

Electricity Supply Commission.

Electricity House,

82, Marshall Street,

Johannesburg,

May, 1930.

To the Honourable

The Minister of Mines and Industries,
Pretoria.

SIR,

In conformity with the provisions of Section 14 of the Electricity Act, 1922, I have the honour to submit the Commission's Seventh Annual Report, covering its operations for the year ended 31st December, 1929, together with a brief review of its activities up to 30th April, 1930.

The year 1929 is the first complete year throughout which all the Commission's Undertakings have been in operation, and marks a stage in the history of the Commission's operations. Although with the completion and starting to work of its five Undertakings the Commission's activities are now directed principally to the fulfilment of its main function, viz.: the production, distribution and supply of electricity, a good deal of construction work is in progress in connection with extensions of its Undertakings, both in respect of power station plant and on the distribution systems. This construction work is the concomitant of development.

This Report, covering as it does the first complete year of operation of all the Commission's Undertakings, offers an appropriate opportunity for a brief outline of the origin and functions of the Commission and of its achievements since its inception in 1923.

Origin,
functions
and
achievements
of
Commission.

The Electricity Act, 1922, was the outcome of a general recognition that a cheap and abundant supply of electricity is a factor of increasing importance in the development of South Africa, and

that it was necessary to introduce legislation which would provide not only for the control and guidance of the electricity supply industry along lines that experience in South Africa and elsewhere had indicated to be desirable, but also for the setting up of machinery by means of which electricity production and supply would be undertaken and co-ordinated in the interests of the community as a whole.

Without closing the door to private enterprise, but with the object of safeguarding the national interest in the electricity supply business and, at the same time, of combining the advantages of public ownership and private enterprise, the South African Electricity Act provides for the establishment of an Electricity Supply Commission, which represents no particular group of persons or interests, which operates strictly on business lines and, although receiving financial support (in the form of temporary advances) from the Government in the initial stages, is outside political control, and which is required by Statute to operate each of its Undertakings, as far as practicable, neither at a profit nor at a loss.

Before the Commission can establish or acquire an Undertaking, it must report to and obtain the approval of the Minister of Mines and Industries, and must also obtain a Licence or Permit from the Electricity Control Board—the Control Board being the licensing and controlling authority and the authority which represents the Government and ensures compliance by all authorised undertakers with the general policy of the Electricity Act.

Broadly, the functions of the Commission are:

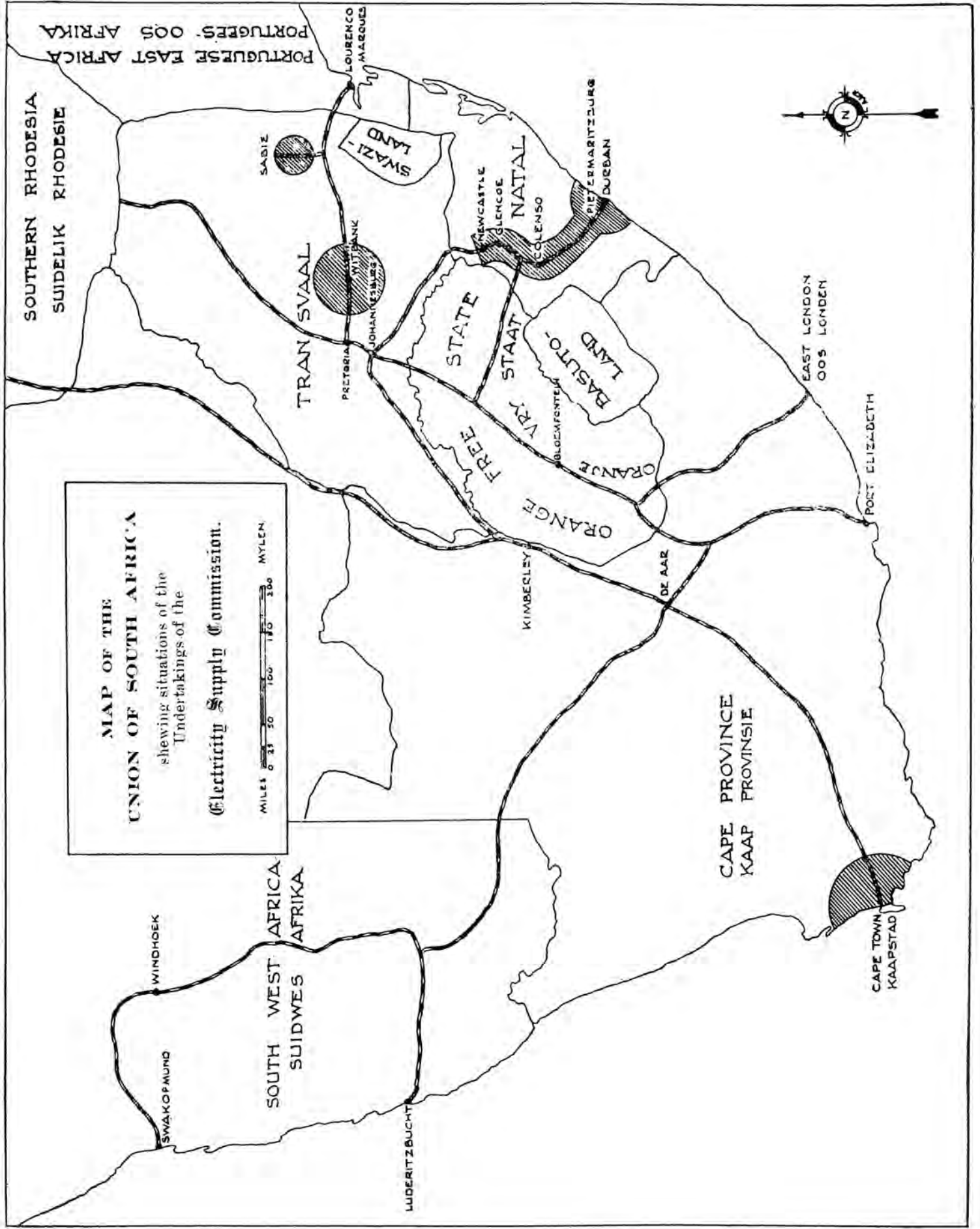
- (1) to establish, acquire, maintain and work undertakings for an efficient supply of electricity;
- (2) to investigate new or additional facilities for the supply of electricity and the co-ordination and co-operation of existing undertakings so as to stimulate the provision of a cheap and abundant supply of electricity; and
- (3) to advise the Administrators of the several Provinces upon new municipal electricity schemes or extensions to existing municipal schemes. (The Commission's function in this respect is purely advisory. It has, however, in a number of instances been the means of bringing about co-ordination of electricity production and supply.)

The extent to which scope existed in South Africa for the operations of a body such as the Commission may be gathered from the fact that in 1929, only six years after the Commission was appointed, five Undertakings were in operation with an output aggregating approximately 800 million units per annum. The situation of these Undertakings is shown on the map reproduced on page 4.

Three of the Commission's Undertakings, viz., those at Witbank, Capetown and Durban, were inter-connected from the outset with existing power supply systems, representing both Municipal and private enterprise. The scope for further inter-connection between the larger electricity supply systems in South Africa is, for the time being, comparatively limited, due to the distances dividing main centres of population and industrial activity.

Although the supply of electricity from the Commission's Undertakings is frequently faced with competition from alternative sources and mediums of power supply, substantially the whole of the potential electricity load in the areas at present served is being supplied from, or is in course of connection to, the Commission's systems. In the more outlying towns and districts adjoining these areas, schemes of supply are in many cases financially impracticable for the present due to the relatively small loads available and the length of transmission involved. Development in the more immediate future is, therefore, largely dependent upon increases in the requirements of existing consumers and the establishment of any new industrial enterprises in the areas concerned.

In the circumstances, the rapid rate at which the output of the Commission's Undertakings has increased since the supply of electricity was commenced in 1926 may not be maintained during the next few years, but the Commission anticipates a steady growth due to increases in the requirements of its existing consumers. So far as new industrial enterprises are concerned, although there are other important considerations affecting the establishment of, and the choice of locality for, new industries, the availability of a cheap and abundant supply of electricity should assist in developments in this direction.



MAP OF THE
 UNION OF SOUTH AFRICA
 shewing situations of the
 Undertakings of the
 Electricity Supply Commission.

MILES 0 25 50 100 150 200 300
 MYLEN

SOUTHERN RHODESIA
 SUIDELIK RHODESIE

PORTUGUESE EAST AFRICA
 PORTUGES. OOS AFRIKA

SWAKOPMUND
 WINDHOEK

SOUTH WEST AFRICA
 SUIDWES AFRIKA

LUDERITZBUCHT

TRAN SVAAL

PRETORIA
 TUTUKA
 JOHANNESBURG

SABIE

SWAZI-LAND

LOURENCO
 MARQUES

STATE

VRYS-STAAT

ORANGE

KIMBERLEY

DE AAR

CAPE PROVINCE
 KAAP PROVINSIE

CAPE TOWN
 KAAPSTAD

NEWCASTLE
 GLENCOE

COLENSO

NATAL

PIETERMARITZBURG
 DURBAN

EAST LONDON
 OOS LONDEN

PORT ELIZABETH



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Origin,
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Commission.

The Electricity Act, 1922, was the outcome of a general recognition that a cheap and abundant supply of electricity is a factor of increasing importance in the development of South Africa, and

The Commission's five Undertakings are as follows:—

Name of Undertaking.	Capacity of Main Generating Sets. Kilowatts.	Date of Commencement of Supply.
Natal Central	60,000	March 1926
Witbank	*80,000	May, 1926
Capetown	30,000	May, 1926
Durban	36,000	July, 1928
Sabie	1,350	November, 1925

Commis-
sion's
Under-
takings.

The figures of primary interest in connection with the operations of the Commission's Undertakings during the year 1929, are:

Total Capital Expenditure at 31st December, 1929 ...	£7,805,353
Less—Net Revenue during construction ...	150,313
	£7,655,040
Total Revenue	£985,152
Total Production costs (including interest and all other capital charges)	£990,270
Excess of production costs over revenue	£5,118
Total capacity of main generating sets	(kilowatts) 207,350
Total electricity sales	(units) 796,998,351
Average cost per unit sold	0·298d.
Total coal consumption	(tons) 693,325
Number of consumers at 31st December, 1929	1,017
Total area of supply (approx.)	(square miles) 11,000

The foregoing figures in respect of total revenue and production costs for the year 1929 include revenue and production costs in respect of the Capetown and Durban Undertakings prior to the commencement of commercial operation (the dates upon which these two Undertakings were placed in commercial operation being 1st June, 1929, and 1st January, 1930, respectively), and to this is attributable the deficiency of £5,118 on the year's working.

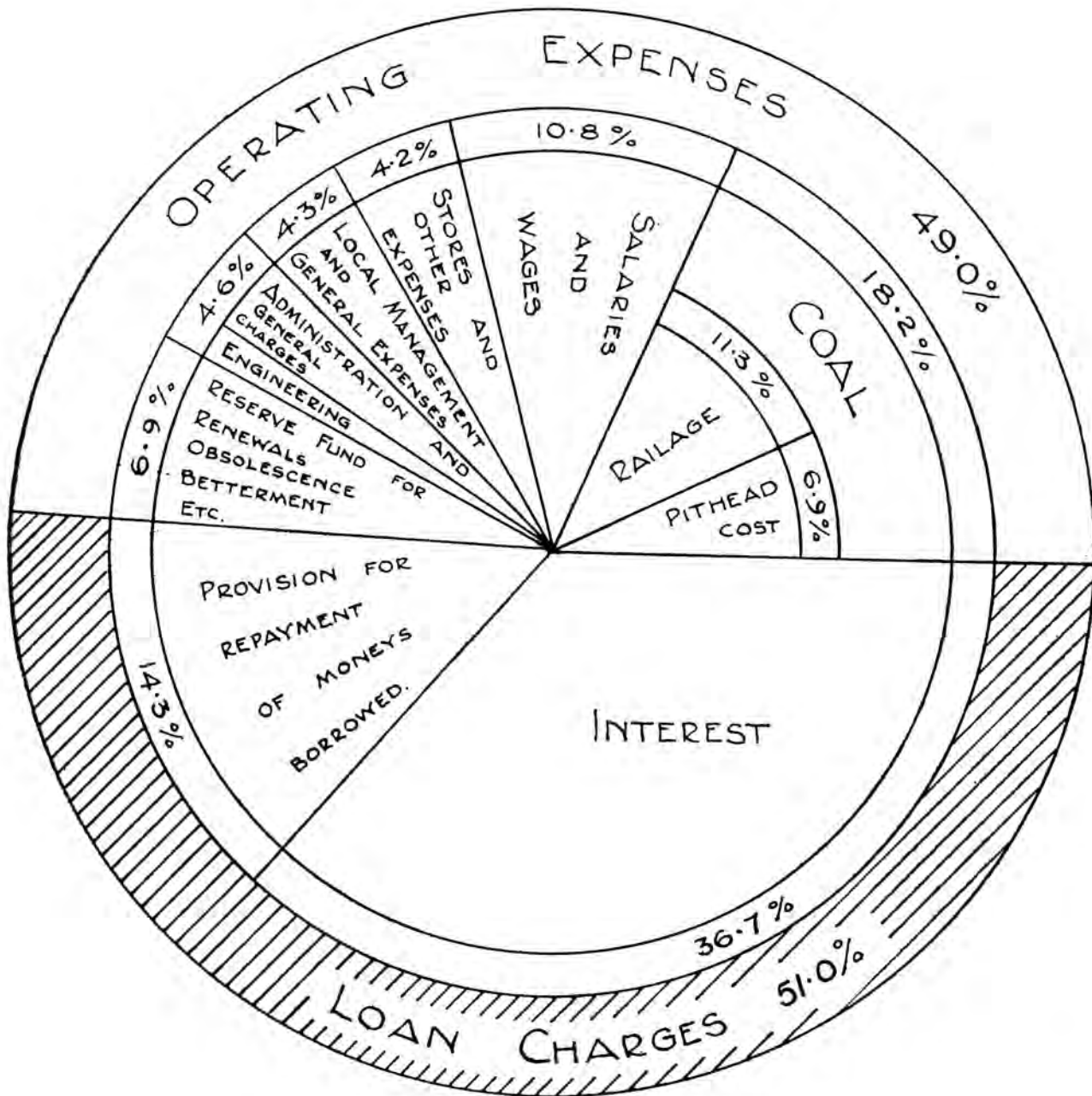
Revenue and
Production
Costs, 1929.

The Commission is, of course, required by Statute to operate its Undertakings, as far as practicable, "neither at a profit nor at a loss," and its objective in fixing its tariffs, and making adjustments therein from time to time is to achieve, as nearly as practicable, a balance between total revenue and total production costs on each of its Undertakings.

* An additional 20,000 kilowatt generating set is in course of installation at the Witbank Power Station. This will bring the capacity of that station up to 100,000 kilowatts.

ELECTRICITY SUPPLY COMMISSION

DIAGRAMMATIC SUB-DIVISION OF TOTAL PRODUCTION COSTS
DURING THE YEAR 1929



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A diagram showing the sub-division of the Commission's total production costs during the year 1929 is reproduced on the opposite page.

The Commission's total electricity sales during the year 1929, amounting to 796,998,351 units, represent an increase of 169,086,056 units, or approximately 27 per cent., as compared with the year 1928. A portion of this relatively large increase is due to the fact that the 1929 figure includes a full year's output from the Durban Undertaking, the Congella (Durban) Power Station having been placed permanently on load towards the end of 1928, although construction work had not then been completed.

The following statement shows the units sold to all consumers during the past four years:—

Undertaking.	UNITS SOLD.			
	1926.	1927.	1928.	1929.
Natal Central ...	719,666	104,206,235	114,213,037	123,911,774
Witbank ...	160,031,213	439,061,722	464,267,213	543,091,138
Capetown ...	280,242	5,811,836	31,038,697	47,945,690
Durban ...	—	—	15,563,460	78,873,576
Sabie ...	727,401	1,938,940	2,829,888	3,176,173
Totals ...	161,758,522	551,018,733	627,912,295	796,998,351

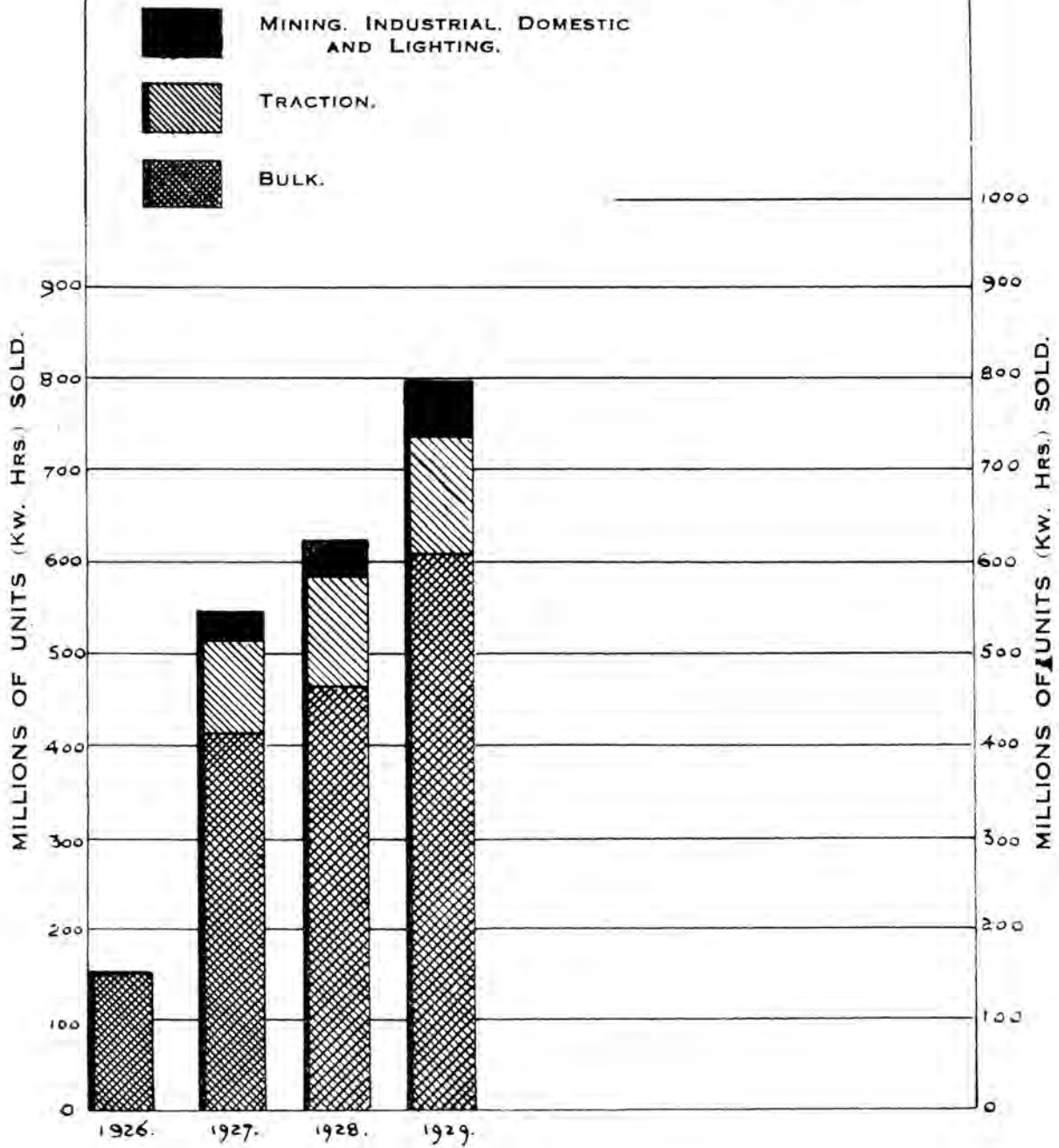
The distribution of the units sold during 1929, as between the various classes of consumers, was as follows:—

Undertaking.	UNITS SOLD, 1929.				Total.
	Domestic and Lighting.	Industrial and Mining.	Railway Traction.	Bulk Supplies.	
Natal Central	160,417	2,368,988	110,960,117	10,422,252	123,911,774
Witbank ...	369,110	29,335,005	—	513,387,023	543,091,138
Capetown ...	126,693	14,929,068	28,942,013	3,947,916	47,945,690
Durban ...	—	—	—	78,873,576	78,873,576
Sabie ...	—	3,176,173	—	—	3,176,173
Totals ...	656,220	49,809,234	139,902,130	606,630,767	796,998,351

A chart showing the development of electricity sales year by year is reproduced on page 8.

