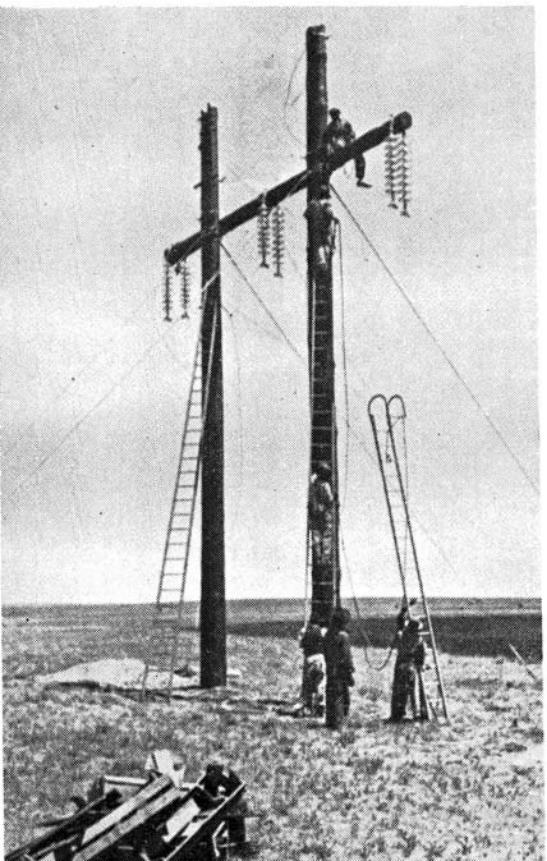
On the 21-kV network a 10 mile extension was made from Vlaklaagte No. 35 to Koornfontein, to supply the new colliery there, and another of nearly 7 miles from Kendal substation to Vlakfontein No. 50, to supply New Largo Colliery. The latter line will eventually serve as a feeder out of the new Wilge Power Station. Terminal arrangements for the standby 21-kV cable from the power station to the 88-kV step-up substation at Witbank were completed and placed in commission.

Substations at Koornfontein and New Largo were completed, and alterations were carried out at Vlaklaagte and Kendal for feeding new outgoing lines. Eight other substations on the 21-kV network were enlarged, to cater for the growing loads at collieries.

The heavy power cables laid in 1950 to the new Rand Carbide factory were placed in commission. The changeover at the factory awaits the completion of certain work being done by the consumer.

Reconstruction of the line from Doornpoort Dam to Middelburg Town was started early in 1952, with alterations to the Middelburg substation to make 11-kV supply available to the town. Re-coppering of the Waterpan to Kendal line will also be undertaken.

Financial—Following a tariff increase which became effective from 1st January, 1951, revenue increased by £65,805 and although working costs rose by £36,934, the year's working resulted in a surplus of £9,057 which reduced the accumulated deficit from £18,344 in 1950 to £9,287 in 1951.



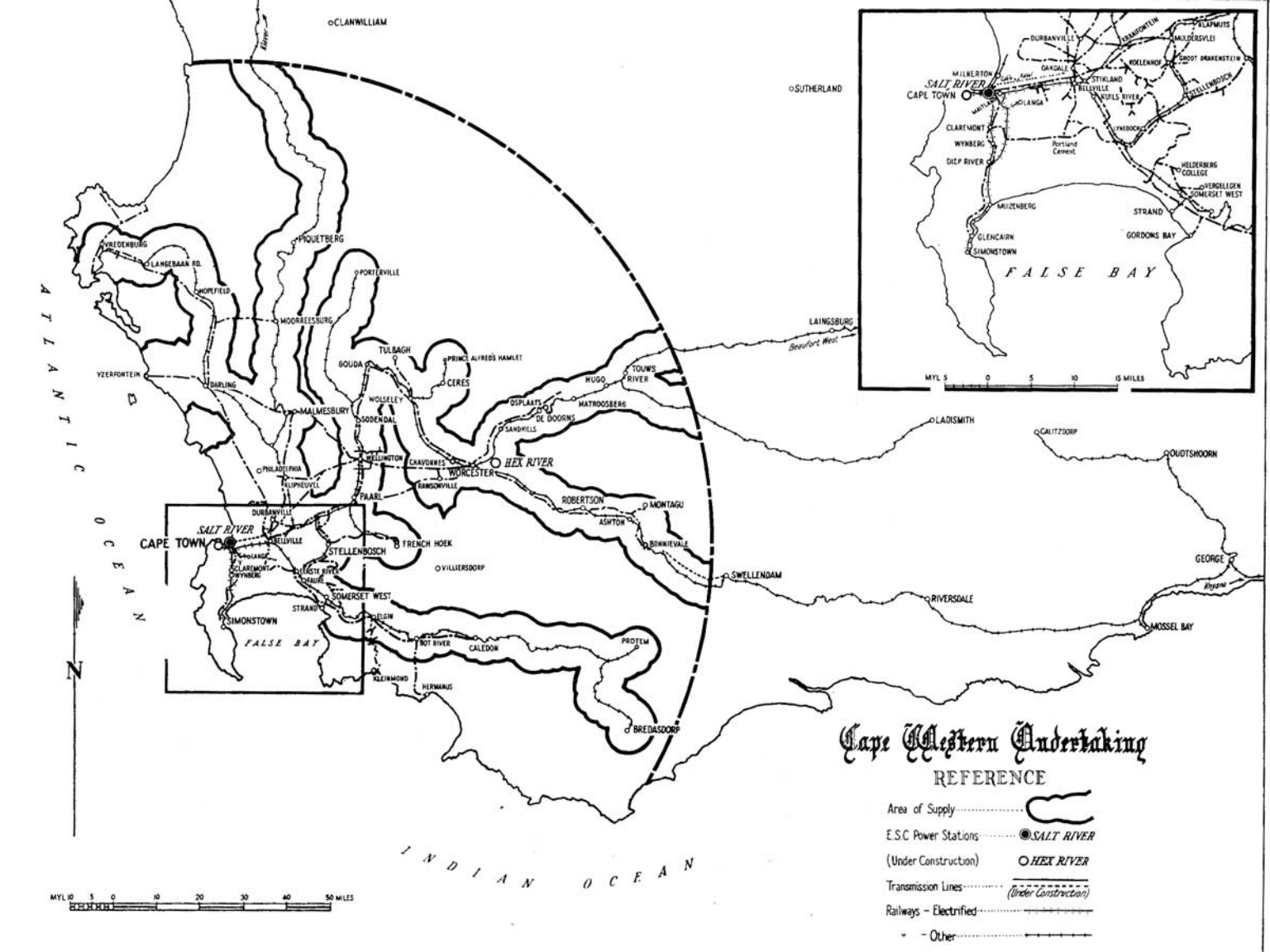
H-TYPE STRAIN MAST,
88-kV wooden pole transmission line,
Bethal to Standerton.

CAPE WESTERN UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase		1951	1950
			%	£	d	d
Traction	1	59,516,598	2·990	161,600	0·6517	0·6620
Bulk	18	79,482,369	15·039	228,965	0·6914	0·6555
Industrial	1,483	102,492,356	10·343	380,377	0·8907	0·8554
Domestic and Lighting	16,576	61,985,053	18·888	303,561	1·1754	1·2144
	18,078	303,476,376	11·612	1,074,503	0·8498	0·8323

	1951	1950	Accumulated to 31.12.51
Total Revenue	£1,080,557	£946,537	
Working Costs	£1,128,111	£959,395	
Surplus	—	—	£5,783
Deficit	£47,554	£12,858	—
Capital Expenditure	£2,506,044	£1,537,392	£9,294,559

	Salt River Power Station		Worcester Power Station	
	1951	1950	1951	1950
Units Sent Out ...	194,731,379	189,124,992	1,391,820	1,938,774
Maximum half-hour Demand kW S.O.	61,850	61,750		
Station Peak kW ...	68,800	68,000		
Load Factor % ...	36·0	35·0		
Thermal Efficiency % S.O.	18·42	17·96		
FUEL:				
Coal Consumed — tons	145,920	143,141		
Average per unit sent out—lb	1·499	1·514		
Calorific Value B.Th.U./lb	12,350	12,550		
Total Cost	£246,619	£232,025		
Cost per ton	33s 10d	32s 5d		
Fuel Oil consumed—lb			792,808	1,123,929
Fuel Oil per unit sent out—lb			0·566	0·580



Cape Western Undertaking

REFERENCE

Area of Supply

E.S.C. Power Stations ..... SALT RIVER

(Under Construction) ..... HEX RIVER

Transmission Lines ..... (Under Construction)

Railways – Electrified .....

" – Other .....

General—The preceding statistics demonstrate the growth in the demand for electricity, and during 1951 progress and expansion continued in regard to the connection of new consumers and the development of the major transmission system, although a considerable amount of the construction work carried out on the transmission system had not, by the end of the year, reached completion.

Arrangements between the Commission and the Cape Town City Council continued to operate in terms of the Pooling Agreement of 1933. The total number of units sent out from the pooled stations was 937,832,640, an increase of 67,107,798 units over the 1950 figure. The Commission's Salt River station sent out 194,731,379 units in 1951, the corresponding figure for 1950 being 189,124,992.

Coal—Coal supply difficulties continued to be acute. With the co-operation of the South African Railways Administration it was just possible to keep the power stations running uninterruptedly, but there were times when coal reserves were almost nil.

System Operation—Continuity of generation and supply was maintained throughout 1951, except for three major interruptions, due to trouble at the City Council's Table Bay Power Station. Those on February 15th and 20th, due to vacuum trouble caused by marine fouling of condensing plant, involved interruptions to sections of the City Council's area ranging from five minutes to four hours. The third interruption occurred on October 29th, when a generator exciter developed trouble resulting in loss of supplies in the Council's area for periods up to three hours. Restrictions on consumption which became necessary when load exceeded the generating capacity of the pooled stations in April, 1952, are described on page 8. Fortunately it was possible to relieve the strain throughout the system by speeding up initial operation at Hex River Power Station to June 2nd.

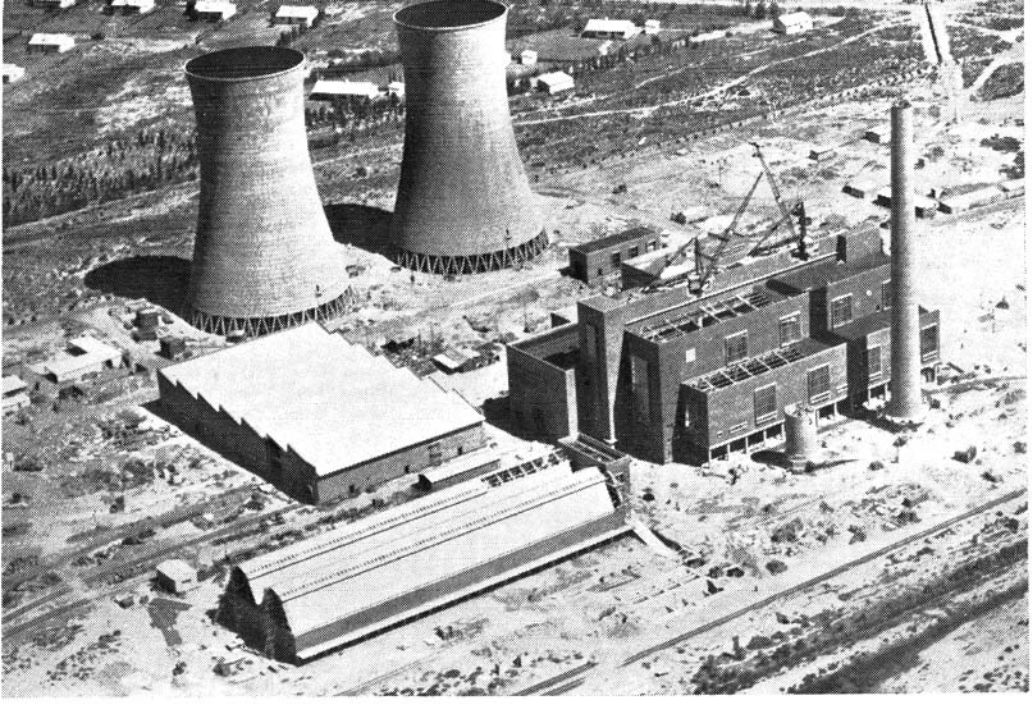
On the distribution system supplies were successfully maintained except for minor outages.

Major Transmission System—Two main sections of this system were put into commission during the year: the Wellington to Worcester 66-kV line via Tulbagh Kloof, which enabled supplies to Worcester and beyond to be converted from 33 to 66 kV, and the conversion to 66-kV of the Wellington to Paarl section. The new substation at Paarl was put into service during February.

Work proceeded on other major projects, including the Oakdale to Somerset West 66-kV line and the changeover of the Oakdale to Paarl line to 66-kV construction, but they were not ready for commissioning by the end of the year. No progress was made on the Worcester to Touws River 66-kV section, as the Contractor's personnel were required for urgent work elsewhere; they are due to return about the middle of 1952.

Some trouble was experienced in negotiating with property owners for rights of way in respect of major and subsidiary transmission lines, but it was possible to achieve the desired results without significant delay to construction work.

Load Growth and System Planning—It has become evident that the post-war growth of load has been such that the major transmission system, as planned, will prove insufficient to meet the expanding demand. A proposal is under consideration for the provision of two 66-kV underground feeders from Salt River Power Station to Oakdale, and the construction of a 66-kV overhead line from Oakdale to Stellenbosch. It is estimated that these measures, with certain minor additions, should prove sufficient to carry the system up to 1961.



HEX RIVER POWER STATION
Aerial view, January, 1952.

[Photo Robin Summers

Urban Development—In the Commission's reticulation areas of Bellville, Parow and Goodwood, transformer capacity has been increased at five minor substations, and a new brick-built substation on the site of the old Bellville switchpoint has been commissioned. The main transformer capacity feeding into the urban system has been increased by some 6,000 kVA, and additional units are on order.

In these areas 1,008 consumers were connected, 8 of whom were large users.

Rural Development—A number of large users were connected in rural areas, among the most important being six fisheries in the Vredenburg area. An interesting recent development is the number of farmers who, in various sections, have combined to provide the capital needed for the supply of electricity to their areas. In the 16 months, January, 1951, to April, 1952, 83 farmers have thus provided capital to a total amount of £42,113. Of this amount, £23,100 was provided by a group of 32 farmers in the Tulbagh area.

In January, direct bulk supplies were provided for Somerset West and Strand, which had previously been supplied via Cape Explosives Works, Ltd.

Altogether 337 applicants for electricity accepted our terms, and 428 consumers, including a backlog from previous years, were connected.

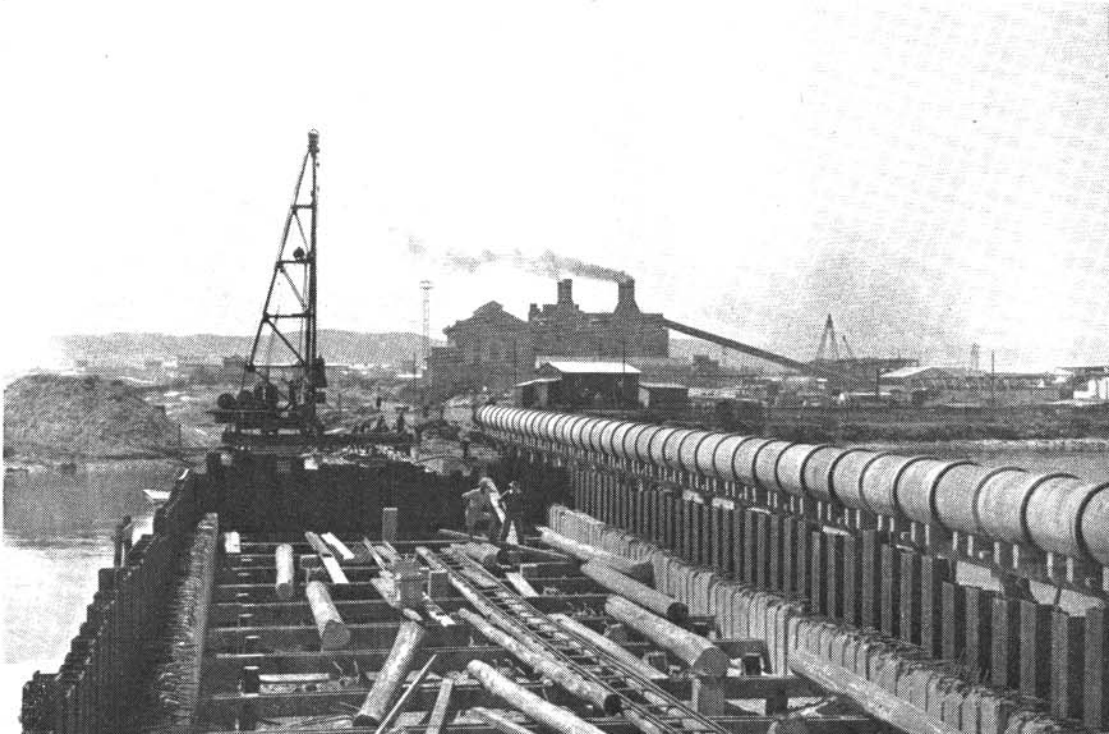
Land and Buildings—Substation sites were purchased in Goodwood, Elsies River, Tiger Valley, Bellville and Durbanville, and two morgen of land adjacent to the Oakdale site were purchased for stores and depot purposes. District linesmen's houses were built at Stellenbosch and Caledon. Agreement was reached with the Stellenbosch Municipality for the construction of quarters for Native labourers, and building work will proceed during 1952.

New Power Stations—Developments in connection with the new Hex River and Salt River No. 2 stations are reported on page 9.

