1942.

VICTORIA.

STATE ELECTRICITY COMMISSION OF VICTORIA.

TWENTY-THIRD ANNUAL REPORT

COVERING THE

FINANCIAL YEAR ENDED 30TH JUNE, 1942,

TOGETHER WITH

APPENDICES.

PRESENTED TO PARLIAMENT PURSUANT TO SECTION 35 (*b*) OF STATE ELECTRICITY COMMISSION ACT No. 3776.

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APPENDICES.

SUPPLEMENT.

STATE ELECTRICITY COMMISSION OF VICTORIA.

FEATURES OF YEAR'S OPERATIONS.

—		1941–42.	1940–41.	Increase or Decrease.	Percentage.
FINANCIAL.					
REVENUE—					
Electricity Supply	£	4,657,450	4,241,264	+ 416,186	+ 9·8
Briquetting (after Stock Adjustment and less Sales to Works)	£	330,756	379,847	— 49,091	— 12·9
Brown Coal	£	12,594	—	+ 12,594	—
Tramways	£	109,955	89,571	+ 20,384	+ 22·8
Miscellaneous	£	42,894	13,374	+ 29,520	+ 220·6
	£	5,153,649	4,724,056	+ 429,593	+ 9·1
EXPENDITURE (including Reserve Appropriations, Writings off, &c.)	£	5,069,227	4,563,376	+ 505,851	+ 11·1
NET SURPLUS	£	84,422	160,680	— 76,258	— 47·5
ACCUMULATED LOSS—At end of Year	£	136,538	220,960	— 84,422	— 38·2
CAPITAL EXPENDITURE—At end of Year	£	26,955,737	26,116,795	+ 838,942	+ 3·2
RESERVES—At end of Year	£	9,256,460	8,218,078	+ 1,038,382	+ 12·6
ELECTRICITY PRODUCTION AND SALES.					
MAXIMUM COINCIDENT DEMAND ON GENERATING STATIONS (This Year—June 24th)	kW.	297,696	261,820	+ 35,876	+ 13·7
ELECTRICITY GENERATED	kWh.—millions	1,331·3	1,155·1	+ 176·2	+ 15·3
ELECTRICITY SALES	kWh.—millions	1,073·6	924·8	+ 148·8	+ 16·1
NUMBER OF CONSUMERS (excluding Bulk Supplies)		292,341	284,373	+ 7,968	+ 2·8
AVERAGE SALES PER CONSUMER—					
Overall (excluding Bulk Supplies)	kWh.	2,433	2,201	+ 232	+ 10·5
Domestic	kWh.	703	658	+ 45	+ 6·8
AVERAGE PRICE PER kWh. SOLD—					
Excluding Bulk Supplies	d.	1·261	1·342	— 0·081	— 6·0
Bulk Supplies	d.	0·621	0·625	— 0·004	— 0·6
NUMBER OF FARMS SERVED		6,131	5,771	+ 360	+ 6·2
MOTORS CONNECTED—					
Number		50,465	46,114	+ 4,351	+ 9·4
Horse-power		322,283	299,988	+ 22,295	+ 7·4
BRIQUETTES—					
Produced	tons	413,450	433,756	— 20,306	— 4·7
Sold (includes 6,857 tons from Stock in 1940-41)	tons	402,161	438,068	— 35,907	— 8·2
TRAMWAY PASSENGERS		12,638,901	9,879,165	+ 2,759,736	+ 27·9

The absence of graphs and photographs, which usually form part of the Annual Report of the Commission, is due to the exigencies of war.

TWENTY-THIRD ANNUAL REPORT.

The Honourable F. E. Old, M.L.A.,
Minister in Charge of Electrical Undertakings,
Melbourne.

SIR,

In conformity with the provisions of Section 35 (*b*) of the State Electricity Commission Act No. 3776, we have the honour to present the Twenty-third Annual Report of the Commission covering the financial year ended 30th June, 1942, with Balance-sheet and Profit and Loss Account for the period.

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The difficulties under which the Commission's several activities have been functioning became more marked after the entry of Japan into the war, which, together with a further abnormal rise in consumption, placed a severe strain upon the personnel and equipment.

The year's revenue was sufficient not only to give a satisfactory financial result but also to enable the Commission to strengthen its reserves and thus to provide in some degree for war and post-war needs and possibilities.

Since the war began, the use of electricity in industry has increased by 77 per cent. (Great Britain by 62 per cent.) and the annual rate of increase in the total consumption for all consumer requirements has more than doubled. There are many temporary factors which constitute elements of uncertainty, both in relation to the commercial and technical development of the undertaking; and, as the Commission has pointed out in earlier reports, great caution should be exercised in assessing the ultimate influence of those factors.

Furthermore, it is anticipated that in the post-war period, the financial position of the Commission will be dominated by the need to restore its reserve plant position and to overtake arrears of maintenance.

In the year under review, the reserve plant margin was as low as 6 per cent., instead of the 20 per cent. margin generally recognized as essential in large-scale generating systems. This depletion in the reserve plant margin has temporarily benefited the revenues of the Commission ; reserve plant is normally non-productive, its capital and fixed charges being met from the total earnings of the system.

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During the year, 1,074 million kilowatt-hours of electricity were sold in Victoria. Ninety-eight per cent. was supplied from the State system to 407,000 consumers, of whom 292,000 (72 per cent.) are served directly by the Commission. The average price of electricity per kilowatt-hour sold in the areas served by the Commission was further reduced by 6 per cent. In a period of seventeen years of operation this overall average price has been reduced by more than one-half.

Severe restrictions have been imposed upon developmental programmes, including rural extensions: this seriously affected the progressive pre-war policy. The upward trend in the domestic use of electricity continues, despite restrictions on home building and on the manufacture (though not on the sale) of electricity consuming apparatus.

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While it is apparent that the Commission cannot at present continue its pre-war policy as exemplified by the general tariff reductions (at the rate of £250,000 per annum) made early in the year 1939, it hopes to be able to give effect at an early date to a long contemplated reclassification of the tariffs for its country consumers. The Commission also intends to release country consumers from their revenue guarantees for the war period, and has made provision in this year's accounts for further allocation to its Rural Development Reserve ; this will finance war-time arrears of country electrical development.

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As stated elsewhere in this Report, the Commission's plant and apparatus functioned satisfactorily in meeting record demands for electricity while providing a high degree of continuity of service. The almost complete freedom from interruption of the main generating and transmission system is most satisfactory, particularly under ruling conditions in which shortage of man power and materials precludes the high standard of maintenance of plant and apparatus normally demanded in electricity supply.

Long-standing orders for new plant have been subjected to continued delays both overseas and in Australia; the completion of the first section of the Kiewa–Newport extension project has been retarded by at least twelve months. At Kiewa all efforts are being concentrated on the first section (known as No. 3 Development). Work on all other sections was stopped in February, 1942. The question of proceeding with these sections will be reviewed by the Commission from time to time in the light of war and other conditions.

When the system is faced, in the winter of 1943, with further anticipated war production requirements, superimposed on the record consumption experienced during last winter, there will be almost certainly a serious shortage of electricity unless the new plants, now under construction, can be completed in sufficient time. Such a shortage, quite apart from a general rationing of fuel, would involve restrictions on supply to consumers, in which priority of supply would necessarily be given to existing and new demands for war purposes.

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The extensions to the Yallourn briquette factory, completion of which likewise has been delayed, will, it is hoped, during 1943, reach a stage at which additional production is possible.

FINANCIAL.

ANNUAL ACCOUNTS.

The net surplus for the year was £84,422 compared with £160,680 for 1940–41. This amount remains after providing for the usual annual charges, including depreciation, sinking fund, provident fund, loan flotation expenses, administration of Electric Light and Power Act, expenditure on war emergency and precautionary measures, appropriations of £121,000 to Contingency Reserve, £75,000 to Rural Development Reserve, and £60,000 to Rate Stabilization Reserve. The surplus has been applied in the reduction of accumulated losses. These losses at 30th June, 1942, were thus reduced to £136,538.

Electricity supply revenue totalled £4,657,450, an increase for the year of £416,186. Expenditure on account of Electricity Supply, exclusive of special expenditure and appropriations, amounted to £3,500,694, an increase of £91,722.

Revenue from briquette sales, after allowing for stocks on hand, amounted to £330,756, a decrease of £49,091; expenditure totalled £356,545, a decrease of £19,893. These reductions are due in a large measure to the transfer of supplies from the household to the industrial market.

Losses on tramways were :—Ballarat, £5,482; Bendigo, £15,071; and Geelong, £7,268, making a total of £27,821 as compared with £50,212 for the previous year. Tramways revenue increased by £20,384, principally owing to the regulated use of petrol and to increased industrial activity.

The General Profit and Loss Account, Balance-sheet and Schedules of Fixed Capital, of loans raised by the Commission and of debentures guaranteed by the Commission are contained in Appendices 1 to 4.

LOAN LIABILITY.

The total loan liability of the Commission at 30th June, 1942, was £20,523,266. The commitments involved are :—

	£
Liability to the State of Victoria	16,913,119
State Electricity Commission of Victoria Loans	3,566,080
Municipal debentures in respect of undertakings acquired	44,067
	20,523,266

Loan liability has decreased by :—	£	
(*a*) Reduction of indebtedness to State through National Debt Sinking Fund	120,318	
(*b*) Redemption of State Electricity Commission loans ..	23,500	
(*c*) Repayment of fifth instalment on £100,000 borrowed for tramway reconstruction	7,036	
(*d*) Redemption of municipal debentures guaranteed by the Commission	5,718	
	156,572	
Less—Increase in discount and flotation expenses ..	1,499	
		155,073

RESERVES.

The Depreciation and Sinking Fund Reserves at 30th June, 1942, totalled £7,976,428, an increase of £762,263 for the year. Of the total, £1,351,435 was to the credit of the Commission in the National Debt Sinking Fund, £6,445,393 to the credit of the Depreciation Fund (which is invested in the business of the Commission), £147,024 to the credit of the State Electricity Commission Sinking Fund and £32,576 to the credit of the Commission in the National Recovery Loan Fund Reserve.

As a further provision for unforeseen happenings of a major nature, an appropriation of £121,007 was made to the Contingency Reserve, bringing the total up to £600,000. This reserve is invested outside the business in trustee securities.

The Rate Stabilization Reserve, established in 1939–40 to offset any decrease in the revenue from munition manufacture and other special national defence works upon return to more normal conditions, was further strengthened by the transfer of £60,000, bringing the total of that reserve to £180,000.

To aid post-war plans for the acceleration of construction works to extend supply to rural areas, a second instalment of £75,000 has been reserved.

CAPITAL EXPENDITURE.

After deductions for retirements and the writing out of non-productive expenditure, the total expenditure on capital works increased by £838,942. The principal increases were in the following accounts :—

	£
Coal Production	128,539
Power Production, Steam Stations—	
Newport	64,132
Power Production, Water Stations—	
Kiewa	207,392
Transmission Systems—	
Main Transmission Systems	151,631
Provincial and Country Branches	80,217
Distribution Systems—	
Metropolitan	95,412
Provincial and Country Branches	75,321
Briquette Production—	
Factory Extensions	51,190

SHORTAGE OF STATE ELECTRICITY GENERATING RESOURCES.

The Commission has been gravely concerned at the abnormal increse in demand ; the continued delays in manufacture of plant on order both in England and Australia ; and lack of sufficient man power for the site works at Kiewa and Newport.

At the time of presenting this Report, no restriction of supply has had to be enforced, although the plant reserved for use in event of breakdown has been fully called upon during the 1942 winter.

The State generating system consists of eight inter-connected sources of power, the largest of which is the Yallourn Station.

Briefly, the position with regard to plant capacity in relation to the estimated loading for the winter of 1943 is as follows :—

	kW.	kW.
Installed capacity at date, without provision for breakdown		341,815
Assured capacity, with full provision for breakdown		263,000
Maximum demand recorded during the year	297,696	
Estimated additional requirements during 1942–43—		
Commonwealth Government requisitions	31,000	
Yearly load increment, industrial and other needs	19,000	
		347,696

The plant deficiency for 1943 on this basis (with full provision for breakdown) will be 84,696 kW.

Orders for new plant installations have been placed long since in anticipation of increased requirements, and there now are being manufactured in England and Australia the following three plants :—

Kiewa—2-12,000 kW. turbo-generators.

Newport—

18,000 kW. turbo-generator.

30,000 kW. turbo-generator and boiler plant.

Serious manufacturing delays have occurred and delivery is long overdue ; it is hoped, however, that some portion of the additional plant will be available for the winter of 1943.

The Commonwealth Government has recognized the seriousness of the position and, in an endeavour to meet requirements, has made special representations to the British Government. As a result of Commonwealth action, the Commission's Chief Engineer : Power Production (Mr. E. Bate) is abroad, with full authority to give effect to any measures necessary to hasten the completion and despatch of the generating plant to Australia. Priorities have been established for the related works and for the manufacture of plant items in Australia. It has been impossible to obtain the whole of the requisite man power for civil construction works, particularly at Kiewa ; however, recently the Allied Works Council made available approximately 300 men for work at Kiewa.

The Commission records its gratification at the response from the Commonwealth Government and its departments following the representations by the Honourable the Premier to the Right Honourable the Prime Minister, setting out the gravity of the situation with which this State is faced with respect to its power production resources as related to 1943 requirements.

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A Special Committee of the Commission—Commissioner Professor Burstall, and Mr. Commissioner Strickland—was appointed further to investigate matters relative to the ability of the generating system to meet expected war-time demands. As an outcome of their report, immediate action was taken to facilitate the provision at Newport of the second 30,000 kW. turbo-generator in conformity with the extension proposals approved by Parliament. This set is to be generally to the same specification as the turbo-generator now in the course of manufacture.

FURTHER CO-ORDINATION OF STATE GENERATING STATIONS.

Provision has existed since 1923 for an interchange of electricity between the 50-cycle system of the Commission and the 25-cycle system of the Victorian Railways Commissioners, but it has been limited by the capacity of the cables between the Commission's Yarraville terminal station and the Railways' Newport generating station.

After joint investigation the capacity of the inter-connexions is being increased from 12,000 kW. to 22,500 kW. :—

(i) By erecting additional overhead conductors between the Commission's Newport generating station and its Yarraville terminal station.

(ii) By linking the Commission's 5,000 kW. frequency changer at Richmond with the Railways' Jolimont sub-station.

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The two bodies have collaborated in ensuring that the work of reconstructing the Railways generating station and the Commission's major plant extensions at Newport is correlated.

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The Commission's generating station at Ballarat, which had been operating as an independent local unit, has now been linked with the State system by the completion of a 66 kV. transmission line from the Commission's Newport generating station.

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Through the co-operation of the State Rivers and Water Supply Commission in releasing additional water at Sugarloaf for short periods of maximum demand, generating capacity at Sugarloaf has been increased ; appreciation is recorded of the practical co-operation by that authority.

ELECTRICITY SUPPLY TARIFFS.

The table given below shows that the average retail selling price in the areas served by the Commission is now 52 per cent. lower than it was in 1924–25, the earliest year for which comparable figures are available. Since that year consumption has increased nearly fivefold; revenue only one and three-quarter times. The 52 per cent. reduction represents a saving to consumers of £4,000,000 for 1941–42 if the rates for 1924–25 be used as the basis of comparison. To this amount reductions in tariffs have directly contributed £617,000. The balance is the result of price reductions, which, as consumption increases, follow under the Commission's tariffs.