Electricity Supply Commission.

DIAGRAM SHOWING TOTAL ELECTRICITY SALES.



The average cost per unit sold during 1929 from all the Commission's Undertakings, viz., 0·298d., might, without explanation, give rise to misunderstanding if comparisons were made between this figure and the cost per unit from any one Undertaking. The fact that each Undertaking stands by itself financially as a distinct separate concern, and the differences in the conditions obtaining at the several Undertakings must be taken into account in any such comparison.

Average
cost
per unit.

The conditions attaching to each of the Commission's Undertakings are entirely different, resulting in very wide variations in the average cost per unit as between one Undertaking and another. The principal factors responsible for these variations are:—

- (a) the relationship between
 - (i) power station expenditure, and
 - (ii) expenditure involved in transmission, distribution and (in the case of supplies to the Railway Administration for traction purposes) the expensive item of conversion to direct current;
- (b) the cost of coal, due mostly to railage;
- (c) the ratio of the maximum demand to the installed capacity of the generating sets; and
- (d) the load factor.

For convenience of reference, the comparative figures in these respects for each Undertaking are tabulated hereunder:—

Undertaking.	Approximate Proportion of Capital Expenditure.		Cost of Coal per ton (2,000 lbs.)	Ratio of maximum demand to installed capacity.	Load Factor.	Average cost per unit sold.
	Power Station.	Transmission, Distribution & Conversion.				
Natal Central	44·9%	55·1%	8/-	48%	51·1%	0·736d.
Witbank ...	94·6%	5·4%	2/-	100%	84·5%	0·115d.
Capetown ...	67·8%	32·2%	23/10d.	54%	34·3%	1·055d.
Durban ...	100%	—	13/2d.	65%	62·5%	0·379d.
Sabie ...	79·8%	20·2%	Hydro	50%	56·9%	1·041d.

The conditions attaching to the Witbank Undertaking are, as will be seen, pre-eminently favourable. Almost 95 per cent. of the capital expenditure is invested in the power station (the bulk of the output being sold at the power station), in contrast with, say, the Natal Central Undertaking, where over 55 per cent. of the capital represents expenditure on transmission, distribution and conversion.

The cost of coal per ton at Witbank is also very much lower than at any of the Commission's other steam stations, being a quarter of the cost at Colenso, about one-seventh of the cost at Durban and nearly one-twelfth of the cost at Capetown. The higher cost of coal at Colenso, Durban and Capetown is due primarily to railage charges, which, in the case of Capetown, represent about 85 per cent. of the cost of coal per ton. Practically no railage is involved at Witbank owing to the situation of the power station in the heart of the Witbank coalfield.

The Witbank Power Station, which is inter-connected with The Victoria Falls and Transvaal Power Company's system on the Witwatersrand, is operated as a base load station, and no standby plant is provided, i.e., the generating plant (apart from overhaul periods) is 100 per cent. effective. The ratio of maximum demand to installed capacity of the main generating sets in the case, for example, of the Natal Central Undertaking, is 48 per cent., i.e., there is available, on the basis of existing loading condition, a substantial margin of standby plant.

The load factor at Witbank is 84·5 per cent. as compared, for example, with 34·3 per cent. at Capetown, i.e., approximately 2½ times as great. This results in the fixed costs, such as capital charges, wages, management, etc., being spread over a much larger number of units, thus reducing the cost per unit of output.

There are a number of other differences in conditions affecting the costs as between one Undertaking and another. The foregoing will, however, serve to illustrate the significance of the main factors and the extent to which the average cost of electricity per unit is influenced thereby.

During the year 1929, the coal consumed at the Commission's four steam-using power stations, amounting to a total of 693,325 tons, was as follows:—

Coal
consumed.

Power Station.	COAL CONSUMED.		B.T.U.'s.	
	Tons (2,000 lbs.)	Lbs. per unit generated.	Average per lb. of coal.	Average per unit generated.
Colenso (Natal Central) ...	105,452	1.53	12,300	18,800
Witbank	487,420	1.69	11,350	19,200
Salt River (Capetown) ...	42,831	1.66	13,230	22,000
Congella (Durban)	57,622	1.35	13,120	17,700

The cost of coal during 1929 represented over 18 per cent. of the total production costs of the four Undertakings concerned. Railage and sidings charges in respect of the coal consumed at the Commission's power stations in 1929 amounted to approximately £110,000.

The number of consumers being supplied with electricity from the Commission's Undertakings, as at 31st December, 1929, was 1,017, an increase of 286 during the year. Consumers.

The following table shows the number of consumers of the various classes on each Undertaking as at 31st December, 1929:—

Undertaking.	Domestic and Lighting.	Industrial and Mining.	Traction.	Bulk Supplies.	Total.
Natal Central ...	154	14	1	5	174
Witbank	368	30	—	2	400
Capetown	418	16	1	4	439
Durban	—	—	—	1	1
Sabie	—	3	—	—	3
Totals ...	940	63	2	12	1,017

Reference is made later in this Report to the negotiations in connection with supplies of electricity to new consumers and the necessary extensions of the Commission's transmission and distribution systems in connection therewith.

The Commission is not at present engaged, to any material extent, in the business of house-to-house distribution of electricity in urban areas. In the case of six small towns and villages this business has, by arrangement between the Commission and the Local Authorities concerned, been undertaken by the Commission, but most of the larger Municipalities and other Local Authorities in the Commission's areas of supply are purchasing electricity in

Undertakings, the position of the Fund in this respect, at 31st December, 1929, being as follows:—

Balance from 1928	...	...	...	...	...	£189,517
Contributions during 1929	...	...	...	...	...	127,047
Interest earned during 1929	...	...	...	...	...	11,859
Balance, as per Balance Sheet at 31st December, 1929	...					<u>£328,423</u>

The position of the Commission's Reserve Fund at 31st December, 1929, was as follows:—

Balance from 1928	...	...	...	...	...	£95,888
Contributions during 1929	...	...	...	...	...	61,537
Interest earned during 1929	...	...	...	...	...	5,048
						<u>£162,473</u>
Less expenditure on replacements and betterment during 1929						16,955
Balance, as per Balance Sheet at 31st December, 1929	...					<u>£145,518</u>

Revenue and Expenditure Accounts in respect of the Natal Central, Witbank, Capetown and Sabie Undertakings are also embodied in Annexure "A" to this Report.

These Accounts and the Balance Sheet, which discloses an excess of assets over liabilities amounting to £480,422, reflect the soundness of the Commission's financial position, particularly when it is borne in mind that the Capetown and Durban Undertakings were only placed in commercial operation in June, 1929, and January, 1930, respectively, and that commercial operation of the other three Undertakings commenced within the last three years.

Tariffs.

The standard prices for the supply of electricity from each of the Commission's Undertakings and the conditions attaching thereto are embodied in the Licences and Permit 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 prices for the time being in force are published annually by the Commission in the *Gazette* and local newspapers.

The standard prices in force as at 31st December, 1929, in respect of the several Undertakings are embodied in Annexure "B" to this Report.

The standard prices are subject, where necessary, to variation in terms of Section 26 of the Electricity Act, 1922, the price or tariff applicable to any particular consumer necessarily depending upon the situation, extent, and characteristics of the load. Even in cases where the same tariff applies to several consumers, the average price per unit varies with each consumer's load factor, and in some instances with the extent and/or power factor of his load.

It will also be appreciated that no one form of tariff would be suitable for general application to both large and small consumers. The Commission's standard prices, which take the form of multi-part tariffs, were designed for application to comparatively large consumers, and are, as will be observed from Annexure "B," unsuitable for small supplies, such as lighting and domestic uses. In such cases the tariffs, which are subject to the approval of the Electricity Control Board, are based on the standard prices, in respect of the Undertaking concerned, plus the additional costs of house-to-house reticulation. The price per unit to small consumers, particularly for lighting purposes, is necessarily higher than in the case of, say, large power supplies, due to the incidence of a lighting load and the comparatively small number of units consumed in relation to the expenditure involved—a fact which is frequently overlooked by such consumers.

In the matter of costs and prices, electricity is essentially different from most other commodities, and there is no simple basis for comparison of electricity costs and prices as between one Undertaking and another or as between one class of consumer and another. Without considerable qualification, the popular and apparently simple method of comparing average prices per unit is delusive, and is one of the most fruitful sources of misconception amongst those who are unfamiliar with the factors governing the costs of electricity supply.

The staff employed by the Commission as at 31st December, 1929, numbered 633, made up as follows:— staff.

Europeans	...	...	...	308
Non-Europeans	...	...	...	325
				633
Total	...	...	...	633

The foregoing figures do not include the staff employed at the Witbank Power Station which, as explained later in this Report, is, by agreement, operated, on the Commission's behalf, by The Victoria Falls and Transvaal Power Company, Limited.

World
Engineering
Congress and
Sectional
Meeting of
World Power
Conference.

In November, 1929, the Commission's Commercial Manager and its Local Manager (Capetown), who, in his capacity as City Electrical Engineer, represented also the Capetown Corporation, attended the World Engineering Congress and Sectional Meeting of the World Power Conference in Japan. These Conferences were on a very large scale and, apart from the volume of valuable information disseminated thereat, afforded an opportunity for the delegates from South Africa to discuss various aspects of the power supply and other problems with eminent engineers and executives from almost all parts of the civilised world.

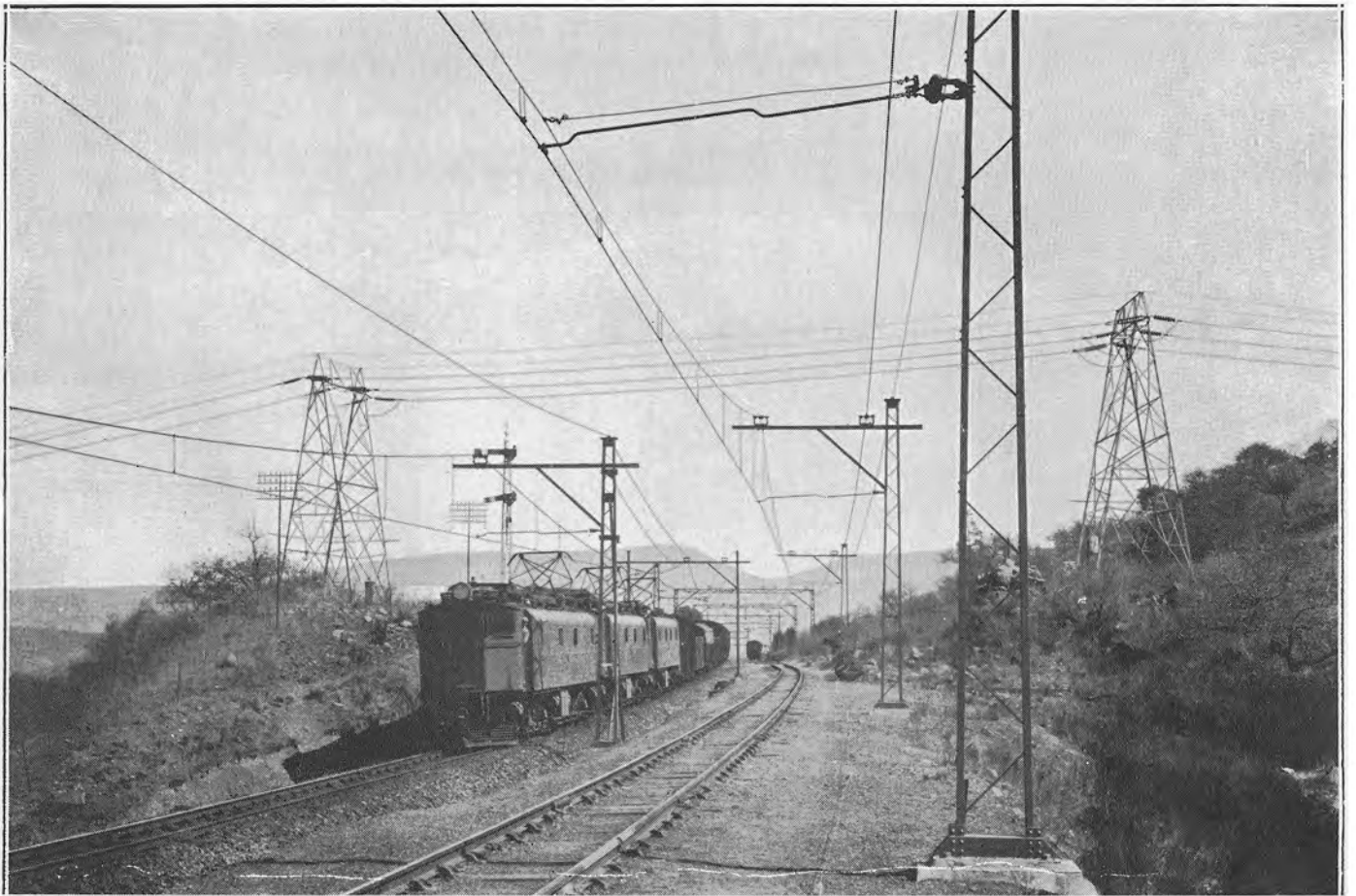
On their way to Japan the Commission's and the Capetown Corporation's representatives spent several weeks in the United States of America where, thanks to the courtesy and assistance of all the leading executives in the electricity industry with whom they came into contact, they were able to obtain a great deal of instructive information.

General.

The operations and developments of the individual Undertakings are reviewed in greater detail in the following pages, reference also being made to the Commission's work, in an advisory capacity to the Administrators of the several Provinces, in relation to Municipal Electricity Schemes.



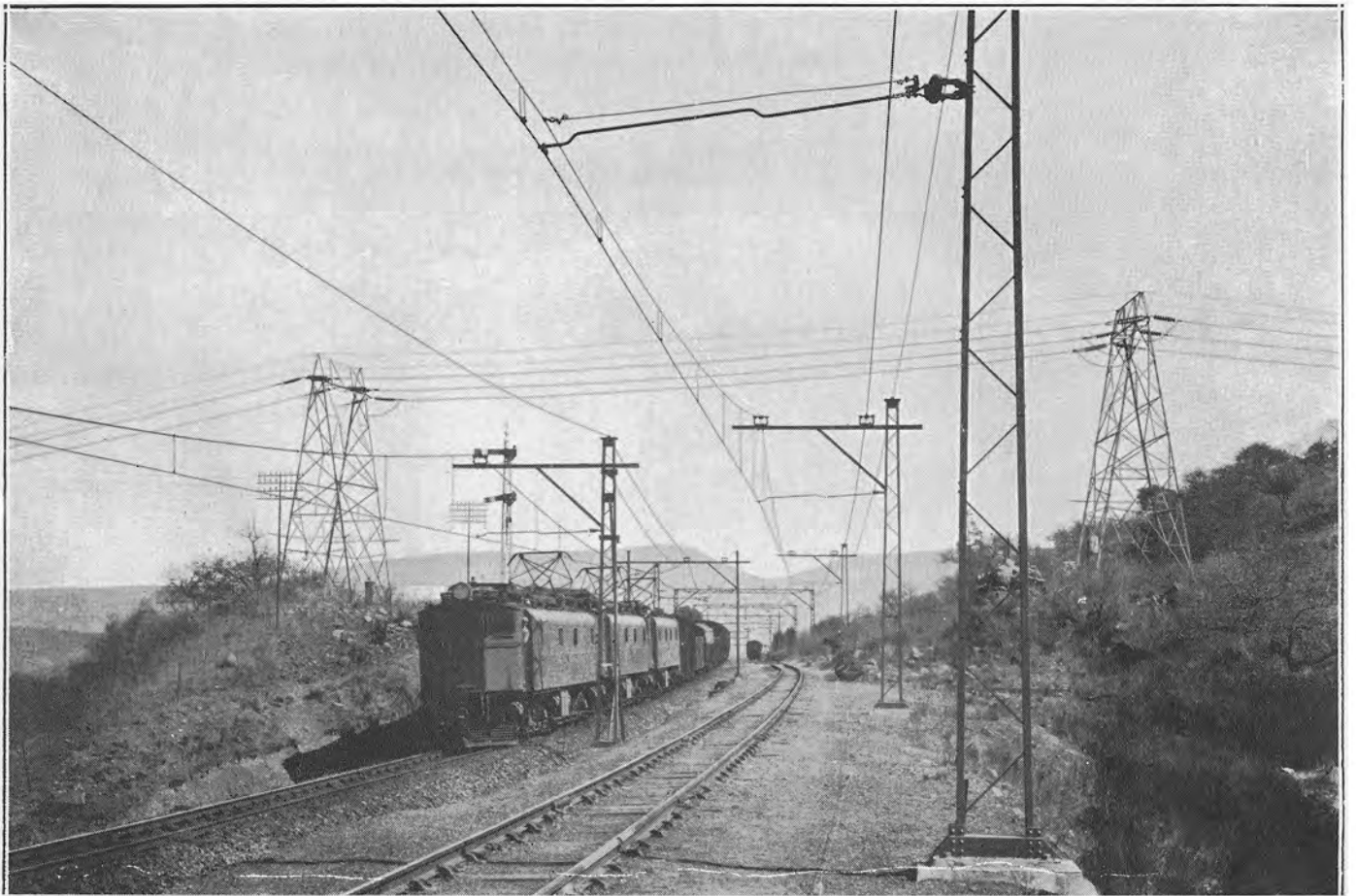
Natal Central Undertaking: Colenso Power Station, Tugela River Barrage.



Natal Central Undertaking: View of Railway Track, showing 88,000-volt Transmission Line crossing.



Natal Central Undertaking: Colenso Power Station, Tugela River Barrage.



Natal Central Undertaking: View of Railway Track, showing 88,000-volt Transmission Line crossing.

NATAL CENTRAL UNDERTAKING.

The Colenso Power Station, 88,000-volt transmission lines and twelve sub-stations situated at intermediate points between Glencoe Junction and Pietermaritzburg, which were constructed by the South African Railways and Harbours Administration in connection with the electrification of that portion of the Natal main line, were acquired by the Commission from the Administration in January, 1927. Prior to the transfer of this Undertaking from the Administration to the Commission, negotiations were opened by the Commission with prospective consumers along the route of the electrified section of the Natal main line, and, by arrangement with the Administration, the supply of electricity to several of these consumers was commenced before the Commission assumed control of the operation of the Undertaking.

The capital expenditure on the Natal Central Undertaking to 31st December, 1929, amounted to £3,383,161.