Financial—Revenue exceeded £1 million for the first time in 1951, rising by £134,020 to £1,080,557, while working costs increased by £168,716 to £1,128,111. A deficit of £47,554 on the year's working reduced the accumulated surplus to £5,783. Capital charges incurred on transmission and distribution projects to meet consumers' increasing requirements, and increased cost of labour and materials, continued to be major factors in rising costs.

Capital expenditure on work in progress exceeded £2½ million in 1951, and in the last three years amounted to a total of almost £5½ million. This heavy expenditure was mainly incurred in connection with the construction of Hex River Power Station, major extensions to the transmission system, and preparations for electrification of the railway main line from Bellville to Touws River. The resultant increase in annual expenditure is expected to exceed the growth in revenue based on the tariffs at present in force, and makes inevitable an increase in charges for electricity.

COFFER DAM FOR SALT RIVER No. 2
Power Station.



Above: **CONGELLA POWER STATION, 1951.**
[Photo Air Survey Co.

Below: **UMGENI POWER STATION under construction, November, 1951.**
[Photo Whysalls

DURBAN UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase or Decrease		1951	1950
			%	£	d	d
Traction	1	41,827,720	− 0·425	75,842	0·4352	0·4283
Bulk	2	541,182,411	+11·072	947,697	0·4203	0·4192
Industrial	217	22,876,091	− 1·114	54,180	0·5684	0·5454
Domestic and Lighting	3,047	11,067,022	+17·846	80,430	1·7442	1·7516
	3,267	616,953,244	+ 9·824	1,158,149	0·4505	0·4473

	1951	1950	Accumulated to 31.12.51
Total Revenue	£1,161,909	£1,048,687	
Working Costs	£1,145,390	£1,023,708	
Deficit	—	—	£12,893
Surplus	£16,519	£24,979	—
Capital Expenditure	£999,220	£768,985	£6,796,614

	Congella Power Station Nos. 1 and 2		Port Shepstone Power Station	
	1951	1950	1951	1950
Units Sent Out ...	596,367,170	542,105,800	1,706,676	989,077
Maximum half-hour Demand kW S.O.	131,820	120,859	3,366	2,690
Station Peak kW ...	143,700	135,400	3,430	2,800
Load Factor % ...	51·6	51·2	3·7	4·2
Thermal Efficiency % S.O.	21·47	20·67		
FUEL:				
Coal Consumed — tons	393,087	366,413		
Average per unit sent out—lb	1·318	1·352		
Calorific Value B.Th.U./lb	12,060	12,210		
Total Cost	£393,335	£356,007		
Cost per ton	20s 0d	19s 5d		
Fuel Oil consumed—lb			617,199	566,357
Fuel Oil per unit sent out—lb			0·573	0·573

Output and Sales—The foregoing statistics illustrate the rapid and continuing increase in demand for electricity. Sales during each of the last two years show an increase approaching 10 per cent over those of the preceding year. The maximum two-minute demand on Congella Power Station reached 143,700 kW in 1951, compared with 135,400 kW in 1950.

Congella Power Station—Continuity of supply was maintained throughout the year, with the exception of two interruptions in July, the first for 29 minutes when four feeders were affected, and the second for two minutes on one feeder.

Shortage of coal continued to cause grave concern. Only once during the year was the coal storage filled to capacity, whereas on several occasions stocks fell below one day's usage.

Although a new 40,000-kW turbo-generator was commissioned in March, it will not be fully available until the three new 200,000-lb/hr boilers are commissioned towards the end of 1952, and plant capacity will be barely sufficient to meet the anticipated load during the winter months.

Work has been completed on the electrostatic precipitators installed to obviate the dust nuisance experienced by residents in the vicinity of the power station. Four mechanical dust-collection equipments have been ordered for boilers Nos. 1 to 4, and delivery is expected late in 1952.

Umgeni Power Station—The new Umgeni Power Station, which is expected to begin operating during the second half of 1953, is described on page 10. Work has begun on the Springfield substation, which will be the terminal of the 132-kV interconnector line between Colenso, Umgeni and Congella. The foundations are almost complete, a start has been made on the superstructure, and the 33-kV switchgear has arrived on site.

South Coast—On the South Coast 14,586,849 units were sold in 1951, an increase of 14·5 per cent over the 1950 figure. Demand in this area continues to increase rapidly.

The new 88-kV line as far as Umzinto was commissioned in October and is giving satisfactory service. It is hoped that the line to Marburg will be energised in June, 1952. The demand south of Marburg has outgrown the supply which can be given by the two existing 11-kV lines, so it has been decided to extend the 88-kV line to Margate. The work is in hand and should be completed by September, 1952. With the completion of the new line, the troubles hitherto attending the supply to the South Coast area should be ended, and some of the old lines will be dismantled.

North Coast—945,519 units were sold in this area, compared with 698,169 units in the previous year. There were some serious outages during the year, due to faults in the Durban Corporation network, but the scheme is making steady progress.

Rural Supplies—3·3 miles of medium-voltage line were constructed in 1951, and 9·5 miles of 6·6-kV were converted to 11-kV. 52 new rural consumers were connected.

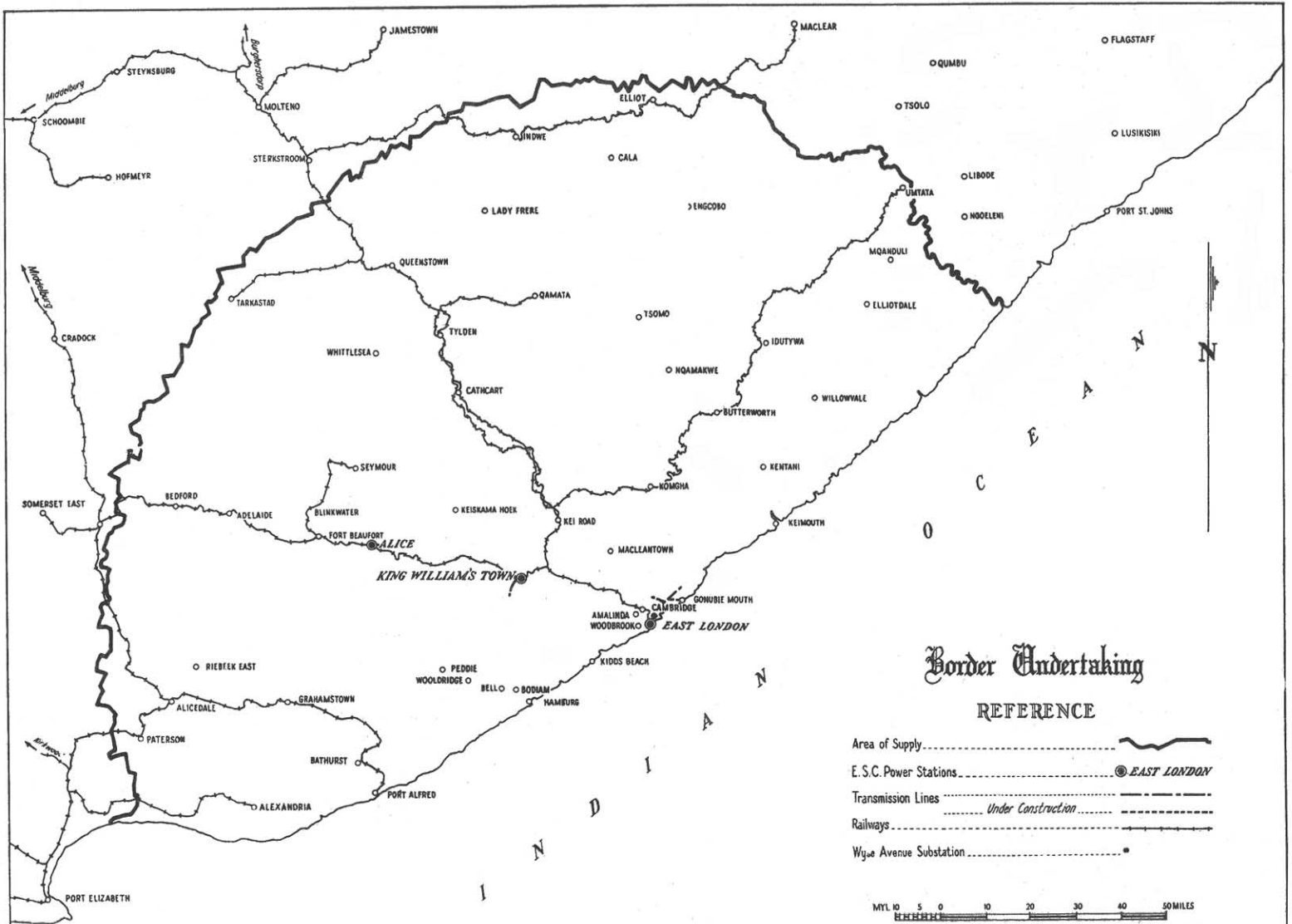
Financial—While revenue increased by £113,222 to £1,161,909, working costs rose by £121,682 to £1,145,390. A revenue surplus of £16,519 reduced the accumulated deficit from £29,412 at the end of 1950 to £12,893 at the end of 1951.

SABIE UNDERTAKING

CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Decrease		1951	1950
			%	£	d	d
Mining	1	6,081,087	3·524	8,419	0·3323	0·3035

	1951	1950	Accumulated to 31.12.51
Total Revenue	£8,419	£7,971	
Working Costs	£8,354	£8,005	
Surplus	£65	—	£110
Deficit	—	£34	—
Capital Expenditure	—	—	£96,170
SABIE POWER STATION—			
Units Sent Out	6,308,900	6,573,100	
Maximum half-hour Demand kW S.O.	1,150	1,260	
Station Peak kW	1,250	1,400	
Load Factor %	62·6	59·6	
RAINFALL:			
Inches at Power Station	45·74	47·52	

The Commission's only hydro-electric station again operated satisfactorily throughout the year, giving uninterrupted service to the gold mine which it supplies.


JAMESTOWN
MACLEAR
FLAGSTAFF
QUMBU
STEYNSBURG
Middelburg
Burgersdorp
MOLTENO
ELLIOT
TSOLO
SCHOOMBIE
JINDWE
LUSIKISIKI
STERKSTROOM
CALA
HOFMEYR
LIBODE
UMTATA
LADY FRERE
ENGCOBO
NQOELENI
PORT ST. JOHNS
MQANDULI
QUEENSTOWN
Middelburg
TARKASTAD
QAMATA
ELLIOTDALE
TSOMO
CRADOCK
TYLDEN
IDUTYWA
WHITTLESEA
NQAMAKWE
CATHCART
WILLOWVALE
BUTTERWORTH
SEYMOUR
KENTANI
KOMGHA
SOMERSET EAST
BEDFORD
ADELAIDE
BLINKWATER
KEISKAMA HOEK
KEI ROAD
KEIMOUTH
FORT BEAUFORT
ALICE
MACLEANTOWN
KING WILLIAM'S TOWN
GONUBIE MOUTH
CAMBRIDGE
AMALINDA
WOODBROOKO
EAST LONDON
RIEBEEK EAST
PEDDIE
KIDDS BEACH
WOOLDRIDGE
BELLO
BODIAM
HAMBURG
ALICEDALE
GRAHAMSTOWN
PATERSON
BATHURST
ALEXANDRIA
PORT ALFRED
PORT ELIZABETH
INDIAN OCEAN
Border Undertaking
REFERENCE
Area of Supply
E.S.C. Power Stations
EAST LONDON
Transmission Lines
Under Construction
Railways
Wyue Avenue Substation
MYL 10 5 0 10 20 30 40 50 MILES

BORDER UNDERTAKING

CONSUMERS — Class	Number	SALES — Units	SALES — Increase	Revenue from Sales	Average Price per Unit Sold — 1951	Average Price per Unit Sold — 1950
			%	£	d	d
Bulk	1	79,233,280	10·182	205,742	0·6232	0·6250
Industrial	115	2,243,581	15·803	16,201	1·7331	1·7942
Domestic and Lighting	1,938	6,457,388	8·692	41,179	1·5305	1·5407
Steam—Industrial	2	131,394	36·422	394	0·7197	0·3819
	2,056	88,065,643	10·239	263,516	0·7181	0·7211

	1951	1950	Accumulated to 31.12.51
Total Revenue	£263,934	£240,728	
Working Costs	£285,048	£240,359	
Surplus	—	£369	
Deficit	£21,114	—	£10,271
Capital Expenditure	£309,905	£144,701	£888,562

	East London 1951	East London 1950	Alice 1951	Alice 1950
Units Sent Out	79,233,280	71,911,330	674,846	583,934
Maximum Half-hour Demand kW S.O.	20,150	17,400	199	197
Load Factor %	44·9	47·2	38·7	33·8
Thermal Efficiency % S.O.	15·52	15·97		
FUEL:				
Coal Consumed—tons	70,333	61,654		
Average per Unit Sent Out—lb	1·775	1·715		
Calorific Value B.Th.U./lb	12,390	12,460		
Total Cost	£110,833	£93,733	£5,086	£3,874
Cost per ton	31s 6d	30s 5d	£18 5s 11d	£15 9s 0d
Fuel Oil consumed—lb			555,970	501,500
Fuel Oil per unit S.O.—lb			0·824	0·859

BORDER UNDERTAKING—(continued)

	King William's Town			
	1951 Steam	1950 Steam	1951 Oil	1950 Oil
Units Sent Out	8,375,937	8,078,389	104,500	17,881
Maximum Half-hour Demand kW S.O.	2,606	2,384	In parallel with steam plant	
Load Factor %	37·1	38·7		
Thermal Efficiency % S.O. ...	13·18	12·84		
FUEL:				
Coal consumed—tons	8,342*	8,234**		
Average per unit S.O.—lb ...	1·992	2·016		
Calorific Value B.Th.U. lb ...	13,090	13,180		
Total Cost	£13,792	£13,030	£467	£109
Cost per ton	33s 1d	31s 8d	£15 4s 6d	£15 10s 10d
Fuel Oil consumed—lb ...			61,354	14,025
Fuel Oil per unit S.O.—lb ...			0·587	0·784

* Includes 130 tons for Steam Supply.

** Includes 93 tons for Steam Supply.

Output and Sales—Sales in 1951 increased by 10·2 per cent over the corresponding figure for 1950, and each of the three power stations recorded a substantial increase in output.

East London—Operational continuity at the power station was maintained without interruption throughout the year.

Good progress was made with the installation of equipment for the extensions to West Bank No. 1 Power Station, comprising two 55,000-lb hr boilers and a 7,500-kW turbo-generator in new buildings, together with extensions to the cooling water system. The new turbo-generator was placed in preliminary operation at 11-kV during November. No. 6 turbo-generator, at present generating at 6·6-kV, will be reconnected during 1952 to generate at 11-kV. The two sets will be coupled to the existing 6·6-kV system through two 10,000-kVA transformers which are in position, one having been placed in service in November. One boiler started in commercial operation during July and the other during August.

The progress of work on West Bank No. 2 Station is reported on page 12.

Consumption has developed considerably along the 7½-mile distribution line from the East London municipal boundary to Gonubie Mouth. The maximum

demand for this section rose from 49 to 252 kVA and the number of consumers from 37 to 125. The Gonubie Brickfields took supply in July with a maximum demand of 144 kVA, and an agreement is being negotiated with Modern Brickfields to take 118 kVA of supply early in 1952, entailing a two mile extension to the Gonubie line. A spur line will be erected to Bonza Bay, to serve 38 consumers.

King William's Town—Units sent out increased from 8,096,270 in 1950 to 8,480,437 in 1951, and the maximum half-hour demand rose from 2,384 to 2,606 kW S.O.

The changeover to the new 11-kV switchboard in the power station proceeded, and all turbo-generators and a number of outgoing reticulation feeder cables are now connected to it.

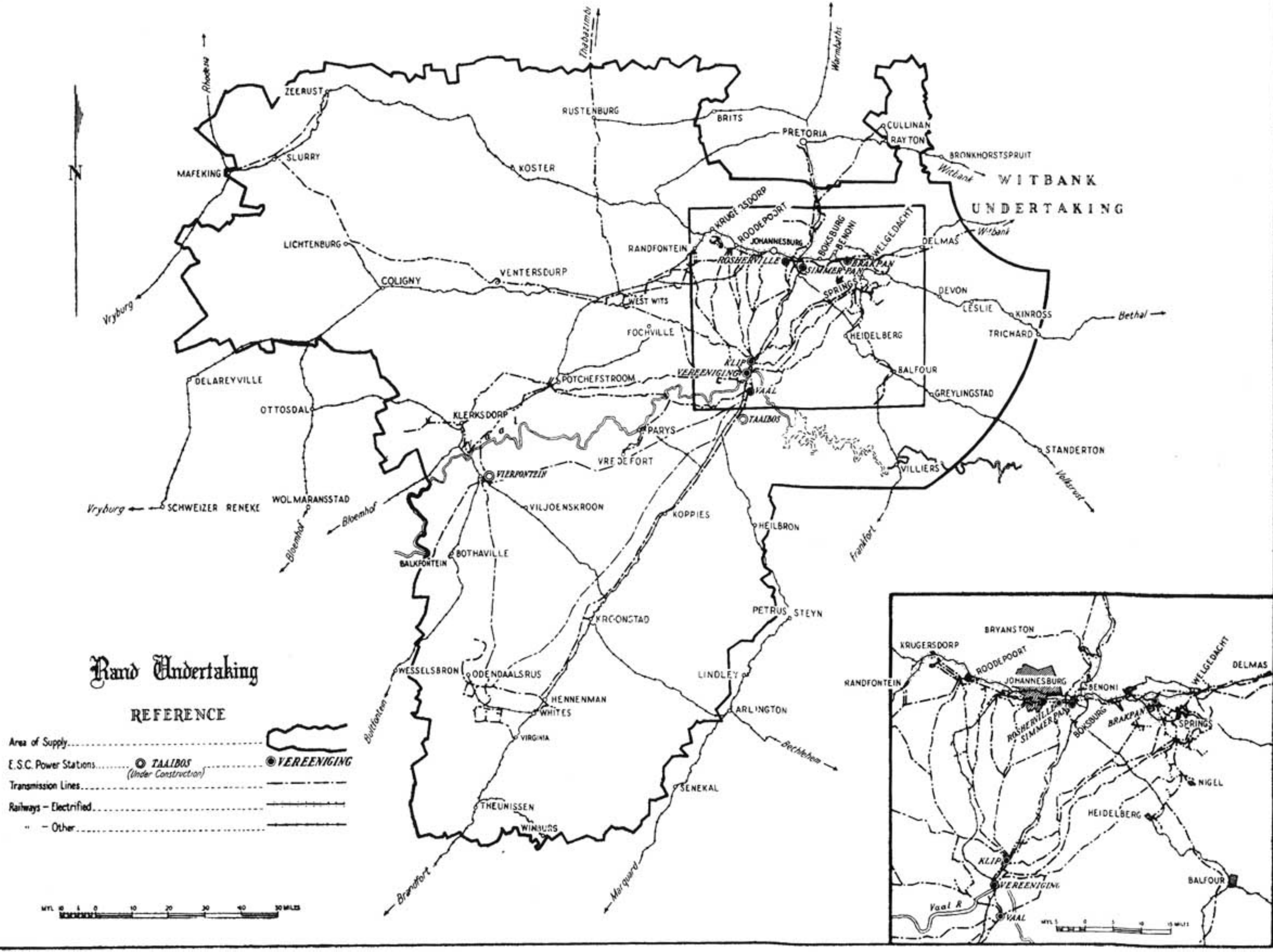
Alice—Units sent out showed an increase from 583,934 in 1950 to 674,846 in 1951, while load factor improved from 33·8 to 38·7 per cent.