The figures for 1924–25 and 1941–42 compare as follows :—

Year.	Total Retail Sales—kWh.	Revenue.	Average Price per kWh. Sold.
		£	
1924–25	124,536,000	1,358,000	2·62d.
1941–42	704,362,000	3,702,000	1·26d.
	Increase 579,826,000 = 466%	Increase 2,344,000 = 173%	Decrease 1·36d. = 52%

In the domestic class the reduction in average price per kilowatt-hour is 64 per cent. In this case the comparison is made with the year 1925–26, the first year of classification of consumer groups.

Year.	Total Domestic Sales—kWh.	Revenue.	Average Price per kWh. Sold.
		£	
1925–26	26,583,000	600,000	5·42d.
1941–42	173,951,000	1,430,000	1·97d.
	Increase 147,368,000 = 554%	Increase 830,000 = 138%	Decrease 3·45d. = 64%

Details of the standard tariffs available to consumers at 1st November, 1942, are shown in Appendix No. 7.

. . . . . .

Country Centres.—Consumers in the towns of Morwell, Myrtleford, and Tallangatta have been transferred to a lower scale of schedule tariffs as a result of an increase in the number of consumers taking supply.

COUNTRY ELECTRICAL DEVELOPMENT.

Since 1940, the Commission's long-range plans for the extension of its transmission lines into the more remote country areas have been considerably curtailed by the shortage of essential materials, principally copper. For some time prior to the entry of Japan into the war, the whole of the Commission's facilities for the construction of major transmission lines had been engaged on projects for the extension of the State system to defence establishments and munition works. For security reasons, it is not advisable to refer in detail to the works so constructed or under construction for the Commonwealth. Their total value is approximately £280,000, but, in the financial arrangements, account has been taken of the fact that some of the lines will ultimately conform to the planned extensions to new territories.

Chiefly by extension from existing low tension reticulations, the number of consumers in the country areas increased during the year by 4·6 per cent. to 68,721 ; the number of farms supplied by 6·2 per cent. to 6,131.

Appendix No. 9 shows the country undertakings acquired and their electrical development since acquisition. For the places listed, electricity sales have increased tenfold, while the average price per kilowatt-hour sold has decreased from 8·02d. to 1·86d.

During the year, supply was made available at Keysborough, Koo-wee-rup North, Campbell's Creek, Cressy, Katunga and Bright.

The local undertaking at Bright was acquired and merged with the State system as transmitted supply was already available at the town from the Wangaratta–Kiewa line.

PROCLAMATION OF "RESTRICTIONS ON USE OF ELECTRICITY" REGULATIONS.

In October, 1938, the State, by regulation, placed with the Commission the responsibility of giving effect to restrictive measures with respect to the use of electricity in the event of a state of emergency being proclaimed by the Governor in Council.

On the 29th July, 1942, concurrently with the temporary introduction of gas rationing, a proclamation was issued empowering the Commission to invoke the 1938 "Restrictions on use of Electricity Regulations." Fortunately, restrictions were not necessary in consequence of the four days of gas rationing.

USE OF BROWN COAL FOR ESSENTIAL SERVICES.

The last annual report referred in the following terms to the establishment of an Investigatory Committee to consider this question :—

> "At the request of the Honourable the Premier, the Chairman of the Commission convened a conference with the Chairman of the Victorian Railways, Commissioners and the Chairman of the Metropolitan Gas Company on the 7th October 1940, to discuss the seriousness of the position which confronts this State in regard to its fuel supplies.
>
> As a result of this conference, an Investigatory Committee consisting of Mr. Norman Harris and Mr. W. O. Galletly, representing the Victorian Railways Commissioners, Mr. C. F. Broadhead, representing the Metropolitan Gas Company, and Dr. H. Herman as the Commission's representative and Chairman of the Committee, was established to investigate and report upon :—
>
> (*a*) the possibility of processed brown coal being used to meet portion of the fuel demands of essential services and industry, having regard to the possible long-continued emergency condition arising from war or industrial disturbance in which supplies of sea-borne coal are uncertain or cease ; and
>
> (*b*) the practicability of brown coal, processed or otherwise, being utilized for all essential needs of the State with the ultimate object of completely freeing Victoria from dependence on imported black coal."

The Committee in its second and final report, dated 4th July, 1941, reached the following important main conclusions, upon which the Commission submitted its views to the Government under date the 20th October, 1941 :—

(i) *Pulverized Coal for Railways Locomotives*—

Pulverized brown coal (not briquettes) is a suitable fuel for Victorian Railways' locomotives, but its future use will depend mainly on its price compared with that of Maitland black coal.

(ii) *Briquettes for Gas Making*—

Brown coal briquettes are a suitable fuel for manufacture of town's gas in total gasification plants.

(iii) *Briquettes for Industrial and Domestic Use*—

For industries (other than Railways and town's gas) now using sea-borne coal, there is a potential market of 740,000 tons per annum.

For any further major extension of the Commission's undertakings, based on brown coal, entirely new open cut workings are required. These will determine the location of any new briquette factory.

The State's brown coal fields can supply most of Victoria's basic energy requirements, and the Commission, in the belief that the Government intends as a policy to render Victoria, by progressive stages, less dependent upon sea-borne fuel, already has entered on an investigation of the advantages and disadvantages of the various coal deposits in Victoria.

It also is extending its researches into the further exploitation of these resources of energy and of chemical products.

EMERGENCY FUEL SUPPLY FROM OLD OPEN CUT, YALLOURN.

Under the heading "Use of Brown Coal for Essential Services" in last year's report reference is made to the action taken at the request of the Government for the re-opening of the Cut for the emergency needs of industry. At that time it was emphasized that to produce a maximum of 2,000 tons of coal a day for emergency purposes would require the services of 380 additional men and the provision by the Railways Department of additional rolling stock to bring the coal to Melbourne.

The quality of this coal is such as to make 2,000 tons equivalent to no more than 850 tons of New South Wales black coal.

During the year the Commission has been supplying the Australian Paper Manufacturers Ltd., at Maryvale, with raw coal from these workings.

FUEL FOR POWER GENERATION.

The steam stations of the State supply system use fuel as follows:—Yallourn (brown coal); Richmond, Geelong, and Ballarat (briquettes); Newport (black coal); and Spencer-street (black coal and coke).

In 1938, the Commission established with the Government that there is no mandate from Parliament requiring it to provide an assurance to Victorian fuel users against any failure in the supplies of New South Wales black coal. It also then decided that, in principle, Victorian consumers of electricity would have at all times first claim on briquette production, the application of this policy to be deferred until an emergency condition arose, such as the interference with the normal supplies of black coal to its generating stations.

Stocks of fuel for the Newport Power Station, which uses New South Wales black coal (up to 75,000 tons per annum) were accumulated during the years 1938, 1939, and 1940, with the object of providing against interruptions in the supplies of black coal. It was also desired to avoid having to divert supplies of briquettes from industrial customers to the Newport Generating Station, which is equipped to use briquettes. These stocks have been seriously reduced under Commonwealth Coal Control.

EXTENSION OF THE YALLOURN BRIQUETTE FACTORY.

Steady progress has been made with the extension needed to provide an additional 300 tons a day as approved by the Government, on the Commission's recommendation in December, 1940.

With the existing briquetting installation, practically all the general and layout plans were obtained from Germany, where the driers and presses were manufactured. For the extension the whole of the work is being designed and fabricated in Australia, without the aid of these usual sources of technical information; but, as was to be expected under ruling conditions, there has been continued delay in the manufacture of the plant and equipment. It is gratifying to note that, apart from the inevitable delays, the results so far achieved are reasonably satisfactory.

The Commission desires to acknowledge the special work of the engineering firms and of its own design and construction staff in overcoming many problems.

Owing to the difficulty in securing contracts for the supply of the four twin presses, the Ministry of Munitions has itself placed orders for all the press parts. Fabrication at several engineering works is now under way and parts have already been delivered for assembly by the Commission at the factory site. Unless further difficulties arise, it is hoped to have some increment in output for next winter, and full additional output before the end of 1943.

YALLOURN OPEN CUT—COAL SUPPLY PLANT.

The abnormally rapid increase in the demand for coal due to the war has made urgent the need for additional plant, and this need has been intensified by the entry of the working faces into an area of increased depth of overburden. Prior to the war, and as with briquetting, major items of plant for coal winning and overburden removal were procured from Germany, where there has been intensive development in special open cut methods of winning brown coal.

As war conditions precluded importation, the Commission's Coal Supply engineers undertook the original design for the manufacture in Australia of a machine which as a continuous process will deposit and spread the overburden in the worked-out part of the Open Cut.

This work has been rendered still more onerous by the labour shortage and the absence of the usual facilities for fabrication and erection. That this task was accomplished under such difficult conditions is evidence of skilful design and a high standard of workmanship.

Of the four electric locomotives reported last year as being constructed locally, two are in service; the others are nearing completion. Similar locomotives had previously been imported from Germany.

THE COMMISSION AND THE WAR.

(*a*) *Public Lighting Charges—Adjustment to Lighting Restriction Measures*—Following the restriction of public lighting under National Security Regulations, the Commission relieved municipalities and other public lighting consumers of the annual cost of all unlighted lamps. This meant a saving to them at the rate of approximately £85,000 per annum, which later was reduced to about £25,000 when the authorities permitted all street lighting lamps of the general service type up to a maximum of 100 watts to be restored, if appropriately screened.

(*b*) *Manpower—Enlistment of Commission Personnel* — The Commission, in recognition of the understandable and highly commendable desire of its personnel to serve in the fighting forces, was naturally loth to withhold consent to individual enlistments, and, accordingly, in the earlier war years released many of its personnel; but it soon became apparent that, if this policy were continued, the Commission could not fulfil its obligations to the community, and, in more recent times, the number of releases has been restricted. It is, therefore, with pride that the Commission records that out of a total normal complement at the outbreak of war, of approximately 7,000 (including 400 women), 1,672 men are in the defence forces, and an additional 75 men have been lent to Commonwealth Departments; in its workshops, &c., 355 men undertake much direct work for Munitions and the Services Departments.

(*c*) *Manpower—Deficiency in Requirements*—At the 30th June, 1942, the Commission was 600 short of personnel for maintenance, operation, and new construction.

Throughout the war period drastic modifications of working conditions have been necessary; functions, standards of work and records of value to the undertaking have either been substantially reduced or, in some cases, actually suspended. Three hundred women have been engaged for clerical work usually done by men. The Women's Employment Board has approved the engagement by the Commission of women as tram conductors, chauffeurs, and lift attendants and is being invited to authorize the engagement of women meter readers, collectors, store assistants, motor mechanics and car cleaners. This will result in the engagement of about 100 additional women.

(*d*) *Substitute Fuels for Motor Transport*—In the last annual report mention was made of the Commission's work on sustitute fuels for motor transport. Further progress was made during the year, and endeavours in this direction are continuing because, under war conditions, suitable fuels must be available tor the continued operation of the Commission's fleet of motor vehicles throughout the State.

By strict control of its vehicles, the application of petrol saving devices, and the use of substitute fuels, the Commission has reduced petrol consumption by one-third since 1938–39.

Investigations have been continued and tests made under operating conditions of such substitutes as town gas, charcoal, charcoal briquettes, brown coal, brown coal briquettes and hydrogen gas.

The Commission has installed at its Richmond Works the first compressor unit designed in Australia for the use of town gas in motor vehicles. Sixty of the Commission's vehicles in the metropolitan area will use this gas, the cost of which compares favourably with that of liquid fuel at its present price.

The Commission's active association with the application of charcoal gas producers for motor vehicles began early in 1939, when an experimental unit was manufactured and installed on a light truck; as the result more than 100 units of the Commission's transport fleet are using producer gas. After laboratory tests, an experimental plant was established at South Melbourne to explore both the technical and commercial aspects of charcoal briquetting; encouraging progress has been made.

Four electric battery vehicles are giving satisfactory service.

(*e*) *War Precautions*—The last report referred in some detail to the Commission's precautionary measures for the protection of personnel and vital plant. These have been completed, the remaining sections of the work having been expedited after Japan's entry into the war in December last.

Shelter accommodation adjacent to places of employment is available for all staff and and employees in the "declared areas." These measures include strong "keyman" shelters for essential operating personnel. Generating equipment, including boilers, turbines and generators, control rooms and switchyards have been protected both laterally and overhead against high explosive and incendiary bombs: additional fire-fighting equipment has been installed.

Training of personnel in first-aid, fire-fighting, decontamination, rescue and demolition has proceeded throughout the year: adequate numbers, together with the necessary equipment, are available for an emergency.

The Commission's Auxiliary Police Force has been maintained at a strength of about 200 men, and has constantly guarded all important assets. No instance of attempted sabotage was detected.

During the year, 1941–42, an expenditure of £365,000 was incurred on measures allied to war, including £69,000 for Commission Auxiliary Police and a provision for reserve stores.

An Emergency Supplies Committee, composed of departmental officers, has done excellent work in conserving supplies of essential materials, and in suggesting economies and substitution methods. The Department of Supply and Development and the Department of Munitions continue to extend valuable collaboration in arranging priorities for the manufacture and delivery of essential plant and materials.

The Commission's Secretary, Mr W. J. Price, was a member of the State Emergency Council for Civil Defence when it was disbanded in December last. Mr. Price was then appointed by the Government to the newly formed Power and Fuel Supplies Committee of the State Emergency Services.

(*f*) *Patriotic Fund—Staff and Employees*—Activities on behalf of the Red Cross and the Australian Comforts Fund by men and women of the Commission's service have been further encouraged and co-ordinated by a representative Committee. It is most gratifying to record that, through their State Electricity Commission Patriotic Fund and by the separate local efforts at Yallourn, Ballarat, Bendigo, Geelong and country centres, a total of about £13,000 has already been subscribed to patriotic funds and 15,000 garments have been made and distributed.

YALLOURN TERRITORY.

Population.—The total population of the Yallourn Territory at 30th June, 1942, was 3,881, of whom 3,104 were resident in the town; there was a total decrease of 239, departures being mostly single men and young women.

Housing.—During the year efforts were made to overcome the shortage of housing accommodation. Contracts were let for the construction of 37 houses, 10 of which were completed and occupied, bringing the total to 793 houses available as private residences.

Bush Fire Control.—Completion of a firebreak of from three to five chains in width as part of bush fire precautionary measures has been delayed by labour shortage. However, more than one-half of the total area—approximately 360 acres—has been cleared. Twelve outbreaks of fire outside the territory were observed from the recently erected steel lookout tower, and controlled in the early stages.

Sewerage.—Owing to labour shortage, work on the reticulation sewers and of the effluent outfall line was discontinued early in January, 1942. The treatment plant is complete, but has not been brought into operation pending further progress in laying reticulation sewers.

Water Supply.—In order to supplement the existing untreated water systems, a new 8-in. fibrolite main was laid from the regulating basin to the briquette factory with a 6-in. branch to the power station-coal supply area.

Transport Workshops.—The new transport workshop in course of erection will relieve the congestion at the main Yallourn workshops and will serve all units of the Commission's motor transport located in Gippsland.

Hospital and Medical Services.—The Yallourn Medical and Hospital Society administers the medical and hospital services, which are financed by regular contributions from all employees. These services include a Health Centre in the town. The daily average number of occupied beds at the hospital was 26·13, as against 25·9 in 1941. Two new wards have been added to the hospital, increasing accommodation to 44 (emergency capacity 71), and will meet both the need for normal expansion and for emergency accommodation in the event of war casualties.

Technical School.—The Education Department has built five additional class-rooms at the technical school at a cost of £7,270. The Australian Paper Manufacturers Ltd. and the Commission each contributed £1,135.

COAL SUPPLY.

Production of coal has been greatly increased during the last five years. The total tonnage produced to meet last year's record demand upon the Yallourn generating station and the continuous operation of the briquette factory at a maximum capacity compares with the production of previous years as follows :—

Yallourn Open Cut—Brown Coal Production.