The units generated at the Colenso Power Station during the year 1929 total 137,611,010. The units sent out from the power station total 128,729,434, and the maximum half-hourly demand was 28,740 kilowatts, the load factor being 51·1 per cent. The thermal efficiency of the power station on units sent out was 16·9 per cent.

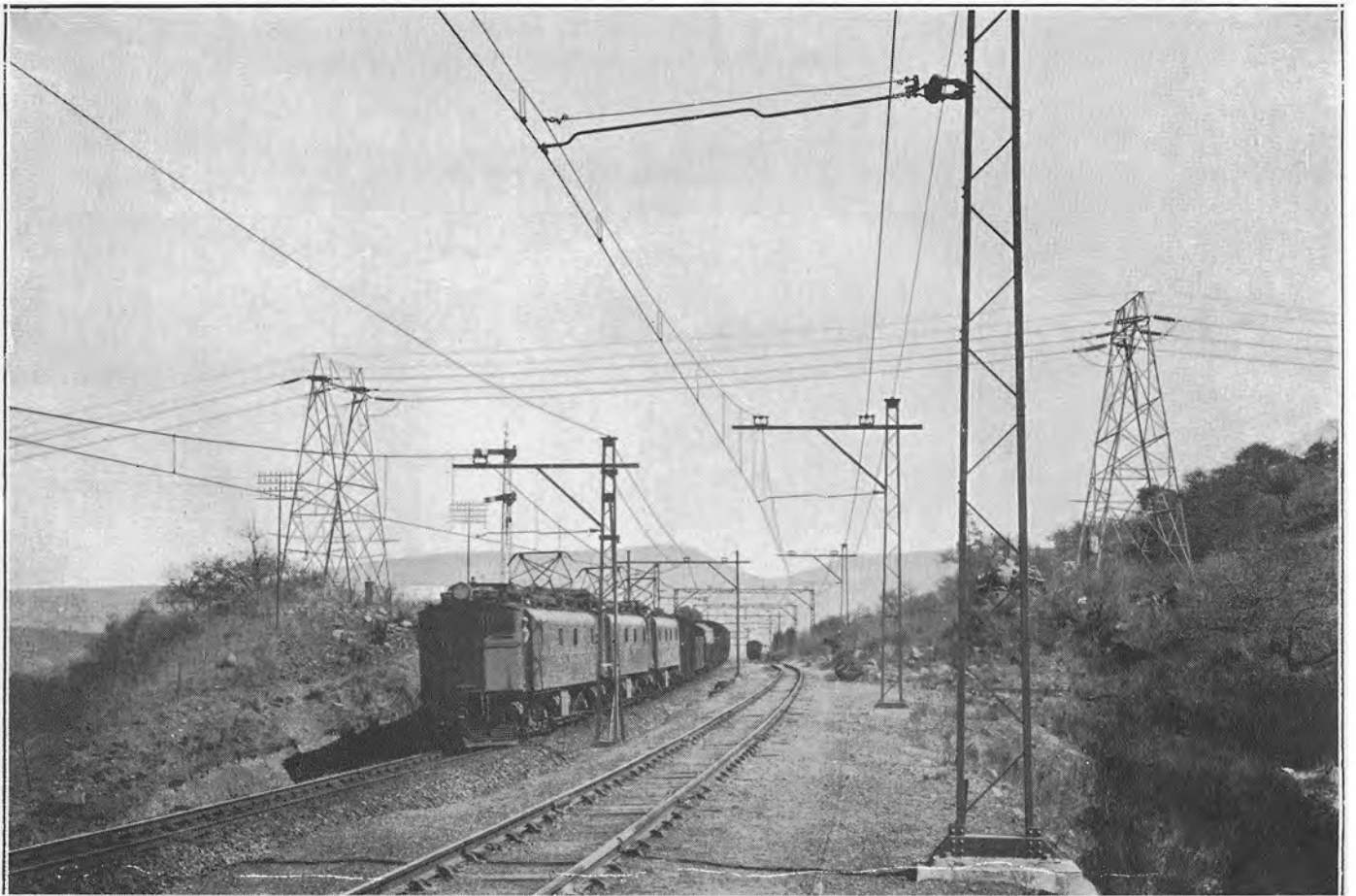
Working
Results.

The units sold during the year 1929 total 123,911,774, of which 113,192,597 units were supplied to the Railway Administration. The units supplied to the Railway Administration for traction purposes total 110,960,117, an increase of approximately 4·2 per cent. as compared with the year 1928. Electricity supplied for traction purposes is converted by the Commission from alternating to direct current, and is delivered to the Railway Administration at twelve intermediate points between Glencoe Junction and Pietermaritzburg as direct current at a pressure of 3,000 volts. The price paid by the Railway Administration for this supply therefore includes the costs of conversion. In the case of supplies of electricity to other consumers conversion from alternating to direct current is not involved.

The total sales during 1929 to consumers other than the Railway Administration amounted to 10,719,177 units, as compared with 5,712,004 units in 1928, an increase of 88 per cent.



Natal Central Undertaking: Colenso Power Station, Tugela River Barrage.



Natal Central Undertaking: View of Railway Track, showing 88,000-volt Transmission Line crossing.

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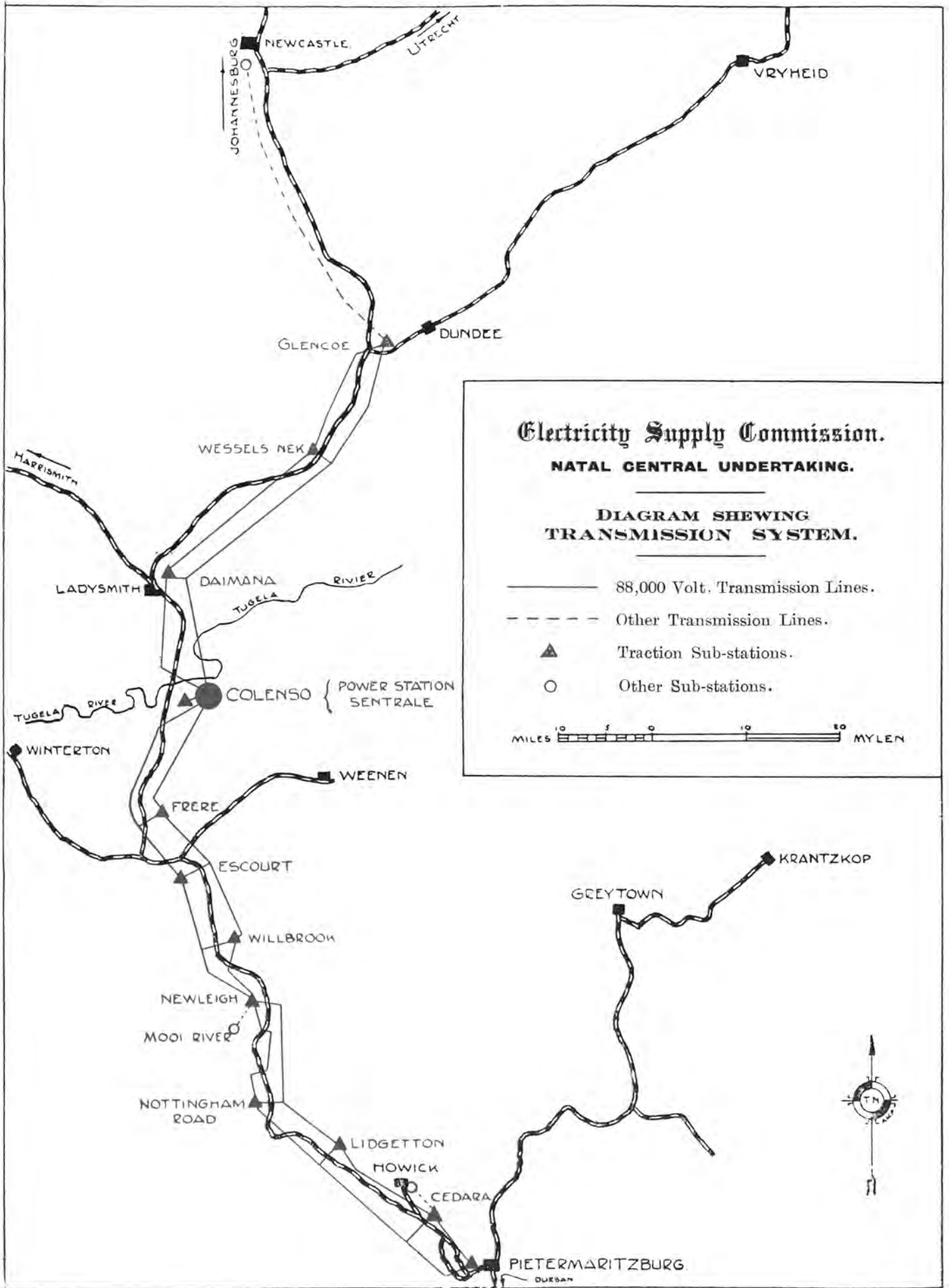
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Electricity Supply Commission.
NATAL CENTRAL UNDERTAKING.
DIAGRAM SHEWING
TRANSMISSION SYSTEM.

- 88,000 Volt. Transmission Lines.
- - - - - Other Transmission Lines.
- ▲ Traction Sub-stations.
- Other Sub-stations.

MILES 0 5 10 15 20 MILES



The operation of the Undertaking throughout the year has been satisfactory. On several occasions during the year the supply of electricity from the Colenso Power Station has been interrupted momentarily owing to the plant under steam in the power station being "swamped" with load. The conditions at Colenso in this respect are extreme, due to the characteristics of the predominating traction load, the fluctuations of which may be judged from the following figures:

Year 1929.	Kilowatts.
Average load	14,700
Maximum half-hourly demand	28,740
Maximum two-minute demand	38,000
Maximum observed peak	42,500

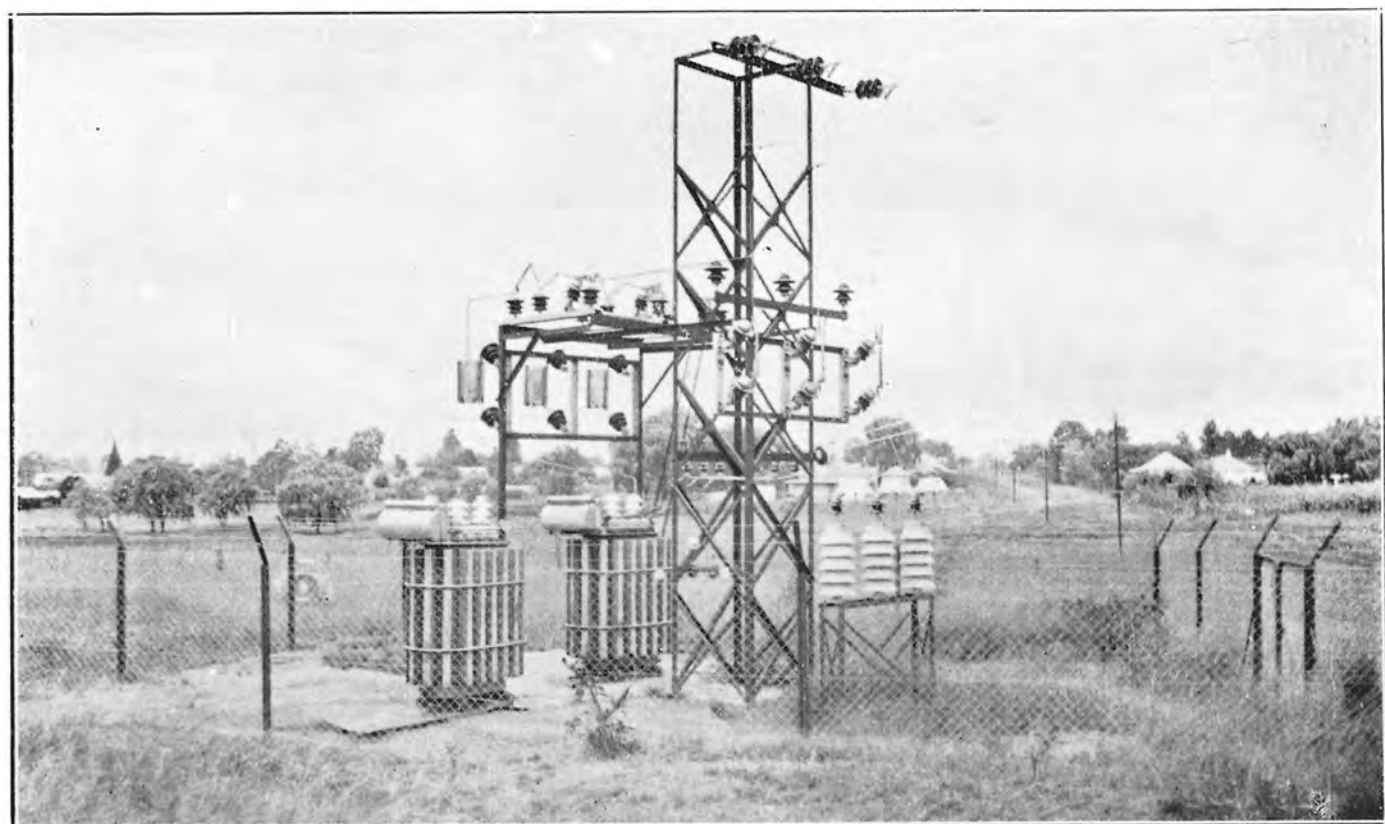
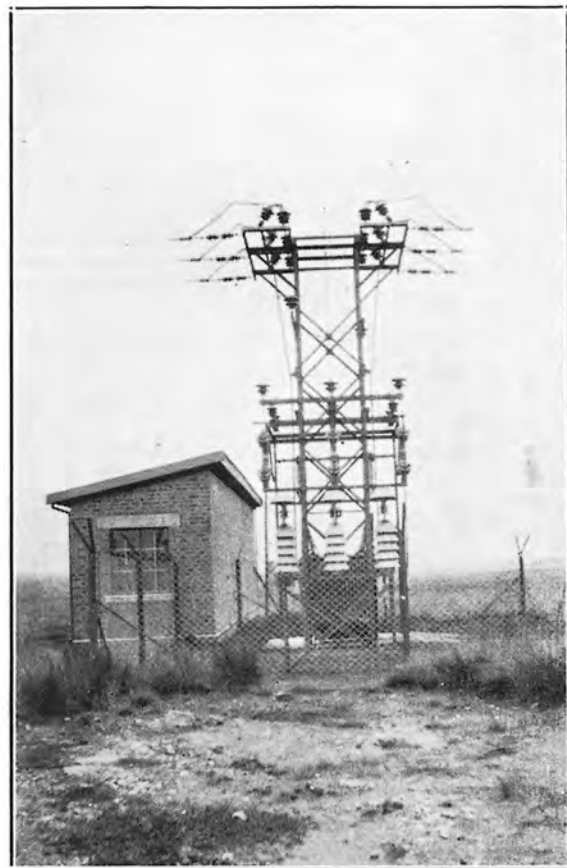
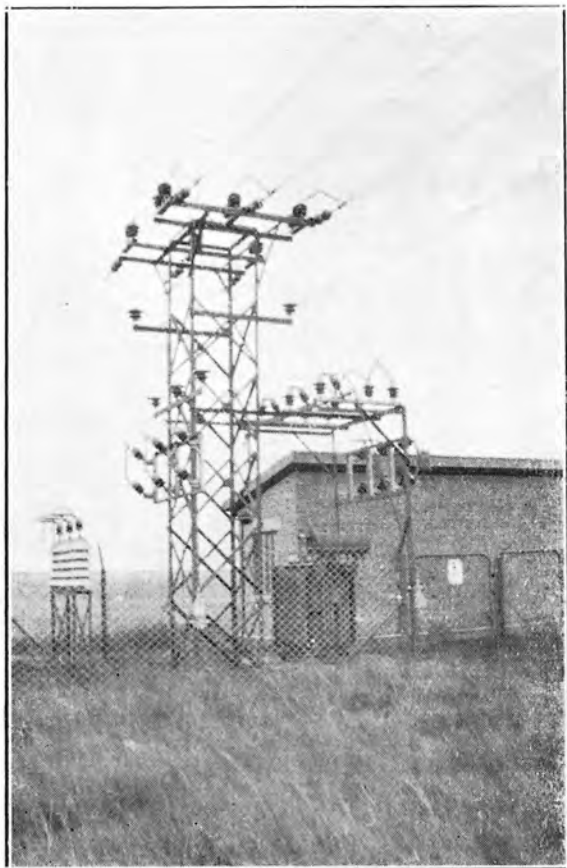
The financial results of the operation of the Natal Central Undertaking for the year ended 31st December, 1929, are given in Annexure "A" (Account No. 1) to this Report.

A diagram showing the transmission system of the Natal Central Undertaking is reproduced on the opposite page.

The supply of electricity to the Mooi River Local Board, to the works of the South African Rubber Manufacturing Company, Limited, at Howick, and to a number of smaller consumers was commenced during the year under review. Supplies
to
Consumers.

Reference was made in the Commission's last Annual Report to the negotiations proceeding with the Newcastle Municipality for the supply of electricity in bulk from the Commission's Undertaking as an alternative to the erection of a new Municipal Power Station at Newcastle. An agreement has since been concluded between the Commission and the Newcastle Municipality and work in connection with the extension of the Commission's transmission system from Glencoe to Newcastle, a distance of approximately 32 miles, is proceeding.

On 18th December, 1929, the Electricity Control Board granted the Commission's application for an amendment of its Licence in respect of the Natal Central Undertaking extending the area of supply of that Undertaking to include Newcastle and the intervening area between Glencoe Junction and Newcastle. Amendment
of Licence.



Witbank Undertaking: Typical outdoor step-down sub-stations on 21,000-volt system.