The second of two 230-kW diesel engine driven generating sets was commissioned, enabling a 125-kW set to be removed for repair.

The changeover from direct to alternating current for supply to consumers and street lighting proceeded, and was completed in two of the five zones.

Upward revision of charges for electricity became necessary and the new tariff became operative in January, 1952.

Financial—A deficit of £21,114 on the year's working for the Undertaking was due largely to the commissioning of new plant.


Rand Undertaking
REFERENCE
Area of Supply
E.S.C. Power Stations
TAAIBOS
(Under Construction)
VEREENIGING
Transmission Lines
Railways – Electrified
" – Other
MYL 10 5 0 10 20 30 40 50 MILES
N
WITBANK
UNDERTAKING
Rhodesia
Thabazimbi
Warmbaths
ZEERUST
SLURRY
MAFEKING
RUSTENBURG
BRITS
PRETORIA
CULLINAN
RAYTON
BRONKHORSTSPRUIT
Witbank
KOSTER
LICHTENBURG
COLIGNY
VENTERSDURP
Vryburg
KRUGERSDORP
ROODEPOORT
JOHANNESBURG
BOKSBURG
BENONI
WELGEDACHT
DELMAS
RANDFONTEIN
ROSHERVILLE
SIMMER PAN
BRAKPAN
SPRINGS
WEST WITS
FOCHVILLE
HEIDELBERG
DEVON
LESLIE
KINROSS
TRICHARD
Bethal
KLIP
VEREENIGING
VAAL
BALFOUR
GREYLINGSTAD
DELAREYVILLE
POTCHEFSTROOM
OTTOSDAL
KLERKSDORP
PARYS
TAAIBOS
VREDEFORT
STANDERTON
VILLIERS
Volksrust
VIERPONTEIN
SCHWEIZER RENEKE
WOLMARANSSTAD
Bloemhof
VILJOENSKROON
KOPPIES
HEILBRON
Frankfort
BOTHAVILLE
BALKFONTEIN
KROONSTAD
PETRUS STEYN
WESSELSBRON
ODENDAALSRUS
LINDLEY
HENNENMAN
WHITES
ARLINGTON
Bultfontein
VIRGINIA
Bethlehem
SENEKAL
THEUNISSEN
WINBURG
Brandfort
Marquard
BRYANSTON
NIGEL
Vaal R
MYL 5 0 5 10 15 MILES

RAND UNDERTAKING

CONSUMERS		SALES			Average Price per Unit Sold	
		Units		Revenue from Sales		
Class	Number	1951	Increase or Decrease		1951	1950
ELECTRICITY:			%	£	d	d
Bulk	41	391,018,975	+ 19·306	496,597	0·3048	0·2863
Mining	96	3,983,216,509	+ 5·304	4,397,903	0·2650	0·2411
Industrial	704	880,114,383	+ 20·555	1,078,974	0·2942	0·2741
Domestic and Lighting	11,300	41,469,152	+ 19·753	173,625	1·0048	1·1563
	12,141	5,295,819,019	+ 8·632			
AIR AND STEAM:						
Bulk	1	2,759,809	+ 2·118			
Mining	12	254,967,756	− 3·471			
Industrial	22	9,633,836	− 3·011			
	35	267,361,401	− 3·399	552,424	0·4959	0·4444
	12,176	5,563,180,420	+ 7·986	6,699,523	0·2890	0·2657

	1951	1950	Accumulated to 31.12.51
Revenue	£6,962,809	£5,958,222	
Working Costs	£7,074,514	£6,011,312	
Deficit	£111,705	£53,090	£104,738
Capital Expenditure	£5,876,842	£4,068,291	£39,508,210

RAND UNDERTAKING—(continued)

	Brakpan Power Station		Klip Power Station	
	1951	1950	1951	1950
Electricity Units Sent Out	166,559,663	134,549,739	2,694,882,121	2,567,878,688
Maximum Load } One-hour kW S.O. }	43,024	42,970	372,951	358,678
Load Factor %	44·2	35·7	82·5	81·7
Thermal Efficiency % Sent Out	13·25	12·82	20·55	19·81
COAL:				
Consumption—tons	233,592	193,347	2,441,423	2,450,793
Average per unit sent out—lb	2·805	2·874	1·812	1·909
Calorific Value B.Th.U./lb	9,180	9,260	9,160	9,020
Total Cost	£117,142*	£97,400*	£923,785	£615,522
Cost per Ton	8s 10d*	8s 9d*	7s 7d	5s 0d

	Rosherville Power Station		Simmerpan Power Station	
	1951	1950	1951	1950
Electricity Units Sent Out	171,632,986	141,854,580	109,114,318	83,764,143
Maximum Load } One-hour kW S.O. }	51,047	55,967	41,159	39,061
Load Factor %	38·4	28·9	30·3	24·5
Thermal Efficiency % Sent Out	10·99	11·01	10·26	10·07
COAL:				
Consumption—tons	275,006	225,732	199,632	158,875
Average per unit sent out—lb	3·205	3·183	3·659	3·793
Calorific Value B.Th.U./lb	9,690	9,740	9,090	8,930
Total Cost	£245,326*	£197,890*	£97,456	£75,311
Cost per Ton	10s 7d*	9s 5d*	9s 9d	9s 6d

* Includes cost of coal for compressed air. See compressed air section.

RAND UNDERTAKING—(continued)

	Vaal Power Station		Vereeniging Power Station	
	1951	1950	1951	1950
Electricity Units Sent Out	1,362,811,212	1,231,376,194	933,410,207	877,676,808
Maximum Load	192,149	170,773	140,811	146,688
One-hour kW S.O.				
Load Factor %	81·0	82·3	75·7	68·3
Thermal Efficiency % Sent Out	22·29	22·48	16·51	16·44
COAL:				
Consumption—tons	1,118,042	1,008,315	1,092,700	1,009,722
Average per unit sent out—lb	1·641	1·638	2·341	2·301
Calorific Value B.Th.U./lb	9,330	9,270	8,830	9,020
Total Cost	£329,672	£267,959	£312,007	£274,984
Cost per Ton	5s 11d	5s 4d	5s 9d	5s 5d

	Brakpan Power Station		Rosherville Power Station	
	1951	1950	1951	1950
Compressed Air Units Sent Out	17,670,000	16,605,730	137,162,800	138,020,800
COAL:				
Consumption—tons	30,977	29,888	188,032	194,483
Average per unit sent out—lb	3·506	3·600	2·742	2·818
Calorific Value B.Th.U./lb	9,180	9,260	9,690	9,740

	Canada Dam Compressor Station		Robinson Compressor Station	
	1951	1950	1951	1950
Compressed Air Units Sent Out	52,037,500	65,315,300	60,154,900	56,547,300
Electric Input—kWh exc. Trans. losses	61,541,901	77,334,731	74,810,081	71,978,977
Air Units Sent Out kWh per cent.	84·56	84·46	80·41	78·56

Brakpan and Rosherville Power Stations generate both Electricity and Compressed Air.

RAND UNDERTAKING—(continued)

	Modder B and New Modder Compressor Stations	
	1951	1950
COMPRESSED AIR:		
Units Sent Out	9,904,241	10,081,978
Electric Input kWh	11,582,745	11,747,207
Air Units Sent out kWh per cent.	85·51	85·82

Growth of Load—The foregoing statistics for the year ended 31st December, 1951, indicate the increased output from all the Undertaking's power stations during the year under review, resulting from the rising demands for which the Undertaking has been required to cater. There was a minor decrease in the number of units of compressed air and steam sold, but the effect of this decrease is reflected principally in the decreased electrical input to Canada Dam Compressor Station, in consequence of which a small number of additional electric units became available for distribution to consumers of electricity. It is noteworthy that the increased output of electric units has resulted, in all cases except Vaal, in materially increased load factors at generating stations.

In last year's Report reference was made to the extension into the afternoon and early evening of the running hours of the plant at Rosherville, Simmerpan and Brakpan Power Stations, and during 1951 this tendency continued and these stations are now generating throughout the 24 hours of each weekday.

The rising load factor at Klip and Vereeniging Stations entails further curtailment of the (off-peak) period during which plant may be taken out of commission for routine maintenance and overhaul, and of the Undertaking's ability to furnish additional supplies during that period.

The increase in the number of supplies furnished in bulk is accounted for by the connection to the system of certain small municipalities to which the Undertaking has for several years been committed to furnish supply, and the increase in the number of units taken for industrial purposes is to a large extent accounted for by the substantially increased demand of the S.A. Iron and Steel Industrial Corporation and African Metals Corporation, to which the Commission has been committed for many years.

The Undertaking continues to receive a large number of applications for new supplies and notifications of additional requirements from existing consumers, but under existing conditions it has been necessary to defer the furnishing of many additional supplies which are not of an essential nature.

Plant Capacity—The maximum electric load carried during 1951 was 953,000 kW, (including the load of the Witbank Local Supply System), which was over

14,000 kW higher than the maximum in 1950. This load was again in excess of the capacity of the installed plant and it was only possible to achieve so high a figure by utilising the supplementary supplies made available by the Johannesburg and Pretoria Municipalities and the Randfontein Estates Limited.

As stated in last year's Report, No. 6 33,000-kW turbo-generator at Vaal Power Station was commissioned in February, 1951, and the installation of Nos. 11 and 12 boilers is now expected to be completed about August, 1952.

Owing to the breakdown of No. 2 generator at this station in April, 1952, special measures were adopted to enable No. 7 generator to be placed in commercial service; but the full capacity of all seven turbo-generators now installed will not be attained until the end of 1952, when boilers Nos. 11 to 14 will be in commission. The installation of turbo-generators Nos. 8 and 9 is proceeding, and boilers Nos. 15 to 18 are expected to be commissioned during 1953.

The negotiations with the Rand Water Board and Randfontein Estates G.M. Company, Limited, for the interconnection of the former's Vereeniging and Zwartkoppies Pumping Stations and the latter's Randfontein Power Station with the Undertaking's network, were completed during 1951, and the necessary connections with the Rand System were made, with the exception of that affecting Zwartkoppies Pumping Station, which will be carried out before the winter of 1952.

Additional plant in process of installation and on order for the extension of existing Power Stations now includes:

Vaal: Two 33,000-kW turbo-generators,
One 7,000-kW house set,
Eight 190,000-lb hr boilers.

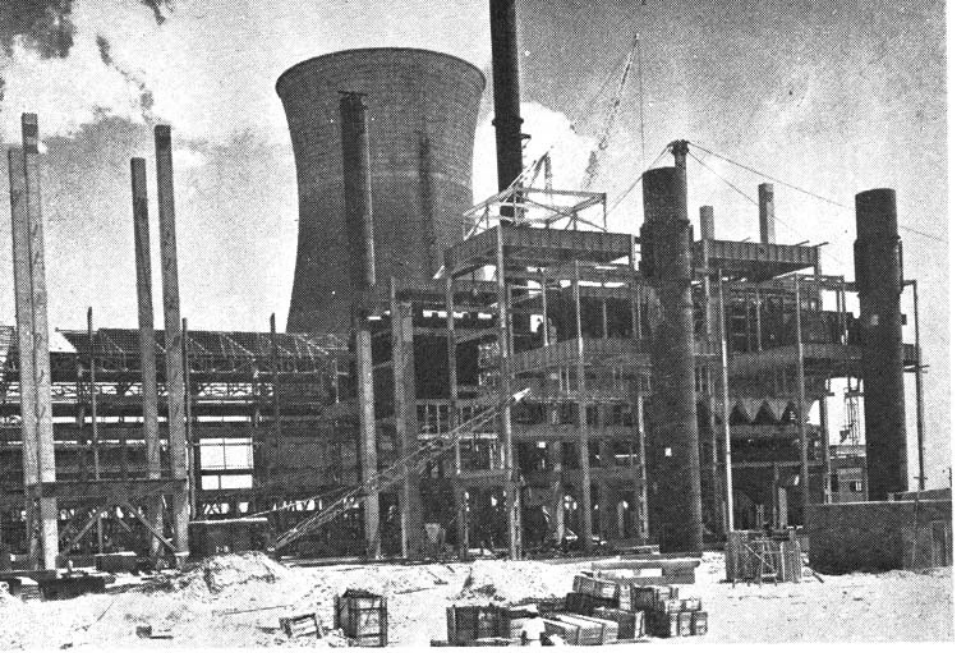
Vereeniging: One 180,000-lb hr boiler.

New Power Stations—The progress of work and plans for Taaibos, Vierfontein and Wilge Power Stations is reported on pages 10 and 12.

Limitation of Maximum Demands—As was forecast in the last Annual Report, the gap between the potential demand on the Rand Undertaking and the capacity of generating plant available to the system widened further during 1951. The position has only been met by the special steps taken by the Commission (which were reported in the Annual Report for 1950) to impose definite limitations on the maximum demands which could be taken by consumers and by deferring the provision of new supplies which do not fall within the categories of supplies required for essential services or for purposes of national importance.

The closest collaboration and exchange of information was maintained throughout the year between the Technical Power Committee of the Chamber of Mines and the Undertaking, with a view to utilising to optimum advantage the allocation to the Mining Industry of its quota of available generating plant.

It is gratifying to report also that a large measure of co-operation was received from town councils and their technical staffs and from other consumers, particularly large industrial consumers, in taking special steps to reduce the demand for electricity where this could be done without reduction of output, and to avoid exceeding the quotas allocated to them. In general, these efforts have resulted in supplies to local authorities and industry being maintained within the aggregate load limitations set by the Commission.



VIERFONTEIN POWER STATION
under construction, March, 1952.

[Photo B.R.S. Photographers

One important effect of the limitation of maximum demands has been to shift a considerable portion of the potential additional load to the off-peak period. The rise in load factor at generating stations has already been commented upon, and the overall effect on the system is reflected by the increase in the system load factor to over 90 per cent. The Undertaking's load curve for the year shows that the valley period, which normally began at about 3 p.m., has virtually disappeared, and even on Sundays the effective margin of available plant over maximum demand has fallen as low as 30 megawatts. Operation under these conditions imposes severe strain not only on machines, by restricting the time available for overhauls and maintenance, but also on personnel, and the Commission records its appreciation of the special efforts made, in the public interest, by those concerned.

A review of conditions, made in February, 1952, revealed that no additional plant could be brought into service before the end of the coming winter and that it would not be possible to allow any general increase in quotas until substantial increments of new plant can be brought into commercial service.

Distribution System—During the period under review the new Dunnottar Distribution Station was placed in service. This station is fed by an 88-kV overhead transmission line, 41 miles in length, from Vaal Power Station, and the initial installation at Dunnottar includes a 45-MVA 88/40-kV transformer group; a 20-MVA synchronous condenser was on site and its erection put in hand at the end of the year. The commissioning of this distribution station has improved the reliability and voltage of supply in the Springs/Nigel area.

A second 20-MVA synchronous condenser was installed at West Wits Distribution Station and the second 45-MVA transformer group was commissioned.

The work reported as in hand in the Commission's Report for the year 1950 was completed and the equipment placed in service.

Supplies made available during the year under review included Ventersdorp Municipality, Oberholzer Township and Fochville and Koppies Villages.