	Tons.
1941–42	4,702,725
1940–41	4,485,241
1939–40	3,944,515
1938–39	3,643,490
1937–38	3,597,048

Overburden Removal.—1,511,200 cubic yards of overburden were removed, compared with 1,605,900 cubic yards for the previous year, bringing the total removed to 30th June, 1942, to 17,753,300 cubic yards.

As previously reported, in addition to the large increases in coal produced, there is an increasing depth of overburden to be excavated as the coal workings are extended Consequently, the quantity of overburden removed this and last year is more than 40 per cent in excess of the amount removed in 1939–40.

The area of the Open Cut increased from 340 to 358 acres at grass level and from 310 to 328 acres at the surface of the coal.

Coal Winning.—The coal won during the year (4,702,725 tons) brought the tota excavated from the Cut since the commencement of operations to 44·5 million tons. Of the coal won, 3,096,351 tons were delivered to the Yallourn generating station and 1,606,374 tons to the briquette factory. The average daily output exceeded 15,500 tons, the highest recorded output reaching 19,482 tons on 11th May, 1942.

Old Open Cut.—The excavation of coal from this Cut recommenced in September, 1941, and 32,538 tons were made available for industrial purposes.

. . . .

Reference is made on page 11 of this Report to the construction of a machine, which will deposit and spread overburden in the worked-out portion of the Open Cut, and the progress in manufacture of four electric locomotives. Of the twenty-four overburden trucks reported last year as having been ordered, twelve were delivered ; the remainder is 30 per cent. complete.

A 5 cubic yard electrically operated power shovel for use on overburden excavation and the 2½ cubic yard electric shovel and dragline equipment ordered last year were delivered from overseas. Good progress is being made in erecting both shovels, the former being practically complete.

In March, 1942, an order was placed in England for the manufacture of a 3½ cubic yard electrically operated power shovel for use as a general purpose standby excavating machine.

The existing delivery system (No. 4 ropeway) for the transport of coal from the Open Cut to the briquette factory is nearing the end of its useful life. In anticipation of coal being required for the extended briquette factory in excess of the normal capacity of the ropeway this is being replaced by a conveyor belt system as part of the planned development of the Open Cut.

POWER PRODUCTION AND TRANSMISSION.

The maximum coincident demand on the generating stations for the year 1941–42 was 297,696 kW, representing an increase of 13·7 per cent. on the previous year's figures, the total electricity generated being 1,331·3 million kWh., compared with 1,155·1 million kWh. for the previous year. All generating stations operated satisfactorily.

MAJOR EXTENSIONS.

NEWPORT GENERATING STATION.

As reported last year, the first of the three 30,000 kW. generating sets to be installed as part of the ultimate development at Newport is, with the necessary boiler plant ,being manufactured in England. The progress in manufacture has been constantly interrupted, due to priority of urgent British war work. The building of the turbine and boiler houses to accommodate this additional generating plant is proceeding.

An order has been placed in England for an 18,000 kW. set. Steam is available for this set at Newport, and arrangements have been made to purchase surplus condensing plant from the Department of Railways, New South Wales.

KIEWA HYDRO-ELECTRIC SCHEME.

Considerable difficulty was experienced during the year in obtaining the requisite labour to complete the civil construction works. Under to-day's conditions only the No. 3 development is being proceeded with. The major works which thus have been postponed include No. 4 development and associated works, the Pretty Valley Dam and associated works, and the Kiewa–Brunswick transmission line.

No. 3 Development.

The first stage, begun in 1939, is that associated with No. 3 generating station, with an installed capacity of 24,000 kW. and located about one and a half miles downstream from the junction of the Pretty Valley and Rocky Valley branches of the East Kiewa River.

The two major contracts for civil construction works, namely, the Junction Dam and the head race tunnel, were terminated as the contractors could not procure sufficient labour to complete these urgent works in time. The Commission is completing the work by day labour, and, under an arrangement with the Allied Works Council, approximately 300 men of the Civil Construction Corps have been assigned to Kiewa. Allied Works Council conditions will be applicable to all employed on the area until this work is complete.

The following progress has been made in respect of major items :—

Junction Dam.—Excavations for buttresses and cut-off wall were 71 per cent. complete, 15,755 cubic yards of material having been removed. Concreting for foundations was 51 per cent. complete, 11,600 cubic yards having been poured.

Head Race Tunnel.—The main drive was advanced from 2,541 feet from the centre line of the dam (at 30th June, 1941) to its full length at the surge tank—4,341 feet—by 21st November, 1941. The surge tank has been enlarged to full section and concrete lined, and the cleaning up of the tunnel is proceeding.

The installation of a 10 ft. diameter steel pressure pipe at the No. 3 pressure tunnel is practically complete and the construction of the concrete portal in progress.

Generating Station.—Main excavations for the foundations of the building structure were completed early in 1942, concreting for foundations being 30 per cent. complete.

General.

The road to No. 4 generating station site on the West Kiewa River was formed to a length of 13,000 feet from the Upper Kiewa Valley Road ; the surfacing has been postponed along with all work on No. 4 development. Additional surveys of areas for future developments were continued at Pretty Valley, Rocky Valley, No. 2 development and the head waters of the Big River, and sub-surface investigations proceeded by diamond drilling and by pits and shafts at various locations.

Design.

Visit of Dr. J. L. Savage, Chief Designing Engineer, United States Bureau of Reclamation.

Dr. J. L. Savage, Chief Designing Engineer, United States Bureau of Reclamation, a world authority on dam design and construction, visited Melbourne early in 1942 for consultations with the Melbourne and Metropolitan Board of Works concerning the construction of the proposed Upper Yarra Dam. The Commission took the opportunity to seek the advice of Dr. Savage on the following aspects concerning the design and construction of the Pretty Valley Dam, Kiewa :—

(*a*) The suitability of earth fill construction, having regard to the site, materials available and its climatic conditions.

(*b*) The general principles which should guide the design and construction of the dam, assuming the suitability of materials and site.

Dr Savage's report contains valuable suggestions for guidance in the design and construction of the dam, and states that materials available for the earth portion of an earth and rock fill dam are usable and reasonably satisfactory.

MAIN TRANSMISSION AND TRANSFORMATION.

The Ballarat Generating Station has been linked with the main transmission system by the completion during the year of a 66 kV. transmission line from Newport.

To meet increased industrial loading, new sub-stations were completed and brought into service at Footscray (20,000 kVA.); Brooklyn (7,500 kVA.); and Maribyrnong (750 kVA.). The erection of a new sub-station at Richmond (20,000 kVA.) was begun, and the overhead line from this sub-station to the Richmond terminal station was completed. The laying of two 22,000 kV. underground cables from the Brunswick terminal station to sub-station "F", North Fitzroy, is in progress.

ELECTRICITY SUPPLY.

ANALYSIS OF DEVELOPMENT.

Developmental work directed towards increased electricity sales has been systematically curtailed since the outbreak of war; during the year under review these activities were wholly suspended. Notwithstanding this, the demand for electricity continues to grow, for electricity sold increased by 148,825,532 kWh., or 16·1 per cent. for the year. The metropolitan area, including bulk supplies, took approximately 130 million kWh. of the increase, the greater part of which is due to increased requirements of munitions factories and industrialists engaged on work connected with national defence.

Kilowatt-hours sold during last five years:—

Year.	kWh.
1937–38	679,808,810
1938–39	730,426,637
1939–40	826,623,171
1940–41	924,772,662
1941–42	1,073,598,194

Domestic Class.—Average yearly consumption for the last five years:—

Year.	Average consumption per domestic consumer.
1937–38	540 kWh.
1938–39	566 ,,
1939–40	626 ,,
1940–41	658 ,,
1941–42	703 ,,

Commercial Class.—There was a marked reduction in sales to commercial consumers, owing to the elimination of Friday night shopping, to lighting restrictions and the closing of many small shops under wartime conditions. These reductions were more than offset by increased requirements of military camps and of other defence establishments grouped under this classification; the overall increase in sales for the year was 6·3 per cent.

Industrial Class.—The increase in electric motors connected was 22,290 horse-power; the use of electric heating in industrial processes was also considerably extended. There was a record growth in sales, amounting to 24·6 per cent. of the previous year's consumption.

Towards the end of the year the Commonwealth Government, under its National Security Regulations, prescribed minimum standards of illumination for industrial premises. These will be applied first to new buildings and to Commonwealth controlled establishments.

Mining.—Largely owing to the effect of the National Security (Manpower) Regulations on gold mining the number of consumers taking supply was reduced from 75 to 59; a further reduction is expected. Consumption for gold mining purposes amounted to 12·8 million kilowatt-hours as against 14·6 million kilowatt-hours last year.

Rural.—The usual advisory service on the application of electricity to farm work and by primary production was continued, emphasis being laid upon the effective use of the existing supplies. By the end of the year the construction of rural extensions had ceased, for reasons given elsewhere in this Report.

Public Lighting.—Consumption was greatly reduced owing to lighting restrictions under the National Security Regulations.

COMMISSION'S ELECTRICITY SUPPLY UNDERTAKINGS FOR LOCAL DISTRIBUTION.

The following statistical data relating to the nine branches of the Commission's Electricity Supply Department is summarized from information contained in this Report :—

REVENUE increased by £274,394 (7·9 per cent.) to £3,738,386.

SALES OF ELECTRICITY increased by 91,838,409 kilowatt-hours (14·7 per cent.) to 714,534,397 kilowatt-hours.

CONSUMERS increased by 7,929 (2·8 per cent.) to 291,300.

FARMS connected increased by 360 (6·2 per cent.) to 6,131.

Metropolitan Branch.—This branch covers an area of 208 square miles and serves 195,361 consumers located in the seventeen municipalities of Brighton, Camberwell, Caulfield, Collingwood, Essendon, Fitzroy, Hawthorn, Kew, Malvern, Moorabbin, Mordialloc, Oakleigh, Prahran, Richmond, St. Kilda, Sandringham and South Melbourne ; in portions of the City of Melbourne (Kensington and Flemington), and of the Braybrook, Broadmeadows, Keilor, Mulgrave and Werribee Shires.

The remainder of the metropolitan area, including the City of Melbourne, is served by ten municipal undertakings, which, as distributors, first constituted under the *Electric Light and Power Act* 1896, purchase electricity in bulk from the State system.

Conversion of the system of supply from single phase to standard three phase proceeded in the suburbs of Brighton, Camberwell, Caulfield, Kew, Malvern, Moorabbin, and Prahran. Conversion is now restricted to sub-stations to serve defence industries and munition works, or to areas where the single-phase system is severely overloaded.

Twenty-eight distribution sub-stations (10,160 kVA.), 15·1 route miles of high voltage and 23 route miles of low voltage line were erected.

Ballarat Branch.—This branch, which also manages the Ballarat tramway system, supplies 11,245 consumers in an area of 149·7 square miles extending from Ballan on the east to Skipton on the west, and from Buninyong on the south to Clunes and Hepburn Springs on the north.

On the completion of a 66 kV. transmission line from Newport to Ballarat and the erection of the terminal station in Howitt-street, a 6·6/22 kV. sub-station at the local power station was retired from service.

Low voltage overhead lines increased by 3·9 route miles.

Bendigo Branch.—This branch, which also manages the Bendigo tramway system, supplies 8,162 consumers in an area of 61·4 square miles embracing the City of Bendigo, the Borough of Eaglehawk and portions of the Marong, Strathfieldsaye and Huntly Shires.

Four distribution sub-stations (1,365 kVA.), 3·7 route miles of high voltage and 2·0 route miles of low voltage line were erected.

Owing to increased loading, the 66 kV. transmission line from Thomastown to Bendigo is being duplicated.

Eastern Metropolitan Branch.—This branch, with headquarters at Dandenong, serves 17,498 consumers in an area of 483 square miles extending from Whittlesea and Healesville to Flinders and to Point Nepean.

Supply was extended to Keysborough.

Twenty-six distribution sub-stations (617 kVA.), 7·5 route miles of high voltage and 26·4 route miles of low voltage line were erected.

The feeder from Dandenong main sub-station supplying the township of Dandenong was converted from 6·6 kV. to 22 kV. operation.

Geelong Branch.—This branch, which also manages the Geelong tramway system, is bounded by Lara on the north, Torquay on the south, Queenscliff and Portarlington on the east and Batesford on the west, and serves 14,267 consumers in an area of 107·2 square miles.

Ten distribution sub-stations (2,078 kVA.), 8·4 route miles of high voltage and 2·9 route miles of low voltage line were erected.

Gippsland Branch.—This branch, with headquarters at Traralgon, serves 14,670 consumers in an area of 996 square miles extending from beyond Lakes Entrance on the east to Tooradin on the west, and from Noojee, Valencia Creek and Bruthen on the north to Inverloch and Port Franklin on the south.

Supply was extended to Koo-wee-rup North.

A new 22 kV. feeder from Yallourn to the Maryvale mill of the Australian Paper Manufacturers Ltd. was completed.

Twenty-five distribution sub-stations (2,360 kVA.), 21·8 route miles of high voltage and 20·8 route miles of low voltage line were erected.

Midland Branch.—This branch, with headquarters at Castlemaine, supplies 6,871 consumers contained in an area of 358·9 square miles extending from Keilor and Rockbank on the south to Dunolly on the north.

Supply was extended to Campbell's Creek.

Construction of subsidiary 22 kV. lines between Sunbury and Castlemaine was begun. Loading at centres served from the existing 22 kV. line, which is being converted as part of the second 66 kV. Thomastown–Bendigo circuit, will be transferred thereto.

Thirteen distribution sub-stations (605 kVA.), 10·2 route miles of high voltage and 4·3 route miles of low voltage line were erected.

North Eastern Branch.—This branch, with headquarters at Benalla, serves 13,411 consumers, in an area of 944 square miles bounded by Tallangatta and Harrietville on the east, Rochester on the west, Acheron on the south, and the River Murray on the North. The municipalities of Albury, Corowa, Berrigan, Coreen, and Moama in New South Wales receive bulk supply from the transmission system of this branch.

Supply was extended to Bright, where the local undertaking was acquired, and to Katunga.

Three transmission and thirty distribution sub-stations, 25·7 route miles of high voltage and 5·0 route miles of low voltage line were erected.

The conversion from 22 kV. to 66 kV. of one of the existing Wangaratta–Albury feeders was begun.

South Western Branch.—This branch, with headquarters at Colac, serves 9,815 consumers in an area of 736·5 square miles bounded by Winchelsea on the east, Macarthur on the west, Willaura on the north, and Lorne on the south.

Supply was extended to Cressy.

The conversion of the main transmission line from 44 kV. to 66 kV. was continued. Wartime restrictions have retarded the construction programme planned for completion in 1943 to cope with the rapid growth in load.

The conversion of the Terang–Noorat feeder from 6·6 kV. to 22 kV. was completed.

Two transmission sub-stations (375 kVA.), 43 distribution sub-stations (926 kVA.), 39·4 route miles of high voltage and 8·2 route miles of low voltage line were erected.

TRAMWAYS—BALLARAT, BENDIGO, AND GEELONG.

A loss of £27,821 resulted from the operation of the three tramway systems compared with £50,212 last year—a decrease of £22,391 (44·6 per cent.), the respective losses at Ballarat, Bendigo and Geelong being £5,482, £15,071, and £7,268.

The total revenue was £109,955, an increase of £20,384 (22·8 per cent.). The number of passengers carried—12,638,901—is the highest on record, and represents an increase of 2,759,736 (27·9 per cent.), principally owing to the regulated use of petrol and to greater industrial activity.

The total expenditure was £137,776, a decrease of £2,008 (1·4 per cent.).