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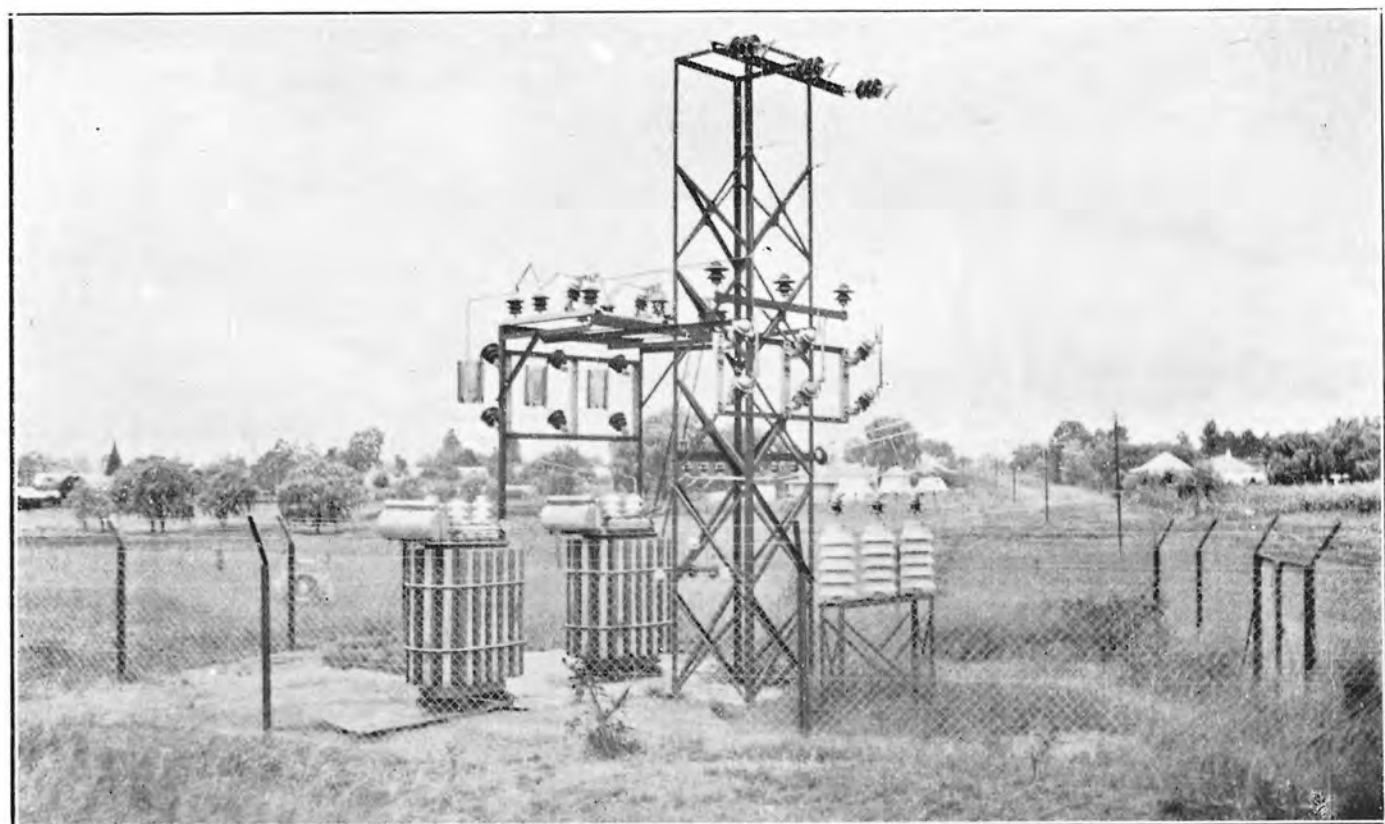
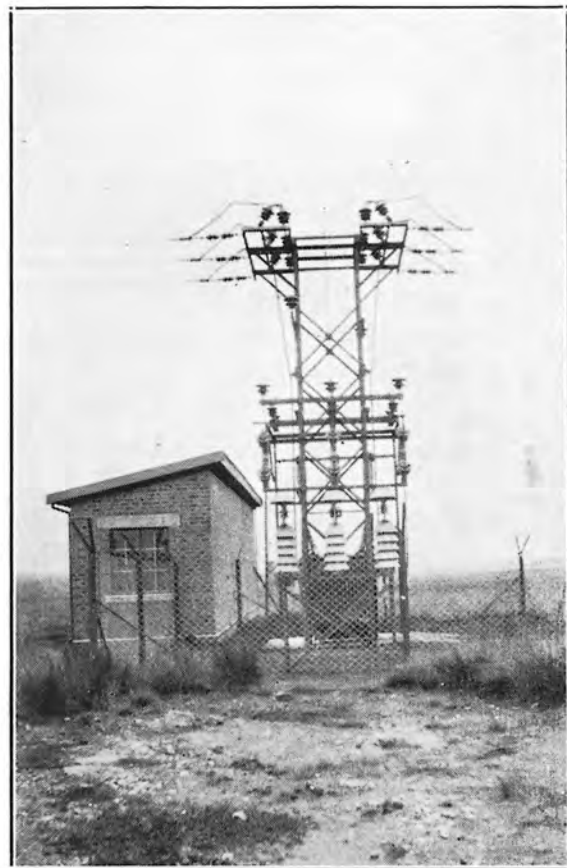
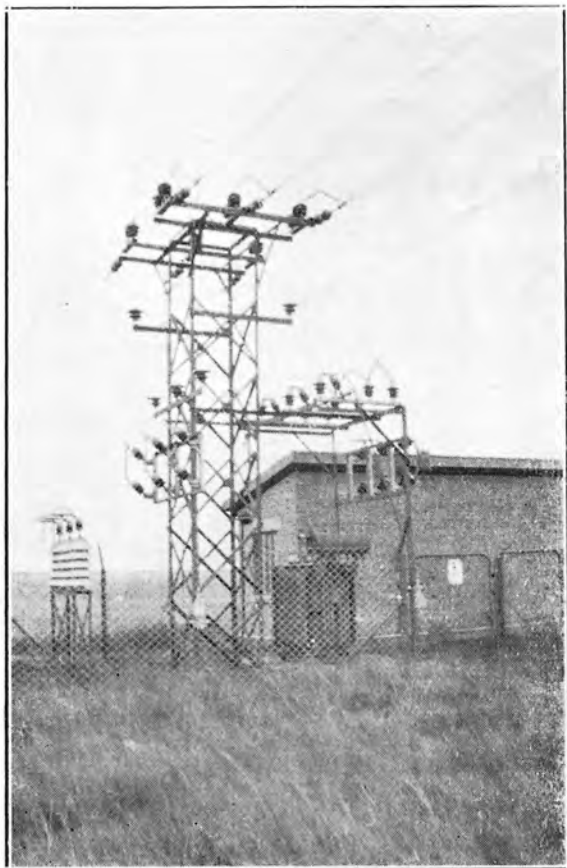
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Witbank Undertaking: Typical outdoor step-down sub-stations on 21,000-volt system.

WITBANK UNDERTAKING.

The Witbank Power Station is the largest of the Commission's stations, having a total installation of 80,000 kilowatts, in four main generating sets of 20,000 kilowatts each, and fifteen boilers, each of a normal capacity of 70,000 lbs. of steam per hour. A fifth 20,000 kilowatt set and one additional 70,000-lb. boiler are at present in course of installation.

The Witbank Power Station is operated, on the Commission's behalf, by The Victoria Falls and Transvaal Power Company, Limited, and is inter-connected with that Company's power supply system on the Witwatersrand by means of a 132,000-volt overhead transmission line between Witbank and Brakpan, a distance of approximately 65 miles. Under the agreement between the Commission and the Victoria Falls Company, that Company takes the whole available output of the Witbank Power Station after the requirements of the Commission's other consumers have been met, so that the power station is operated at its maximum capacity and at a very high load factor. These conditions, coupled with the situation of the power station in close proximity to the Collieries on the Witbank coalfield, result in electricity being available from the Commission's Witbank Undertaking at a very cheap price.

The Commission's 21,000-volt reticulation system in the Witbank area has been extended during the year 1929 in an easterly direction to Middelburg, and in a south-westerly direction to Minnaar, a further extension, in the latter direction, to Kendal having since been completed. A plan of this system is reproduced on the next page.

The capital expenditure on the Witbank Undertaking to 31st December, 1929, was £1,931,092.

The installation of the fourth 20,000-kilowatt generating set and three additional boilers at the Witbank Power Station was completed in May, 1929.

Extension
of Witbank
Power
Station.

Reference was made in the Commission's last Annual Report to the decision to proceed with a further extension of the Witbank Power Station by the installation of a fifth 20,000-kilowatt set and one additional boiler, bringing up the installation in the power station to 100,000 kilowatts and sixteen 70,000-lb. boilers.

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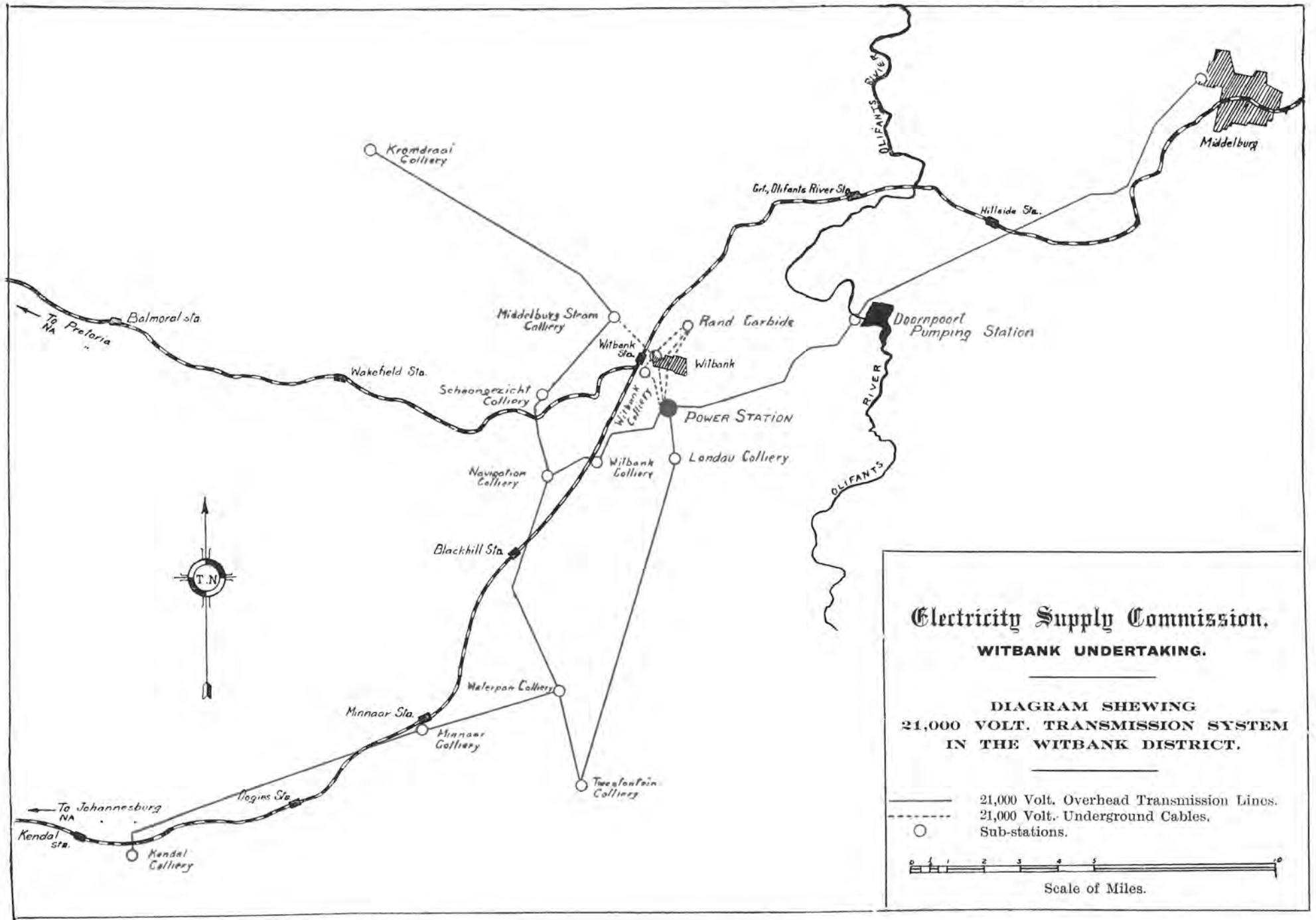
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Construction work in connection with this extension is well advanced, and the fifth set will be in commission in two or three months' time.

The units generated at the Witbank Power Station during the year 1929 total 575,158,843. The maximum hourly demands were as follows:—

Working
Results.

	Kilowatts.
Prior to the installation of the fourth 20,000 kw. set	60,968
Subsequent to the installation of the fourth 20,000 kw. set	82,230
The mean load factor for the year being	84.5%

The thermal efficiency of the Witbank Power Station on units sent out was 16.7 per cent. On account, principally, of the low cost of coal, the Witbank Power Station was designed to operate as a base load station at an unusually high load factor, but the additional cost of obtaining a higher thermal efficiency was not justified by the corresponding saving in fuel. The station was therefore designed to give the most favourable overall results, taking into account all the factors involved.

The units sold from the Witbank Undertaking during the year 1929 total 543,091,138, of which 29,731,115 units were supplied to consumers in the Witbank District. The increase in the Commission's sales in the Witbank District year by year since the supply of electricity was commenced in December, 1926, is reflected in the following table:—

Year.	Units Sold.
1926 (December)	499,057
1927	13,389,333
1928	19,950,004
1929	29,731,115

During the year under review, two reductions were made in the standard tariff to consumers in the Witbank District, the reductions taking effect, respectively, from January and July, 1929. The standard tariff in force with effect from July, 1929, is given in Annexure "B" to this Report.

With effect from July, 1929, the tariffs in force in Witbank Township for domestic, lighting and small power supplies were also reduced by allowing a discount of 10 per cent. in respect of monthly accounts paid within fifteen days of rendering.

The financial results of the Witbank Undertaking for the year ended 31st December, 1929, are given in Annexure "A" (Account No. 2) to this Report. A surplus of revenue over expenditure of £2,670 was realised on the working of the Undertaking during the year. This amount, together with the balance of £4,977 brought forward from the year 1928, has been carried forward to the year 1930, in terms of Section 10 (3) of the Electricity Act, 1922.

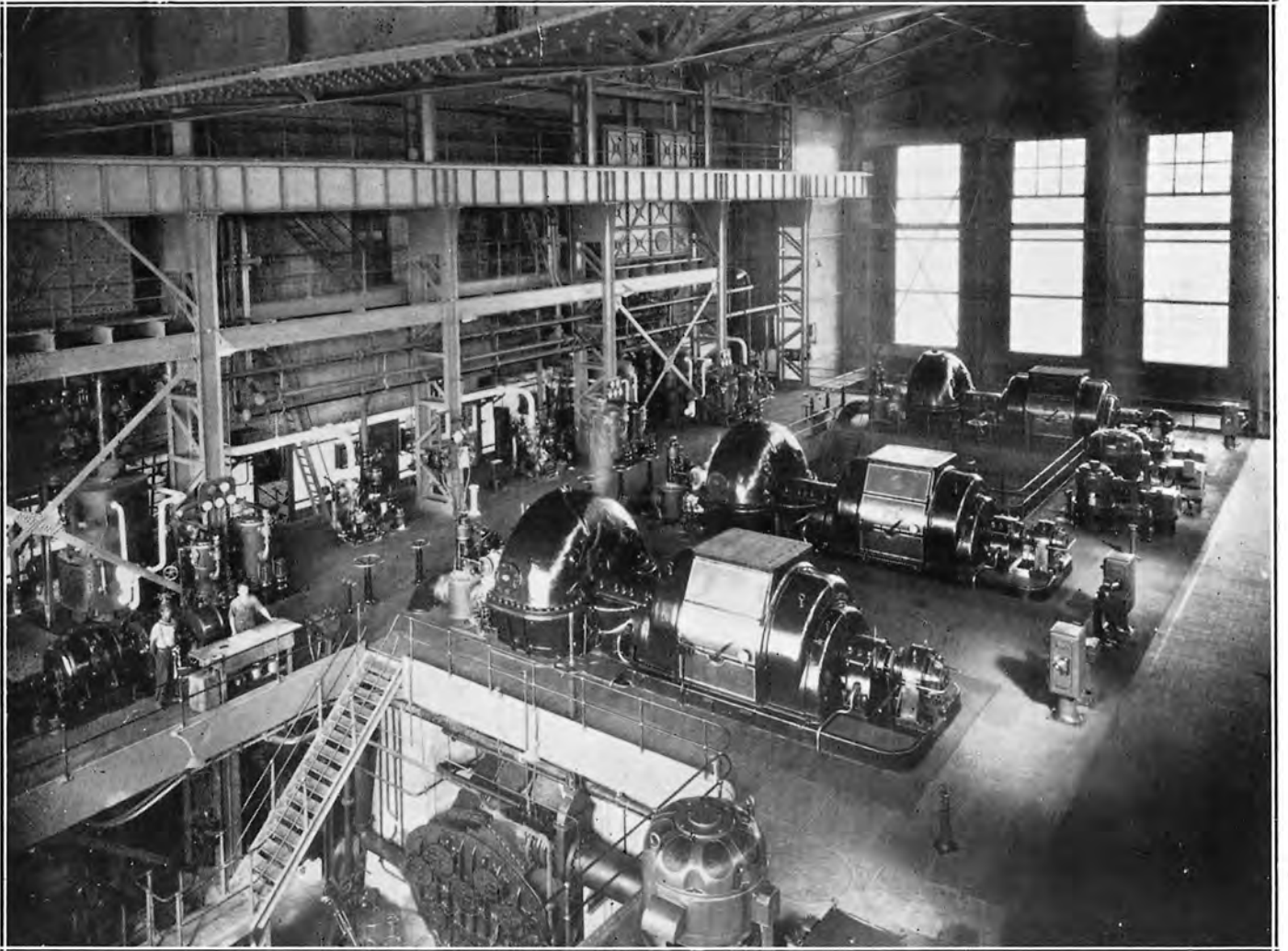
It will be appreciated that the full effect of the tariff reductions made by the Commission in July, 1929, is not reflected in the total revenue for the year 1929.

Consumers.

The Middelburg Municipality, several collieries, and a number of other consumers have been connected to the Commission's system in the Witbank District during the year, and construction work is proceeding in connection with extensions of the system to supply a number of new consumers.

Amendment
of Licence.

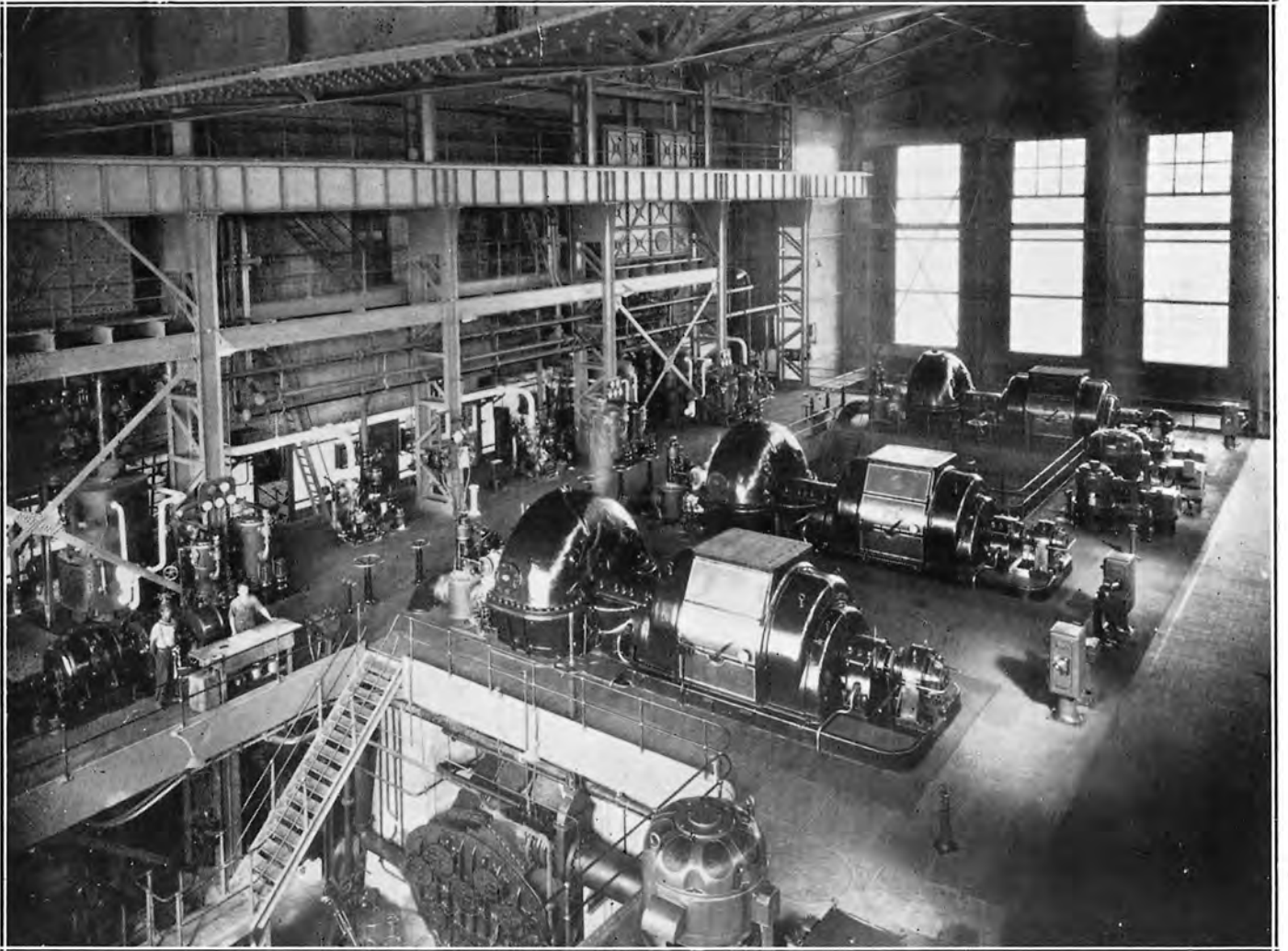
The gradual extension of the Commission's reticulation network at Witbank has brought additional consumers within range of the system and, as a result of negotiations with prospective consumers situated beyond the Commission's original area of supply (the area within a radius of 15 miles from the Witbank Power Station), application was made to the Electricity Control Board for an extension of the area of supply by increasing the radius from the power station from 15 to 25 miles. On 18th December, 1929, the Control Board granted the Commission's application.