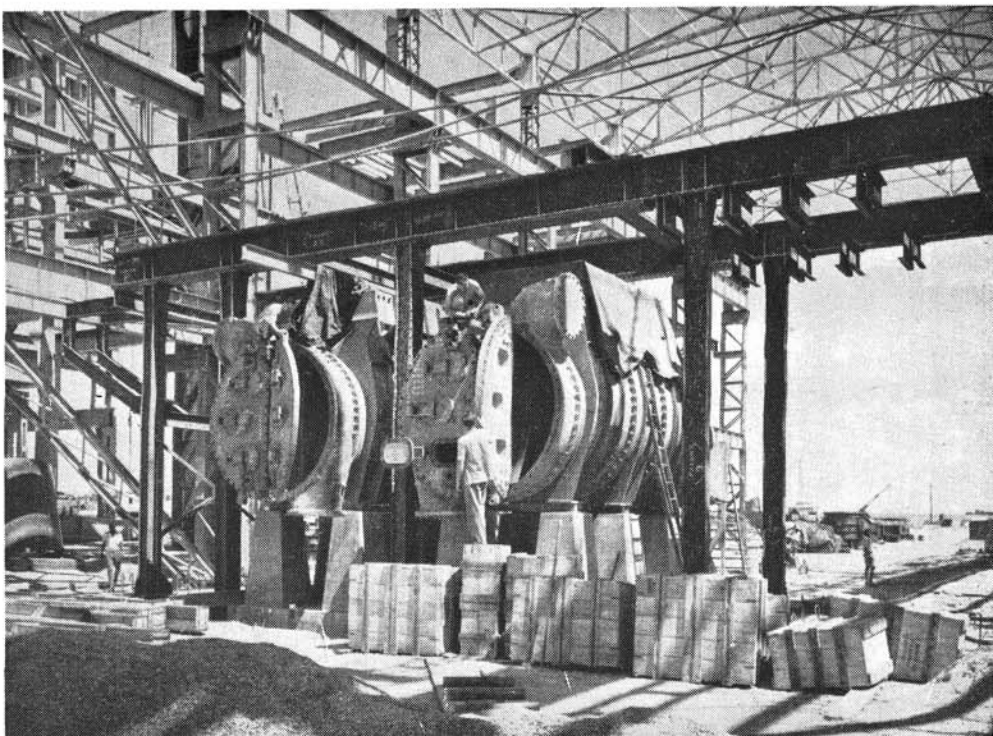
Numerous temporary supplies were converted to permanent ones and much work of a routine nature was carried out for the augmentation of existing supplies.

Considerable progress was made with the erection of an 88-kV line from Klip Power Station to the new 88-kV switching station in course of erection near Rosherville Power Station. This station will become a coupling point between the Undertaking's system and that of the Johannesburg Municipality, and will also serve as a supply point to the new distribution station (to be known as North Rand) which will be situated to the east of Modderfontein Dynamite Factory. It is nearing completion, and its purpose will be to augment supply to consumers in the area between Germiston and Pretoria.

Work in hand at the year's end included a 26-mile 88-kV wood pole transmission line between Slurry and Zeerust, extensions to West Wits. Distribution Station and civil work in connection with the new E.R.P.M. Distribution Station, as well as a large mileage of standard 88-kV and 40-kV transmission line construction and the installation of transformers and switchgear.

Orange Free State Supplies—The 88-kV portion of Alma Distribution Station was completed during 1951, the plant now in service comprising two 45-MVA, 80/40-kV transformer groups and two 20-MVA synchronous condensers. The load in the area has increased rapidly, the observed load at the sending end of the lines being frequently 66 megawatts.

VIERFONTEIN POWER STATION
Condensers under erection. [Photo l'atelier



Construction of the Vaal/Vierfontein/Alma 132-kV line was completed by the end of the year and this transmission line will be placed in service as soon as the requisite 88 132- and 132/40-kV transformer groups, now in transit from overseas, are delivered and assembled.

Good progress was made towards completing the 40-kV "rings" based on Alma.

During the year supplies were made available to the Union Irrigation Department at de Erf, and President Brand, Lorraine and Jeannette gold mines.

Licences and Tariffs—Applications for amendments to the licences for the Rand Undertaking, including inter alia a revision of the schedule of standard prices, have been lodged by the Commission with the Electricity Control Board and have now to be dealt with in terms of the Electricity Act, 1922. It has, however, been agreed between the Commission and the Transvaal Chamber of Mines, on behalf of the consumers who will be supplied under the provisions of the proposed new Group Agreement, that in the meanwhile the proposed new tariff be applied with effect from January, 1952, on the understanding that if any modification of the proposed new tariff is made by the Board, the Commission will adjust retrospectively charges made by it during the period January, 1952, to the date of granting any amendments to the licences.

As regards industrial consumers not covered by the Commission's agreement with the Transvaal Chamber of Mines, the proposed new standard tariffs submitted to the Electricity Control Board have been applied with effect from January, 1952, on the same understanding.

Staff—Considerable difficulty was again experienced in augmenting the engineering and other staff to the extent necessary to cope with large construction and expanding maintenance programmes, and most engineering departments continued to be short staffed. As stated on page 8, efforts are being made to recruit artisans from overseas.

Financial—Working costs increased from £6,011,312 in 1950 to £7,074,514 in 1951, while revenue rose from £5,958,222 to £6,962,809. The resultant deficit of £111,705 for 1951 left the Undertaking with an accumulated deficit at the end of that year of £104,738. Capital expenditure in 1951 was £5,876,842.

CAPE NORTHERN UNDERTAKING

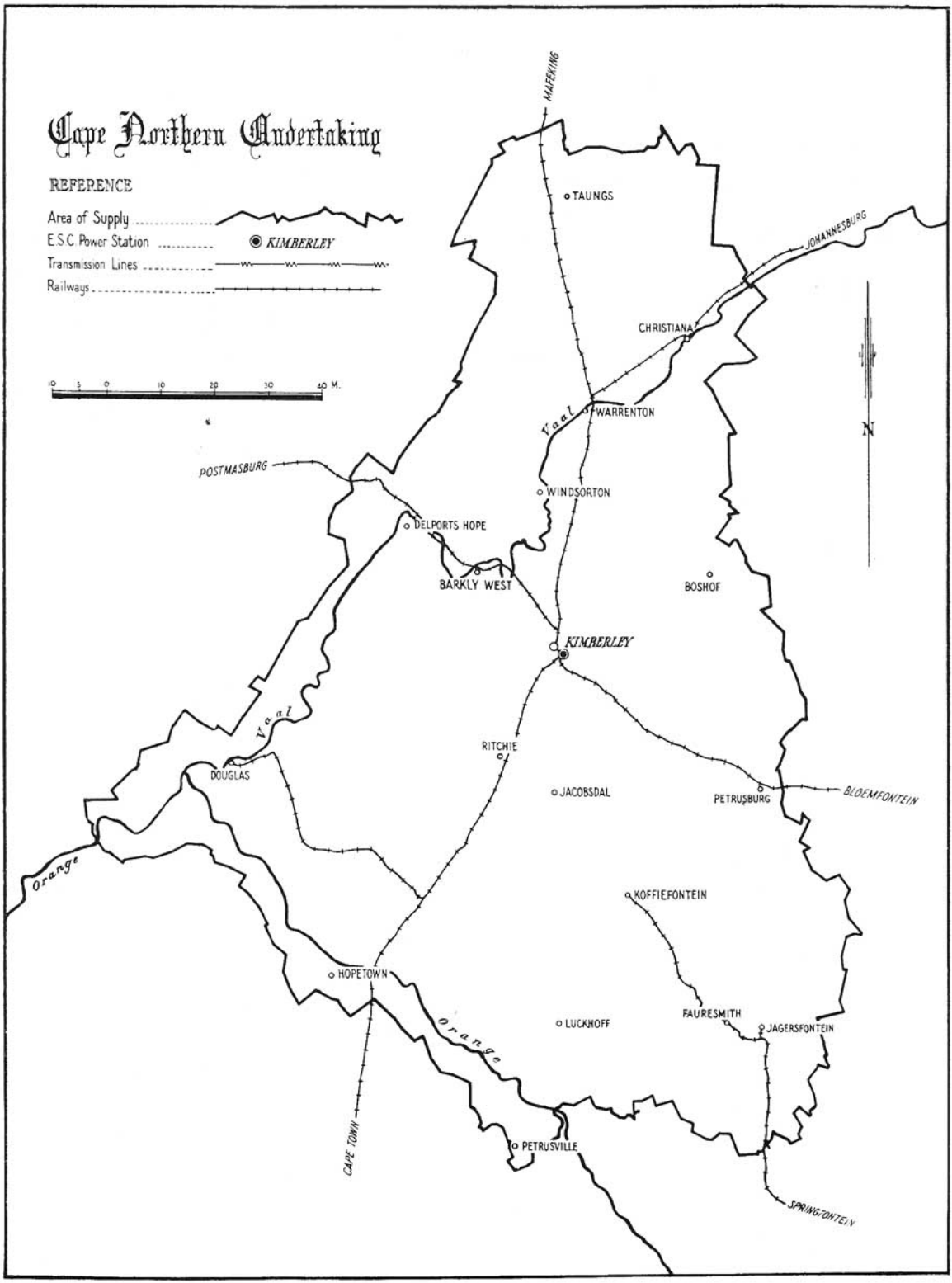
CONSUMERS		SALES		Revenue from Sales	Average Price per Unit Sold	
Class	Number	Units	Increase or Decrease		1951	1950
			%	£	d	d
Bulk	2	36,630,200	+16·230	88,305	0·5786	0·5563
Mining	1	21,867,800	− 2·325	60,100	0·6596	0·6262
Industrial	7	19,838	+20·369	101	1·2152	0·7501
Domestic and Lighting	1	3,164	+42·458	14	1·0759	1·1081
	11	58,521,002	+ 8·529	148,520	0·6091	0·5854

	1951	1950	Accumulated to 31.12.51
Total Revenue	£148,788	£131,596	
Working Costs	£151,212	£126,196	
Surplus	—	£5,400	£2,976
Deficit	£2,424	—	
Capital Expenditure	£80,796	£215,844	£296,640
CENTRAL POWER STATION—			
Units Sent Out	58,513,651*	53,922,202	
Maximum half-hour Demand kW S.O.	14,050	12,635	
Load Factor %	47·5	48·7	
Termal Efficiency % Sent Out ...	13·25	13·71	
COAL:			
Consumption—tons	61,501	54,127	
Average per unit sent out—lb ..	2·102	2·008	
Calorific Value B.Th.U./lb ...	12,250	12,390	
Total Cost	£74,944	£62,569	
Cost per ton	24s 4d	23s 1d	

* In addition, units were purchased.

Output and Sales—Units sold in 1951 show an increase of 8·5 per cent over the figure for the previous year. Units sent out, maximum half-hour demand and the station peak load in 1951 all constitute records for the power station.

Power Station—The overhaul of boilers, mentioned in last year's Report, continued throughout the year, with seven steaming and one under repair, to ensure that all units be in good order during 1952, when maximum boiler capacity will be essential. The overhauls will be completed and all boilers steaming in May, 1952. The two new 75,000-lb/hr boilers on order are expected to be ready by June, 1953, and a start was made early in 1952 on the pouring of foundations for them and for the boiler house. Two additional 75,000-lb hr boilers were ordered in April, 1952.


Cape Northern Undertaking
REFERENCE
Area of Supply
E.S.C. Power Station
KIMBERLEY
Transmission Lines
Railways
10 5 0 10 20 30 40 M.
MAFEKING
TAUNGS
JOHANNESBURG
CHRISTIANA
Vaal
WARRENTON
N
POSTMASBURG
WINDSORTON
DELPORTS HOPE
BARKLY WEST
BOSHOF
KIMBERLEY
Vaal
RITCHIE
DOUGLAS
JACOBSDAL
PETRUSBURG
BLOEMFONTEIN
Orange
KOFFIEFONTEIN
HOPETOWN
LUCKHOFF
FAURESMITH
JAGERSFONTEIN
Orange
CAPE TOWN
PETRUSVILLE
SPRINGFONTEIN

The difficult operating conditions caused by limited boiler capacity were accentuated towards the end of the year by a shortage of cooling water due to prolonged drought. Load-shedding had to be resorted to during the peak periods until the position was relieved by rain.

Generating capacity will be increased by the installation of two 6,000-kW turbo-generators from Congella Power Station. By the end of the year most of the old concrete foundations had been removed from the turbine house to make room for these sets which, due to local steaming conditions, will be derated to 5,500-kW each. The foundation for one of them is expected to be ready during May, 1952.

New workshops, stores buildings, and European and Native change houses were completed and occupied, and the old workshop was demolished.

Coal—Stock of coal at the beginning of 1951 amounted to 2,658 tons, the monthly usage being about 5,000 tons. Stock improved to 2,884 tons in March, but dwindled away to nil towards the end of July. In July and August stock was below half a day's supply on several occasions, and thanks are due to the De Beers Company for preventing an interruption of supply in August by a timely loan of four trucks of coal.

Distribution: Rural Supplies—The rural system along the Vaal River, mentioned in last year's Report, was placed in commercial operation in December, and bulk supply to Barkly West began on the 10th of that month. Earlier completion of the scheme was prevented by delay in delivery of the step-down transformers which were installed at Riverton substation. By the year's end 10 pumping plants, totalling 200 h.p., had been connected and 22 miles of 11-kV line had been erected.

Financial—The year's working resulted in a deficit of £2,424, compared with a surplus of £5,400 in the previous year. The deficit was caused by heavy boiler house maintenance costs, and low power station efficiency during the period of cooling water shortage, as described above.

MUNICIPAL ELECTRICITY SUPPLY SCHEMES—1951

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	*Extensions*	*Tenders*
Germiston	Carletonville	Belfast
Graskop	Christiana	Hartebeestfontein
Leeuwdoornsstad	Coligny (2)	Meyerton
White River	Groblersdal	Potgietersrus
	Johannesburg	Standerton
	Meyerton	
	Potchefstroom	
	Potgietersrus (2)	
	Rustenburg	
	Standerton	

ORANGE FREE STATE:

Extensions	*Tenders*
Brandfort	Bloemfontein (3)
Marquard	Marquard (2)
Odendaalsrus	Odendaalsrus
Senekal	Philippolis

NATAL:

Extensions	*Tenders*
Eshowe (2)	Vryheid
Vryheid (2)	

CAPE:

New Schemes	*Extensions*	*Tenders*
Cofimvaba	Aberdeen	Aberdeen
Venterstad	Barkly East	Barkly East
Vredendal	Beaufort West (2)	Beaufort West
	Burgersdorp	Bizana
	Citrusdal	Bredasdorp

CAPE—(Continued):

Extensions	*Tenders*
Dordrecht	Burgersdorp
Elliot	Butterworth
Engcobo	Cofimvaba
Fort Beaufort	Colesberg (3)
Hanover (2)	Despatch
Hofmeyr	Dordrecht
Hopetown	George
Indwe	Hanover
Matatiele	Hopetown
Murraysburg	Philipstown
Riversdale	Swellendam
Robertson	
Sterkstroom	
Steynsburg	
Swellendam	
Tulbagh	
Vryburg	
Wolseley	

SOUTH WEST AFRICA:

New Schemes	*Extensions*	*Tenders*
Walvis Bay	Omaruru	Karasburg
	Swakopmund	Luderitz
	Windhoek	Outjo

Up to the 31st December, 1951, 1,223 Reports on Municipal Electricity Supply Schemes had been submitted by the Commission. Of these 227 were in respect of new schemes, 576 in respect of extension schemes, and 420 were reports on tenders.

ANNEXURES

The Commission submits for the year 1951 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—Natal Central Undertaking

Account No. 4—Witbank Undertaking

Account No. 5—Cape Western Undertaking

Statement of Pooled Costs, Cape Town

Account No. 6—Durban Undertaking

Account No. 7—Sabie Undertaking

Account No. 8—Border Undertaking

Account No. 9—Rand Undertaking

Account No. 10—Cape Northern 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, 1951.

Statement No. 2—Summary of principal plant and equipment in course of installation or on order as at 31st December, 1951.

Statement No. 3—Units sold to all consumers during the past twenty-seven years.

Statement No. 4—Units sold and number of consumers, 1951.

Statement No. 5—Power Station Statistics, 1951.

Statement No. 6—Water consumed by power stations, 1951.

Statement No. 7—Power purchased, 1951.

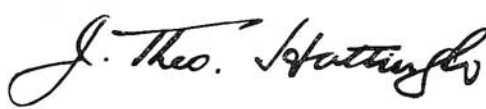
Statement No. 8—Showing the price or rent of land or rights or interests in or over land or other property acquired or hired by the Commission during the year 1951.

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 June, 1952.

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, 1951.

REDEMPTION FUND

In the course of our audit we have investigated 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.

In valuing the Fund at the 31st December, 1951, we have taken into account the market value of the investments at that date.

We find that in the aggregate the value of the Fund at 31st December, 1951, was materially in excess of the sum required to provide for the redemption of the respective loans over the maximum periods laid down in the terms of issue.

The Minister has fixed the date from which provision for redemption of Loan No. 16 commenced at 1st September, 1951.

LOAN FROM INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

The Commission has entered into an agreement dated 23rd January, 1951, with the Bank to borrow $30,000,000 carrying interest at the rate of 4% per annum. The amount drawn at 31st December, 1951, was $6,883,110, equivalent to £2,468,170 and the balance of the loan must be taken up during the period ending 31st December, 1953.

This agreement was validated by Act No. 1 of 1951. The loan, which is secured on all the assets and revenues of the Commission ranks pari passu with all other loans or securities issued by the Commission, and has, as required by the Bank's constitution, been guaranteed by the Union Government. The loan is repayable over 17 years by equal half-yearly instalments including principal and interest, the first instalment being payable on 15th May, 1954. The half-yearly repayments of principal take the place of contributions to Redemption Fund normally required to be made in respect of loans issued by the Commission. To avoid losses through fluctuations in the Exchange Rate between Union and United States currencies the Commission has arranged forward dollar cover with the South African Reserve Bank for payments falling due under this agreement.

ACQUISITION OF THE UNDERTAKINGS OF THE VICTORIA FALLS AND TRANSVAAL POWER COMPANY LIMITED

We drew attention in our report dated 12th May, 1951, on the accounts for the previous year to the fact that certain documents of title had not yet been produced to us. Certain of these documents are still in the hands of the Commission's solicitors or with the relative Deeds Offices for registration, but we are informed that registration should be completed during 1952.

HEAD OFFICE ADMINISTRATION, ENGINEERING AND GENERAL EXPENSES, INCLUDING PUBLICITY

The total expenditure under this heading shows an increase over that of the previous year. This is mainly accounted for by:—

(1) The continued expansion in the operations of the Commission.