At the request of the Commonwealth Government the Bendigo tramway system is being extended from the Lake Weeroona terminus to the Thunder-street railway crossing. The Commonwealth will advance the capital cost of construction, estimated at £12,400 with the provision that if, during the next ten years, there is any profit on this extension, it will go to the Commonwealth until the advance is met.

BRIQUETTE PRODUCTION AND DISTRIBUTION.

Production.—The factory output—413,450 tons—decreased by 20,306 tons, 4·7 per cent. on the previous year; 1,606,374 tons of raw brown coal were consumed in the process.

The respective outputs of household and industrial types were 4,642 and 408,808 tons. The factory operated continuously seven days per week for the whole of the year, including statutory holidays, with the exception of a period of two weeks for essential maintenance and of short periods for structural alterations in connexion with the factory extensions. Last year there was no interruption to production for these purposes.

Electricity generated amounted to 77·4 million kWh., of which 56·8 million kWh. were delivered to the main system; the remainder was used at the briquette factory.

Factory Extensions.—The extensions to the briquette factory are referred to more fully on page 11 of this Report. At the close of the year, the building for the crushing and screening plant was practically complete, and the construction of the building for the drier and press plant was at an advanced stage. Three of the drier units are on the site. The manufacture of the remaining three units has been delayed for eight months awaiting specially rolled steel plates: these have now been rolled, and fabricated. Four twin presses are being manufactured at several large engineering works under arrangement with the Ministry of Munitions, and delivery of parts began in June. The presses will be assembled by the Commission at the factory.

Distribution.—

Sales	402,161 tons.
Revenue	£330,756
Expenditure	£356,545
Loss	£25,789

All charges, including interest and depreciation, are included in the expenditure.

As recorded in the last annual report, the fuel requirements of war industries and munition factories have necessitated the withdrawal of supplies of briquettes from the household market, except for their use in hot water systems. The loss of £25,789 is due to rising costs of production and the gradual transfer of sales to the lower priced industrial market. To meet this situation, the price scale affecting customers for large quantities of briquettes has been increased to provide an additional revenue of approximately £25,000 for the year 1942–43.

INDUSTRIAL.

The disposition of the Commission's wages employees at 30th June, 1942, was:—

—	Operation.	Construction.
Power Generation	616	367
Main Transmission Lines, Terminal and Sub-stations	226	214
Electricity Supply—Metropolitan Branch	206	126
Electricity Supply—Country Branches	261	210
Briquette Production and Distribution	299	53
Coal winning—Yallourn	548	38
General Services and Workshops—Yallourn	457	93
General Services and Workshops elsewhere	745	91
Tramways—Ballarat, Bendigo and Geelong	191	..
Total	3,549	1,192
GRAND TOTAL	4,741 (1941–5,232)	

During the year the Commonwealth issued the following National Security Regulations affecting industrial conditions of Commission employees:—

Industrial Peace, Economic Organization, Control of Absenteeism, Employment of Women, and Manpower.

Under the National Security (Manpower) Regulations, the Commission has been declared a " protected industry " ; release from employment is subject to the consent of the Manpower Directorate.

Alterations in base rates, due to increases in the cost of living figures, added £42,000 to the Commission's expenditure during the year.

There are 179 apprentices employed, principally in the engineering trades ; 37 were indentured during the year, and reports of the progress of apprentices generally were satisfactory. Forty-one apprentices are serving with the various defence arms.

Safety Council.—In view of the present manpower shortage and additional responsibilities now being met, the procedure of the safety movement established by the Commission in 1938 has been considerably modified and its activities curtailed. The Safety Council and certain of its committees have ceased to function until they can be effectively re-established after the conclusion of the war, but provision has been made to preserve the interest already established by that organization.

One of the features of the Council's activities was the organization of first aid competitions between representative teams throughout the service. The interest shown culminated in the final display being held in Melbourne on 21st November, 1941, when the Yallourn men and the Metropolitan Branch women won the challenge cups for the State. Twelve hundred in the Commission's employ have completed a first aid training course.

PUBLIC SAFETY AND OTHER REGULATORY RESPONSIBILITIES.

Electric Light and Power Act 1928.—During the year the following Orders in Council were approved by the Governor in Council, authorizing the undertakers to supply electricity within the prescribed areas :—

Order No.	Undertaker.	Area of Supply.
244	Phillip Island Shire Council	Phillip Island (Previous Order No. 210 expired 26th August, 1939.)
247	Walpeup Shire Council	Ouyen and environs (Replacing Order No. 171 applicable to smaller supply area.)
248	Walpeup Shire Council	Murrayville and environs (Previous Order No. 202 expired 27th June, 1938.)
249	Charles Clifford Wallis	Serviceton and environs
250	Charles William Sims	Mitiamo and environs
251	Swan Hill Borough Council	Swan Hill (Consequential to the transfer of the township electricity supply assets to the Borough.)

The Governor in Council approved the revocation of the following Orders in Council :—

Order No.	Undertaker.	Area of Supply.	Reason for Revocation.
171	Walpeup Shire Council ..	Ouyen	New Order (No. 247) approved for larger area of supply.
218	Block and Sons Pty. Ltd.	Bright	Undertaking transferred to State ownership 1st December, 1941.
228	Lamplough Gold Mining Co. N.L.	Mining lease south-west of Avoca	Undertaking had ceased supply under terms of Order.
230	Talbot Alluvials Ltd. ..	Mining lease south-west of Talbot	Undertaking had ceased supply under terms of Order.

At the close of the financial year, 89 Orders in Council for the supply of electricity were in force. Of these, 60 were issued to municipal councils (several of which operate under more than one order) and 29 to companies or persons.

In the exercise of the Commission's functions under the above Act, 25 electrical undertakings were inspected. In addition, special inspections were made of newly installed generating plant and of routes for high-tension lines ; several complaints of unsatisfactory service and poor voltage regulation were investigated.

The power house buildings at Swan Hill and Birchip were destroyed by fire, certain items of plant also being destroyed. The Commission made available the services of officers to overhaul and recondition the damaged plant, and generally assisted in the early restoration of supply.

Following the declaration of the town of Swan Hill as a Borough and its consequential excision from the Shire of Swan Hill, the local electricity supply undertaking was partitioned into two separate units. The Commission felt that the interests of electricity consumers, both in the Shire and the Borough areas, would best be served by one undertaking controlled and operated by the Borough Council and recommended accordingly to the Government. It was not found possible to bring about such a desirable arrangement, and the Shire is now receiving its supply in bulk from the Borough. This is noted as a departure from the established principle of consolidation and unification of electricity supply in Victoria as declared in the *State Electricity Commission Act* 1928.

Licensing of Electrical Mechanics.—In July, 1941, the Governor in Council approved of the Licensing of Electrical Mechanics Regulations 1941, which consolidate all the previous regulations and also bring them into line with existing legislation and industrial Awards.

The number of Electrical Mechanics' Licences in force at 30th June, 1942, was :—

Grade "A"	1,916
,, "B1"	110
,, "B"	616
,, "C"	376

In addition, there were issued 274 permits to engage in electrical wiring work under special conditions for periods not exceeding six months, and limited permits for periods not exceeding twelve months were granted in respect of certain classes of electrical maintenance work. At the close of the year, 404 limited permits remained in force.

Two licensing examinations, each including theory and practice, were conducted during the year.

In the issue of licences, it was decided to recognize, subject to certain conditions, wartime service as an electrical mechanic (or its equivalent) with His Majesty's Forces.

Three persons were fined for breaches of the Regulations.

Registration of Electrical Contractors.—At the 30th June, 1942, 436 contractors' registrations were in force ; 21 were cancelled during the year for various reasons.

Approval of Electrical Appliances and Equipment.—The Electrical Approvals Board, since it was constituted in 1934, has dealt with 1,216 applications for approval, of which 796 have been granted.

The articles brought within its purview include apparatus connectors, bread toasters, celluloid lampshades, cord connectors, cord extension sockets, decorative lighting outfits, earth leakage circuit-breakers Class 1, flexible cords, grillers, handlamps, irons (hand), jugs, kettles and saucepans, lamp-holder adaptors, plugs and sockets, plug socket adaptors, portable immersion heaters, radiators, razors, soldering irons and wall switches.

Two members of the Board retire each year : the retiring members, Mr. W. H. Stock, representing Fire Underwriters, and Mr. A. W. Henderson, representing the workers in the electrical trade, were re-appointed. Mr. W. H. Stock was appointed Deputy Chairman of the Board during the absence on military duty of Mr. B. H. Miller, who has filled that office since the Board's inception.

Installation Inspections.—To ensure uniform application of the Wiring Regulations and of the measures adopted to overcome difficulties arising from temporary shortages of supplies, association was maintained with electricity supply authorities throughout the State.

The quantities of electrical apparatus examined while under construction at manufacturers' works were considerably reduced owing to restrictions on manpower and materials.

Electrolysis Mitigation.—The Melbourne Electrolysis Committee consists of representatives of the Postmaster-General, Victorian Railways Commissioners, Melbourne and Metropolitan Board of Works, Melbourne and Metropolitan Tramways Board, Melbourne City Council, Metropolitan Gas Company, and the State Electricity Commission of Victoria. As most of the representatives are engaged on important war work, regular meetings of the Committee were discontinued in December, 1941. The Technical Sub-Committee, however, has continued the investigation of electrolysis conditions in the metropolitan area and instituted additional remedial measures.

The general position with regard to lead covered cables continues to show improvement: there was some increase in the faults on steel pipes.

A comprehensive report of the technical investigations and action taken in reducing substantially electrolysis damage on underground metallic conduits in Victoria, together with a brief history of the activities of the Melbourne Electrolysis Committee, is included as a supplement to this report.

COMMISSIONERS.

Mr. T. P. Strickland, B.E., M.Sc., M.I.E.E., M.I.E. (Aust.), M.E.I.C., M.Amer.I.E.E., was appointed by the Government as a Commissioner for a period of twelve months from 16th December, 1941, to fill the vacancy caused by the death of Mr. C. A. Norris, C.B.E.

Mr. A. W. Fairley was re-appointed by the Government as a Commissioner for a period of three years as from 9th March, 1942.

STAFF.

It is with pleasure and satisfaction that the Commission again appreciatively records the loyal and efficient services rendered by the staff under the very difficult conditions which have obtained throughout the year.

Of the large number of our men who have enlisted in His Majesty's Forces, fifteen have died on service, nine have been killed in action, and thirty-five have been reported missing or are prisoners of war. The Commission records with regret and sympathy the death on active service during the year of the following :—

CRILLY, J., Private	Construction Branch, Yallourn.
LANCASTER, R. C., Gunner	Electricity Supply Department, Geelong Branch.
MacDONALD, D., Leading Aircraftman	Electricity Supply Department, Richmond.
McKELVEY, D. C., Trooper	Electricity Supply Department, Metropolitan Branch.
METHERALL, W. J., Sgt. Pilot	Electricity Supply Department, Metropolitan Branch.
STONE, W. E., Leading Aircraftman	South Melbourne Transport Workshops.
WILLIAMS, W. L., Leading Aircraftman	Electricity Supply Department, Richmond.

The expansion of the work of the Commission is imposing an ever increasing burden on its higher management. The Commission has therefore created within its organization an Administrative Department, under the Manager. Mr. W. J. Price has been appointed head of this new department, and also continues to fill the position of Secretary.

Mr. C. T. Briggs, the Commission's Mechanical Engineer, reached the retiring age during the year, but, as a wartime arrangement, he has consented to continue.

During the year the following important staff promotions were made :—

Mr. J. M. Harrison ..	Acting Manager, Gippsland Branch, Electricity Supply Department.
Mr. H. W. Linaker ..	Acting Assistant General Superintendent, Yallourn.
Mr. H. A. McKittrick ..	Deputy Chief Draftsman.
Mr. R. A. K. Palmer ..	Assistant Fuel Sales Manager.
Mr. A. J. Poppins ..	Construction Superintendent, Kiewa.

We have the honour to be,

Sir,

Your obedient servants,

G. G. JOBBINS, *Chairman.*
ANDREW W. FAIRLEY, *Commissioner.*
AUBREY F. BURSTALL, *Commissioner.*
T. P. STRICKLAND, *Commissioner.*

W. J. PRICE,
Secretary.
20th November, 1942.

STATE ELECTRICITY COMMISSION OF VICTORIA

GENERAL PROFIT AND LOSS ACCOUNT FOR YEAR ENDED 30th JUNE, 1942.

Expenditure—	£ s. d.	£ s. d.
Electricity Supply—		
Purchased Electricity	175,125 18 9	
Generation, Transmission, and Distribution	1,653,993 7 2	
Interest	1,019,480 5 6	
Depreciation	395,800 8 10	
Administration and General Expense	280,440 2 6	
	3,524,840 2 9	
Deduct—Electricity transferred to Works	24,146 9 9	
		3,500,693 13 0
Briquetting—		
Manufacture and Distribution	360,164 16 4	
Interest	69,266 19 0	
Depreciation	32,529 3 0	
Administration and General Expense	10,820 6 4	
	472,781 4 8	
Deduct—Briquettes transferred to Works	116,236 8 8	
		356,544 16 0
Brown Coal—		
Winning and Distribution	14,212 14 3	
Interest	1,448 4 9	
	15,660 19 0	
Deduct—Brown Coal transferred to Works	1,896 13 6	
		13,764 5 6
Tramways—		
Power and Traffic Expenses	96,937 19 11	
Interest	12,345 3 1	
Depreciation	12,496 9 7	
Administration and General Expense	15,996 9 0	
		137,776 1 7
Sinking Fund Contributions		83,469 9 6
Loan Flotation Expense		18,840 0 0
Provident Fund Contributions		53,554 0 3
Employees' Retiring Allowances		896 8 0
Pay Roll Tax		54,537 16 3
War Emergency Expenditure		203,127 13 5
Miscellaneous Expenses		46,308 0 3
Profit—carried down		684,136 15 7
		5,153,648 19 4
Contingency Reserve		121,006 15 8
Rate Stabilisation Reserve		60,000 0 0
Rural Development Reserve		75,000 0 0
Miscellaneous Reserves		205,000 0 0
Special Retirements		138,708 6 10
Surplus for Year		84,421 13 1
		684,136 15 7
Accumulated Deficit as at 30th June, 1941		220,959 16 6
		220,959 16 6

Income—	£ s. d.	£ s. d.
Electricity Supply—		
Bulk Supplies	955,523 2 10	
Public Lighting	105,577 13 3	
Domestic	1,429,917 6 1	
Industrial—General	1,244,629 9 6	
,, —Mining	39,969 3 0	
Traction	187,525 8 10	
Commercial	687,720 9 5	
Miscellaneous	6,587 4 8	
		4,657,449 17 7
Briquetting—		
Briquette Sales	320,096 9 8	
Add—Briquettes on hand 30th June, 1942	33,667 13 6	
	353,764 3 2	
Deduct—Briquettes on hand 30th June, 1941	23,008 4 11	
		330,755 18 3
Brown Coal—		
Brown Coal sales	12,594 5 0	
	12,594 5 0	
		12,594 5 0
Tramways—		
Traffic Receipts	109,530 16 3	
Advertising, Rents, &c.	424 4 1	
		109,955 0 4
Interest on Investments		27,803 16 11
Miscellaneous Income		15,090 1 3
		5,153,648 19 4
Profit—brought down		684,136 15 7
		684,136 15 7
Surplus for year		84,421 13 1
Accumulated Deficit as at 30th June, 1942 carried to General Balance Sheet		136,538 3 5
		220,959 16 6

Sales of Electrical Appliances.—The operating Accounts include in respect of this function—

	Revenue.	*Expenditure.*
1940–41	£26,267	£18,447
1941–42	£27,077	£17,000

STATE ELECTRICITY COMMISSION OF VICTORIA.