Capetown Undertaking: Salt River Power Station Turbine House.



Capetown Undertaking: Salt River Power Station Boiler House.



Capetown Undertaking: Salt River Power Station Turbine House.



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CAPETOWN UNDERTAKING.

The Capetown Undertaking was established by the Commission primarily for the supply of electricity to the South African Railways and Harbours Administration for electric traction on the Cape suburban railway lines. Although railway electrification is at present confined to the Cape Peninsula, the Commission's activities have been extended into the rural areas eastwards of Capetown, where a substantial load has been secured.

In the Cape Peninsula itself, electricity (other than for the Railway Administration's workshops, docks and traction requirements) is supplied by the Capetown Corporation from its Electricity Undertaking.

The Commission's and the Corporation's Undertakings are, however, inter-connected, and normally the power stations of the respective parties are operated in parallel, thus ensuring greater reliability and efficiency for the two systems.

The capital expenditure on the Commission's Capetown Undertaking to 31st December, 1929, was £1,596,217. The Undertaking was placed in commercial operation on 1st June, 1929.

The units generated at the Salt River Power Station in 1929 total 51,552,532. The units sent out from the power station total 48,767,894 and the maximum half-hourly demand was 16,220 kilowatts, the load factor being 34·3 per cent.

Working
Results.

The thermal efficiency of the power station on units sent out was 14·6 per cent., which is 1 per cent. higher than the previous year. The lower thermal efficiency of Salt River Power Station, as compared with the results at the Commission's other power stations, is due to the relatively low load factor and to the unfavourable characteristics of the electric traction load at Capetown. Some idea of the conditions in this respect may be gathered from the following:—

Year, 1929.	Kilowatts.
Average load	5,570
Maximum half-hourly demand	16,220
Maximum observed peak (nominally for two minutes)	23,300

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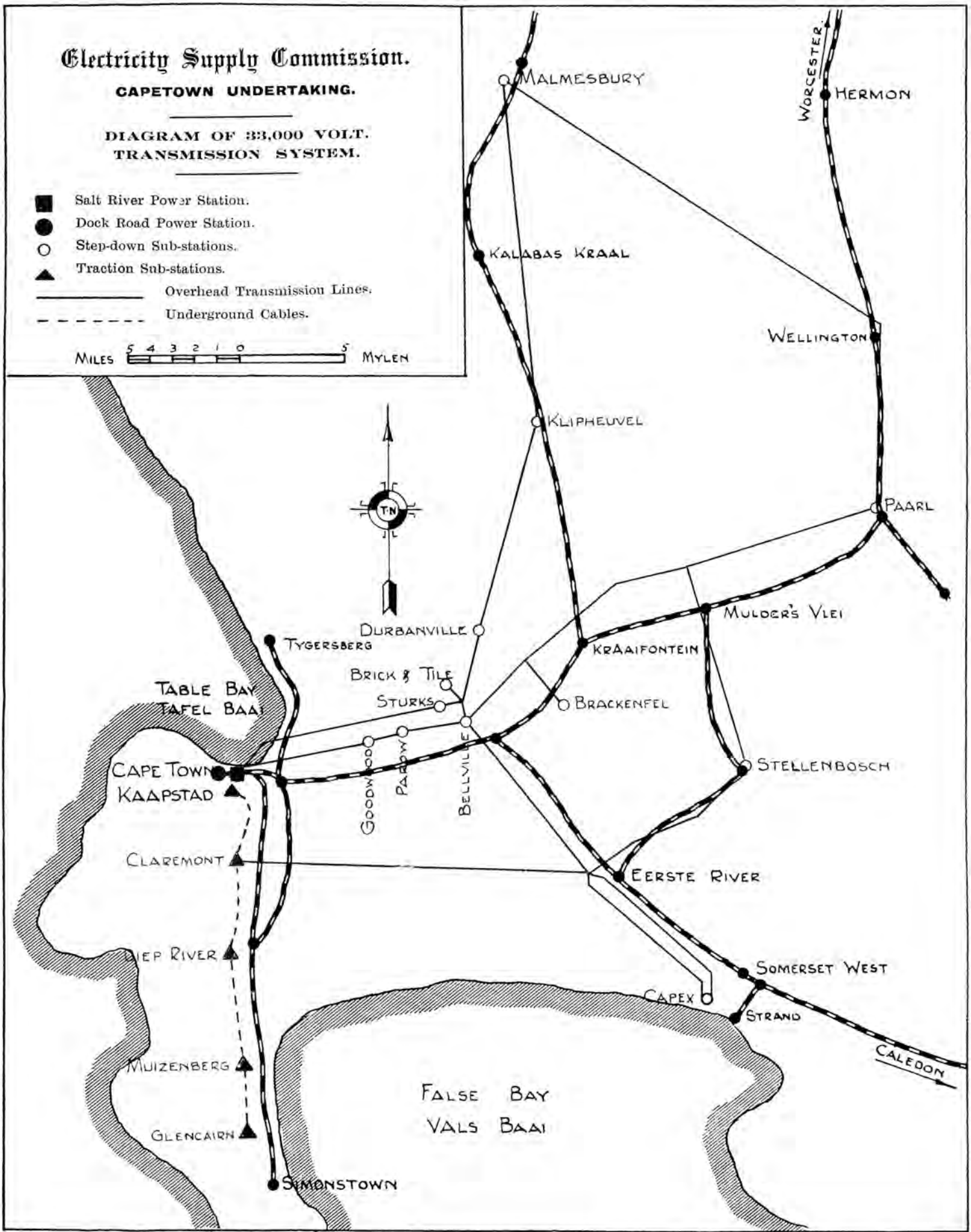
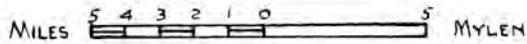
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Electricity Supply Commission.

CAPETOWN UNDERTAKING.

DIAGRAM OF 33,000 VOLT. TRANSMISSION SYSTEM.

- Salt River Power Station.
- Dock Road Power Station.
- Step-down Sub-stations.
- ▲ Traction Sub-stations.
- Overhead Transmission Lines.
- - - - - Underground Cables.



There are certain well-defined traction peaks, resulting from rush-hour traffic on the Capetown-Simonstown line, which necessitate placing additional plant in commission at the power station twice each day.

The units sold during the year 1929 total 47,945,690, of which 28,942,013 units were supplied to the Railway Administration for traction purposes. Electricity for traction purposes is converted from alternating to direct current by the Commission, and is delivered to the Administration at five intermediate points on the route of the Capetown-Simonstown suburban line as direct current, at a pressure of 1,500 volts. The price paid by the Railway Administration for this supply therefore includes the costs of conversion. In the case of supplies of electricity to other consumers, conversion from alternating to direct current is not involved.

The Administration's requirements for traction purposes were reduced, during the year under review, by about $12\frac{1}{2}$ per cent., due to the closing down in April, 1929, of the Sea Point suburban line, on which approximately 4,000,000 units per annum were being utilised for traction purposes. The loss of this load to the Commission's Undertaking naturally resulted in an increase in the average cost per unit for the reduced output, besides rendering idle the capital invested by the Commission in cables, switchgear and converting plant provided for the supply of direct current to the Administration for the working of the Sea Point line.

The following table shows the development in the load on the Commission's system in the Cape rural area since the supply was made available in 1926:—

Cape Rural
Supply
Scheme.

Year.					Units Sold.
1926	...	...	...	...	280,242
1927	...	...	...	...	4,690,009
1928	...	...	...	...	9,767,699
1929	...	...	...	...	11,231,658

The Commission's system in the Cape Rural Areas comprises a 33,000-volt network extending into the Stellenbosch, Paarl and Malmesbury districts, the larger consumers being supplied from step-down sub-stations situated on or adjoining the consumer's property. A diagram showing the transmission system at the Cape is reproduced on the opposite page.

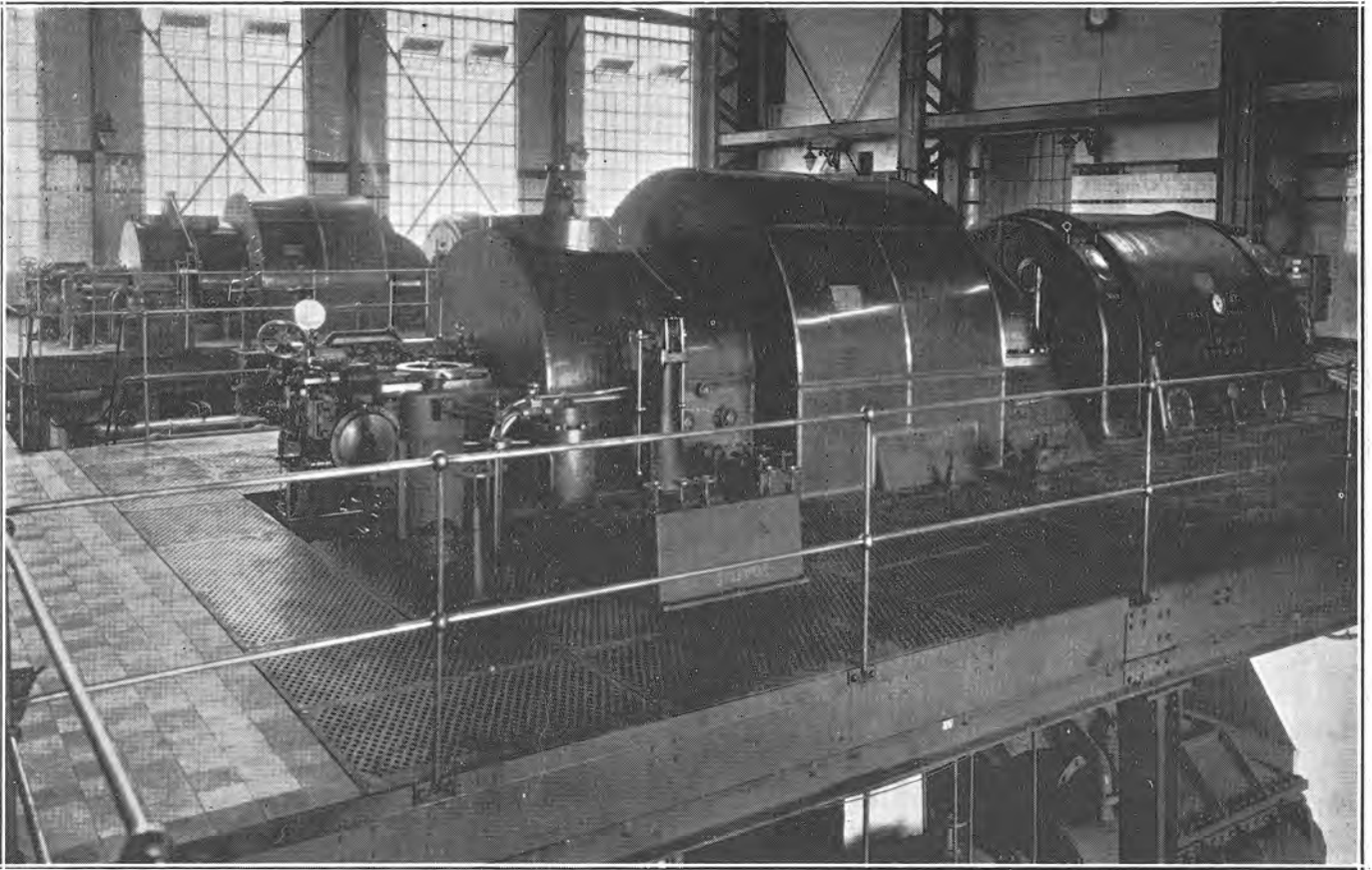
In four of the villages in the Rural Area the Commission has, by arrangement with the Local Authorities concerned, undertaken the distribution of electricity for lighting, domestic and power requirements as well as street lighting, standard low pressure reticulation systems being provided. Several of these villages, which are within easy reach of Capetown, are growing steadily as residential areas, and the availability of electricity for lighting and domestic purposes will assist in their development.

During certain seasons of the year a considerable amount of trouble has been experienced on the 33,000-volt overhead transmission lines in the Cape Rural Area, due to the climatic conditions which adversely affect the insulation of these lines and, so far as the Commission has been able to ascertain, the conditions obtaining at the Cape in this respect are as bad, if not worse, than the most extreme conditions obtaining in other countries. Increased insulation, coupled with periodic insulator cleaning during the worst part of the season, is apparently the only remedy, a conclusion which was confirmed, as a result of investigations made last year by the Commission's Local Manager, by the experience of power companies on the Atlantic and Pacific seaboard in America, where similar difficulties have been experienced.

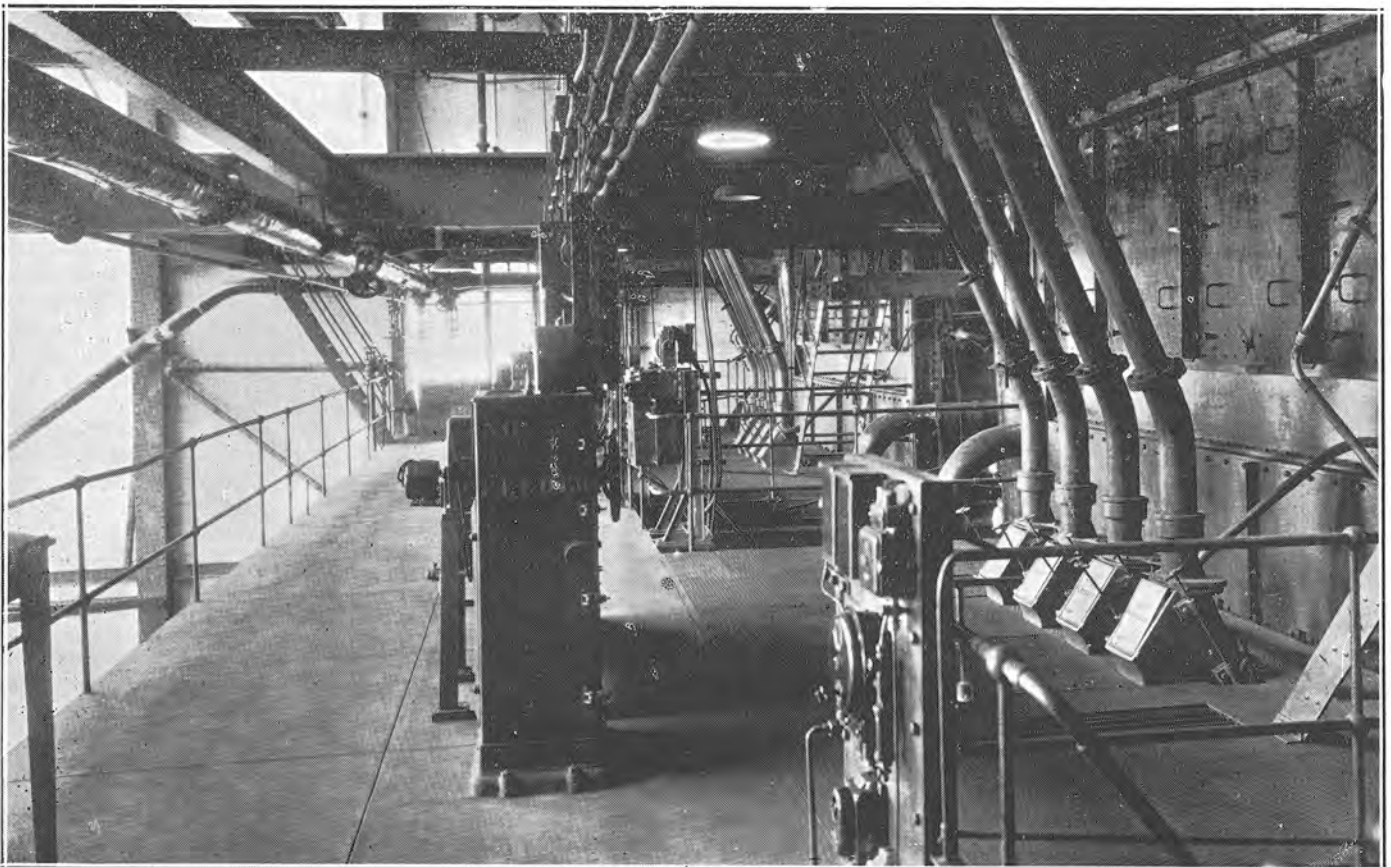
With the gradual extension of the Commission's system and the completion of ring mains affording alternative means of transmitting the supply between various points on the system, the Commission is confident of improved service.

Financial
Results.