(2) The increased expenditure on salaries, cost of living allowances and Pension Fund contributions, mainly due to increased staff necessary to deal with the increased volume of work.

Against the total expenditure has been set off or credited:—

(1) Amounts transferred to costs of Capital and Reserve Fund Expenditure at undertakings for services of Head Office Staff.

(2) Fees for reporting on Power Schemes of Local Authorities.

(3) Amounts chargeable to Revenue Accounts under other headings.

The amount remaining has been apportioned by the Commission against the Revenue Accounts of all undertakings in commercial operation. We have no reason to disagree with the apportionment so made.

REVENUE ACCOUNTS

Natal Central Undertaking—This Undertaking shows a surplus of £10,237 on the year's operations as compared with a surplus of £1,151 in the previous year. The accumulated deficit at the commencement of the year has now been converted into a small surplus of £169.

Witbank Undertaking—The working of this Undertaking for the year has resulted in a surplus of £9,057 as compared with a deficit of £19,814 in the previous year. An amount of £10,000 was set aside to Reserve Fund in 1951, while no contribution was made in the previous year. There remains an accumulated deficit of £9,287.

An increase in the tariff of supplies to consumers in the Witbank local and Municipal area took effect on 1st January, 1951. The balance of this Undertaking's output is charged out at the residual cost.

Cape Western—The deficit on operations for the year at this Undertaking has increased from £12,859 in 1950 to £47,554 in 1951. There remains an accumulated surplus of £5,783, but it is evident that an adjustment of tariffs will be required at this Undertaking and we are informed that the Commission is taking the necessary steps to this end.

Durban—This Undertaking shows a surplus on the year's operations of £16,519 as compared with a surplus of £24,978 in the previous year. The deficit carried forward has now been reduced to £12,893. The amount set aside to Reserve Fund has been increased from £25,000 in 1950 to £35,000 in 1951, and this has resulted in an increase in the amount of Reserve Fund held for this Undertaking. This amount is still low, however, in relation to the total capital expenditure on the Undertaking.

Sabie—The position at this Undertaking calls for no special comment.

Border—The three sections of this Undertaking comprising East London, King Williamstown and Alice, show deficits on the year's operations amounting in total to £21,114, resulting in a deficit carried forward of £10,271. We are informed that new tariffs have been introduced at Alice from 1st January, 1952, and that applications have been made to the Electricity Control Board to sanction new tariffs for the East London and King Williamstown sections.

Rand Undertaking—The deficit on the year's operations was £111,705 as compared with a deficit of £53,090 in 1950, resulting in a deficit carried forward of £104,738.

The amount set aside to Reserve Fund was increased from £258,077 in 1950 to £345,689 in 1951. Expenditure out of Reserve Fund held for this Undertaking continues to be heavy, and the amount of Reserve Fund applicable to this Undertaking has increased from £993,207 at 31st December, 1950, to £1,017,982 at 31st December, 1951. An increase in tariffs, which is subject to confirmation by the Electricity Control Board, was brought into effect on 1st January, 1952.

Cape Northern—The position at this Undertaking calls for no special comment.

GENERAL

As the result of our audit of the books and accounts of the Commission for the year 1951, 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. This expenditure is being amortised by the operation of the Redemption Fund. 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 and recommendations as Auditors have been complied with and carried out.

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

Electricity Supply Commission.

Incorporated under the Electricity Act, 1922.

BALANCE SHEET at 31st DECEMBER, 1951.

Loan Capital (as per Schedule No. 3)		£66,968,170
Interest Accrued on Loan Capital		315,072
Sundry Loans and Amounts Outstanding for Rights Acquired (as per Schedule No. 3)		172,311
Sundry Creditors and Credit Balances		3,290,553
Current Liabilities and Provisions.		
Barclays Bank (Dominion, Colonial and Overseas)		971,936
Temporary Advances, less Cash on Current Account.		
Advances at Call		3,330,500
Redemption Fund (as per Account No. 1)		15,733,451
Sinking Fund (Umkomaas Town Board Loans)		5,122
Sundry Loans Repaid		194,292
Reserve Fund (as per Account No. 2)		2,271,059
		£93,252,466

NOTE—

In addition to the liabilities shown above the Commission is committed to the extent of approximately £63,900,000 for expenditure on Capital Account and £681,000 chargeable against Reserve Fund.

The Commission is committed to purchase £1,250,000 Electricity Supply Commission 3½ per cent. Local Registered Stock, 1968/73 from a stockholder at par during 1952.

In addition to the annual contributions the Commission is committed to pay £32,131 annually to the Electricity Supply Commission Pension and Provident Fund for the period ending 31st December, 1969, and £11,027 during 1970.

Expenditure on Capital Account (at Cost) (as per Schedule No. 1)			£68,641,577
Land and Rights	£708,967		
Buildings and Civil Works	14,775,901		
Machinery and Plant	51,754,731		
	67,239,599		
Assets sold to South African Railways and Harbours	1,401,978		
Movable Plant and Equipment (less Depreciation)			600,132
Workshop Equipment, Instruments, Tools and Loose Plant	274,162		
Transportation Equipment	201,825		
Furniture and Office Equipment	124,145		
Stores and Materials			4,555,517
Sundry Debtors and Debit Balances			1,448,277
Current Debtors less Reserves	1,376,839		
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	70,838		
Investments			203,660
Amount invested in First Mortgages on Freehold Properties, in terms of the Electricity Amendment Act, 1941, less Reserve.			
Investment of Redemption Fund (as per Schedule No. 2) (Market Value £13,631,747)			15,249,064
Investment of Sinking Fund			5,124
Amount invested in Stocks of Electricity Supply Commission, the Government of the Union of South Africa and Municipalities	5,100		
Interest Accrued (Market Value £4,702)	24		
Investment of Reserve Fund			2,420,964
Amount invested in Stocks and Securities of Electricity Supply Commission, the Government of the Union of South Africa and Municipalities	2,405,715		
Interest Accrued (Market Value £2,295,023)	15,249		
Balance on Revenue Accounts (as per Accounts Nos. 3 to 10)			128,151
Natal Central Undertaking		Cr. 169	
Witbank Undertaking		9,287	
Cape Western Undertaking		Cr. 5,783	
Durban Undertaking		12,893	
Sabie Undertaking		Cr. 110	
Border Undertaking		10,271	
Rand Undertaking		104,738	
Cape Northern Undertaking		Cr. 2,976	
			£93,252,466

Johannesburg,
15th April, 1952.

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

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

SCHEDULE No. 1

Schedule of Expenditure on Capital Account at 31st December, 1951.

Expenditure in connection with Electricity Undertakings.	Total at 31st December, 1950.	Year ended 31st December, 1951.	Total at 31st December, 1951.
RAND UNDERTAKING:			
Rand.			
Land and Rights	£188,561	£13,039	£201,600
Buildings and Civil Works	1,805,735	36,690	1,842,425
Machinery and Plant	12,272,719	440,160	12,712,879
	£14,267,015	**£489,889**	**£14,756,904**
Klip Power Station.			
Land and Rights	£127,975	£350	£128,325
Buildings and Civil Works	1,588,020	34,737	1,622,757
Machinery and Plant	4,896,332	Cr. 1,195	4,895,137
	£6,612,327	**£33,892**	**£6,646,219**
Vaal Power Station.			
Land and Rights	£5,768	—	£5,768
Buildings and Civil Works	2,068,261	£118,836	2,187,097
Machinery and Plant	4,796,499	1,646,860	6,443,359
	£6,870,528	**£1,765,696**	**£8,636,224**
Vierfontein Power Station.			
Land and Rights	£1,079	£14,181	£15,260
Buildings and Civil Works	381,465	736,448	1,117,913
Machinery and Plant	22,679	764,512	787,191
	£405,223	**£1,515,141**	**£1,920,364**
Taaibos Power Station.			
Land and Rights	—	£193	£193
Buildings and Civil Works	£8,427	123,249	131,676
Machinery and Plant	—	9,134	9,134
	£8,427	**£132,576**	**£141,003**
Wilge Power Station.			
Land and Rights	—	£18	£18
Buildings and Civil Works	—	1,948	1,948
Machinery and Plant	—	429,613	429,613
	—	**£431,579**	**£431,579**
Rand Extension.			
Land and Rights	£15,672	£21,811	£37,483
Buildings and Civil Works	166,648	100,912	267,560
Machinery and Plant	2,991,954	744,811	3,736,765
	£3,174,274	**£867,534**	**£4,041,808**
Greater Rand Extension.			
Land and Rights	£2,878	£6,262	£9,140
Buildings and Civil Works	184,512	25,817	210,329
Machinery and Plant	2,106,184	608,456	2,714,640
	£2,293,574	**£640,535**	**£2,934,109**
TOTAL RAND UNDERTAKING:			
Land and Rights	£341,933	£55,854	£397,787
Buildings and Civil Works	6,203,068	1,178,637	7,381,705
Machinery and Plant	27,086,367	4,642,351	31,728,718
	£33,631,368	**£5,876,842**	**£39,508,210**
NATAL CENTRAL UNDERTAKING:			
Land and Rights	£32,158	£3,579	£35,737
Buildings and Civil Works	1,313,100	70,794	1,383,894
Machinery and Plant	4,942,947	662,875	5,605,822
	6,288,205	737,248	7,025,453
Assets sold to S.A.R. and H. ...	465,298	—	465,298
	£6,753,503	**£737,248**	**£7,490,751**
WITBANK UNDERTAKING:			
Land and Rights	£13,239	£5,204	£18,443
Buildings and Civil Works	612,404	89,162	701,566
Machinery and Plant	2,161,631	191,285	2,352,916
	2,787,274	285,651	3,072,925
Assets sold to S.A.R. and H. ...	472,687	—	472,687
	£3,259,961	**£285,651**	**£3,545,612**
CAPE WESTERN UNDERTAKING:			
Land and Rights	£53,132	£7,518	£60,650
Buildings and Civil Works	1,656,413	725,773	2,382,186
Machinery and Plant	4,614,977	1,772,753	6,387,730
	6,324,522	2,506,044	8,830,566
Assets sold to S.A.R. and H. ...	463,993	—	463,993
	£6,788,515	**£2,506,044**	**£9,294,559**
DURBAN UNDERTAKING:			
Land and Rights	£106,164	£18,489	£124,653
Buildings and Civil Works	1,564,971	497,737	2,062,708
Machinery and Plant	4,126,259	482,994	4,609,253
	£5,797,394	**£999,220**	**£6,796,614**
SABIE UNDERTAKING			
Land and Rights	£510	—	£510
Buildings and Civil Works	60,491	—	60,491
Machinery and Plant	35,169	—	35,169
	£96,170	—	**£96,170**
BORDER UNDERTAKING			
Land and Rights	£6,320	£36	£6,356
Buildings and Civil Works	61,648	72,685	134,333
Machinery and Plant	510,689	237,184	747,873
	£578,657	**£309,905**	**£888,562**
CAPE NORTHERN UNDERTAKING:			
Land and Rights	£4,800	Cr. £2,656	£2,144
Buildings and Civil Works	35,476	23,837	59,313
Machinery and Plant	175,568	59,615	235,183
	£215,844	**£80,796**	**£296,640**
SWARTKOPS RIVER UNDERTAKING:			
Land and Rights	£1,482	£20	£1,502
Buildings and Civil Works	40,526	229,159	269,685
Machinery and Plant	—	52,067	52,067
	£42,008	**£281,246**	**£323,254**
HEAD OFFICE:			
Land	£61,185	—	£61,185
Buildings and Equipment	339,655	£365	340,020
	£400,840	**£365**	**£401,205**
SUMMARY:			
Land and Rights	£620,923	£88,044	£708,967
Buildings and Civil Works	11,887,752	2,888,149	14,775,901
Machinery and Plant	43,653,607	8,101,124	51,754,731
	56,162,282	11,077,317	67,239,599
Assets sold to S.A.R. and H. ...	1,401,978	—	1,401,978
	£57,564,260	**£11,077,317**	**£68,641,577**

Johannesburg,
15th April, 1952.

J. VAN NIEKERK, Chief Accountant.

Electricity Supply Commission.

SCHEDULE No. 2.

Schedule showing details of Investments of the Redemption Fund at 31st December, 1951.

	Nominal Amount.	Totals.	Loan No. 3 £500,000 4¾% Local Registered Stock. 1953/63.	Loan No. 4 £2,500,000 4½% Local Registered Stock, 1953.	Loan No. 5 £6,750,000 3¾% Local Registered Stock. 1954/64.	Loan No. 6 £2,500,000 3½% Local Registered Stock. 1959/64.	Loan No. 7 £2,000,000 3¼% Local Registered Stock. 1956/66.	Loan No. 8 £2,000,000 3½% Local Registered Stock. 1957/67.	Loan No. 9 £2,000,000 3¾% Local Registered Stock. 1959/64.	Loan No. 10 £1,500,000 3¾% Local Registered Stock. 1960/65.	Loan No. 11 £2,000,000 3¼% Local Registered Stock. 1961/66.	Loan No. 12 £2,500,000 3¼% Local Registered Stock. 1965/70.	Loan No. 13 £3,000,000 3% Local Registered Stock. 1967/73.	Loan No. 14 £3,000,000 3% Local Registered Stock. 1968/74.	Loan No. 15 £15,000,000 3¼% Local Registered Stock. 1968/73.	Loan No. 16 £3,000,000 3½% Local Registered Stock. 1969/74.	Loan No. 17 £3,000,000 3¾% Local Registered Stock. 1969/74.	Loan No. 18 £5,250,000 3¾% Local Registered Stock. 1965/67.	Loan No. 19 £3,000,000 3¾% Local Registered Stock. 1964/67.	Future Loans. (Not yet raised)
Local Registered Stocks.																				
Electricity Supply Commission:																				
4¾ per cent. 1953/63	£108,475	£108,475	£43,025	—	£65,450	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4½ per cent. 1953	312,176	312,176	1,500	£290,676	15,500	£4,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3¾ per cent. 1954/64	896,781	896,033	10,000	—	811,599	53,722	£17,000	£3,518	—	£194	—	—	—	—	—	—	—	—	—	—
3½ per cent. 1959/64	196,397	195,273	—	—	35,000	144,973	5,600	5,400	£4,300	—	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1956/66	346,050	334,975	16,490	92,767	143,560	19,400	62,758	—	—	—	—	—	—	—	—	—	—	—	—	—
3½ per cent. 1957/67	355,677	347,896	24,288	85,565	77,628	60,043	21,922	77,377	1,073	—	—	—	—	—	—	—	—	—	—	—
3¾ per cent. 1959/64	521,310	510,407	19,483	90,028	180,287	62,540	55,274	45,785	57,010	—	—	—	—	—	—	—	—	—	—	—
3¾ per cent. 1960/65	443,400	434,694	17,340	60,270	140,630	72,030	48,020	52,430	33,810	9,864	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1961/66	515,900	505,813	23,520	96,040	136,220	80,360	45,080	56,840	30,380	16,660	£20,713	—	—	—	—	—	—	—	—	—
3¼ per cent. 1965/70	553,500	553,245	17,000	87,000	129,700	61,000	62,000	67,000	65,000	8,000	19,000	£37,545	—	—	—	—	—	—	—	—
3 per cent. 1967/73	641,050	636,007	19,402	92,038	189,050	72,138	52,238	45,273	43,780	34,327	45,272	27,362	£15,127	—	—	—	—	—	—	—
3 per cent. 1968/74	1,142,000	1,142,000	13,000	94,000	334,000	26,500	215,000	73,000	55,000	93,000	91,000	127,000	20,500	—	—	—	—	—	—	—
3½ per cent. 1968/73	5,376,800	5,368,665	80,820	376,375	1,178,870	349,500	181,650	192,285	278,625	167,710	201,075	157,050	123,175	£24,930	£1,973,600	—	—	—	—	—
3½ per cent. 1969/74	296,300	291,891	6,897	33,499	57,145	24,631	15,074	15,764	16,749	13,794	17,735	18,720	20,691	15,764	—	£35,428	—	£63,000	£15,000	£5,000
3¾ per cent. 1969/74	42,700	41,846	—	—	—	—	—	—	—	—	—	—	—	41,846	—	—	—	—	—	—
3¾ per cent. 1965/67	50,000	48,500	—	—	—	—	—	—	—	—	—	19,400	—	—	—	—	—	—	—	—
3¾ per cent. 1964/67	600,000	588,000	—	—	—	—	63,700	73,500	—	43,120	99,960	44,100	63,700	71,540	—	63,700	£64,680	24,250	—	4,850
3¾ per cent. 1964/68	100,000	98,000	—	—	—	—	—	—	—	—	—	19,600	19,600	19,600	—	19,600	19,600	—	—	—
The Government of the Union of South Africa:																				
4½ per cent. 1953	356,265	356,265	—	356,265	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3¾ per cent. 1953	5,000	5,000	—	—	5,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3½ per cent. 1953/58	25,000	25,000	3,000	11,000	11,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3½ per cent. 1955/65	2,300	2,300	—	—	2,300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3 per cent. 1956/61	40,000	40,000	—	10,000	10,000	5,000	5,000	5,000	5,000	—	—	—	—	—	—	—	—	—	—	—
3 per cent. 1957/66	535,000	534,975	17,998	89,995	159,999	79,994	56,996	46,400	51,996	16,998	7,999	6,600	—	—	—	—	—	—	—	—
3 per cent. 1958/68	15,000	15,000	—	1,000	11,000	—	1,000	—	—	—	2,000	—	—	—	—	—	—	—	—	—
3 per cent. 1959/69	100,000	100,000	6,000	30,000	44,000	20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3 per cent. 1960/70	343,700	343,700	12,000	66,000	125,600	54,000	19,900	21,100	18,600	10,700	13,100	2,700	—	—	—	—	—	—	—	—
Municipal:																				
Johannesburg:																				
3½ per cent. 1956/66	1,600	1,600	—	—	—	—	1,600	—	—	—	—	—	—	—	—	—	—	—	—	—
3¾ per cent. 1959	6,200	6,200	—	—	—	—	—	1,900	4,300	—	—	—	—	—	—	—	—	—	—	—
3¾ per cent. 1960/65	20,000	20,000	—	8,000	12,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3½ per cent. 1962/67	129,000	126,531	18,620	42,140	16,660	32,425	16,686	—	—	—	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1965	1,200	1,200	—	—	—	—	—	—	—	1,200	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1965/70	294,000	294,000	8,000	44,000	86,000	29,000	26,000	26,000	26,000	21,000	22,000	6,000	—	—	—	—	—	—	—	—
3 per cent. 1967/77	30,000	30,000	—	—	—	—	—	5,000	5,000	5,000	5,000	5,000	5,000	—	—	—	—	—	—	—
Cape Town:																				
3¾ per cent. 1960/65	2,000	2,000	—	—	—	—	—	—	—	2,000	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1962/67	225,000	222,568	—	—	—	—	38,998	46,838	58,109	40,123	27,000	11,500	—	—	—	—	—	—	—	—
3 per cent. 1976	100,000	99,750	2,992	14,963	30,424	11,471	8,479	6,983	6,982	5,486	7,481	4,489	—	—	—	—	—	—	—	—
Durban:																				
3¼ per cent. 1962/72	115,500	115,211	—	115,211	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1965/75	45,000	45,000	2,500	14,500	28,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3¼ per cent. 1966/76	50,000	50,000	—	—	—	—	—	10,000	10,000	10,000	10,000	10,000	—	—	—	—	—	—	—	—
3 per cent. 1967/77	334,000	334,000	10,000	48,000	96,000	35,000	25,000	24,000	23,000	19,000	14,000	30,000	10,000	—	—	—	—	—	—	—
	£15,274,281	£15,184,196	£374,175	£2,249,332	£4,132,622	£1,298,227	£1,044,975	£901,393	£794,714	£518,176	£603,335	£527,066	£277,793	£173,680	£1,973,600	£118,728	£84,280	£87,250	£15,000	£9,850
Interest Accrued	—	64,868	1,958	10,062	19,480	6,315	5,995	4,962	4,174	2,425	3,022	2,157	1,197	1,223	—	1,055	748	79	—	16
	£15,274,281	£15,249,064	£376,133	£2,259,394	£4,152,102	£1,304,542	£1,050,970	£906,355	£798,888	£520,601	£606,357	£529,223	£278,990	£174,903	£1,973,600	£119,783	£85,028	£87,329	£15,000	£9,866
Market Values	£13,631,747	—	£342,966	£2,099,915	£3,729,217	£1,172,154	£934,598	£811,086	£702,727	£453,182	£531,163	£460,623	£249,505	£165,184	£1,683,687	£114,104	£82,303	£77,520	£12,788	£9,025