GENERAL BALANCE-SHEET AS AT 30th JUNE, 1942.

LIABILITIES.

	£ s. d.	£ s. d.
Capital Liabilities—		
Victorian Government Advances	18,264,553 19 10	
Deduct—Redeemed or cancelled Securities	1,351,434 18 0	
	16,913,119 1 10	
Debentures and Inscribed Stock—		
Issued by Commission (see Appendix No. 4) £3,682,000 0 0		
Deduct—Redeemed or cancelled Securities 115,920 6 3		
	3,566,079 13 9	
Issued by Undertakings acquired by Commission (see Appendix No. 4)	44,066 19 9	
		20,523,265 15 4
Current and Accrued Liabilities—		
Sundry Creditors	77,175 16 8	
Sundry Creditors' Retention	35,472 14 2	
Consumers' Deposits	13,780 17 5	
Service Charges received in advance	99,013 9 11	
Unclaimed Wages	699 6 2	
Consumers' Advances for Construction	56,834 16 3	
Other Deposits and Trust Moneys	18,114 1 11	
Interest Accrued	39,821 13 10	
Salaries and Wages Accrued	82,345 14 7	
Miscellaneous Current and Accrued Liabilities	60,544 12 3	
		483,803 3 2
Reserves—		
Depreciation and Sinking Fund	7,976,427 16 8	
Contingency	600,000 0 0	
Uncollectable Accounts	30,316 13 1	
Rate Stabilization	180,000 0 0	
Rural Development	150,000 0 0	
Miscellaneous	319,715 9 3	
		9,256,459 19 0
		30,263,528 17 6

ASSETS.

	£ s. d.	£ s. d.
Fixed Capital—		
Coal Production	993,859 17 5	
Briquette Production	1,267,869 14 8	
Power Production—Steam Stations	7,140,879 19 8	
,, ,, —Water Stations	813,831 14 6	
Transmission Systems	5,763,898 15 7	
Distribution Systems	6,564,053 13 1	
Tramways	242,988 18 3	
General	2,834,930 13 2	
Construction Work in Progress	1,416,743 5 5	
	27,039,056 11 9	
Deduct—Proportion of cost of extensions payable by consumers	83,319 16 4	
		26,955,736 15 5
Current and Accrued Assets—		
Cash	118,116 15 0	
Sundry Debtors	631,083 3 9	
Materials and Supplies	785,421 9 3	
Advances	16,435 5 2	
Investments	298,619 1 8	
Prepayments	5,890 11 10	
Miscellaneous Current and Accrued Assets	177,499 15 5	
		2,033,066 2 1
Suspense Debits—		
Overburden Removal and Disposal	226,867 9 1	
Preliminary Investigations	3,157 13 5	
Unamortised Loan Flotation Expense	190,038 3 0	
Work in Progress	134,525 3 3	
Miscellaneous	77,354 11 2	
		631,942 19 11
Reserve Funds—		
Sinking Funds	27,285 0 3	
Contingency Fund	478,959 16 5	
		506,244 16 8
Profit and Loss Account—		
Accumulated Deficit as at 30th June, 1941	220,959 16 6	
Less Surplus for year 1941–42	84,421 13 1	
		136,538 3 5
		30,263,528 17 6

There is a contingent asset and contingent liability in respect of securities lodged as bona fides under Contracts to the extent of £57,766 10s. 0d. held by the Bank on the Commission's behalf.

H. S. KILFOYLE, Chief Accountant.

R. LIDDELOW, Manager.
15th October, 1942.

AUDITOR-GENERAL'S CERTIFICATE.

The accounts of the State Electricity Commission of Victoria have been audited in accordance with Section 32 of Act 3776 and, in my opinion, the above Balance-sheet presents a true and correct view of the affairs of the undertaking at the 30th June, 1942.

27th October, 1942.

E. A. PEVERILL, Auditor-General.

STATE ELECTRICITY COMMISSION OF VICTORIA.

SCHEDULE OF FIXED CAPITAL AT 30th JUNE, 1942.

—	Expenditure during 1941-42.	Expenditure to 30th June, 1942.	
	£ s. d.	£ s. d.	£ s. d.
Coal Production—			
Yallourn	10,672 6 7	993,859 17 5	
			993,859 17 5
Briquette Production	3,223 19 3	1,267,869 14 8	
			1,267,869 14 8
Power Production—Steam Stations—			
Ballarat	311 0 5	24,410 7 7	
Geelong	1,134 2 10	345,870 15 9	
Newport	14,305 13 1	1,528,994 15 8	
Richmond	109 7 8	199,464 14 3	
Yallourn	13,038 13 3	5,042,139 6 5	
			7,140,879 19 8
Power Production—Water Stations—			
Sugarloaf-Rubicon	138 7 10	813,831 14 6	
			813,831 14 6
Transmission Systems—			
Main Transmission Systems	166,236 14 6	4,220,599 3 7	
Ballarat Branch	188 18 0	46,877 18 1	
Bendigo Branch	2,602 15 10	9,046 19 8	
Eastern Metropolitan Branch	3,274 9 0	218,299 5 9	
Geelong Branch	..	29,253 18 10	
Gippsland Branch	14,564 1 6	330,197 8 2	
Metropolitan Branch	..	10,598 17 4	
Midland Branch	3,781 6 5	125,928 1 8	
North-Eastern Branch	23,070 13 8	399,677 3 5	
South-Western Branch	13,798 5 9	373,419 19 1	
			5,763,898 15 7
Distribution Systems—			
Ballarat Branch	17,491 13 2	204,348 8 11	
Bendigo Branch	5,404 16 1	145,060 4 9	
Eastern Metropolitan Branch	25,341 14 0	440,993 5 7	
Geelong Branch	11,681 13 11	342,011 18 0	
Gippsland Branch	26,740 7 2	427,321 0 2	
Metropolitan Branch	112,117 15 5	4,226,655 16 3	
Midland Branch	9,772 18 5	171,467 19 8	
North-Eastern Branch	18,390 12 3	329,403 0 2	
South-Western Branch	10,333 14 10	252,276 7 1	
Yallourn and Brown Coal Mine	1,486 7 2	24,515 12 6	
			6,564,053 13 1
Tramways—			
Ballarat	179 13 5	66,442 10 0	
Bendigo	8 1	34,538 14 2	
Geelong	..	142,007 14 1	
			242,988 18 3
General—			
Ballarat Branch	642 19 1	29,491 0 9	
Bendigo Branch	34,892 9 6	50,609 19 0	
Eastern Metropolitan Branch	241 14 3	34,240 8 4	
Geelong Branch	616 16 7	31,663 13 10	
Gippsland Branch	1,601 15 4	40,547 8 3	
Kiewa Branch	68,552 14 4	77,761 18 3	
Metropolitan Branch	6,532 4 7	697,973 15 8	
Midland Branch	731 9 10	7,506 5 2	
North-Eastern Branch	623 15 3	39,084 8 4	
South-Western Branch	357 15 1	32,913 13 5	
Yallourn Branch..	21,515 15 9	1,307,568 5 8	
Metropolitan Area	36,030 7 2	485,569 16 6	
			2,834,930 13 2
	681,732 6 3	25,622,313 6 4	25,622,313 6 4
CONSTRUCTION WORK IN PROGRESS—			
Beginning of Year—*Deduct*	997,636 7 6	..	..
	Cr. 315,904 1 3	25,622,313 6 4	25,622,313 6 4
CONSTRUCTION WORK IN PROGRESS—			
End of Year—*Add*	1,416,743 5 5	1,416,743 5 5	1,416,743 5 5
	1,100,839 4 2	27,039,056 11 9	27,039,056 11 9
Deduct—Proportion of Cost of Extensions Payable by Consumers	5,745 3 5	83,319 16 4	83,319 16 4
	1,095,094 0 9	26,955,736 15 5	26,955,736 15 5

APPENDIX No. 4.

STATE ELECTRICITY COMMISSION OF VICTORIA.

DEBENTURES AND INSCRIBED STOCK.

ISSUED UNDER THE AUTHORITY OF THE STATE ELECTRICITY COMMISSION ACTS Nos. 4087 and 4512.

Loan No.	Original Issue.	Amount Subscribed to 30th June, 1942.	Rate.	Term.	Due.	Sinking Fund.	Redeemed to 30th June, 1942.	Outstanding at 30th June, 1942.
	£	£	%	Yrs.		%	£ s. d.	£ s. d.
State Electricity Commn. of Victoria Loan No. 1	600,000	600,000	3½	20	1954	1	42,000 0 0	558,000 0 0
,, ,, ,, ,, ,, 2	382,000	382,000	3½	20	1954	1	26,740 0 0	355,260 0 0
,, ,, ,, ,, ,, 3	100,000	100,000	4	15	1951	1	6,000 0 0	94,000 0 0
,, ,, ,, ,, ,, 4	800,000	800,000	3⅞	10	1948	1	32,000 0 0	768,000 0 0
,, ,, ,, ,, ,, 5	900,000	900,000	4¼	10	1949	1	..	900,000 0 0
,, ,, ,, ,, ,, 6	200,000	200,000	4¼	10	1949	1	4,085 0 0	195,915 0 0
,, ,, ,, ,, ,, 7	150,000	150,000	4¼	15	1955	1	..	150,000 0 0
,, ,, ,, ,, ,, 8	250,000	250,000	3·8125	10	1950	1	5,095 6 3	244,904 13 9
,, ,, ,, ,, ,, 9	300,000	300,000	3·4375	16	1957	1	..	300,000 0 0
		3,682,000					115,920 6 3	3,566,079 13 9

ISSUED BY UNDERTAKINGS ACQUIRED BY THE STATE ELECTRICITY COMMISSION OF VICTORIA.

Municipality.	Loan No.	Actual Rate.	Rate under Financial Emergency Act.	Original Issue.	Date of Acquisition.	Outstanding at Date of Acquisition.	Redeemed Since Date of Acquisition.	Outstanding at 30th June, 1942.
Bendigo Branch.		%	%	£		£ s. d.	£ s. d.	£ s. d.
Marong Shire	2	5⅝	5	1,700	1.7.31	1,591 17 11	419 15 2	1,172 2 9
Eaglehawk Borough	8	4¼	4¼	3,500	1.10.35	3,150 13 3	1,361 7 0	1,789 6 3
,, ,, ...	9	3¾	3¾	4,500	,,	4,345 9 8	1,157 5 2	3,188 4 6
				9,700		9,088 0 10	2,938 7 4	6,149 13 6
Eastern Metropolitan Branch.								
Dandenong Shire	20	6	5	4,000	1.10.23	3,946 19 0	3,615 17 4	331 1 8
Flinders Shire	5	5	4¼	3,500	1.10.27	3,356 10 7	2,293 12 4	1,062 18 3
Frankston and Hastings Shire ..	16	6½	5·0375	5,000	21.2.28	4,665 15 5	3,276 4 2	1,389 11 3
Healesville Shire	2	6	4½	8,000	1.4.33	6,215 0 0	2,410 0 0	3,805 0 0
,, ,, ...	3	6½	4½	2,000	,,	1,585 0 0	600 0 0	985 0 0
,, ,, ...	9	5¾	5	3,000	,,	2,728 11 2	671 14 8	2,056 16 6
Lilydale Shire	16	6½	5·0375	3,000	1.4.25	2,869 12 7	1,332 14 2	1,536 18 5
,, ,, ...	13	6	5	1,200	,,	1,200 0 0	..	1,200 0 0
,, ,, ...	16	6½	5·0375	2,000	,,	1,913 1 7	888 9 4	1,024 12 3
,, ,, ...	17	6	5	4,000	,,	3,600 0 0	3,400 0 0	200 0 0
Mornington Shire	11	5¾	5	1,000	1.8.30	895 16 8	563 19 8	331 17 0
				36,700		32,976 7 0	19,052 11 8	13,923 15 4
Gippsland Branch.								
Maffra Shire	1	4¾	4¾	6,500	1.9.24	5,660 0 11	2,673 16 8	2,986 4 3
,, ,, ...	2	5	5	1,000	,,	877 5 7	607 14 1	269 11 6
				7,500		6,537 6 6	3,281 10 9	3,255 15 9
Metropolitan Branch.								
Werribee Shire	3	4¾	4¼	1,000	10.4.24	818 1 5	671 9 9	146 11 8
,, ,, ...	4	5½	4¼	1,000	,,	856 16 2	641 11 9	215 4 5
				2,000		1,674 17 7	1,313 1 6	361 16 1
Midland Branch.								
Kyneton Shire	3	5¾	4½	12,000	1.10.29	10,830 0 0	3,980 0 0	6,850 0 0
,, ,, ...	5	6	4¼	3,800	,,	3,084 15 2	2,619 14 11	465 0 3
Newham and Woodend Shire ..	2	5	5	750	1.8.29	750 0 0	300 0 0	450 0 0
				16,550		14,664 15 2	6,899 14 11	7,765 0 3
North-Eastern Branch.								
Mansfield Shire	3	4½	4½	500	1.6.28	500 0 0	..	500 0 0
,, ,, ...	6	6	5	1,200	,,	1,200 0 0	..	1,200 0 0
,, ,, ...	8	6	5	800	,,	800 0 0	700 0 0	100 0 0
Numurkah Shire	4	4¾	4¾	4,200	1.10.31	2,600 0 0	2,100 0 0	500 0 0
,, ,, ...	7	7	5·425	2,500	,,	1,922 4 11	1,189 17 5	732 7 6
Rodney Shire	1	5	5	3,000	1.10.26	2,286 7 8	1,835 9 2	450 18 6
Rutherglen Borough	2	4½	4¼	3,000	15.10.26	2,094 3 8	2,007 2 0	87 1 8
,, Shire	4	6	5	350	1.2.26	296 1 8	207 6 1	88 15 7
Towong Shire	1	4⅛	4⅛	6,500	1.11.40	4,565 0 0	503 15 1	4,061 4 11
Wangaratta Borough	8	6½	4¼	6,500	12.3.27	6,078 12 8	2,609 10 4	3,469 2 4
,, ,, ...	9	6	4¼	1,500	,,	1,412 2 5	625 19 11	786 2 6
Yarrawonga Shire	3	4	4	3,500	1.8.25	2,600 0 0	2,100 0 0	500 0 0
,, ,, ...	5	5	4¼	500	,,	387 11 1	341 7 2	46 3 11
,, ,, ...	6	5	4¼	500	,,	406 1 8	316 19 9	89 1 11
				34,550		27,148 5 9	14,537 6 11	12,610 18 10
GRAND TOTAL				107,000		92,,089 12 10	48,022 13 1	44,066 19 9

STATE ELECTRICITY COMMISSION OF VICTORIA.

TABULATION OF CAPITAL, REVENUE, AND OPERATING ACCOUNTS.