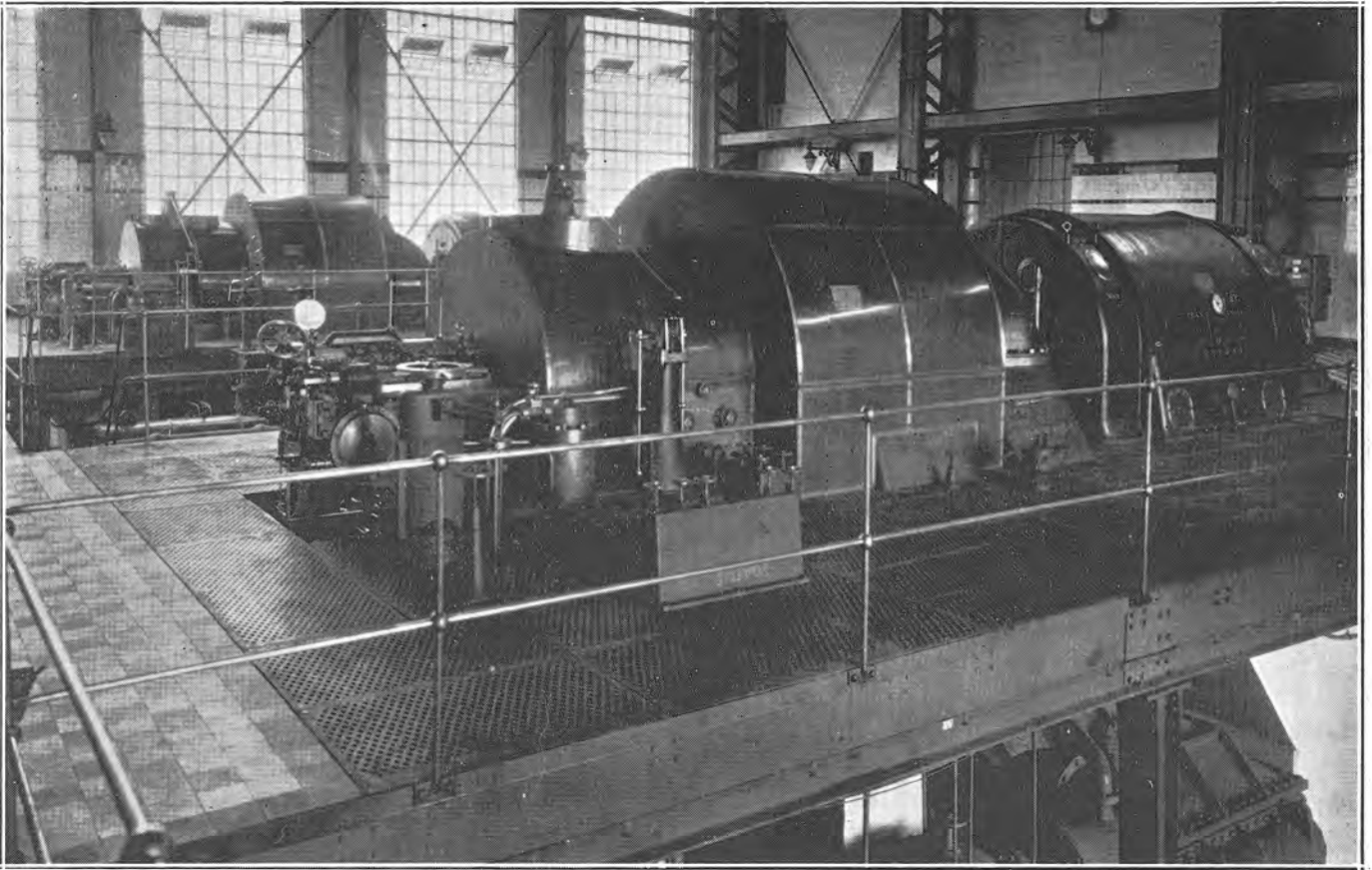
The financial results of the operation of the Capetown Undertaking for the seven months ended 31st December, 1929, are given in Annexure "A" (Account No. 4) to this Report. The working of the Undertaking during the period in question resulted in a deficit of £1,167, which has been carried forward to the year 1930, in terms of Section 10 (3) of the Electricity Act, 1922.



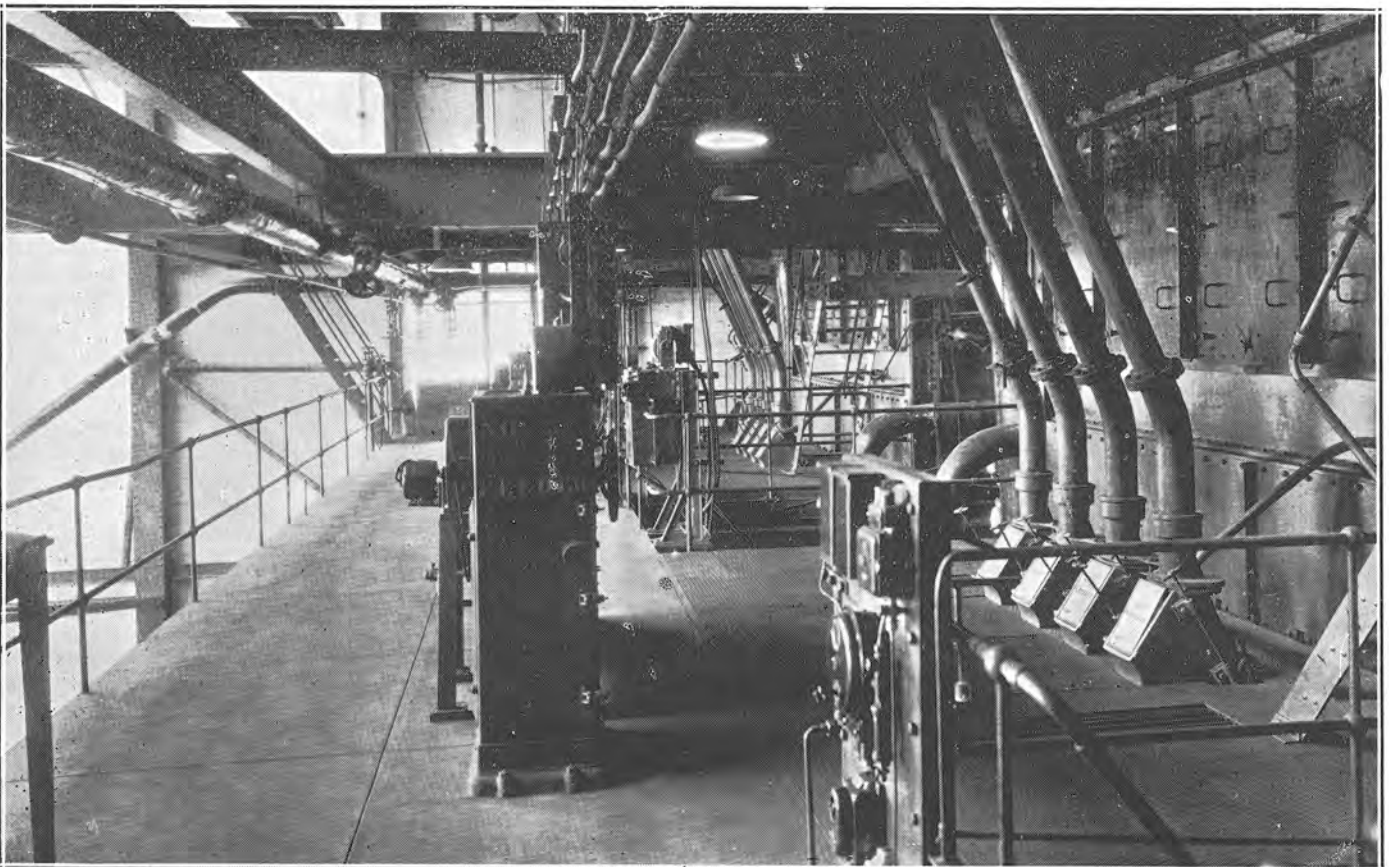
Durban Undertaking: Congella Power Station Turbine House.



Durban Undertaking: Congella Power Station Boiler House.



Durban Undertaking: Congella Power Station Turbine House.



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DURBAN UNDERTAKING.

The Durban Undertaking was established by the Commission primarily for the supply of electricity in bulk to the Durban Corporation. Electricity in the Durban Borough itself and within an area of 16 miles from the Borough boundary is distributed to consumers by the Durban Corporation.

The Commission's power station at Durban, which is situated near the Graving Dock at Congella, had an initial installation of 24,000 kilowatts in two main generating sets of 12,000 kilowatts each.

Whilst the initial construction work was still in progress, it was arranged between the Durban Corporation and the Commission that two 6,000-kilowatt sets should be transferred from the Corporation's power station at Alice Street to the Commission's power station at Congella, so that the installation at the Congella Power Station now comprises 36,000 kilowatts in four main generating sets, two of 12,000 kilowatts each and two of 6,000 kilowatts each. The transfer to and installation at Congella of the first 6,000-kilowatt set was completed towards the end of 1929, and of the second 6,000-kilowatt set early in the current year.

The boiler plant at the Congella Power Station comprises six 60,000-lb. boilers, all of which are fired by pulverised coal.

Accommodation has been provided in the power station buildings for additional turbine and boiler plant, and the circulating water works have been designed for handling a quantity of water considerably in excess of immediate requirements. The capacity of the power station is therefore readily capable of extension.

The capital expenditure on the Durban Undertaking to 31st December, 1929, amounted to £787,746, and the Undertaking was placed in commercial operation on 1st January, 1930.

The units generated at the Congella Power Station during the year 1929 total 85,473,037. The maximum half-hourly demand, prior to the installation in November, 1929, of the first of the two additional 6,000-kilowatt sets, was 15,500 kilowatts, the load factor

Working
Results.

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Working
Results.

for the first eleven months of the year being 62·5 per cent. The thermal efficiency of the power station on units sent out was 17·8 per cent.

During the year 1929, the Congella Power Station, which is inter-connected with the Durban Corporation's Alice Street Power Station, has operated under relatively favourable load conditions, the load factor, for 10 to 12 hours per day, being 100 per cent. These conditions, coupled with the use of pulverised coal, are responsible for the higher thermal efficiency of the Congella Power Station.

During the first few months of operation, an excessive amount of the finer particles of ash, resulting from the combustion of powdered coal, was discharged from the chimneys of the Congella Power Station. The prevailing north-east wind carried this discharge over the neighbouring residential area, where deposition of part of the dust resulted, much to the Commission's regret, in inconvenience to residents in this area, and immediate steps were taken by the Commission to check the discharge. Although the same difficulty has been experienced in Europe, it was ascertained by the Commission, as a result of investigations there, that none of the remedial methods which had been evolved would be entirely suitable for Congella. A system of ash extraction was, however, designed and installed by the Commission, and the trouble at the Congella Power Station has been eliminated.

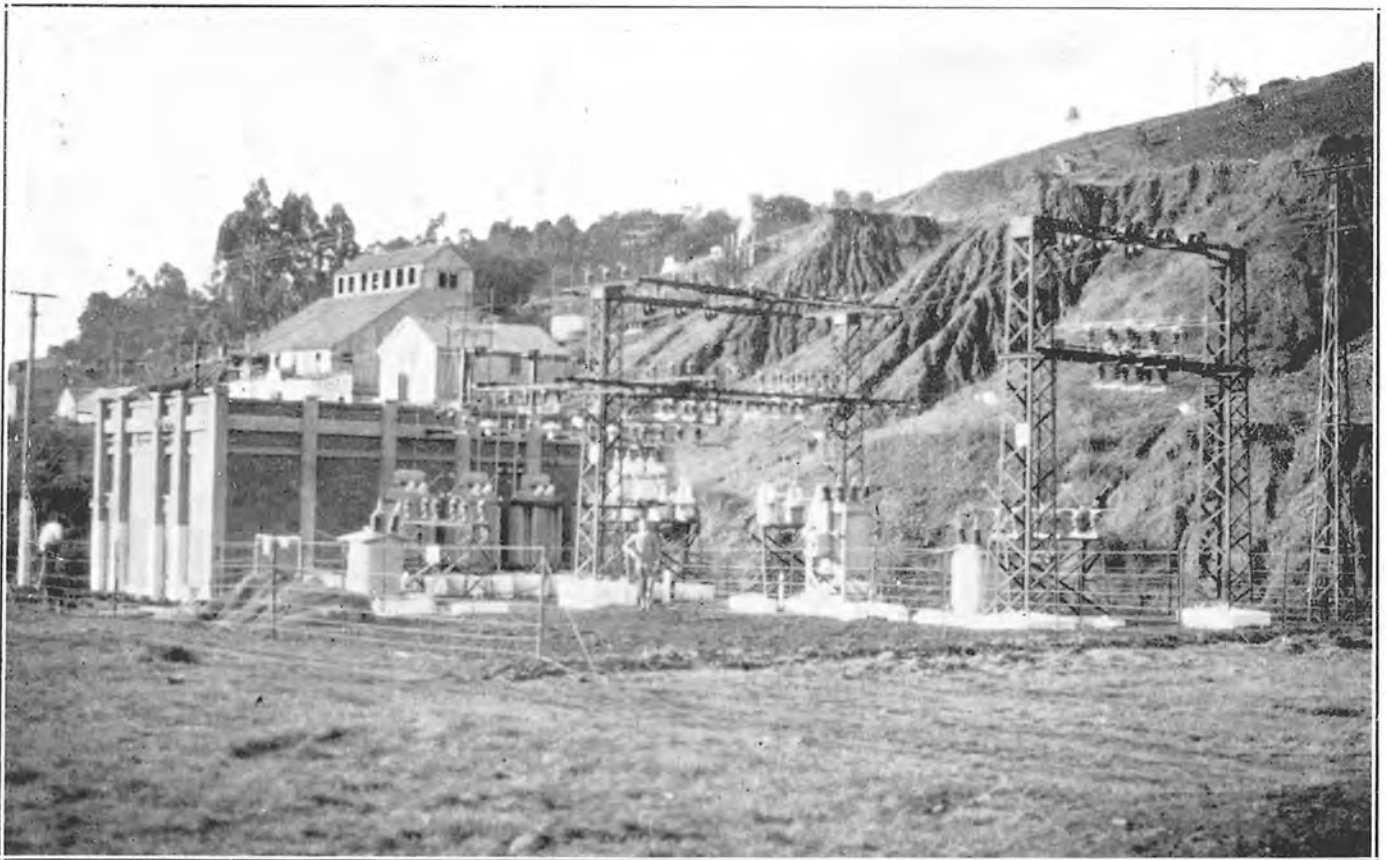
Supply to
Durban
Corporation.

The units sent out from Congella Power Station and supplied to the Durban Corporation during 1929 total 78,873,576.

In view of the continued increase in the Durban Corporation's requirements, the installation of an additional 12,000-kilowatt generating set and additional boiler plant at the Congella Power Station is at present under consideration.



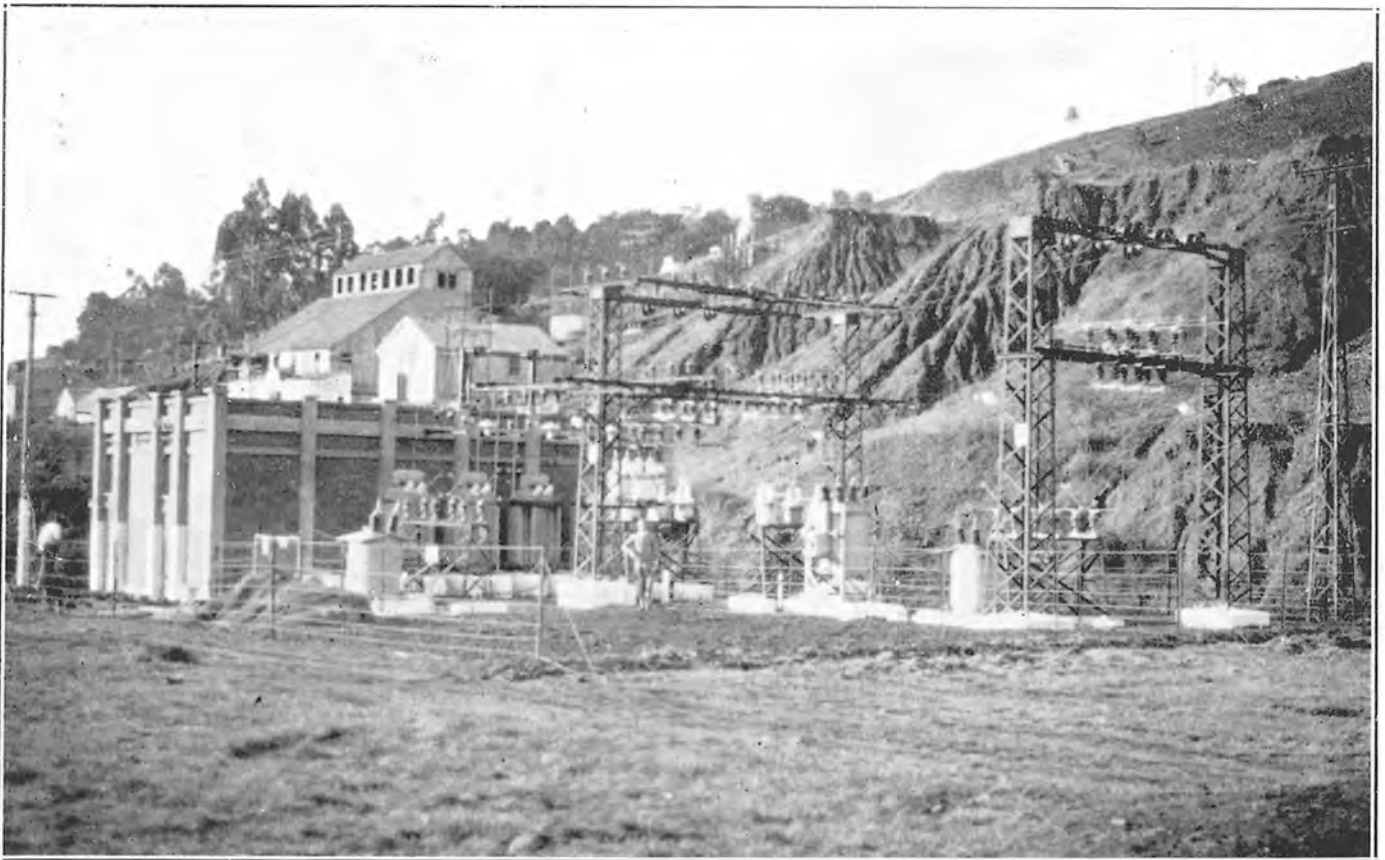
Sabie Undertaking: Sabie River Gorge, with Power Station in middle distance.



Sabie Undertaking: Distribution Sub-station.



Sabie Undertaking: Sabie River Gorge, with Power Station in middle distance.



Sabie Undertaking: Distribution Sub-station.

SABIE UNDERTAKING.

The Sabie Undertaking is the Commission's only hydro-electric scheme, the power station being situated on the Sabie River, in a gorge about eight miles downstream from Sabie Township.

This Undertaking was established by the Commission to supplement the existing sources of power supply for the gold mining industry at Sabie. Repeated representations had previously been made to the Government to establish a power station for this purpose, and the whole question was referred by the Government to the Commission shortly after its appointment.

Shortage of power in the dry season at Sabie had seriously restricted normal mining operations, and the absence of an adequate and reliable power supply was leading to a feeling of uncertainty which, it was represented, would have a detrimental effect upon further development. The removal of this disability by the establishment of the Commission's Undertaking has not, however, been followed by development to the extent anticipated, and this has reacted on the cost of power sold by the Commission.

In the case of hydro-electric schemes, production costs are affected only to a very limited extent by the amount of output, and consequently any increase of consumers' requirements, within the normal capacity of such a scheme, involves practically no additional operating expenditure and results in a substantial reduction in the average cost per unit of output.

The Sabie Undertaking was designed for an output of approximately $5\frac{1}{2}$ million units per annum at the prevailing load factor of the district. During the year 1929 the units sold total 3,176,173, the average cost per unit being 1.04d. This figure is approximately $33\frac{1}{3}$ per cent. less than the price of 1.5d. which the mines expected to pay when the establishment of the Commission's Undertaking was under consideration, and had the requirements of the district come up to expectations, the larger output would have resulted in a still lower cost per unit.

The Sabie Undertaking has operated satisfactorily throughout the year under review. Working
Results.

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Shortage of power in the dry season at Sabie had seriously restricted normal mining operations, and the absence of an adequate and reliable power supply was leading to a feeling of uncertainty which, it was represented, would have a detrimental effect upon further development. The removal of this disability by the establishment of the Commission's Undertaking has not, however, been followed by development to the extent anticipated, and this has reacted on the cost of power sold by the Commission.

In the case of hydro-electric schemes, production costs are affected only to a very limited extent by the amount of output, and consequently any increase of consumers' requirements, within the normal capacity of such a scheme, involves practically no additional operating expenditure and results in a substantial reduction in the average cost per unit of output.