Johannesburg,
15th April, 1952.

J. VAN NIEKERK, Chief Accountant.

Electricity Supply Commission.

SCHEDULE No. 3.

LOAN CAPITAL AT 31st DECEMBER, 1951.

Loan No. 1:	Government of the Union of South Africa ...	£3,000,000
Loan No. 2:	Government of the Union of South Africa ...	5,000,000
		8,000,000
	Less—Repaid during 1933 and 1934	8,000,000

LOCAL REGISTERED STOCKS.

Loan No. 3:	£500,000 4¾ 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 3⅛ 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 3¾ 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
	£64,500,000	Total Local Registered Stocks ...	£64,500,000
Loan No. 20:	£10,750,000	$30,000,000 4 per cent. loan from International Bank for Reconstruction and Development: to be taken up during the period ending 31st December, 1953.	
		Amount received to 31st December, 1951	2,468,170
	£75,250,000		£66,968,170

SUNDRY LOANS AND AMOUNTS OUTSTANDING FOR RIGHTS ACQUIRED AT 31st DECEMBER, 1951.

Umkomaas Town Board	£7,780
Volksrust Municipality	5,294
Rand Water Board	34,848
Caledon Municipality	1,358
Rawsonville Village Management Board	3,674
East London Municipality	116,368
Alice Municipality	2,989
	£172,311

J. VAN NIEKERK,
Chief Accountant.

Johannesburg,
15th April, 1952.

Electricity Supply Commission.

ACCOUNT No. 1.

Redemption Fund Accoun for the Year ended 31st December, 1951.

	Totals.	Loan No. 3 £500,000 4¾% Local Registered Stock, 1953/63.	Loan No. 4 £2,500,000 4½% Local Registered Stock, 1953.	Loan No. 5 £6,750,000 3¾% Local Registered Stock. 1954/64.	Loan No. 6 £2,500,000 3½% Local Registered Stock, 1959/64.	Loan No. 7 £2,000,000 3½% Local Registered Stock, 1956/66.	Loan No. 8 £2,000,000 3½% Local Registered Stock, 1957/67.	Loan No. 9 £2,000,000 3¾% Local Registered Stock, 1959/64.	Loan No. 10 £1,500,000 3¾% Local Registered Stock, 1960/65.	Loan No. 11 £2,000,000 3½% Local Registered Stock, 1961/66.	Loan No. 12 £2,500,000 3½% Local Registered Stock, 1965/70.	Loan No. 13 £3,000,000 3% Local Registered Stock, 1967/73.	Loan No. 14 £3,000,000 3% Local Registered Stock, 1968/74.	Loan No. 15 £15,000,000 3½% Local Registered Stock, 1968/73.	Loan No. 16 £3,000,000 3½% Local Registered Stock, 1969/74.	Loan No. 17 £3,000,000 3¾% Local Registered Stock, 1969/74.	Loan No. 18 £5,250,000 3¾% Local Registered Stock, 1965/67.	Loan No. 19 £3,000,000 3¾% Local Registered Stock, 1964/67.	Future Loan (not yet raised)
Cr.																			
By **Balance at 31st December, 1950, brought forward—**																			
Natal Central Undertaking ...	£2,389,573	£2,309	£82,025	£1,901,566	—	£103,743	£22,429	£14,553	£41,396	£108,667	£45,575	£14,926	£19,502	—	£29,476	£1,526	£1,880	—	—
Witbank Undertaking	2,427,413	2,160	1,353,918	540,286	—	204,973	97,330	30,568	65,531	1,508	106,587	4,267	6,579	£6,872	3,962	479	2,393	—	—
Cape Western Undertaking ...	1,938,433	264,688	143,982	1,131,727	—	20,288	43,731	117,072	40,820	76,137	27,689	19,569	14,353	—	18,912	16,880	2,585	—	—
Durban Undertaking	1,399,528	105,206	588,910	228,266	—	7,058	118,027	40,552	39,885	19,387	76,958	105,368	56,732	—	5,267	6,253	1,659	—	—
Sabie Undertaking	99,470	—	73,834	24,611	—	—	—	—	—	1,025	—	—	—	—	—	—	—	—	—
Border Undertaking	12,293	—	—	—	—	—	—	—	—	—	—	5,891	3,968	—	1,326	1,108	—	—	—
Rand Undertaking	5,276,880	—	—	—	£1,195,766	543,277	560,753	531,894	300,085	328,298	248,972	90,119	52,386	1,359,008	38,193	20,422	7,707	—	—
Cape Northern Undertaking ...	5,096	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	232	—	£4,864
Head Office	165,235	—	4,670	54,058	—	102,646	—	1,342	1,009	138	164	322	516	—	253	—	117	—	—
	£13,713,921	£374,363	£2,247,339	£3,880,514	£1,195,766	£981,985	£842,270	£735,981	£488,726	£535,160	£505,945	£240,462	£154,036	£1,365,880	£97,389	£46,668	£16,573	—	£4,864
.. **Amounts contributed during the year as per Revenue Accounts—**																			
Natal Central Undertaking ...	£142,107	£47	Dr. £510	£75,305	—	£2,545	£1,419	£1,299	£732	£4,521	£1,867	£4,700	£13,999	—	£27,578	£3,767	£2,873	£1,965	—
Witbank Undertaking	57,935	88	39,689	15,842	—	Dr. 5,846	Dr. 2,769	Dr. 434	Dr. 901	115	Dr. 1,388	1,514	2,412	£2,667	2,861	615	3,087	383	—
Cape Western Undertaking ...	129,619	10,119	8472	20,711	—	1,618	Dr. 739	10,346	2,687	7,916	4,427	5,268	4,796	—	10,937	26,976	12,539	3,546	—
Durban Undertaking	137,660	4,270	31,065	Dr. 5,655	—	443	7,857	3,928	3,480	2,794	18,270	24,090	26,562	—	3,217	4,264	10,271	2,804	—
Sabie Undertaking	Dr. 3,619	—	Dr. 2,736	Dr. 851	—	—	—	—	—	Dr. 32	—	—	—	—	—	—	—	—	—
Border Undertaking	10,176	—	—	—	—	—	—	—	—	—	—	1,754	1,491	—	830	2,707	—	3,394	—
Rand Undertaking	1,041,074	—	—	—	£39,035	31,825	52,236	49,032	38,532	50,419	45,065	50,084	34,492	527,764	29,712	28,195	45,053	19,630	—
Cape Northern Undertaking ...	6,242	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	293	168	£5,781
	£1,521,194	£14,524	£75,980	£105,352	£39,035	£30,585	£58,004	£64,171	£44,530	£65,733	£68,241	£87,410	£83,752	£530,431	£75,135	£66,524	£74,116	£31,890	£5,781
.. **Other Contributions**	£15,806	—	£259	£3,113	—	£5,888	—	£197	£81	£13	£28	£86	£636	—	£247	£4,932	£326	—	—
.. **Nett Proceeds of Sales of Fixed Property—**																			
Natal Central Undertaking ...	£173	—	—	£173	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Witbank Undertaking	4	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cape Western Undertaking ...	2,900	£500	—	2,400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Durban Undertaking	135	—	—	135	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rand Undertaking	4,500	—	—	—	—	—	—	—	—	—	—	—	—	£4,500	—	—	—	—	—
	£7,712	£500	—	£2,712	—	—	—	—	—	—	—	—	—	£4,500	—	—	—	—	—
. **Nett Interest earned on Investments after deducting amounts appropriated in writing off premiums on investments purchased—**																			
Natal Central Undertaking ...	£83,898	£81	£2,904	£67,061	—	£3,406	£788	£510	£1,324	£3,513	£1,441	£539	£816	—	£1,279	£105	£119	£12	—
Witbank Undertaking	85,371	76	49,558	19,234	—	6,322	3,008	957	2,022	52	3,233	153	243	£183	161	26	141	2	—
Cape Western Undertaking ...	68,418	9,365	5,307	39,277	—	706	1,419	4,107	1,423	2,671	948	695	527	—	737	950	263	23	—
Durban Undertaking	50,700	3,734	21,596	8,145	—	246	4,165	1,422	1,402	687	2,689	3,682	2,190	—	216	349	170	7	—
Sabie Undertaking	3,619	—	2,736	851	—	—	—	—	—	32	—	—	—	—	—	—	—	—	—
Border Undertaking	500	—	—	—	—	—	—	—	—	—	—	211	148	—	52	75	—	14	—
Rand Undertaking	176,192	—	—	—	£41,994	18,930	19,797	18,638	10,702	11,771	8,599	3,588	2,147	36,202	1,569	1,114	972	169	—
Cape Northern Undertaking ...	283	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	1	£268
Head Office	5,837	—	171	1,946	—	3,575	—	47	36	5	5	11	20	—	11	—	10	—	—
	£474,818	£13,256	£82,272	£136,514	£41,994	£33,185	£29,177	£25,681	£16,909	£18,731	£16,915	£8,879	£6,091	£36,385	£4,025	£2,619	£1,689	£228	£268
Grand Total	**£15,733,451**	**£402,643**	**£2,405,850**	**£4,128,205**	**£1,276,795**	**£1,051,643**	**£929,451**	**£826,030**	**£550,246**	**£619,637**	**£591,129**	**£336,837**	**£244,515**	**£1,937,196**	**£176,796**	**£120,743**	**£92,704**	**£32,118**	**£10,913**
Dr.																			
To **Balance as per Balance Sheet—**																			
Natal Central Undertaking ...	£2,615,751	£2,437	£84,419	£2,044,105	—	£109,694	£24,636	£16,362	£43,452	£116,701	£48,883	£20,165	£34,317	—	£58,333	£5,398	£4,872	£1,977	—
Witbank Undertaking	2,570,723	2,324	1,443,165	575,366	—	205,449	97,569	31,091	66,652	1,675	108,432	5,934	9,234	£9,722	6,984	1,120	5,621	385	—
Cape Western Undertaking ...	2,139,370	284,672	157,761	1,194,115	—	22,612	44,411	131,525	44,930	86,724	33,064	25,532	19,676	—	30,586	44,806	15,387	3,569	—
Durban Undertaking	1,593,351	113,210	641,571	230,891	—	7,747	130,049	45,902	44,767	22,868	97,917	133,140	85,880	—	8,700	15,798	12,100	2,811	—
Sabie Undertaking	99,470	—	73,834	24,611	—	—	—	—	—	1,025	—	—	—	—	—	—	—	—	—
Border Undertaking	22,969	—	—	—	—	—	—	—	—	—	—	7,856	5,607	—	2,208	3,890	—	3,408	—
Rand Undertaking	6,498,646	—	—	—	£1,276,795	594,032	632,786	599,564	349,319	390,488	302,636	143,791	89,025	1,927,474	69,474	49,731	53,732	19,799	—
Cape Northern Undertaking ...	11,621	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	539	169	£10,913
Head Office	181,550	—	5,100	59,117	—	112,109	—	1,586	1,126	156	197	419	776	—	511	—	453	—	—
	£15,733,451	**£402,643**	**£2,405,850**	**£4,128,205**	**£1,276,795**	**£1,051,643**	**£929,451**	**£826,030**	**£550,246**	**£619,637**	**£591,129**	**£336,837**	**£244,515**	**£1,937,196**	**£176,796**	**£120,743**	**£92,704**	**£32,118**	**£10,913**

J. VAN NIEKERK, Chief Accountant.

Johannesburg,

We hereby certify that we are satisfied both 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 June, 1952.

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

ACCOUNT No. 2.

Electricity Supply Commission.

Reserve Fund Account for the Year ended 31st December, 1951.

Dr. | Cr.

To **Expenditure during the year on Replacements and Betterment**			£463,999	
Natal Central Undertaking	£17,659			
Witbank Undertaking	28,094			
Cape Western Undertaking	26,251			
Durban Undertaking	22,904			
Border Undertaking	11,042			
Rand Undertaking	358,049			
,, **Balance as per Balance Sheet**			2,271,059	
Natal Central Undertaking	529,175			
Witbank Undertaking	181,693			
Cape Western Undertaking	411,653			
Durban Undertaking	96,090			
Sabie Undertaking	11,018			
Border Undertaking	10,788			
Rand Undertaking	1,017,982			
Cape Northern Undertaking	12,660			
			£2,735,058	

By **Balance at 31st December, 1950, brought forward**			£2,178,321
Natal Central Undertaking	£507,877		
Witbank Undertaking	192,868		
Cape Western Undertaking	368,996		
Durban Undertaking	81,032		
Sabie Undertaking	10,622		
Border Undertaking	18,339		
Rand Undertaking	993,207		
Cape Northern Undertaking	5,380		
,, **Amounts set aside during the year as per Revenue Accounts**			475,328
Natal Central Undertaking	20,000		
Witbank Undertaking	10,000		
Cape Western Undertaking	54,639		
Durban Undertaking	35,000		
Border Undertaking	3,000		
Rand Undertaking	345,689		
Cape Northern Undertaking	7,000		
,, **Interest earned on Investments**			81,409
			£2,735,058

Johannesburg,
15th April, 1952.

J. VAN NIEKERK, Chief Accountant.

Electricity Supply Commission.

ACCOUNT No. 3.

NATAL CENTRAL UNDERTAKING.

Dr. Revenue Account for the Year ended 31st December, 1951. Cr.

Generation of Electricity.		
To Operation—		
Fuel	£246,562	
Water, Oil, Waste and Stores	2,976	
Salaries and Wages	55,775	
Other Expenses	566	
,, Maintenance—		
Stores	17,402	
Salaries and Wages	36,950	
Other Expenses	3,915	
		£364,146
Distribution of Electricity.		
,, Operation and Maintenance—		
Stores	14,138	
Salaries and Wages	58,922	
Other Expenses	8,001	
		81,061
General Expenses.		
,, Local Administration and Technical Management	36,940	
,, General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)	44,811	
,, Head Office Administration and General Expenses, including Publicity	25,545	
,, Engineering Expenses	12,693	
		119,989
,, Deferred Payment Scheme, including Propaganda and Showroom Expenses		124
		565,320
,, Interest		236,901
,, Redemption Fund		142,107
,, Instalments paid on Volksrust Municipality Loan		1,322
,, Amount set aside to Reserve Fund		20,000
,, Balance carried down		10,237
		£975,887
To Balance at 31st December, 1950, brought forward	£10,068	
,, Balance as per Balance Sheet	169	
	£10,237	

By Sales of Electricity—		
Traction Supplies	£471,262	
Bulk Supplies	289,019	
Mining Supplies	51,037	
Industrial Supplies	78,024	
Domestic and Lighting Supplies	69,724	
		£959,066
,, Electricity supplied to Durban Undertaking		6,207
,, Other Revenue		10,614
		£975,887
By Balance brought down		£10,237
		£10,237

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

WITBANK UNDERTAKING.

Dr. Revenue Account for the Year ended 31st December, 1951. Cr.