Year ended 30th June.	Capital.			Revenue.					Operating Expenditure including Writings Off, &c.	+ Surplus. — Deficit.	
	Capital Expenditure.	Loan Liability.	Reserves.	Electricity Supply.	Briquetting.	Tramways.	Miscellaneous.	Total.		Year.	To date.
	£	£	£	£	£	£	£	£	£	£	£
1923	3,891,718	4,212,719	13,992	225,481	..	..	..	225,481	225,502	— 21	+ 23
1924	**6,234,213**	**6,522,482**	**22,532**	**392,999**	..	..	**19,798**	**412,797**	**471,282**	— **58,485**	— **58,462**
1925	7,759,825	8,293,765	43,936	617,286	40,468	..	41,602	699,356	963,638	— 264,282	— 322,744
1926	9,032,464	10,120,794	67,616	713,252	122,379	..	19,476	855,107	1,125,077	— 269,970	— 592,714
1927	**10,742,104**	**11,849,698**	**262,942**	**975,362**	**179,184**	..	**16,124**	**1,170,670**	**1,367,324**	— **196,654**	— **789,368**
1928	12,762,939	13,567,546	493,935	1,262,787	192,256	..	10,698	1,465,741	1,463,868	+ 1,873	— 787,495
1929	14,530,684	15,126,107	833,618	1,427,751	226,186	..	7,858	1,661,795	1,657,181	+ 4,614	— 782,881
1930	**16,397,608**	**16,778,413**	**1,151,139**	**1,624,255**	**264,459**	..	**9,153**	**1,897,867**	**1,892,601**	+ **5,266**	— **777,615**
1931	18,553,592	19,286,428	1,593,462	2,234,756	276,930	30,971	2,236	2,544,893	2,562,846	— 17,953	— 795,568
1932	19,337,273	19,735,177	2,135,205	2,456,696	357,056	35,450	717	2,849,919	2,846,888	+ 3,031	— 792,537
1933	**19,667,259**	**19,668,146**	**2,823,912**	**2,577,547**	**313,435**	**34,180**	**97**	**2,925,259**	**2,921,830**	+ **3,429**	— **789,108**
1934	19,748,318	19,109,659	3,332,096	2,717,992	309,936	33,510	74	3,061,512	3,028,393	+ 33,119	— 755,989
1935	20,305,078	19,527,309	3,757,812	2,995,707	297,858	77,121	10,098	3,380,784	3,374,306	+ 6,478	— 749,511
1936	**20,866,242**	**18,806,748**	**4,380,047**	**3,164,703**	**348,650**	**78,207**	**8,180**	**3,599,740**	**3,572,012**	+ **27,728**	— **721,783**
1937	21,638,314	18,682,415	5,008,027	3,339,560	337,227	76,142	7,500	3,760,429	3,721,528	+ 38,901	— 682,882
1938	22,698,893	19,242,265	5,672,343	3,539,974	394,634	75,567	1,008	4,011,183	3,957,354	+ 53,829	— 629,053
1939	**24,268,880**	**19,422,927**	**6,449,707**	**3,685,107**	**377,022**	**78,664**	**1,099**	**4,141,892**	**4,020,992**	+ **120,900**	— **508,153**
1940	25,369,679	20,524,010	7,300,198	3,894,893	400,125	78,211	3,700	4,376,929	4,250,416	+ 126,513	— 381,640
1941	26,116,795	20,678,339	8,218,078	4,241,264	379,847	89,571	13,374	4,724,056	4,563,376	+ 160,680	— 220,960
1942	**26,955,737**	**20,253,266**	**9,256,460**	**4,657,450**	**330,756**	**109,955**	**55,488**	**5,153,649**	**5,069,227**	+ **84,422**	— **136,538**

STATE ELECTRICITY COMMISSION OF VICTORIA.

ELECTRICITY SALES—REVENUE—CONSUMER STATISTICS—ALL UNDERTAKINGS SERVED BY STATE SYSTEM.

Year Ended 30th June.	Sales—kWh. (Millions).						Revenue.			Consumer Statistics—Commission Undertakings.							
	Bulk Supplies.	Commission Undertakings.				Total.	Total.	Per kWh. Sold.		Population of Area of Supply.	Number of Consumers.	Percentage of Consumers to Population.	kWh. Sold per Consumer (Average).		Motors Connected.		Number of Farms Supplied.
		Public Lighting.	Domestic.	Industrial.	Commercial.			Excluding Bulk Supplies.	Bulk Supplies Only.				Domestic.	Total (excluding Bulk).	Number.	H.P.	
							£	*d.*	*d.*								
1935	181·900	11·681	81·367	203·114	39·437	517·499	2,996,488	1·785	0·660	972,000	213,669	22·0	466	1,601	24,260	191,550	1,375
1936	**211·004**	**11·975**	**89·630**	**219·996**	**44·231**	**576·836**	**3,164,086**	**1·705**	**0·644**	**972,000**	**225,534**	**23·2**	**487**	**1,663**	**26,608**	**204,503**	**1,970**
1937	220·031	12·408	100·994	240·551	49·372	623·356	3,331,934	1·632	0·643	984,000	235,942	24·0	520	1,746	29,063	213,667	2,615
1938	241·988	12·950	110·597	258·274	54·080	677·889	3,528,396	1·588	0·638	1,018,000	249,244	24·5	540	1,794	32,386	227,903	3,426
1939	**257·394**	**14·282**	**122·134**	**273·372**	**59·915**	**727·097**	**3,685,538**	**1·536**	**0·633**	**1,050,000**	**260,733**	**24·8**	**566**	**1,838**	**36,282**	**245,697**	**4,367**
1940	285·031	16·804	141·172	311·916	67·224	822·147	3,881,022	1·413	0·604	1,080,000	271,749	25·2	626	2,015	41,530	275,458	5,147
1941	311·546	16·516	155·726	367·438	73·547	924·773	4,241,264	1·342	0·625	1,104,000	284,373	25·8	658	2,201	46,114	299,988	5,771
1942	**369·236**	**10·509**	**173·951**	**441·734**	**78·168**	**1,073·598**	**4,657,452**	**1·261**	**0·621**	**1,123,000**	**292,341**	**26·0**	**703**	**2,433**	**50,465**	**322,283**	**6,131**
METROPOLITAN BULK UNDERTAKERS (10).																	
1942	**331·890**	..	..	..	..	**331·890**	**876,665**	..	..	..	..	..	..	..	..	..	..
1941	294·100	..	..	..	..	294·100	756,542	..	..	..	..	..	..	..	..	..	..
COMMISSION'S ELECTRICITY SUPPLY UNDERTAKINGS FOR LOCAL DISTRIBUTION (9).																	
BRANCHES.																	
Metropolitan ..	**1942**	**0·516**	**7·991**	**133·438**	**357·390**	**48·040**	**547·375**	**2,512,663**	**1·102**	**0·819**	**710,494**	**195,361**	**27·50**	**776**	**2,823**	**32,055**	**217,325**	**35**
	1941	0·470	13·262	119·565	294·333	46·159	473·789	2,314,073	1·173	0·829	699,984	191,148	27·31	720	2,514	29,107	201,999	31
Ballarat	**1942**	..	**0·291**	**3·009**	**8·456**	**3·455**	**15·211**	**125,908**	**1·987**	..	**51,872**	**11,245**	**21·68**	**339**	**1,380**	**2,177**	**11,040**	**130**
	1941	..	0·402	2·575	5·326	2·823	11·126	111,312	2·401	..	51,192	10,753	21·01	316	1,089	1,924	8,958	121
Bendigo	**1942**	..	**0·363**	**2·143**	**3·319**	**2·013**	**7·838**	**77,580**	**2·376**	..	**32,287**	**8,162**	**25·28**	**319**	**972**	**1,030**	**6,666**	**101**
	1941	..	0·467	1·908	3·015	1·975	7·365	76,461	2·492	..	32,262	7,963	24·68	295	939	966	5,928	100
Eastern Metropolitan	**1942**	**1·612**	**0·410**	**10·949**	**4·778**	**6·666**	**24·415**	**200,305**	**2·033**	**1·057**	**59,887**	**17,498**	**29·22**	**769**	**1,332**	**1,383**	**8,635**	**1,280**
	1941	1·530	0·521	9·230	4·497	5·590	21·368	183,150	2·134	1·058	58,870	16,452	27·95	703	1,244	1,259	8,064	1,201
Geelong	**1942**	..	**0·284**	**4·910**	**21·765**	**4·619**	**31·578**	**195,692**	**1·487**	..	**58,660**	**14,267**	**24·32**	**410**	**2,219**	**4,369**	**30,326**	**194**
	1941	..	0·401	4·650	18·018	4·330	27·399	183,787	1·610	..	56,830	14,039	24·70	402	1,979	4,315	30,040	190
Gippsland ..	**1942**	..	**0·291**	**6·129**	**17·685**	**3·106**	**27·211**	**195,157**	**1·721**	..	**61,665**	**14,670**	**23·79**	**596**	**1,875**	**3,848**	**17,301**	**2,181**
	1941	..	0·375	5·661	13·781	3·061	22·878	177,211	1·859	..	59,892	14,126	23·59	588	1,669	3,474	15,983	2,076
Midland	**1942**	..	**0·218**	**2·273**	**7·651**	**2·446**	**12·588**	**89,677**	**1·710**	..	**36,664**	**6,871**	**18·74**	**436**	**1,870**	**1,043**	**6,923**	**226**
	1941	..	0·275	1·970	6·216	2·594	11·055	83,136	1·805	..	35,567	6,526	18·35	426	1,831	937	6,306	216
North-Eastern ..	**1942**	**10·446**	**0·425**	**5·232**	**13·580**	**4·685**	**34·368**	**219,259**	**1·808**	**0·897**	**62,851**	**13,411**	**21·34**	**531**	**1,809**	**2,503**	**15,917**	**983**
	1941	9·826	0·470	4·781	15·707	3·651	34·435	216,605	1·754	0·897	61,261	12,823	20·93	520	1,972	2,221	15,176	895
South-Western ..	**1942**	..	**0·199**	**4·597**	**7·110**	**2·045**	**13·951**	**122,145**	**2·101**	..	**44,720**	**9,815**	**21·95**	**626**	**1,431**	**1,983**	**7,972**	**1,001**
	1941	..	0·285	4·207	6·545	2·244	13·281	118,257	2·137	..	44,420	9,541	21·48	601	1,425	1,837	7,361	941
Total ..	**1942**	**12·574**	**10·472**	**172·680**	**441·734**	**77·075**	**714·535**	**3,738,386**	**1·262**	**0·914**	**1,119,100**	**291,300**	**26·03**	**701**	**2,434**	**50,391**	**322,105**	**6,131**
	1941	11·826	16·458	154·547	367·438	72·427	622·696	3,463,992	1·343	0·915	1,100,278	283,371	25·75	655	2,200	46,040	299,815	5,771

NOTE.—Above figures do not include allowances for unread meters prior to 1941.

STATE ELECTRICITY COMMISSION OF VICTORIA.

STANDARD TARIFFS AS AT 1ST NOVEMBER, 1942.

(Applicable to Centres as Indicated in Appendix No. 8.)

Tariff.	Metropolitan.	Ballarat, Bendigo, and Geelong.	Country.		
	1	2	3	5	6
Residential Tariff (Domestic and Commercial Residential Premises)—					Tariffs for the following centres are the same as shown in Column No. 3, except the Residential Tariff:— Croydon, Dandenong, Frankston, Heathmont, Mt. Eliza, Ringwood, Seaford. Tariffs for the following centres are the same as shown in Column No. 5, except:— Kilsyth and Montrose (Residential Tariff) Lara and Lara Lake (Commercial and Industrial Tariffs:— Lighting–Power and Heating) Details of tariffs for above centres will be supplied on request.
Service charge per month per assessable room ..	11d.	1s. 2d.	1s. 2d.	1s. 2d.	
Rate per kWh.	0·9d.	1·25d.	1·4d.	1·4d.	
Maximum overall rate per kWh.	5·0d.	8·0d.	8·0d.	8·0d.	
Commercial and Industrial Lighting— Block Tariff—rates per kWh. (based on monthly consumption)	First 20 at 4d. Balance at 3d.	First 100 at 5d. Balance at 3·5d.	First 100 at 5·5d. Next 200 at 4·5d. Balance at 3·5d.	First 100 at 6·0d. Next 200 at 5·0d. Balance at 4·0d.	
Commercial and Industrial—Power and Heating— Block Tariff—rates per kWh. (based on monthly consumption)	First 200 at 2d. Next 4,800 at 1·2d. ,, 20,000 at 0·9d. ,, 100,000 at 0·8d. Balance at 0·7d.	First 200 at 2·25d. Next 4,800 at 1·5d. ,, 20,000 at 1·0d. ,, 100,000 at 0·8d. Balance at 0·7d.	First 50 at 2·5d. Next 150 at 2·25d. ,, 4,800 at 1·5d. ,, 20,000 at 1·0d. ,, 100,000 at 0·9d. Balance at 0·75d.	First 50 at 3·0d. Next 150 at 2·25d. ,, 4,800 at 1·5d. ,, 20,000 at 1·0d. ,, 150,000 at 0·9d. Balance at 0·8d.	
Prescribed hours—rate per kWh.	11 p.m.–7 a.m.—0·3d.	10.30 p.m.–6.30 a.m.—0·35d.	10. p.m.–6. a.m.—0·35d.	10 p.m.–6 a.m.—0·35d.	
Rental for Two-rate meter per month	5s.	5s.	5s.	5s.	
Maximum Demand Tariff (see Note (2) below) ..	£9 10s. per kW. per annum 0·225d. per kWh. 500 kW. (Minimum Demand Charge) Reset Monthly				
Commercial Cooking—Flat Tariff per kWh. ..	0·9d.	1·25d.	1·4d.	1·4d.	
Water Heating—Night Tariff .. per kWh.	11 p.m.–7 a.m.—0·35d.	10.30 p.m.—6.30 a.m.—0·45d.	10 p.m.–6 a.m.—0·45d.	10 p.m.–6 a.m.—0·45d.	
Minimum Charge .. .. per month	2s. 6d.	3s.	3s. 6d.	3s. 6d.	

SPECIAL ALL-PURPOSES INDUSTRIAL TARIFF

Applicable throughout all areas of supply.

Block Tariff—rates per kWh. (based on monthly consumption)	First 20 at 4d. Next 480 at 3d. ,, 4,500 at 1·9d. ,, 20,000 at 0·9d. ,, 100,000 at 0·8d. Balance at 0·7d.
Prescribed hours—rate per kWh. ..	11 p.m.–7 a.m.—0·3d.
Rental per Two-rate meter per month ..	5s.

A consumer adopting the Special Industrial All-Purposes Tariff must agree to pay a minimum charge of £10/5/10 per month, which will cover any consumption up to the first 1,000 kWh., irrespective of the hours during which the consumption may be recorded.

NOTES.—1. Details regarding the application of the above tariffs are shown in the Commission's published tariff schedules which are available on request.

2. The Maximum Demand Tariff is available only to consumers entering into a five-year agreement providing for high tension supply and for monthly payments based on the minimum demand indicated or half the stipulated rate of supply, whichever is the greater.

STATE OF VICTORIA.

ELECTRICITY SUPPLY UNDERTAKINGS AT 30TH JUNE, 1942.

SUMMARY.

—	Population.	Consumers.		*Kilowatt-hours Sold.	
		Number.	Percentage of Grand Total.	Number.	Percentage of Grand Total.
STATE ELECTRICITY COMMISSION OF VICTORIA—					
Metropolitan	702,000	193,625	44·23	540,767,592	53·25
Provincial Cities—					
Ballarat	40,850	9,314	2·13	12,641,684	1·24
Bendigo	31,807	8,039	1·84	7,766,455	0·77
Geelong	51,850	12,650	2·89	30,220,297	2·98
Country	296,474	68,721	15·69	112,966,092	11·12
TOTAL	1,122,981	292,349	66·78	704,362,120	69·36
OTHER UNDERTAKINGS—					
Metropolitan (receiving Bulk Supply from State Electricity Commission of Victoria)	398,422	114,984	26·27	292,167,506	28·77
Country	126,000	30,433	6·95	19,000,000	1·87
TOTAL	524,422	145,417	33·22	311,167,506	30·64
GRAND TOTAL	1,647,403	437,766	100·00	1,015,529,626	100·00

* Retail sales to Victorian consumers by Electricity Supply undertakings.

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA.