The Sabie Undertaking was designed for an output of approximately $5\frac{1}{2}$ million units per annum at the prevailing load factor of the district. During the year 1929 the units sold total 3,176,173, the average cost per unit being 1.04d. This figure is approximately $33\frac{1}{3}$ per cent. less than the price of 1.5d. which the mines expected to pay when the establishment of the Commission's Undertaking was under consideration, and had the requirements of the district come up to expectations, the larger output would have resulted in a still lower cost per unit.

The Sabie Undertaking has operated satisfactorily throughout the year under review. Working
Results.

The units generated at the Gorge Power Station during 1929 total 3,436,000. The units sent out from the power station total 3,388,700 and the maximum demand was 680 kilowatts, the load factor being 56·9 per cent.

The capital expenditure on the Sabie Undertaking to 31st December, 1929, amounted to £107,137, and the financial results of the operation of the Undertaking for the year 1929 are given in Annexure "A" (Account No. 3) to this Report.

MUNICIPAL ELECTRICITY SUPPLY SCHEMES.

Up to 31st December, 1929, 168 municipal electricity schemes have been reported on by the Commission in terms of Section 38 of the Electricity Act, 1922, and supplementary reports upon tenders have been submitted in respect of 71 schemes.

During the year 1929 the following 24 schemes, of which 14 were new schemes, were reported upon by the Commission, viz. :—

CAPE.

Cradock	Mafeking
Dordrecht	Middelburg
Douglas	Port Elizabeth
Fort Beaufort	Wolseley
Heidelberg	

TRANSVAAL.

Balfour	Maquassi
Bethal	Piet Retief
Bloemhof	Rustenburg
†Elsburg	Ventersdorp
Louis Trichardt	

ORANGE FREE STATE.

Clocolan	Rouxville
Dewetsdorp	

NATAL.

*Paulpietersburg	Port Shepstone
------------------	----------------

SOUTH-WEST AFRICA.

Windhoek

† Supplementary Report.

* Report on tenders only.

Of the total of 168 Municipal electricity schemes reported upon by the Commission up to the end of the year 1929, 83 were new schemes.

The following table shows the total numbers of Local Authorities in the respective Provinces in the Union and in South-West Africa, and the numbers in each case which have established, or are in course of establishing, electricity supply schemes:—

LOCAL AUTHORITIES IN UNION AND SOUTH-WEST AFRICA.

	PROVINCE.					Total.
	Cape.	Transvaal.	O.F.S.	Natal.	S.-W. Africa.	
No. of Municipalities	128	24	61	9	7	229
No. of Other Local Authorities	122	62	6	26	7	223
Total	250	86	67	35	14	452

Local Authorities with Electricity Supply Schemes.

Local Authorities generating and distributing electricity—						
Established	53	15	24	7	2	101
Under Construction	3	3	2	1	—	9
Total	56	18	26	8	2	110
Local Authorities purchasing bulk supplies and carrying out their own distribution—						
Established	11	25	1	8	—	45
Under Construction	—	—	—	—	—	—
Total	11	25	1	8	—	45
Cases in which supply and distribution undertaken by third parties—						
Established	7	4	—	8	3	22
Under Construction	1	—	—	—	—	1
Total	8	4	—	8	3	23
Total Schemes Established	71	44	25	23	5	168
Total Schemes under Construction	4	3	2	1	—	10
Grand Total	75	47	27	24	5	178

ACCOUNTS.

The Commission submits, for the year 1929, as Annexure "A" to this Report:—

- (i) The Report of the Auditors.
- (ii) Balance Sheet duly audited.
- (iii) Schedule of Expenditure on Capital Account.
- (iv) Revenue and Expenditure Accounts in respect of
 - Account No. 1: Natal Central Undertaking.
 - Account No. 2: Witbank Undertaking.
 - Account No. 3: Sabie Undertaking.
 - Account No. 4: Capetown Undertaking.

TARIFFS.

Annexure "B" embodies the standard prices in force, as at 31st December, 1929, in respect of the Commission's several Undertakings.

GENERAL.

The Commission also submits, for the year 1929, as Annexure "C," the following statements:—

- Statement No. 1: Summary of principal plant and equipment installed.
- Statement No. 2: Summary of principal plant and equipment in course of installation or on order.
- Statement No. 3: Statement showing the price or rent of any land or rights or interest in or over land or any other property acquired or hired by the Commission.

UNION STATISTICS.

By the courtesy of the Department of Census and Statistics, the Commission is able to publish some interesting information (extracted from the 1927/28 Industrial Census) bearing upon the production and distribution of electricity in the Union. This information is embodied as Annexure " D " to this Report.

I have the honour to be,

Sir,

Your obedient servant,

A handwritten signature in black ink, reading "J. Guander Bijl". The signature is written in a cursive style with a horizontal line underneath the name.

CHAIRMAN.

bulk from the Commission, and themselves undertaking the distribution and sale of electricity to consumers in their respective areas of jurisdiction.

Electricity purchased in bulk from the Commission is at present distributed and resold by these Municipalities and other Local Authorities to approximately 30,000 individual consumers.

Financial.

The Commission's Balance Sheet, as at 31st December, 1929, is embodied in Annexure "A" to this Report.

The Commission's total capital expenditure to 31st December, 1929, was £7,805,353, made up as follows:—

Undertaking.	Capital Expenditure.
Natal Central	£3,383,161
Witbank	1,931,092
Capetown	1,596,217
Durban	787,746
Sabie	107,137
Total	£7,805,353

Net revenue from the sale of electricity during construction and other revenue accruing prior to the commencement of commercial operation of the several Undertakings, amounting, up to 31st December, 1929, to £150,313, has been credited to capital, so that the net capital expenditure as at that date was £7,655,040.

A Schedule of Expenditure on Capital Account is embodied in Annexure "A" to this Report.

The capital required by the Commission to finance the establishment of its Undertakings has been obtained by means of advances from the Treasury in terms of Section 7 (3) of the Electricity Act, 1922, as amended by Section 4 of the Financial Adjustments Act, 1927. Cost of raising and interest charges during construction have been capitalised and added to the net amount of the advances. The statutory provisions in respect of these advances were designed for the assistance of the Commission during the development stages and were limited to a period of seven years.

The position as at 31st December, 1929, in respect of these advances, was as follows:—

Advances received from Treasury	£7,309,965
Cost of raising charges	£212,125
Interest capitalized	477,910 690,035
Total	£8,000,000

Interest charges paid to the Treasury up to 31st December, 1929, on account of capital invested in Undertakings which had reached the revenue-producing stage and had been placed in commercial operation, amounted to £649,458.

The Electricity Act contemplated and provided for the raising of loans by the Commission in the form of stock or debenture issues to the public. After careful review of all the circumstances, it was decided that it would be preferable, at the present time, to consolidate the advances received from the Treasury into a loan or loans, provided mutually acceptable terms could be come to between the Commission and the Treasury.

Negotiations in this respect with the Treasury have now been concluded and, briefly, the arrangements agreed upon are that the advances made to the Commission by the Treasury up to 31st December, 1929, be consolidated into two loans of £3,000,000 and £5,000,000 respectively. The interest accruing to the Treasury on these two loans as from 1st January, 1930, amounts to £401,440 per annum, and will be paid by the Commission half-yearly on 30th June and 31st December. The £3,000,000 loan is redeemable on 31st December, 1954, and the £5,000,000 loan is redeemable on 31st December, 1979, contributions from revenue to the Redemption Fund in respect of the latter commencing in 1940.

The loan of £5,000,000, with the longer redemption period, covers the capital invested in the Natal Central and Capetown Undertakings, both of which were established primarily for the supply of electricity to the South African Railways and Harbours Administration for railway traction purposes.

As from the date upon which each of the Commission's Undertakings was placed in commercial operation, provision has been made for the repayment of moneys borrowed in respect of such

The financial results of the Witbank Undertaking for the year ended 31st December, 1929, are given in Annexure "A" (Account No. 2) to this Report. A surplus of revenue over expenditure of £2,670 was realised on the working of the Undertaking during the year. This amount, together with the balance of £4,977 brought forward from the year 1928, has been carried forward to the year 1930, in terms of Section 10 (3) of the Electricity Act, 1922.

It will be appreciated that the full effect of the tariff reductions made by the Commission in July, 1929, is not reflected in the total revenue for the year 1929.

Consumers.

The Middelburg Municipality, several collieries, and a number of other consumers have been connected to the Commission's system in the Witbank District during the year, and construction work is proceeding in connection with extensions of the system to supply a number of new consumers.

Amendment
of Licence.

The gradual extension of the Commission's reticulation network at Witbank has brought additional consumers within range of the system and, as a result of negotiations with prospective consumers situated beyond the Commission's original area of supply (the area within a radius of 15 miles from the Witbank Power Station), application was made to the Electricity Control Board for an extension of the area of supply by increasing the radius from the power station from 15 to 25 miles. On 18th December, 1929, the Control Board granted the Commission's application.

ANNEXURE "A": ACCOUNTS.

The Report of the Auditors.

Balance Sheet, duly audited.

Schedule of Expenditure on Capital Account.

Revenue and Expenditure Accounts in respect of:—

- (1) Natal Central Undertaking.
- (2) Witbank Undertaking.
- (3) Sabie Undertaking.
- (4) Capetown Undertaking.

THE REPORT OF THE AUDITORS.

Johannesburg,

16th June, 1930.

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 December 31st, 1929, and have to report as follows:—

(1) As in previous years the general principle has been followed of fixing a date from which a complete Undertaking or portion of an Undertaking is deemed to come into commercial operation.

During the preliminary period of working and before an Undertaking is in full operation all revenue from sales of electricity or otherwise less cost of production is applied in reduction of the capital cost of the Undertaking. From the date of coming into commercial operation revenue accounts are prepared and provision made for repayment of moneys borrowed and reserve fund in terms of the Electricity Act.

The actual position of the various Undertakings in connection with commercial operation during the year 1929 has been as follows:—

The Natal Central, Witbank and Sabie Undertakings have been in commercial operation during the whole of the year.

The Capetown Undertaking was brought into commercial operation as from June 1st, 1929.

The Durban Undertaking was brought into commercial operation as from January 1st, 1930.

NATAL CENTRAL UNDERTAKING.

(2) Consumers other than the South African Railways have been charged on a tariff basis under agreements between them and the Commission. The Railways have been charged for the current supplied to them on the basis of the cost of working the Undertaking, including administration and capital charges, less revenue derived from other consumers.

The capital cost of the Undertaking as taken over from the South African Railways was finally agreed during the year under review and the necessary adjustments of capital charges have been made.

WITBANK UNDERTAKING.

(3) The Power Station is operated by the Victoria Falls and Transvaal Power Co., Ltd., under agreement with the Commission. This agreement lays down *inter alia* the method of calculating the cost of electricity payable by the Company. The charges made by the Commission to the other consumers notwithstanding reductions made in the tariff, have resulted in a surplus

as shown by the Revenue Account which together with a similar amount from the previous year is being carried forward for the benefit of consumers other than the Victoria Falls Company, Limited.

The cost of operating the station incurred by the Victoria Falls Company is in accordance with statements rendered by that Company, which, together with the disbursements made by that Company on Capital Account during the year have been verified by the Internal Auditor of the Commission.

SABIE UNDERTAKING.

(4) Consumers have been charged on a basis which covers cost of production, interest, provision for repayment of moneys borrowed and an appropriation of £1,576 16s. 11d. to Reserve Fund.

In the case of one consumer special extended credit has been given in respect of sums aggregating £600. The recovery of this amount which still remains outstanding is not free from doubt.

CAPETOWN UNDERTAKING.

(5) Consumers other than the South African Railways have been charged for the whole year on a tariff basis in terms of agreements with them.

For the first five months of the year the South African Railways have been charged for energy supplied to them at fixed prices subject to adjustment to the actual working cost of the Undertaking. This working cost is exclusive of provision for repayment of moneys borrowed for the Power Station section of the Undertaking but inclusive of interest and appropriation for Reserve Fund and has received the benefit of revenue derived from the sale of electricity to other consumers.

From June 1st, 1929, from which date the Undertaking came into commercial operation, the South African Railways have been charged a fixed price which is subject to periodical revision. The operations from June to December 1929 have resulted in a loss of £1,166 11s. 2d., which falls to be made good by the South African Railways by adjustment of tariff or otherwise.

The Sea Point Railway being closed, by arrangement a special charge is made to the South African Railways for capital charges on the Commission's expenditure thereon.

DURBAN UNDERTAKING.

(6) This Station was producing power during the whole of 1929 but was not brought into commercial operation as construction had not been completed. The only consumer of the Undertaking was the Durban Corporation to whom power has been sold under special arrangements. No contribution has been made by this Undertaking to Reserve Fund or Provision for repayment of Moneys Borrowed as the Undertaking was not in commercial operation.

The revenue derived from the station less the cost of production (including interest) has been applied in reduction of the capital cost of the Undertaking.

HEAD OFFICE ADMINISTRATION AND ENGINEERING.

(7) As contemplated in Section 11 (2) of the Electricity Act the Commission, has as previously, made an allocation of overhead and administration charges as between the various Undertakings.

PENSION FUND.

(8) During the year a sum equal to 3 per cent. on the white salaries and wages paid has continued to be contributed towards forming the nucleus of a Pension Fund. This provision has been increased by a suitable interest credit and at the end of 1929 amounted to £12,270 13s. 9d., but no separate investment has been made in respect thereof.

A Pension Scheme on a non contributory basis has now been formulated and is receiving the consideration of the Commission.

PROVISION FOR REPAYMENT OF MONEYS BORROWED.

(9) The whole of the funds borrowed by the Commission to December 31st, 1929, have been in the form of advances by the Union Treasury and are subject to interest and cost of raising charges. During the year 1929 by mutual agreement between the Commission and the Treasury the total amount of the advances was fixed at £8,000,000. This arrangement has now been sanctioned by Parliament under the Financial Adjustments Act 1930 which provides that the amount shall be consolidated into two loans of £3,000,000 to be redeemed not later than December 31st 1954 and £5,000,000 to be redeemed not later than December 31st 1979, the interest thereon to run at the rate of 5·018 per cent per annum.

In the Accounts under review in the case of Undertakings or portions of Undertakings in commercial operation the Commission has provided such sums as, on the basis of interest at the rate of $3\frac{1}{2}$ per cent. per annum compounded, will amortise the capital invested in each Undertaking, having regard to the special circumstances of each Undertaking but in no case exceeding a period of 30 years from the date of coming into commercial operation.

In the case of Undertakings under construction and not as yet in commercial operation no amount has been set aside for the repayment of the moneys invested therein, but any surplus over cost of production derived from electricity sold during construction has been applied in reduction of Capital Cost.

In view of the position as stated above we consider that adequate provision has been made for the repayment of the capital invested in the Undertakings or portions of Undertakings in commercial operation.

RESERVE FUND.

(10) During the financial year ended 31st December, 1929, sums aggregating £61,537 4s. 5d. have been set aside by the Commission to Reserve Fund, in terms of Section 9 of the Electricity Act, 1922, in respect of the Natal Central, Witbank, Sabie and Capetown Undertakings.

No appropriation to Reserve Fund has been made during the year in respect of the Durban Undertaking, this Undertaking not then being in commercial operation.

GENERAL.

(11) As the result of our audit of the Books and Accounts of the Commission for the year 1929, and, subject to the foregoing remarks and 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 of its transactions and of the results of trading.
- (c) Due provision has been made for the redemption and repayment of moneys borrowed in view of the circumstances as explained in Paragraph (9) of this Report.
- (d) The value of the 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.

Yours faithfully,

B. HALSEY.

ALEX. AIKEN & CARTER

Electricity Supply

Incorporated under the

BALANCE SHEET at

LIABILITIES.					
Treasury of the Union of South Africa Advance Account	...				£8,000,000 0 0
Balance at 31st December, 1928	...	...	...	£7,830,214 9 6	
Interest	...	...	...	394,638 6 10	
				8,224,852 16 4	
<i>Less—Interest paid during 1929</i>	...	...	...	224,852 16 4	
Sundry Creditors and Credit Balances	...	...	...		134,955 16 3
Provision for Pensions	...	...	...		12,270 13 9
Surplus, being Excess of Assets over Liabilities	...	...	...		480,421 11 9
Made up as follows:—					
Provision for repayment of moneys borrowed	...		...	328,423 4 7	
Reserve Fund	...	...	...	145,517 19 3	
Balance on Revenue Accounts	...	...	...	6,480 7 11	
Witbank Undertaking	...	...	£7,646 19 1		
<i>Less—Capetown Undertaking</i>	...	...	1,166 11 2		

Note.—In addition to the Liabilities shown above, the Commission has approved of Expenditure amounting to approximately £355,256 in connection with the completion and extension of the Undertakings, also £1,024 expenditure chargeable against Reserve Fund.

£8,627,648 1 9

H. J. VAN DER BIJL, Chairman.

A. E. HARTE, C.A. (S.A.), Chief Accountant.

Johannesburg,

24th April, 1930.

Electricity Supply Commission.

SCHEDULE OF EXPENDITURE ON CAPITAL ACCOUNT to 31st December, 1929.

Expenditure in connection with Electricity Undertakings.	Amount Expended to 31st Dec., 1928.	Amount Expended during 1929.	Totals to 31st Dec., 1929.
NATAL CENTRAL UNDERTAKING:			
Land	£16,844 4 9	£221 11 0	£17,065 15 9
Buildings and other Civil Engineering Works ...	752,767 7 11	Cr. 2,209 5 8	750,558 2 3
Machinery and Plant	2,453,472 9 9	26,952 6 7	2,480,424 16 4
Miscellaneous Equipment	6,320 6 7	393 6 3	6,713 12 10
General Expenditure	18,894 1 5	19 1 5	18,913 2 10
Interest during Construction and Cost of Raising Money	103,083 4 5	6,401 14 4	109,484 18 9
	£3,351,381 14 10	£31,778 13 11	£3,383,160 8 9
Less—Net Revenue during Construction ...	2,163 1 0	116 9 6	2,279 10 6
	£3,349,218 13 10	£31,662 4 5	£3,380,880 18 3
WITBANK UNDERTAKING:			
Land	£6,377 9 4	£687 6 3	£7,064 15 7
Buildings and other Civil Engineering Works ...	405,138 6 9	28,560 14 3	433,699 1 0
Machinery and Plant	1,011,562 17 8	113,788 6 10	1,125,351 4 6
Miscellaneous Equipment	14,433 10 9	Cr. 236 4 2	14,197 6 7
General Expenditure	154,892 3 11	13,784 3 7	168,676 7 6
Interest during Construction and Cost of Raising Money	171,465 10 7	10,637 7 3	182,102 17 10
	£1,763,869 19 0	£167,221 14 0	£1,931,091 13 0
Less—Net Revenue during Construction ...	102,052 15 9	1,395 19 2	103,448 14 11
	£1,661,817 3 3	£165,825 14 10	£1,827,642 18 1
SABIE UNDERTAKING:			
Land	£510 0 0	—	£510 0 0
Buildings and other Civil Engineering Works ...	43,909 9 11	£22,042 18 6	65,952 8 5
Machinery and Plant	40,209 5 4	Cr. 2,051 6 1	38,157 19 3
Miscellaneous Equipment	1,915 3 10	601 17 1	2,517 0 11
General Expenditure	15,700 3 0	Cr. 15,700 3 0	—
Interest during Construction and Cost of Raising Money	4,894 9 8	Cr. 4,894 9 8	—
	£107,138 11 9	Cr. £1 3 2	£107,137 8 7
Less—Net Revenue during Construction ...	9,124 15 10	—	9,124 15 10
	£98,013 15 11	Cr. £1 3 2	£98,012 12 9
CAPETOWN UNDERTAKING:			
Land	£19,431 16 8	£554 11 4	£19,986 8 0
Buildings and other Civil Engineering Works ...	478,553 18 1	19,712 8 2	498,266 6 3
Machinery and Plant	702,584 18 5	71,526 10 0	774,111 8 5
Miscellaneous Equipment	4,971 18 9	2,376 6 4	7,348 5 1
General Expenditure	173,066 7 4	Cr. 4,048 14 10	169,017 12 6
Interest during Construction and Cost of Raising Money	122,757 17 9	4,729 9 4	127,487 7 1
	£1,501,366 17 0	£94,850 10 4	£1,596,217 7 4
Less—Net Revenue during Construction ...	17,512 16 11	2,182 19 11	19,695 16 10
	£1,483,854 0 1	£92,667 10 5	£1,576,521 10 6
DURBAN UNDERTAKING:			
Land	£28,526 19 6	£1,123 11 0	£29,650 10 6
Buildings and other Civil Engineering Works ...	228,526 9 5	8,350 8 0	236,876 17 5
Machinery and Plant	306,751 12 5	70,567 12 4	377,319 4 9
Miscellaneous Equipment	1,030 11 5	1,030 8 1	3,889 19 4
General Expenditure	83,049 17 9	3,102 6 5	86,152 4 2
Interest during Construction and Cost of Raising Money	50,124 13 2	3,732 18 6	53,857 11 8
	£699,839 3 6	£87,907 4 4	£787,746 7 10
Less—Net Revenue during Construction ...	1,717 11 5	14,046 19 5	15,764 10 10
	£698,121 12 1	£73,860 4 11	£771,981 17 0

Electricity Supply

NATAL CENTRAL

Dr.