Generation of Electricity.				
To Operation—			By Sales of Electricity—	
Fuel	£165,285		Traction Supplies	£255,227
Water, Oil, Waste and Stores	11,707		Bulk Supplies	16,552
Salaries and Wages	60,107		Mining Supplies	149,436
Other Expenses	839		Industrial Supplies	134,473
,, Maintenance—			Domestic and Lighting Supplies	25,088
Stores	31,334			£580,776
Salaries and Wages	38,975			
Other Expenses	13,054			
	£321,301			
,, Electricity Purchased	23,140			
,, Electricity supplied by Rand Undertaking	232,088		,, Electricity supplied to Rand Undertaking	293,559
Distribution of Electricity.			,, Other Revenue	10,781
,, Operation and Maintenance—				
Stores	4,397			
Salaries and Wages	11,101			
Other Expenses	925			
	16,423			
General Expenses.				
,, Local Administration and Technical Management	26,011			
,, General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)	28,476			
,, Head Office Administration and General Expenses, including Publicity	20,508			
,, Engineering Expenses	10,190			
	85,185			
	678,137			
,, Interest	129,987			
,, Redemption Fund	57,935			
,, Amount set aside to Reserve Fund	10,000			
,, Balance carried down	9,057			
	£885,116			£885,116
To Balance at 31st December, 1950, brought forward	£18,344		By Balance brought down	£9,057
			,, Balance as per Balance Sheet	9,287
	£18,344			£18,344

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

CAPE WESTERN UNDERTAKING.

Revenue Account for the Year ended 31st December, 1951.

Dr.			Cr.			
Generation of Electricity.						
To Proportion of Pooled Costs (as per attached Statement) ...	£559,636		By Sales of Electricity—			
,, Other Operation and Maintenance Costs	7,694		Traction Supplies	£161,600		
		£567,330	Bulk Supplies	228,965		
Distribution of Electricity.			Industrial Supplies	380,377		
,, Operation and Maintenance—			Domestic and Lighting Supplies	303,561		
Stores	11,020				£1,074,503	
Salaries and Wages	77,216		,, Other Revenue	7,434		
Other Expenses	15,094		*Less*—Credited to Pooled Costs	1,380		
		103,330			6,054	
General Expenses.			,, Balance carried down		47,554	
,, Local Administration and Technical Management	66,025					
,, General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)	53,067					
,, Head Office Administration and General Expenses, including Publicity	21,947					
,, Engineering Expenses	10,905					
	151,944					
Less—Charged to Pooled Costs	8,605					
		143,339				
		813,999				
,, Interest	213,534					
,, Redemption Fund	129,619					
,, Instalments on Caledon Municipality and Rawsonville Village Management Board Loans	1,063					
,, Amount set aside to Reserve Fund	54,639					
	398,855					
Less—Charged to Pooled Costs	84,743					
		314,112				
		£1,128,111				£1,128,111
To Balance brought down		£47,554	By Balance at 31st December, 1950, brought forward			£53,337
,, Balance as per Balance Sheet		5,783				
		£53,337				£53,337

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission and City of Cape Town.

Dr. Statement of Pooled Costs for the Year ended 31st December, 1951, and Allocation thereof. Cr.

Pooled Generation of Electricity.

To Operation and Maintenance—		
Fuel	£999,645	
Water, Oil, Waste and Stores	57,276	
Salaries, Wages and Other Expenses	219,939	
		£1,276,860
,, General Expenses (including Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)		27,327
,, Interest		163,454
,, Redemption Fund		184,833
,, Reserve Fund		26,956
		£1,679,430

By Allocation of Pooled Costs in terms of Agreement—		
Electricity Supply Commission	£559,636	
City of Cape Town	1,115,662	
		£1,675,298
,, Sundry Revenue		4,132
		£1,679,430

Cape Town,
15th April, 1952.

C. G. DOWNIE,
Manager of the Pooled Stations.

Electricity Supply Commission.

DURBAN UNDERTAKING.

Revenue Account for the Year ended 31st December, 1951.

Dr. | Cr.

Generation of Electricity.				
To Operation—				
Fuel		£398,891		
Water, Oil, Waste and Stores		20,872		
Salaries and Wages		73,428		
Other Expenses		5,631		
,, Maintenance—				
Stores		35,981		
Salaries and Wages		83,491		
Other Expenses		4,564		
			£622,858	
,, Electricity Purchased			36,907	
,, Electricity supplied by Natal Central Undertaking			6,207	
Distribution of Electricity.				
,, Operation and Maintenance—				
Stores		10,666		
Salaries and Wages		24,095		
Other Expenses		6,007		
			40,768	
General Expenses.				
,, Local Administration and Technical Management		21,669		
,, General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)		37,874		
,, Head Office Administration and General Expenses, including Publicity		17,270		
,, Engineering Expenses		8,581		
			85,394	
			792,134	
,, Interest			180,476	
,, Redemption Fund			137,660	
,, Sinking Fund			120	
,, Amount set aside to Reserve Fund			35,000	
,, Balance carried down			16,519	
			£1,161,909	
To Balance at 31st December, 1950, brought forward			£29,412	
			£29,412	

By Sales of Electricity—			
Traction Supplies	£75,842		
Bulk Supplies	947,697		
Industrial Supplies	54,180		
Domestic and Lighting Supplies	80,430		
		£1,158,149	
,, Other Revenue		3,760	
		£1,161,909	
By Balance brought down		£16,519	
,, Balance as per Balance Sheet		12,893	
		£29,412	

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

SABIE UNDERTAKING.

Revenue Account for the Year ended 31st December, 1951.

Dr.			Cr.		
Generation of Electricity.			By Sales of Electricity—		
To Operation—			Mining Supplies		£8,419
Water, Oil, Waste and Stores	£98				
Salaries and Wages	4,050				
,, Maintenance—					
Stores	167				
Salaries and Wages	220				
Other Expenses	42				
	—	£4,577			
Distribution of Electricity.					
,, Operation and Maintenance—					
Stores	40				
Salaries and Wages	568				
Other Expenses	143				
	—	751			
General Expeness.					
,, Local Administration and Technical Management	276				
,, General Expenses (including Maintenance of Quarters, Insurance, Pension Fund Contributions, etc.)	647				
,, Head Office Administration and General Expenses, including Publicity	962				
,, Engineering Expenses	478				
	—	2,363			
		7,691			
,, Interest		4,282			
,, Redemption Fund		Cr. 3,619			
,, Balance carried down		65			
		£8,419			£8,419
To Balance as per Balance Sheet		£110	By Balance at 31st December, 1950, brought forward		£45
			,, Balance brought down		65
		£110			£110

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

BORDER UNDERTAKING.

Revenue Account for the Year ended 31st December, 1951.

Dr.

Generation of Electricity.		
To Operation—		
Fuel	£130,177	
Water, Oil, Waste and Stores	4,102	
Salaries and Wages	31,908	
Other Expenses	1,390	
,, Maintenance—		
Stores	6,145	
Salaries and Wages	13,925	
Other Expenses	1,513	
		£189,160
,, Electricity Purchased		1,942
Distribution of Electricity.		
,, Operation and Maintenance—		
Stores	1,231	
Salaries and Wages	6,609	
Other Expenses	1,301	
		9,141
General Expenses.		
,, Local Administration and Technical Management	16,216	
,, General Expenses (including Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)	13,733	
,, Investigations and Development Expenses	—	
,, Head Office Administration and General Expenses, including Publicity	5,397	
,, Engineering Expenses	2,682	
		38,028
		238,271
,, Interest		26,299
,, Redemption Fund		10,176
,, Instalments paid on East London and Alice Municipalities Loans		7,302
,, Amount set aside to Reserve Fund		3,000
		£285,048
To Balance brought down		£21,114
		£21,114

Cr.

By Sales of Electricity—		
Bulk Supplies	£205,742	
Industrial Supplies	16,201	
Domestic and Lighting Supplies	41,179	
		£263,122
,, Sales of Steam		394
,, Other Revenue		418
,, Balance carried down		21,114
		£285,048
By Balance at 31st December, 1950, brought forward		£10,843
,, Balance as per Balance Sheet		10,271
		£21,114

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

RAND UNDERTAKING.

Revenue Account for the Year ended 31st December, 1951.

Dr.			Cr.		
Generation.					
To Operation—			By Sales of Electricity—		
Fuel	£2,025,387		Bulk Supplies	£496,597	
Water, Oil, Waste and Stores	69,035		Mining Supplies	4,397,903	
Salaries and Wages	455,706		Industrial Supplies	1,078,974	
Other Expenses	22,300		Domestic and Lighting Supplies	173,625	
,, Maintenance—					£6,147,099
Stores	158,577		,, Sales of Air and Steam		552,424
Salaries and Wages	375,457		,, Electricity supplied to Witbank Undertaking		232,088
Other Expenses	37,327		,, Other Revenue		31,198
	£3,143,789		,, Balance carried down		111,705
,, Electricity Purchased	178,125				
,, Electricity supplied by Witbank Undertaking	293,559				
Distribution.					
,, Operation and Maintenance—					
Stores	103,700				
Salaries and Wages	384,606				
Other Expenses	11,688				
	499,994				
General Expenses.					
,, Local Administration and Technical Management	163,359				
,, General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)	244,818				
,, Head Office Administration and General Expenses, including Publicity	50,127				
,, Engineering Expenses	24,908				
	483,212				
	4,598,679				
,, Interest	1,084,668				
,, Redemption Fund	1,041,074				
,, Provision for Repayment of Amounts Outstanding (Rand Water Board)	4,404				
,, Amount set aside to Reserve Fund	345,689				
	£7,074,514				£7,074,514
To Balance brought down	£111,705		By Balance at 31st December, 1950, brought forward		£6,967
			,, Balance as per Balance Sheet		104,738
	£111,705				£111,705

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

Electricity Supply Commission.

CAPE NORTHERN UNDERTAKING.

Dr. Revenue Account for the Year ended 31st December, 1951. Cr.

Generation of Electricity.				
To Operation—				
Fuel		£74,944		
Water, Oil, Waste and Stores		2,465		
Salaries and Wages		21,409		
Other Expenses		5,201		
.. Maintenance—				
Stores		3,967		
Salaries and Wages		9,439		
Other Expenses		556		
		—	£117,981	
.. Electricity Purchased			49	
Distribution of Electricity.				
.. Operation and Maintenance—				
Salaries and Wages		25		
Other Expenses		20		
		—	45	
General Expenses.				
.. Local Administration and Technical Management		4,781		
.. General Expenses (including Maintenance of Quarters, Stores Expenses, Rates, Insurance, Pension Fund Contributions, etc.)		3,693		
.. Head Office Administration and General Expenses, including Publicity		2,159		
.. Engineering Expenses		1,073		
			11,706	
			129,781	
.. Interest			8,189	
.. Redemption Fund			6,242	
.. Amount set aside to Reserve Fund			7,000	
			£151,212	
To Balance brought down			£2,424	
.. Balance as per Balance Sheet			2,976	
			£5,400	

By Sales of Electricity—			
Bulk Supplies	£88,305		
Mining Supplies	60,100		
Industrial Supplies	101		
Domestic Supplies	14		
	—	£148,520	
.. Other Revenue		268	
.. Balance carried down		2,424	
		£151,212	
By Balance at 31st December, 1950, brought forward		£5,400	
		£5,400	

J. VAN NIEKERK, Chief Accountant.

Johannesburg,
15th April, 1952.

Referred to in our Report of 27th June, 1952.

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

ANNEXURE B

STATEMENT No. 1

Electricity Supply Commission

POWER STATIONS: PRINCIPAL EQUIPMENT INSTALLED AS AT 31st DECEMBER, 1951

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	0·54	—	—	1 1 2	0·025 0·055 0·230		
	King William's Town	Steam	4·5	1 3	10·0 12·0	2 1	1·5 0·5		
		Oil				1	1·0		
	West Bank No. 1	Steam	32·0	4 2 4	21·5 27·5 55·0	1 2 2 1	1·5 4·0 7·5 7·5		
Cape Northern 14,800	Central, Kimberley	Steam	20·0	8	30·0	1 1 2	3·0 5·0 6·0		
Cape Western 5,600	Salt River No. 1 Worcester	Steam	90·3	2 6	60·0 100·0	3 3 2	10·0 20·0 1·0	1	0·3
		Oil	2·0						
Durban 1,900	Congella Nos. 1 and 2	Steam	206·0	6 4 5	60·0 100·0 200·0	3 1 1 3	12·0 20·0 30·0 40·0		
	Port Shepstone	Oil	3·4	—	—	2 2	0·7 1·0		

Natal Central 11,300	Colenso Nos. 1 and 2	Steam	110·0	8 4 2	60·0 80·0 180·0	5 2	12·0 25·0		
	Volksrust	Oil	0·5	—	—	2	0·25		
Rand 28,100	Brakpan	Steam	48·0	8 10 1	28·0 45·0 70·0	1 2 1	3·0 12·5 20·0		
	Klip	Steam	424·0	24	180·0	12	33·0	4	7·0
	Rosherville	Steam	60·5	32 8	38·0 48·0	5 1	9·6 12·5		
	Simmerpan	Steam	40·0	4 12 8	20·0 25·0 48·0	1 5 2	3·0 3·0 11·0		
	Vaal	Steam	212·0	10	190·0	6	33·0	2	7·0
	Vereeniging	Steam	157·5	20 2 5	45·0 60·0 180·0	3 3	20·0 32·5		
Sabie 200	Sabie Gorge	Hydro	1·35	—	—	3	0·45		
Witbank 4,600	Witbank	Steam	108·0	20	70·0	5	20·0	1	8·0

SUMMARY:

Total No. of Boilers		223	
Total Boiler House Rating (thousand lb/hr)		16,935·0	
Total No. of Main Generators	97 Capacity	1,470·29	MW
Total No. of House Sets	8 Capacity	50·3	MW
Total Plant Capacity (Electric)		1,520·59	MW

Major Items of Plant Commissioned 1951

Congella ... ... 1-40 MW Generator.
Vaal ... ... 1-33 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
Electric Driven				
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	
Steam Driven				
Brakpan Power Station ...	3	Recip.	800	7,600
	1	Turbo	2,550	
	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 ...	32	—	—	99,180 =73,990 kW

CAPACITY OF TRANSFORMERS IN SERVICE AT 31st DECEMBER, 1951

Undertaking	Number	MVA
Border	95	27
Cape Northern	14	4
Cape Western	1,908	284
Durban	424	117
Natal Central	904	355
Rand	2,540	5,188
Sabie	13	4
Witbank	367	295
At Compressor Stations, Rand	48	339
TOTALS	6,313	6,613

(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	—	—	—	—	5	14	43	62
Cape Northern	—	—	—	—	25	—	—	25
Cape Western	—	—	141	343	461	245	366	1,556
Durban	—	78	—	57	118	67	119	439
Natal Central	—	596	—	55	509	149	125	1,434
Rand	127	1,616	—	698	202	263	195	3,101
Sabie	—	—	—	—	7	—	1	8
Witbank	—	42	—	—	223	39	50	354
Totals	127	2,332	141	1,153	1,550	777	899	6,979

UNDERGROUND CABLES

Border	—	—	—	—	—	14	—	14
Cape Western	—	—	—	60	42	6	10	118
Durban	—	—	—	2	2	1	2	7
Natal Central	—	—	—	—	2	5	3	10
Rand	—	—	—	—	102	139	9	250
Witbank	—	—	—	—	22	11	2	35
Totals	—	—	—	62	170	176	26	434

TOTAL OVERHEAD LINES AND UNDERGROUND CABLES: 7,413 CIRCUIT MILES.

(2) TELEPHONE AND PILOT CABLES

Cape Western	86	844 circuit miles.
Rand	748	
Witbank	10	

STATEMENT No. 2

POWER-STATIONS: PRINCIPAL EQUIPMENT ON ORDER AS AT 31st DECEMBER, 1951

Undertaking	Electric Power-Station	BOILERS		GENERATORS		Transmission Lines Circuit Miles	TRANSFORMERS	
		No.	Continuous Maximum Rating Each, thousand lb/hr	No.	Normal Rating Each MW		No.	Capacity MVA
Border	West Bank No. 2	2	170	2	15·0	—	1	10
Cape Northern ...	Central, Kimberley	2	75	2	5·5	—	13	41
Cape Western	Caledon	—	—	1	1·0*	—	—	—
	Hex River	4	200	3	20·0	—	92	108
	Salt River No. 2	4	260	2	30·0	—		
Durban	Congella No. 2	3	200	—	—	46	35	191
	Umgeni	4	180	2	30·0			
Natal Central	Colenso No. 2	3	180	1	25·0	130	99	30
Rand	Taaibos	6	580	6	60·0	—	—	—
	Vaal	8	190	3	33·0	—	—	—
				1	7·0	—	—	—
	Vereeniging	1	180	—	—	66	408	3,788
	Vierfontein	12	210	7	30·0	—	—	—
	Wilge	4	150	2	30·0	—	—	—
		2	400	1	60·0	—	—	—
Swartkops	Swartkops	2	210	2	20·0	—	—	—
Witbank	Witbank	2	80	1	20·0	44	9	99

* In Store.