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Metropolitan.						
Brighton	Metro.	A.C., 3 ph. and 1 ph.	702,000	193,625	1	1.9.30
Broadmeadows (Fawkner and Glenroy and portions of North Essendon and Pascoe Vale only)	,,	A.C., 3 ph.				1.8.22
Camberwell	,,	A.C., 3 ph. and 1 ph.				1.9.30
Caulfield	,,	A.C., 3 ph. and 1 ph.				1.9.30
Collingwood	,,	A.C., 3 ph.				1.9.30
Essendon	,,	A.C., 3 ph.				1.8.22
Fitzroy	,,	A.C., 3 ph.				1.9.30
Hawthorn	,,	A.C., 3 ph. and 1 ph.				1.9.30
Kensington/Flemington	,,	A.C., 3 ph.				1.8.22
Kew	,,	A.C., 3 ph. and 1 ph.				1.9.30
Malvern	,,	A.C., 3 ph. and 1 ph.				1.9.30
Moorabbin	,,	A.C., 3 ph. and 1 ph.				1.9.30
Mordialloc	,,	A.C., 3 ph.				1.9.30
Mulgrave (part)	,,	A.C., 3 ph.				1.9.30
Oakleigh	,,	A.C., 3 ph.				1.9.30
Prahran	,,	A.C., 3 ph. and 1 ph.				1.9.30
Richmond	,,	A.C., 3 ph.				1.9.30
St. Kilda	,,	A.C., 3 ph. and 1 ph.				1.9.30
Sandringham	,,	A.C., 3 ph. and 1 ph.				1.9.30
South Melbourne	,,	A.C., 3 ph.				1.9.30
Sunshine	,,	A.C., 3 ph.				1.3.27
Ballarat.						
City of Ballarat (including Alfredton, Ballarat East, Ballarat North, Brown Hill, Canadian and Mt. Pleasant)	Ball.	A.C., 3 ph. and D.C., 3 wire	40,850	9,314	2	1.7.34
Borough of Sebastopol	,,	A.C., 3 ph.				
Ballarat Shire (Wendouree only)	,,	A.C., 3 ph.				
Bendigo.						
City of Bendigo (including Golden Square, Long Gully and White Hills)	Bend.	A.C., 3 ph.				1.7.34
Borough of Eaglehawk	,,	A.C., 3 ph.				1.2.36
Huntly Shire (Portion only, including Epsom)	,,	A.C., 3 ph. and 1 ph.	31,807	8,039	2	19.5.37 (Epsom 29.12.39)
Marong Shire (Portion only, including Kangaroo Flat)	,,	A.C., 3 ph.				1.7.34
Strathfieldsaye Shire (Portion only)	,,	A.C., 3 ph.				1.7.34

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Geelong.						
City of Geelong	Geel.	A.C., 3 ph. .. .. D.C., 3 wire	51,850	12,650	2	1.9.30 (Fyansford 10.10.38)
City of Geelong West	„	A.C., 3 ph.				
Newtown and Chilwell	„	A.C., 3 ph.				
Corio Shire (North Geelong, North Shore and Fyansford)	„	A.C., 3 ph.				
South Barwon Shire (Belmont, Grovedale and Highton)	„	A.C., 3 ph.				
Bellarine Shire (St. Albans) ..	„	A.C., 3 ph.				
Country.						
Acheron	N/E.	A.C., 1 ph.	70	16	5	24.11.37
Agnes	Gipps.	A.C., 1 ph.	100	19	5	1.11.38
Airey's Inlet	S/W.	A.C., 1 ph.*	40	23	5	24.12.36
Airly	Gipps.	A.C., 1 ph.	100	30	5	16.6.37
Alexandra	N/E.	A.C., 3 ph.	998	290	5	11.4.27
Allansford	S/W.	A.C., 1 ph.*	300	48	5	20.11.24
Allansford Rural	S/W.	A.C., 3 ph. and 1 ph.* ..	610	122	5	26.9.28
Altona	Metro.	A.C., 3 ph. and 1 ph. ..	2,448	612	5	9.12.24
Alvie	S/W.	A.C., 1 ph.*	130	26	5	15.10.24
Anglesea	S/W.	A.C., 1 ph.*	80	70	5	21.12.36
Archies Creek	Gipps.	A.C., 3 ph. and 1 ph. ..	240	27	5	1.9.40
Ardmona	N/E.	A.C., 3 ph. and 1 ph. ..	355	163	5	25.3.38
Arundel	Mid.	A.C., 1 ph.	(See Keilor)		5	21.11.35
Ascot	Ball.	A.C., 1 ph.	25	3	5	7.12.38
Avoca	Mid.	A.C., 3 ph.	886	240	5	1.8.40
Bacchus Marsh	Mid.	A.C., 3 ph. and 1 ph. ..	2,459	494	5	3.6.41
Baddaginnie	N/E.	A.C., 1 ph.	92	16	5	23.7.36
Badger Creek	E/M.	A.C., 1 ph.	450	39	5	1.4.33
Bairnsdale	Gipps.	A.C., 3 ph. and 1 ph. ..	4,500	1,186	3	1.4.27
Bairnsdale Rural	Gipps.	A.C., 1 ph.	200	10	5	13.2.36
Bald Hills	Ball.	A.C., 1 ph.	25	3	5	13.7.38
Balintore	S/W.	A.C., 1 ph.*	50	6	5	1.6.37
Ballan	Ball.	A.C., 3 ph. and 1 ph. ..	916	155	5	1.3.40
Ballendella	N/E.	A.C., 1 ph.	150	38	5	20.3.40
Balmattum	N/E.	A.C., 1 ph.	34	8	5	8.10.37
Barnawartha	N/E.	A.C., 1 ph.	283	30	5	7.10.27
Barwon Heads	Geel.	A.C., 1 ph.	350	216	5	6.9.24
Batesford	Geel.	A.C., 1 ph.	150	16	5	28.2.39
Bayles	Gipps.	A.C., 3 ph. and 1 ph. ..	200	56	5	11.9.35
Bayswater	E/M.	A.C., 1 ph.	384	203	5	24.7.26
Beaconsfield	E/M.	A.C., 1 ph.	225	67	5	18.6.28
Beeac	S/W.	A.C., 1 ph.	470	100	5	21.5.24
Belgrave	E/M.	A.C., 3 ph.	1,866	893	3	24.8.25
Bena	Gipps.	A.C., 3 ph. and 1 ph. ..	250	67	5	10.7.30
Benalla	N/E.	A.C., 3 ph.	4,843	1,220	3	1.5.26
Bennison..	Gipps.	A.C., 1 ph.	80	11	5	29.10.38
Berwick	E/M.	A.C., 1 ph.	940	220	5	7.5.28
Birregurra	S/W.	A.C., 1 ph.	400	115	5	30.10.24
Bittern	E/M.	A.C., 1 ph.	152	23	5	22.12.37
Boisdale	Gipps.	A.C., 1 ph.	500	117	5	13.7.37
Bona Vista	Gipps.	A.C., 1 ph.	90	27	5	30.12.38
Bonegilla	N/E.	A.C., 3 ph. and 1 ph. ..	40	7	5	18.12.40
Bonnie Doon	N/E.	A.C., 1 ph.	270	38	5	31.1.41
Bookar	S/W.	A.C., 1 ph.	30	2	5	10.8.37
Boolarra	Gipps.	A.C., 3 ph. and 1 ph. ..	450	66	5	29.10.24
Boolarra South	Gipps.	A.C., 1 ph.	90	16	5	1.8.40
Boronia	E/M.	A.C., 1 ph.	551	318	5	23.1.27
Bostock's Creek	S/W.	A.C., 1 ph.*	50	15	5	15.12.24
Bowen Vale	Mid.	A.C., 1 ph.	50	2	5	10.5.40
Bowser	N/E.	A.C., 3 ph.	90	4	5	23.4.34
Braeside	Metro. and E/M.	A.C., 3 ph. and 1 ph. ..	58	17	5	27.6.30
Bright	N/E.	A.C., 3 ph.	1,570	184	5	1.12.41
Brandy Creek	Gipps.	A.C., 1 ph.	60	12	5	15.2.39
Briagolong	Gipps.	A.C., 1 ph.	500	57	5	5.3.37
Briar Hill	E/M.	A.C., 3 ph.	300	110	5	12.5.26
Bridgewater	Bend.	A.C., 3 ph.	300	83	5	27.4.40
Broadmeadows	Metro.	A.C., 1 ph.	260	50	5	18.11.35
Bruthen	Gipps.	A.C., 1 ph.	600	105	5	1.10.30
Bulla	Mid.	A.C., 1 ph.	194	15	5	10.11.36
Bullock Swamp	S/W.	A.C., 1 ph.*	50	13	5	12.9.24
Buln Buln	Gipps.	A.C., 1 ph.	130	31	5	1.12.30
Bundalaguah	Gipps.	A.C., 1 ph.	150	19	5	13.11.36
Bundoora	E/M.	A.C., 1 ph.	53	31	5	31.12.27
Bungaree	Ball.	A.C., 3 ph.	150	29	5	14.5.40
Bung Bong	Mid.	A.C., 3 ph. and 1 ph. ..	20	4	5	21.4.41
Buninyong	Ball.	A.C., 3 ph. and 1 ph. ..	650	83	5	14.1.37
Bunyip	Gipps.	A.C., 1 ph.	500	106	5	15.10.28
Burramine	N/E.	A.C., 1 ph.	72	4	5	12.9.35
Byrneside	N/E.	A.C., 1 ph.	63	8	5	24.5.37
Caldermeade	Gipps.	A.C., 1 ph.	150	45	5	6.9.35
Campbellfield	Metro.	A.C., 3 ph. and 1 ph. ..	276	46	5	14.9.36
Campbell's Creek	Mid.	A.C., 1 ph.	332	11	5	28.11.41

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Country—*continued.*						
Camperdown	S/W.	A.C., 3 ph.	3,700	773	3	30.12.23
Camperdown Rural	S/W.	A.C., 3 ph. and 1 ph.*	1,050	309	5	9.1.36
Caramut	S/W.	A.C., 1 ph.*	170	19	5	12.8.38
Carisbrook	Mid.	A.C., 1 ph.	210	85	5	24.11.37
Carranballac	S/W.	A.C., 1 ph.*	60	5	5	18.10.39
Castlemaine	Mid.	A.C., 3 ph. and 1 ph.	6,407	1,277	3	31.12.29
Catani	Gipps.	A.C., 1 ph.	100	41	5	27.10.36
Chewton	Mid.	A.C., 3 ph. and 1 ph.	718	60	5	23.9.38
Chiltern	N/E.	A.C., 3 ph.	1,726	147	5	1.9.26
Chocolyn	S/W.	A.C., 1 ph.	20	2	5	14.1.38
Clayton	Metro. and E/M.	A.C., 1 ph.	968	173	5	30.4.26
Clematis	E/M.	A.C., 1 ph.	43	29	5	24.8.34
Cloverlea	Gipps.	A.C., 1 ph.	205	60	5	7.4.30
Clunes	Ball.	A.C., 3 ph.	1,230	187	5	9.2.38
Clydebank	Gipps.	A.C., 1 ph.	100	19	5	9.4.36
Cobden	S/W.	A.C., 3 ph.	760	230	5	26.3.24
Cobram	N/E.	A.C., 3 ph.	1,040	240	5	1.10.28
Cobrico	S/W.	A.C., 1 ph.*	20	1	5	22.12.38
Colac	S/W.	A.C., 3 ph. and 1 ph.	6,000	1,598	3	1.9.23
Colac Rural	S/W.	A.C., 3 ph. and 1 ph.	900	174	5	9.1.36
Coldstream	E/M.	A.C., 3 ph. and 1 ph.	43	37	5	1.7.33
Congupna	N/E.	A.C., 3 ph.	58	7	5	7.9.34
Coragulac	S/W.	A.C., 1 ph.*	100	16	5	30.4.24
Cora Lynn	Gipps.	A.C., 3 ph. and 1 ph.	300	76	5	9.8.35
Cororooke	S/W.	A.C., 3 ph.	400	59	5	27.3.24
Couangalt	Mid.	A.C., 3 ph. and 1 ph.	(See Gisborne)		5	—.8.37
Cowwarr	Gipps.	A.C., 3 ph. and 1 ph.	350	88	5	8.11.24
Cranbourne	E/M.	A.C., 1 ph.	590	111	5	12.9.28
Cressy	S/W.	A.C., 1 ph.	300	43	5	19.11.41
Creswick	Ball.	A.C., 3 ph. and 1 ph.	1,808	238	5	24.11.37
Crib Point	E/M.	A.C., 1 ph.	1,505	165	5	23.8.29
Crossley	S/W.	A.C., 1 ph.*	80	14	5	16.3.38
Croydon	E/M.	A.C., 3 ph. and 1 ph.	2,285	823	6	1.4.25
Cudgee	S/W.	A.C., 1 ph.*	40	4	5	7.12.38
Dalmore	Gipps.	A.C., 1 ph.	100	17	5	29.1.37
Dalyston	Gipps.	A.C., 1 ph.	160	27	5	15.11.40
Dandenong	E/M.	A.C., 3 ph. and 1 ph.	5,807	1,790	6	1.10.23
Darlington	S/W.	A.C., 1 ph.*	110	14	5	22.4.38
Darnum	Gipps.	A.C., 3 ph.	190	40	5	20.12.24
Dawson	Gipps.	A.C., 1 ph.	30	8	5	16.4.37
Daylesford	Ball.	A.C., 3 ph.	2,680	676	3	31.10.40
Deer Park	Metro.	A.C., 3 ph. and 1 ph.	300	58	5	14.2.29
Dennington	S/W.	A.C., 3 ph. and 1 ph.	310	49	5	1.2.29
Derrinallum	S/W.	A.C., 1 ph.	150	47	5	20.4.38
Devenish	N/E.	A.C., 3 ph.	208	29	5	14.2.40
Diamond Creek	E/M.	A.C., 1 ph.	470	100	5	10.5.29
Digger's Rest	Mid.	A.C., 3 ph. and 1 ph.	103	21	5	15.3.29
Dingley	E/M.	A.C., 1 ph.	220	44	5	10.10.29
Donnybrook	E/M.	A.C., 1 ph.	100	19	5	11.3.41
Dookie	N/E.	A.C., 1 ph.	284	73	5	8.3.37
Driffield	Gipps.	A.C., 1 ph.	100	18	5	6.4.38
Dromana	E/M.	A.C., 3 ph. and 1 ph.	1,162	273	5	8.12.27
Drouin	Gipps.	A.C., 3 ph.	1,250	295	5	1.10.24
Drouin Rural	Gipps.	A.C., 1 ph.	100	10	5	13.11.28
Drouin West	Gipps.	A.C., 1 ph.	50	11	5	18.2.39
Drysdale	Geel.	A.C., 1 ph.	1,200	164	5	13.2.24
Dumbalk	Gipps.	A.C., 3 ph. and 1 ph.	150	50	5	14.9.36
Dumbalk North	Gipps.	A.C., 1 ph.	100	68	5	7.8.39
Dunkeld	S/W.	A.C., 1 ph.	370	51	5	10.8.39
Dunolly	Mid.	A.C., 3 ph.	625	157	5	31.3.38
East Oakleigh	E/M.	A.C., 3 ph.	112	40	1 and 5	19.7.26
Eastern View	S/W.	A.C., 1 ph.*	40	8	5	7.9.39
Echuca	N/E.	A.C., 3 ph.	5,140	1,018	3	10.11.24
Eildon Weir	N/E.	A.C., 1 ph.	115	17	5	28.4.39
Eldorado†	N/E.	A.C., 3 ph. and 1 ph.	204	18	5	1.4.39
Elliminyt	S/W.	A.C., 1 ph.	(See Colac)		3	1.7.24
Ellinbank	Gipps.	A.C., 1 ph.	160	41	5	9.9.36
Elphinstone	Mid.	A.C., 1 ph.	110	10	5	4.11.38
Eltham	E/M.	A.C., 1 ph.	713	220	5	12.8.26
Emerald	E/M.	A.C., 1 ph.	298	120	5	7.8.34
Epping	E/M.	A.C., 1 ph.	126	46	5	15.7.36
Euroa	N/E.	A.C., 3 ph.	3,232	517	5	20.3.28
Exford	Mid.	A.C., 1 ph.	(See Melton)		5	20.12.39
Ferny Creek	E/M.	A.C., 1 ph.	182	37	5	2.9.27
Fish Creek	Gipps.	A.C., 3 ph. and 1 ph.	370	91	5	9.7.38
Flinders	E/M.	A.C., 1 ph.	480	79	5	28.10.38
Flynn	Gipps.	A.C., 1 ph.	150	39	5	5.9.38
Foster	Gipps.	A.C., 3 ph. and 1 ph.	700	154	5	30.4.38
Frankston	E/M.	A.C., 3 ph. and 1 ph.	5,566	1,723	6	21.2.28
Freshwater Creek	S/W.	A.C., 1 ph.*	20	4	5	30.4.41
Gainsborough	Gipps.	A.C., 1 ph.	120	20	5	28.9.36
Garfield	Gipps.	A.C., 1 ph.	420	75	5	1.8.29