Revenue Account for the Year

							Generation of Electricity.					
To	Operation—											
	Fuel	...	...	...	...	...	£42,165	11	4			
	Water, Oil, Waste and Stores	...	...	...	...	...	1,567	4	6			
	Salaries and Wages	...	...	...	...	...	16,199	7	2			
	Other Expenses	...	...	...	...	...	190	12	11			
„	Maintenance—											
	Stores	...	...	...	...	...	4,783	8	8			
	Salaries and Wages	...	...	...	...	...	10,601	3	7			
	Other Expenses	...	...	...	...	...	362	5	8			
												£75,869 13 10
							Distribution of Electricity.					
„	Operation and Maintenance—											
	Stores	...	...	...	...	...	2,653	15	7			
	Salaries and Wages	...	...	...	...	...	13,258	5	7			
	Other Expenses	...	...	...	...	...	6,208	17	8			
												22,120 18 10
							General Expenses.					
„	Local Management and General Expenses	...	...	...	...	...	14,647	10	4			
„	Head Office Administration and General Expenses	...	...	...	...	...	9,173	14	3			
„	Engineering Expenses	...	...	...	...	...	4,805	5	0			
												28,626 9 7
							Capital Charges.					
„	Interest	...	...	...	...	...	166,642	15	11			
„	Provision for Repayment of Moneys borrowed	...	...	...	...	...	63,301	3	6			
„	Reserve Fund	...	...	...	...	...	23,401	16	7			
												253,345 16 0
												£379,962 18 3

A. E. HARTE, C.A. (S.A.), Chief Accountant.

Johannesburg,
24th April, 1930.

Electricity Supply

WITBANK

Dr.

Revenue Account for the Year

Generation of Electricity.							
To Operation—							
Fuel	...	...	...	...	...	£49,099	7 4
Water, Oil, Waste and Stores	...	...	...	...	...	2,382	2 11
Salaries and Wages	...	...	...	...	...	19,620	17 1
Other Expenses	...	...	...	...	...	1,018	13 10
„ Maintenance—							
Stores	...	...	...	...	...	4,989	15 0
Salaries and Wages	...	...	...	...	...	9,126	0 2
Other Expenses	...	...	...	...	...	3,769	1 5
							£90,005 17 9
Distribution of Electricity.							
„ Operation and Maintenance—							
Stores	...	...	...	...	...	687	13 9
Salaries and Wages	...	...	...	...	...	1,619	4 3
Other Expenses	...	...	...	...	...	2,026	0 2
							4,332 18 2
General Expenses.							
„ Local Management and General Expenses	...	...	...	...	...	9,573	17 11
„ Administration, Engineering and General Expenses of operating party (The Victoria Falls and Transvaal Power Co., Ltd.)	...	...	...	...	...	6,291	13 4
„ Head Office Administration and General Expenses	...	...	...	...	...	2,508	11 4
„ Engineering Expenses	...	...	...	...	...	1,480	9 8
							19,854 12 3
Capital Charges.							
„ Interest	...	...	...	...	...	83,197	15 1
„ Provision for Repayment of Moneys borrowed	...	...	...	...	...	42,444	2 8
„ Reserve Fund	...	...	...	...	...	21,228	0 11
							146,869 18 8
„ Balance, being excess of Revenue over Expenditure for the Year carried down	...	...	...	...	...		2,670 1 6
							£263,733 8 4
To Balance as per Balance Sheet	...	...	...	...	...		7,646 19 1
							£7,646 19 1

A. E. HARTE, C.A. (S.A.), Chief Accountant.

Johannesburg,
24th April, 1930.

Electricity Supply

SABIE

Dr. Revenue Account for the Year

Generation of Electricity.						
To Operation—						
Water, Oil, Waste and Stores	...	...	...	...	£51	2 8
Salaries and Wages	...	...	...	...	1,109	1 10
,, Maintenance—						
Stores	...	...	...	...	623	9 1
						1,783 13 7
Distribution of Electricity.						
,, Operation and Maintenance—						
Stores	...	...	...	...	56	3 7
Salaries and Wages	...	...	...	...	374	13 8
Other Expenses	...	...	...	...	30	2 9
						461 0 0
General Expenses.						
,, Local Management and General Expenses						
Head Office Administration and General Expenses	...	...	...	...	352	14 4
Engineering Expenses	...	...	...	...	743	16 3
						389 12 4
						1,486 2 11
Capital Charges.						
,, Interest						
Provision for Repayment of Moneys borrowed	...	...	...	...	4,970	2 4
Reserve Fund	...	...	...	...	3,493	11 4
						1,576 16 11
						10,040 10 7
						£13,771 7 1

A. E. HARTE, C.A. (S.A.), Chief Accountant.

Johannesburg,
24th April, 1930.

Electricity Supply

1930
CAPETOWN

Dr.

Revenue Account for the ¹⁹³⁰ Seven Months

Generation of Electricity.								
To Operation—								
Fuel	...	...	...	...	...	...	£28,657	2 6
Water, Oil, Waste and Stores	...	...	...	...	...	...	832	15 9
Salaries and Wages	...	...	...	...	...	...	5,065	5 4
Other Expenses	...	...	...	...	...	...	97	0 3
„ Maintenance—								
Stores	...	...	...	...	...	...	474	0 7
Salaries and Wages	...	...	...	...	...	...	2,421	14 11
Other Expenses	...	...	...	...	...	...	360	8 6
								£37,908 7 10
Distribution of Electricity.								
„ Operation and Maintenance—								
Stores	...	...	...	...	...	...	387	16 2
Salaries and Wages	...	...	...	...	...	...	5,119	8 5
Other Expenses	...	...	...	...	...	...	858	13 9
								6,365 18 4
General Expenses.								
„ Local Management and General Expenses	...	...	...	...	...	...	7,817	15 5
„ Head Office Administration and General Expenses	...	...	...	...	...	...	4,125	7 6
„ Engineering Expenses	...	...	...	...	...	...	2,160	18 0
								14,104 0 11
Capital Charges.								
„ Interest	...	...	...	...	...	...	44,641	10 0
„ Provision for Repayment of Moneys borrowed	...	...	...	...	...	...	17,784	1 3
„ Reserve Fund	...	...	...	...	...	...	8,876	7 3
								71,301 18 6
								£129,680 5 7

A. E. HARTE, C.A. (S.A.), Chief Accountant.

Johannesburg,
24th April, 1930.

ANNEXURE “ B ”: TARIFFS.

EMBODYING—

The standard prices in force, as at 31st December, 1929, in respect of the Commission's several Undertakings.

ANNEXURE “ B ”: TARIFFS.

EMBODYING—

The standard prices in force, as at 31st December, 1929, in respect of the Commission's several Undertakings.

Commission.

Electricity Act, 1922.

31st DECEMBER, 1929.

ASSETS.		
Expenditure on Capital Account	...	£7,655,039 16 7
Natal Central Undertaking	... £3,383,160 8 9	
Witbank Undertaking	... 1,931,091 13 0	
Sabie Undertaking	... 107,137 8 7	
Capetown Undertaking	... 1,596,217 7 4	
Durban Undertaking	... 787,746 7 10	
	7,805,353 5 6	
<i>Less</i> —Net Revenue derived from Sales of Energy and Water during construction	... 150,313 8 11	
Stores and Materials	...	105,132 18 3
Sundry Debtors and Debit Balances	...	100,777 16 1
Investments—		
Union of South Africa: 90 days Treasury Bill, with Interest accrued	... 19,929 0 10	
Cash	... 266,010 1 3	
On Deposit at Interest	... 237,309 0 0	
On Current Account and on Hand	... 28,701 1 3	
Investment of Provision for Repayment of Moneys borrowed (at cost)	...	328,921 0 1
£78,710 Union of South Africa 5% (10 years) Loan 1935	... 78,611 12 3	
£76,000 Union of South Africa 4½% Local Registered Stock, 1953	... 71,345 0 0	
£37,000 Town Council of Johannesburg 5% Local Inscribed Stock, 1948/58	... 36,564 18 7	
Cash on deposit at interest	... * 140,000 0 0	
Interest accrued	... 2,399 9 3	
Investment of Reserve Fund (at cost)	...	151,837 8 8
Amount invested in Municipal and Union of South Africa Local Stocks	... 150,817 8 0	
Interest accrued	... * 1,020 0 8	
		£8,627,648 1 9

Referred to in our Report of 16th June, 1930.

ALEX. AIKEN & CARTER, }
B. HALSEY, } Auditors.

Commission.

Account No. 1.

UNDERTAKING.

ended 31st December, 1929.

Cr.

By Sales of Electricity—							
Traction Supplies	...	...	...	...	...	£342,199	11 6
Bulk Supplies	...	...	...	...	...	25,092	4 8
Industrial Supplies	...	...	...	...	...	7,795	10 5
Domestic Supplies	...	...	...	...	...	1,424	5 4
Street Lighting	...	...	...	...	...	160	0 0
						<u>376,671</u>	<u>11 11</u>
<i>Less</i> —Proportion applied against Capital Cost of part of Undertaking not in commercial operation	...	...	...	...	...	49	17 3
„ Other Revenue	...	...	...	...	...		£376,621 14 8 3,341 3 7

£379,962 18 3

Referred to in our Report of 16th June, 1930.

ALEX. AIKEN & CARTER, } Auditors.
B. HALSEY,

Commission.

Account No. 2.

UNDERTAKING.

ended 31st December, 1929.

Cr.

By Sales of Electricity—							
Bulk Supplies ...	...	...	...	...	...	£216,828	19 1
Industrial Supplies ...	...	...	...	...	...	39,020	15 11
Domestic Supplies ...	...	...	...	...	...	2,780	11 3
Street Lighting ...	...	...	...	...	...	523	5 0
						<hr/>	
						259,153	11 3
Less—Proportion applied against Capital Cost of part of Undertaking not in commercial operation ...						33	11 8
						<hr/>	
						£259,119	19 7
„ Other Revenue ...	...	...	...	...	...	4,613	8 9

						<hr/>	
						£263,733	8 4
						<hr/>	
By Balance at 31st December, 1928, brought forward ...						4,976	17 7
„ Balance, being excess of Revenue over Expenditure for the year brought down ...						2,670	1 6
						<hr/>	
						£7,646	19 1
						<hr/>	

Referred to in our Report of 16th June, 1930.

ALEX. AIKEN & CARTER,
B. HALSEY, } Auditors.

Commission.

Account No. 3.

UNDERTAKING.

ended 31st December, 1929.

Cr.

By Sales of Electricity—									
Industrial Supplies	...	...	...	...	...				£13,771 7 1

£13,771 7 1

Referred to in our Report of 16th June, 1930.

ALEX. AIKEN & CARTER. }
B. HALSEY, } Auditors.

Commission.

Account No. 4.

UNDERTAKING.

ended 31st December, 1929.

Gr.

By Sales of Electricity—						
Traction Supplies	...	...	...	...	...	£79,418 19 11
Bulk Supplies	...	...	...	...	...	9,702 12 10
Industrial Supplies	...	...	...	...	...	34,547 16 7
Domestic Supplies	...	...	...	...	...	1,797 12 4
Street Lighting	...	...	...	...	...	350 3 2
						<hr/>
						125,817 4 10
<i>Less</i> —Proportion applied against Capital Cost of part of Undertaking not in commercial operation	...	...	...	...	...	834 13 8
						<hr/>
						£124,982 11 2
„ Capital Charges recovered from South African Railways and Harbours Administration in respect of Capital Expenditure rendered idle consequent upon the closing down of the Sea Point Line	...	...	...	...	...	2,120 8 3
„ Other Revenue	...	...	...	...	...	1,410 15 0
„ Balance, being excess of Expenditure over Revenue for the period	...	...	...	...	...	<hr/>
						1,166 11 2
						<hr/>
						£129,680 5 7
						<hr/>

Referred to in our Report of 16th June, 1930.

ALEX. AIKEN & CARTER, }
B. HALSEY, } Auditors.

ANNEXURE " C. "

EMBODYING—

Statement No.

1. Summary of principal plant and equipment installed as at 31st December, 1929.
2. Summary of principal plant and equipment in course of installation or on order at 31st December, 1929.
3. Statement showing the price or rent of any land or rights or interest in or over land or any other property acquired or hired by the Commission.

Electricity Supply Commission.

STATEMENT No. 1.

Summary of principal plant and equipment installed at the Commission's several Undertakings as at 31st December, 1929:—

GENERATING PLANT.

No. of Sets.	Capacity each, Kilowatts.	Total Capacity, Kilowatts
4	20,000	80,000
7	12,000	84,000
3	10,000	30,000
1	6,000	6,000
1	1,000	1,000
3	450	1,350
1	300	300
Total 20		202,650

BOILER PLANT.

No. of Boilers.	Capacity in lbs. of steam per hour (normal rating).	
	Each.	Total.
15	70,000	1,050,000
20	60,000	1,200,000
Total 35		2,250,000

TRANSMISSION LINES AND CABLES.

	88,000 volts. Route Miles.	33,000 volts. Route Miles.	21,000 volts. Route Miles.	12,000 volts. Route Miles.	6,600, 3,300 and 2,200 volts. Route Miles.		380/220 volts. Route Miles.	Total Route Miles.
					2,200 volts. Route Miles.	380/220 volts. Route Miles.		
Overhead Lines .	275	107	65	—	9	35		491
Cables	—	29	7	10	6	1		53
Total	275	136	72	10	15	36		544

TRANSFORMERS

(Step-up and Step-down).

Total capacity installed	Kilovolt Amperes.
... ..	320,700

CONVERTING SUB-STATIONS.

MOTOR GENERATOR SETS.			ROTARY CONVERTERS.			TOTALS.		
No. of Sub- Stations.	No. of Sets.	Rating Kilowatts.	No. of Sub- Stations.	No. of Sets.	Rating Kilowatts.	No. of Sub- Stations.	No. of Sets.	Rating Kilowatts.
12	22	44,000	5	10	20,000	17	32	64,000

Note.—Two rotary converters removed from Three Anchor Bay Sub-station, following the closing down of the Sea Point Line, are stored and are not included in this figure.

STAFF QUARTERS.

					Brick Buildings.	Wood and Iron Buildings.	Total.
Married Staff Quarters	...	...	...	...	80	17	97
Single Staff Quarters	...	...	...	...	8	1	9
Total	...	...	...	...	88	18	106

ANNEXURE “ D.”

EMBODYING—

Statistics relating to the production and supply of electricity
in the Union of South Africa.

**STATISTICS RELATING TO THE PRODUCTION AND SUPPLY OF
ELECTRICITY IN THE UNION OF SOUTH AFRICA.**

Extracted from the 1927/28 Industrial Census and Published
by courtesy of the Department of Census and Statistics.

UNITS GENERATED.

Province.	Local Authorities.	Other Producers.	Total.
Cape	96,381,190	34,755,294	131,136,484
Transvaal	108,713,967	1,608,173,828	1,716,887,795
O.F.S.	13,522,801	21,666,460	35,189,261
Natal	82,231,459	144,154,126	226,385,585
Totals	300,849,417	1,808,749,708	2,109,599,125

CONSUMERS AND SALES.

	Cape.	Transvaal.	Province. O.F.S.	Natal.	Total.
Total No. of Consumers	58,002	63,471	8,568	25,583	155,624
Total Units consumed	110,455,486	1,463,791,262	31,560,144	201,047,161	1,806,854,053
Domestic Consumers ...	54,621	56,946	7,743	24,078	143,388
Units sold to					
Domestic Consumers	25,528,909	40,693,539	3,941,612	27,887,481	98,051,541
Average units sold per domestic consumer ...	467	715	509	1,158	684

INSTALLED CAPACITY OF PLANTS.

Capacity.	No. of Power Stations.	Total Installed Capacity Kilowatts.
50,000 kw. and over	3	181,500
20,000 kw. and over and below 50,000 kw.	9	270,000
10,000 kw. and over and below 20,000 kw.	2	20,500
5,000 kw. and over and below 10,000 kw.	4	27,050
1,000 kw. and over and below 5,000 kw.	26	48,060
Below 1,000 kw.	144	33,670
Total	188	580,780

SIZE AND TYPE OF GENERATING UNITS.

Size of Sets.	Steam Turbines.	Steam Recip- rocating Engines.	Oil Engines.	Gas Engines.	Water Wheels and Turbines.	Total No of Sets.
(1) AC Plants:						
Below 100 kw.	—	25	4	7	6	42
100 kw. and over, but below 1,000 kw.	12	88	—	11	16	127
1,000 kw. and over, but below 10,000 kw.	76	4	—	—	—	80
10,000 kw. and over	17	—	—	—	—	17
(2) DC Plants:						
Below 100 kw.	2	66	65	35	11	179
100 kw. and over, but below 500 kw.	3	72	2	10	1	88
500 kw. and over	1	10	—	—	—	11

FUEL CONSUMED.

Type of Fuel.	Quantity (Tons=2,000 lbs.)	Cost £
Coal	2,712,669	1,119,518
Other Fuel	—	68,089

COAL CONSUMPTION.

Average Coal Consumption per Unit Generated	No. of Undertakings.
Under 2 lbs.	7
2 lbs. and over, but under 3 lbs.	14
3 lbs. and over, but under 4 lbs.	11
4 lbs. and over, but under 6 lbs.	17
6 lbs. and over, but under 8 lbs.	21
8 lbs. and over	63

TRANSMISSION AND DISTRIBUTION LINES.

System.	Overhead Lines.	Route Miles. Cables.	Total.
D.C.—All voltages	888	648	1,536
A.C.—Below 2,000 volts	1,907	1,042	2,949
2,000 volts to 11,000 volts	279	767	1,046
Above 11,000 volts	889	60	949

TRANSFORMERS.

Total installed capacity	1,338,714 K.V.A.
Total number of persons employed in the electricity industry (generation and distribution)	8,480
Total salaries and wages paid for the year	£1,145,754