Summary:—

Numbers of Boilers	59	... C.M.R. 13,870,000 lb/hr
Number of Generators	36	... Total Rating 1,103 MW
Transmission Lines	513	... Circuit Miles
Transformers	657	... Rating 4,267 MVA

STATEMENT No. 3

UNITS SOLD BY UNDERTAKINGS TO ALL CONSUMERS DURING THE PAST TWENTY-SEVEN YEARS

Million Units

Year	Border	Cape Northern	Cape Western	Durban	Klip	Natal Central	Rand	Sabie	Vaal	Witbank	**Totals**
1925								0·08			**0·08**
1926			0·3			0·7		0·7		160·0	**161·7**
1927			5·8			104·2		1·9		439·1	**551·0**
1928			31·0	15·6		114·2		2·8		464·3	**627·9**
1929			47·9	78·9		123·9		3·2		543·1	**797·0**
1930			49·8	99·1		117·1		4·6		619·0	**889·6**
1931			52·1	103·9		101·1		6·6		603·4	**867·1**
1932			64·2	109·8		100·3		6·1		610·3	**890·7**
1933			100·7	118·5		109·2		6·3		639·4	**974·1**
1934			73·6	131·1		124·9		7·3		648·3	**985·2**
1935			80·0	149·8		154·3		7·2		727·9	**1,119·2**
1936			85·8	170·4	557·0	171·5		6·9		696·4	**1,688·0**
1937			94·0	189·4	1,349·9	210·6		7·2		684·5	**2,535·6**
1938			98·8	209·5	1,666·9	234·9		7·2		768·1	**2,985·4**
1939			106·5	233·7	2,193·2	266·2		6·4		767·7	**3,573·7**
1940			119·8	242·7	2,566·6	281·1		6·7		853·3	**4,070·2**
1941			136·2	270·3	2,675·9	302·4		6·6		862·6	**4,254·0**
1942			151·8	273·8	2,707·8	307·7		6·3		873·4	**4,320·8**
1943			145·7	293·4	2,669·1	312·4		5·9		849·1	**4,275·6**
1944			158·7	321·6	2,703·6	336·0		6·7		889·2	**4,415·8**
1945			165·9	348·8	2,643·0	333·2		6·6	377·9	830·7	**4,706·1**
1946			184·6	369·7	2,614·3	347·0		7·4	582·5	896·9	**5,002·4**
1947	56·2		198·6	402·6	2,547·2	346·0		7·6	668·6	887·7	**5,114·5**
1948	69·2		222·4	448·7	1,207·4	367·9	2,185·7	7·3	435·1	633·2	**5,576·9**
1949	68·7		249·5	513·0		371·8	4,653·9	7·0		358·3	**6,222·2**
1950	79·9	53·9	271·9	561·8		406·5	5,151·8	6·3		378·5	**6,910·6**
1951	88·0	58·5	303·5	617·0		433·4	5,563·2	6·1		386·8	**7,456·5**

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.

STATEMENT No. 4

ELECTRICITY

UNITS SOLD AND NUMBER OF CONSUMERS, 1951 (Electricity, Air and Steam)

Undertaking	TRACTION			BULK			MINING			INDUSTRIAL			DOMESTIC AND STREET LIGHTING			TOTAL UNITS SOLD		Total Number Consumers
	Units	Per cent. Traction	No. Cons.	Units	Per cent. Bulk	No. Cons.	Units	Per cent. Mining	No. Cons.	Units	Per cent. Industrial	No. Cons.	Units	Per cent. Domestic and Lighting	No. Cons.	Units	Per cent. Total Units Sold	
Border				79,233,280	6·285	1				2,243,581	0·195	115	6,457,388	4·804	1,938	87,934,249	1·223	2,054
Cape Northern ..				36,630,200	2·906	2	21,867,800	0·533	1	19,838	0·002	7	3,164	0·002	1	58,521,002	0·814	11
Cape Western ...	59,516,598	11·035	1	79,482,369	6·305	18				102,492,356	8·913	1,483	61,985,053	46·117	16,576	303,476,376	4·221	18,078
Durban	41,827,720	7·755	1	541,182,411	42·928	2				22,876,091	1·989	217	11,067,022	8·234	3,047	616,953,244	8·582	3,267
Natal Central ...	256,805,513	47·612	1	126,903,898	10·066	12	17,790,135	0·433	8	23,364,230	2·032	406	8,520,873	6·340	3,400	433,384,649	6·028	3,827
Rand				391,018,975	31·017	41	3,983,216,509	97·043	96	880,114,383	76·536	704	41,469,152	30·853	11,300	5,295,819,019	73·666	12,141
Sabie							6,081,087	0·148	1							6,081,087	0·085	1
Witbank ...	181,216,771	33·598	1	6,225,900	0·493	3	75,647,358	1·843	32	118,831,482	10·333	91	4,906,215	3·650	1,675	386,827,726	5·381	1,802
Total Electricity ...	539,366,602	100·000	4	1,260,677,033	100·000	79	4,104,602,889	100·000	138	1,149,941,961	100·000	3,023	134,408,867	100·000	37,937	7,188,997,352	100·000	41,181
Per cent. ...	7·503			17·536			57·096			15·996			1·869			100·000		
AIR AND STEAM																		
Border: Steam ..										131,394	1·346	2				131,394	0·049	2
Rand:																		
Air				2,759,809		1	237,297,756	93·070	11	9,633,836	98·654	22				249,691,401	93·345	34
Steam ...							17,670,000	6·930	1							17,670,000	6·606	1
Total Air and Steam				2,759,809		1	254,967,756	100·000	12	9,765,230	100·000	24				267,492,795	100·000	37
Per cent. ...				1·032			95·318			3·650						100·000		
ELECTRICITY, AIR AND STEAM																		
Grand Totals ...	539,366,602		4	1,263,436,842		80	4,359,570,645		150	1,159,707,191		3,047	134,408,867		37,937	7,456,490,147		41,218
Per cent. ...	7·234			16·944			58·467			15·553			1·802			100·000		
BY PROVINCE																		
Cape	59,516,598	11·035	1	198,968,266	15·748	22	21,867,800	0·501	1	104,887,169	9·044	1,607	68,445,605	50·923	18,515	453,685,432	6·084	20,146
Natal	291,148,397	53·980	1	654,459,829	51·800	12	17,790,135	0·408	8	45,054,565	3·885	532	16,904,482	12·577	4,918	1,025,357,408	13·751	5,471
O.F.S.	7,484,836	1·387	1	41,074,598	3·251	9	256,937,536	5·894	15	38,055,061	3·282	50	609,958	0·454	409	344,161,989	4·616	484
Transvaal ...	181,216,771	33·598	1	368,934,155	29·201	37	4,062,975,174	93·197	126	971,710,396	83·789	858	48,448,822	36·046	14,095	5,633,285,318	75·549	15,117

Electricity — 96·413 }
Air — 3·587 } per cent. of total sales.

POWER STATION OPERATING STATISTICS: YEAR, 1951

STEAM ELECTRIC:

Power Station	Units Generated	Units Sent Out	MAXIMUM DEMANDS ½ Hour (or Hour) Sent Out kW	MAXIMUM DEMANDS Peak kW	Station Load Factor % Sent Out	Coal Burned Tons (2,000 lb)	LB OF COAL Per Unit Generated	LB OF COAL Per Unit Sent Out	Calorific Value of Coal B.Th.U. as Recd. (Weighted Average)	B.Th.U. PER UNIT Generated	B.Th.U. PER UNIT Sent Out	OVERALL THERMAL EFFICIENCY % Generated	OVERALL THERMAL EFFICIENCY % Sent Out
Brakpan	180,412,500	166,559,663	Hour 43,024	—	44·2	233,592	2·590	2·805	9,180	23,780	25,750	14·35	13·25
Central, Kimberley ...	62,624,706	58,513,651	14,050	14,800	47·5	61,501	1·964	2·102	12,250	24,060	25,750	14·18	13·25
Colenso No. 1 and No. 2 ...	498,510,930	471,475,920	87,990	108,000	61·2	345,444	1·386	1·465	12,200	16,910	17,870	20·18	19·09
Congella No. 1 and No. 2 ...	641,874,200	596,367,170	131,820	143,700	51·6	393,087	1·225	1·318	12,060	14,770	15,900	23·10	21·47
King William's Town ...	8,940,440	8,375,937	2,606*	2,880*	37·1*	8,212	1·866	1·992	13,090	24,430	26,080	14·05*	13·18*
Klip	2,882,523,380	2,694,882,121	Hour 372,951	—	82·5	2,441,423	1·694	1·812	9,160	15,520	16,600	21·99	20·55
Rosherville	191,768,186	171,632,986	Hour 51,047	—	38·4	275,006	2·868	3·205	9,690	27,790	31,060	12·28	10·99
Salt River No. 1	208,732,170	194,731,379	61,850	68,800	36·0	145,920	1·398	1·499	12,350	17,270	18,520	19·76	18·42
Simmerpan	115,398,663	109,114,318	Hour 41,159	—	30·3	199,632	3·460	3·659	9,090	31,450	33,260	10·85	10·26
Vaal	1,444,072,607	1,362,811,212	Hour 192,149	—	81·0	1,118,042	1·548	1·641	9,330	14,440	15,310	23·63	22·29
Vereeniging	993,808,211	933,410,207	Hour 140,811	—	75·7	1,092,700	2·199	2·341	8,830	19,420	20,670	17·57	16·51
West Bank, East London ...	83,118,510	79,233,280	20,150	21,200	44·9	70,333	1·692	1·775	12,390	20,960	21,990	16·28	15·52
Witbank	849,767,569	795,147,419	Hour 105,126	—	86·3	740,740	1·743	1·863	10,850	18,910	20,210	18·04	16·88
Totals	8,161,552,072	7,642,255,263				7,125,632							

* Includes Diesel Plant.

HYDRO ELECTRIC:

Power Station	Units Generated	Units Sent Out	Maximum Demand kW ½ Hr. Sent Out	Maximum Demand kW 2 Min. Generated	Station Load Factor Sent Out	Inches Rain
Sabie ...	6,440,900	6,308,900	1,150	1,250	62·6	45·74

Statement No. 5—(continued)

POWER STATION OPERATING STATISTICS: YEAR, 1951

DIESEL ELECTRIC:

Power Station	Units Generated	Units Sent Out	Maximum Demands kW		Load Factor % ½ Hour Sent Out	Fuel Consumed		Lub. Oil Galls.
			½ Hour	2 Mins.		Total lb	Per kWh Sent Out	
Alice	800,955	674,846	199	213	38·7	555,970	0·824	1,208
King William's Town ...	104,500	104,500	960	1,000	*	61,354	0·587	48
Port Shepstone	1,092,006	1,076,676	3,366	3,430	3·7	617,199	0·543	810
Volksrust	8,713	8,713	—	—	—	8,120	0·932	13
Worcester	1,400,145	1,391,820	—	—	—	792,808	0·566	796
TOTALS	3,406,319	3,256,555				2,035,451	0·625	2,875

* In parallel with Steam Plant.

COMPRESSOR STATIONS:

Station	Air Units Generated	Air Units Sent Out		Coal Burned		Electrical Input		Max. Sustained Load over One Hour kW	Load Factor %
		Units	%	Total Tons	lb Coal/ Units Sent Out	Total kWh excluding Losses	Units Sent Out/kWh %		
Central Rand Compressed Air System:									
Rosherville ...	137,438,100	137,162,800	55·01	188,032	2·742	—	—	75,640	37·6
Robinson	60,154,900	60,154,900	24·12	—	—	74,810,081	80·41		
Canada Dam ...	52,037,500	52,037,500	20·87	—	—	61,541,901	84·56		
Air Pipe-Line Totals	249,630,500	249,355,200				136,251,982			
Other Air Stations									
Brakpan (Steam)	17,730,420	17,670,000	—	30,977	3·506	—	—	6,398	31·5
Modder B and New Modder	9,904,241	9,904,241	—	—	—	11,582,745	85·51		
TOTALS AIR + STEAM	277,265,161	276,929,441		219,009		147,934,727			

SUMMARY:

TOTAL COAL BURNED AT ALL E.S.C. STATIONS: 7,344,771 tons, which includes 130 tons for Steam Sold at K.W.T. (increase of 374,357 tons or 5,371% over 1950).

TOTAL UNITS GENERATED = Units generated at STEAM ELECTRIC + HYDRO + DIESEL + AIR (Rosherville and Brakpan) STATIONS

= 8,161,552,072 + 6,440,900 + 3,406,319 + 155,168,520

= 8,326,567,811 (Increase of 552,991,292 or 7·114% over 1950).

STATEMENT No. 6

POWER PURCHASED.

From	Maximum Demand kW	Millions of Units
Cape Town, City of (see below)		
Durban, City of		
at Warner Beach	4,500	16·988
at Canelands	325	1·009
East London, Municipality of	252	0·267
Johannesburg, City of		
ex Jeppe Street Power Station	15,800*	2·423
ex Orlando Power Station	72,960*	123·422
Kimberley, City of	—	0·006
The Good Hope Textile Corp. (Pty.) Ltd.-K.W.T.	—	0·003
Middle Witwatersrand (Western Areas) Ltd.	2,500	12·733
Pretoria, City of		
for use of Rand Undertaking	13,000	22·368
for use of Witbank Undertaking	—	15·406

* Non-simultaneous.

Cape Town, City of:

Under the Pooling Agreement, the E.S.C. received 335·425 million units from the Pool, which includes 194·732 million units from Salt River Power Station.

STATEMENT No. 7

WATER (OTHER THAN SEA WATER) CONSUMED BY POWER STATIONS FOR THE YEAR 1951

(Millions of Gallons)

Undertaking	Potable Water	Crude River Water	Water from Other Sources including Boreholes, Dams and Sewage
Border	11		11
Cape Northern	12		120
Cape Western	21		
Durban	78		
Natal Central	25	348	
Rand (including Witbank Power Station)	242	5,930	866

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 1951

(See previous Annual Reports for Rights or Interests in or over land acquired prior to 1951)

Cape Western Undertaking

Immovable Property was acquired to the value of	£1,897	0	0
Servitudes were acquired for	529	17	0

Natal Central Undertaking

Immovable Property was acquired to the value of	68	16	10
Servitudes were acquired for	159	3	2

Durban Undertaking

Immovable Property was acquired to the value of	1,050	0	0

Witbank Supply System

Immovable Property was acquired to the value of	2,050	0	0
Servitudes were acquired for	92	12	0
Servitudes were acquired for annual rentals amounting to ...	47	1	1
Property was hired for an annual rental of	5	0	0

Rand Undertaking

Immovable Property was acquired to the value of	18,304	2	10
Surface Rights, Rights of Way and other Servitudes were acquired for annual rentals amounting to	1,959	13	9
Property was hired for an annual rental of	192	0	0

Cape Northern Undertaking

Immovable Property was acquired to the value of	1,885	0	0

Swartkops River Undertaking

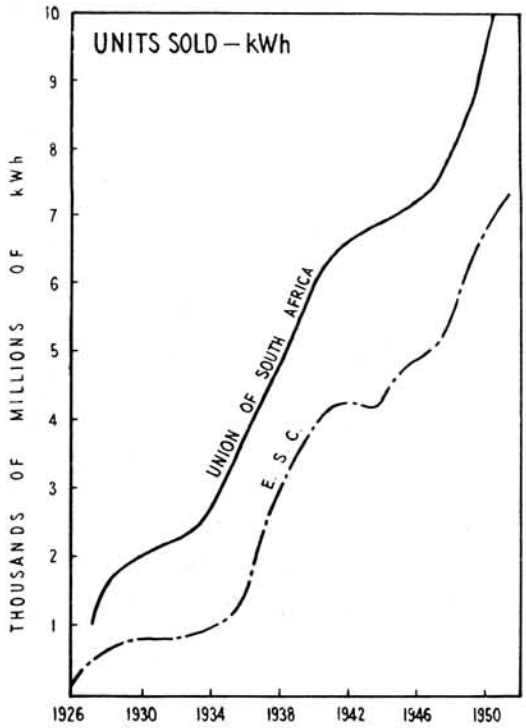
Immovable Property was acquired to the value of	700	0	0

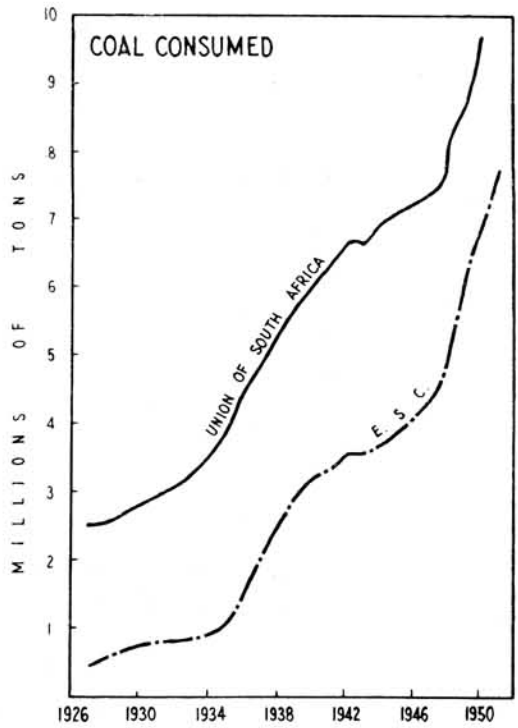
COAL USED AT COMMISSION'S STEAM-RAISING POWER STATIONS

Average Cost per ton (2,000 lb)

Power Station	1945	1946	1947	1948	1949	1950	1951
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Brakpan	—	—	—	7 9	7 8	8 9	8 10
Colenso	10 8	10 11	11 4	11 6	12 9	13 2	14 3
Congella	15 4	15 7	16 4	16 4	18 0	19 5	20 0
East London	—	—	26 7	26 11	28 6	30 5	31 6
Kimberley, Central ...	—	—	—	—	—	23 1	24 4
Klip	4 2	4 4	4 5	4 1	4 7	5 0	7 7
King William's Town ...	—	—	—	27 10	29 6	31 8	33 1
Rosherville	—	—	—	8 3	8 5	9 5	10 7
Salt River	25 4	25 9	28 1	28 5	29 6	32 5	33 10
Simmerpan	—	—	—	8 4	8 3	9 6	9 9
Vaal	5 10	6 0	5 7	4 11	4 9	5 4	5 11
Vereeniging	—	—	—	4 11	4 10	5 5	5 9
Witbank	2 4	2 9	3 4	4 0	3 9	4 2	4 6

ANNEXURE C





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