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Country—*continued.*						
Garvoc	S/W.	A.C., 1 ph.*	150	13	5	25.9.37
Girgarre	N/E.	A.C., 3 ph.	259	68	5	19.5.38
Gishorne	Mid.	A.C., 3 ph. and 1 ph. ..	1,092	141	5	1.10.28
Glen Alvie	Gipps.	A.C., 1 ph.	240	32	5	23.12.40
Glengarry	Gipps.	A.C., 3 ph. and 1 ph. ..	150	49	5	14.8.28
Glenormiston	S/W.	A.C., 3 ph.	100	19	5	10.9.29
Glenvale	E/M.	A.C., 1 ph.	27	14	5	12.4.40
Glen Waverley	E/M.	A.C., 1 ph.	350	58	5	1.6.28
Goorambat	N/E.	A.C., 1 ph.	73	18	5	19.2.40
Gordon	Ball.	A.C., 1 ph.	300	27	5	29.5.40
Gormandale	Gipps.	A.C., 3 ph. and 1 ph. ..	250	67	5	14.10.38
Gnotuk	S/W.	A.C., 1 ph.	120	17	5	—.3.36
Grahamvale	N/E.	A.C., 1 ph.	(See Shepparton East)		5	20.7.37
Grassy Spur	Gipps.	A.C., 1 ph.	30	11	5	26.10.39
Greensborough	E/M.	A.C., 3 ph.	803	229	5	23.3.26
Greenvale	Metro.	A.C., 1 ph.	500	9	5	15.7.38
Hallam	E/M.	A.C., 1 ph.	108	38	5	27.8.37
Harcourt	Mid.	A.C., 3 ph.	387	48	5	9.4.33
Harkaway	E/M.	A.C., 1 ph.	60	17	5	31.7.40
Harrietville†	N/E.	A.C., 3 ph.	150	43	5	29.6.40
Harrisfield	E/M.	A.C., 1 ph.	261	27	5	22.10.35
Hastings	E/M.	A.C., 1 ph.	538	113	5	28.3.27
Haunted Hills	Gipps.	A.C., 1 ph.	320	68	5	18.9.36
Hawkesdale	S/W.	A.C., 1 ph.*	220	10	5	26.4.40
Hazelwood	Gipps.	A.C., 1 ph.	160	56	5	9.9.36
Hazelwood North	Gipps.	A.C., 1 ph.	100	47	5	21.12.37
Healesville	E/M.	A.C., 3 ph. and 1 ph. ..	1,368	569	5	1.4.33
Heathmont	E/M.	A.C., 1 ph.	91	29	6	25.3.37
Hepburn Springs	Ball.	A.C., 3 ph.	500	223	5	1.10.40
Hexham	S/W.	A.C., 1 ph.*	120	13	5	8.7.38
Heyfield	Gipps.	A.C., 3 ph. and 1 ph. ..	830	168	5	15.9.24
Hillside	Gipps.	A.C., 1 ph.	50	17	5	29.5.36
Illowa	S/W.	A.C., 1 ph.*	100	10	5	30.9.37
Inverloch	Gipps.	A.C., 1 ph.	440	111	5	1.10.34
Irrewarra	S/W.	A.C., 1 ph.*	150	14	5	23.2.26
Jancourt	S/W.	A.C., 1 ph.	50	4	5	25.5.39
Jindivick	Gipps.	A.C., 1 ph.	180	73	5	23.8.38
Johnsonville	Gipps.	A.C., 1 ph.	120	32	5	24.1.36
Jordanville	E/M.	A.C., 1 ph.	56	14	5	7.10.38
Joyce's Creek	Mid.	A.C., 1 ph.	55	2	5	16.12.39
Jumbunna	Gipps.	A.C., 1 ph.	350	40	5	24.10.30
Kalimna Point	Gipps.	A.C., 1 ph.	140	13	5	6.12.28
Kalkallo	E/M.	A.C., 1 ph.	26	6	5	11.3.41
Kallista	E/M.	A.C., 1 ph.	230	115	5	19.8.27
Kalorama	E/M.	A.C., 1 ph.	211	76	5	31.5.34
Kardella	Gipps.	A.C., 1 ph.	50	7	5	23.9.36
Kariah	S/W.	A.C., 1 ph.*	20	4	5	12.11.38
Katamatite	N/E.	A.C., 1 ph.	238	33	5	14.7.39
Katunga	N/E.	A.C., 3 ph.	20	9	5	10.12.41
Keilor	Mid.	A.C., 1 ph.	312	46	5	21.11.35
Keysborough	E/M.	A.C., 1 ph.	140	28	5	21.8.41
Kiewa	N/E.	A.C., 1 ph.	155	51	5	12.4.39
Killarney	S/W.	A.C., 1 ph.*	80	9	5	14.5.35
Kilmany South	Gipps.	A.C., 1 ph.	125	7	5	1.7.39
Kilsyth	E/M.	A.C., 1 ph.	160	46	6	1.4.25
Kingston	Ball.	A.C., 1 ph.	270	19	5	16.9.39
Kirkstall	S/W.	A.C., 1 ph.*	80	3	5	9.4.40
Kolora	S/W.	A.C., 1 ph*	70	13	5	21.3.25
Kongwak	Gipps.	A.C., 3 ph. and 1 ph. ..	225	77	5	10.10.30
Koonwarra	Gipps.	A.C., 1 ph.	100	16	5	24.9.40
Koo-wee-rup	Gipps.	A.C., 3 ph. and 1 ph. ..	700	175	5	31.7.35
Koo-wee-rup North	Gipps.	A.C., 1 ph.	130	10	5	28.11.41
Koroit	S/W.	A.C., 3 ph.	1,700	215	5	1.12.28
Korrine	Gipps.	A.C., 1 ph.	40	9	5	19.12.40
Korumburra	Gipps.	A.C., 3 ph. and 1 ph. ..	3,000	595	5	1.12.24
Korumburra Rural	Gipps.	A.C., 1 ph.	100	15	5	1.11.35
Kyabram	N/E.	A.C., 3 ph.	2,170	594	5	1.12.26
Kyneton	Mid.	A.C., 3 ph.	4,170	847	3	1.10.29
Ky Valley	N/E.	A.C., 1 ph.	250	9	5	27.7.40
Lake Bolac	S/W.	A.C., 1 ph.*	150	39	5	5.8.38
Lake Gillear	S/W.	A.C., 1 ph.*	50	3	5	8.7.38
Lakes Entrance	Gipps.	A.C., 1 ph.	950	191	5	19.12.28
Lancaster	N/E.	A.C., 1 ph.	118	14	5	—.6.35
Lancefield	Mid.	A.C., 3 ph. and 1 ph. ..	716	110	5	27.3.29
Lang Lang	Gipps.	A.C., 3 ph. and 1 ph. ..	800	137	5	2.9.35
Lara	Geel.	A.C., 3 ph.	300	54	6	1.9.30
Lara Lake	Geel.	A.C., 3 ph.	(See Lara)		6	1.9.30
Lardner	Gipps.	A.C., 1 ph.	100	25	5	7.2.39
Laverton	Metro.	A.C., 1 ph.	480	75	5	22.11.38
Learmonth	Ball.	A.C., 3 ph.	350	53	5	19.3.38
Leigh Creek	Ball.	A.C., 1 ph.	36	6	5	27.8.40

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Country—*continued.*						
Lemnos	N/E.	A.C., 1 ph.	412	27	5	—.12.38
Leongatha	Gipps.	A.C., 3 ph.	2,000	590	5	15.2.25
Leongatha Rural	Gipps.	A.C., 1 ph.	60	56	5	1.8.28
Leongatha South	Gipps.	A.C., 1 ph.	150	39	5	24.9.40
Leopold	Geel.	A.C., 1 ph.	(See Drysdale)		5	13.2.24
Lilydale	E/M.	A.C., 3 ph. and 1 ph. ..	1,292	432	5	1.4.25
Lindenow	Gipps.	A.C., 1 ph.	250	61	5	6.4.35
Lindenow South	Gipps.	A.C., 3 ph. and 1 ph. ..	150	27	5	6.4.35
Linton	Ball.	A.C., 3 ph.	450	54	5	7.9.39
Lismore	S/W.	A.C., 1 ph.	450	67	5	26.4.38
Lismore Rural	S/W.	A.C., 1 ph.	600	116	5	26.4.38
Looh	Gipps.	A.C., 1 ph.	350	97	5	18.8.30
Lookwood	E/M.	A.C., 1 ph.	166	74	5	23.12.36
Longford..	Gipps.	A.C., 3 ph.	50	3	5	8.3.35
Longwarry	Gipps.	A.C., 3 ph. and 1 ph. ..	360	97	5	11.10.28
Lorne	S/W.	A.C., 3 ph. and 1 ph. ..	450	310	5	15.12.36
Lorne Rural	S/W.	A.C., 3 ph. and 1 ph.* ..	220	15	5	24.12.36
Lovely Banks	Geel.	A.C., 1 ph.	100	9	5	17.5.41
Lower Ferntree Gully	E/M.	A.C., 3 ph. and 1 ph. ..	818	269	5	24.8.25
Lower Plenty	E/M.	A.C., 1 ph.	137	51	5	13.3.28
Lucknow..	Gipps.	A.C., 3 ph.	150	48	3	—.8.27
Lyndhurst	E/M.	A.C., 3 ph.	158	5	5	19.1.38
Lysterfield	E/M.	A.C., 3 ph. and 1 ph. ..	117	19	5	17.7.37
Macarthur	S/W.	A.C., 1 ph.	350	55	5	3.4.40
Macarthur Rural	S/W.	A.C., 1 ph.	450	84	5	3.4.40
Macedon	Mid.	A.C., 3 ph. and 1 ph. ..	1,514	269	5	14.6.29
Maffra	Gipps.	A.C., 3 ph.	2,500	607	5	1.9.24
Maffra Rural	Gipps.	A.C., 1 ph.	300	36	5	14.8.28
Maldon	Mid.	A.C., 3 ph. and 1 ph. ..	1,104	177	5	1.7.36
Malmsbury	Mid.	A.C., 1 ph.	786	36	5	22.12.37
Mansfield	N/E.	A.C., 1 ph.	836	259	5	1.6.28
Mardan	Gipps.	A.C., 1 ph.	150	29	5	31.7.36
Marshall	Geel.	A.C., 1 ph.	70	17	5	6.10.39
Maryborough	Mid.	A.C., 3 ph.	6,500	1,428	3	1.10.37
Maryvale	Gipps.	A.C., 3 ph. and 1 ph. ..	80	19	5	6.8.37
Meeniyan	Gipps.	A.C., 1 ph.	300	93	5	14.9.36
Melton	Mid.	A.C., 3 ph. and 1 ph. ..	384	83	5	20.12.39
Melton South	Mid.	A.C., 1 ph.	(See Melton)		5	31.1.40
Mernda	E/M.	A.C., 1 ph.	220	27	5	28.9.37
Merricks North	E/M.	A.C., 1 ph.	17	14	5	24.5.40
Merrigum	N/E.	A.C., 3 ph.	329	105	5	22.2.27
Metropolitan Farm (Werribee) ..	Metro.	A.C., 3 ph. and 1 ph. ..	342	38	6	15.12.33
Metung	Gipps.	A.C., 1 ph.	150	34	5	23.12.35
Mickleham	Metro.	A.C., 3 ph. and 1 ph. ..	84	4	5	12.6.39
Milawa	N/E.	A.C., 3 ph. and 1 ph. ..	100	28	5	27.7.39
Miner's Rest	Ball.	A.C., 1 ph.	60	8	5	14.2.38
Mirboo	Gipps.	A.C., 1 ph.	70	39	5	7.8.39
Mirboo East	Gipps.	A.C., 1 ph.	70	10	5	1.8.40
Mirboo North	Gipps.	A.C., 3 ph. and 1 ph. ..	700	181	5	1.10.24
Moe	Gipps.	A.C., 3 ph.	1,160	345	5	23.9.23
Moe East	Gipps.	A.C., 1 ph.	260	39	5	24.6.38
Moe Rural	Gipps.	A.C., 1 ph.	300	33	5	14.7.30
Monbulk	E/M.	A.C., 1 ph.	301	95	5	30.11.36
Monegeetta	Mid.	A.C., 1 ph.	76	17	5	3.5.29
Monomeith	Gipps.	A.C., 1 ph.	70	21	5	17.1.36
Montmorency	E/M.	A.C., 1 ph.	419	126	5	11.5.26
Montrose..	E/M.	A.C., 3 ph. and 1 ph. ..	325	103	6	1.4.25
Moolap	Geel.	A.C., 1 ph.	(See Drysdale)		5	30.1.25
Moolort	Mid.	A.C., 1 ph.	83	5	5	14.2.38
Mooroduc	E/M.	A.C., 3 ph. and 1 ph. ..	23	19	5	2.3.25
Mooroolbark	E/M.	A.C., 1 ph.	54	12	5	16.9.36
Mooroopna	N/E.	A.C., 3 ph.	1,733	277	5	1.10.26
Morang South	E/M.	A.C., 1 ph.	230	27	5	28.9.37
Mornington	E/M.	A.C., 3 ph. and 1 ph. ..	2,399	765	3	1.8.30
Mortlake	S/W.	A.C., 3 ph.	1,000	248	5	1.5.24
Morwell	Gipps.	A.C., 3 ph. and 1 ph. ..	2,600	640	3	1.4.26
Morwell Bridge	Gipps.	A.C., 1 ph.	250	62	5	26.11.28
Mossiface	Gipps.	A.C., 1 ph.	160	11	5	1.10.30
Mountain View	Gipps.	A.C., 1 ph.	100	11	5	14.6.40
Moyarra	Gipps.	A.C., 1 ph.	100	22	5	26.6.30
Moyne View	S/W.	A.C., 1 ph.*	30	4	5	27.5.37
Mt. Dandenong	E/M.	A.C., 1 ph.	131	121	5	20.6.33
Mt. Duneed	Geel.	A.C., 1 ph.*	40	8	5	5.10.39
Mt. Eliza	E/M.	A.C., 3 ph. and 1 ph. ..	546	186	6	21.2.28
Mt. Evelyn	E/M.	A.C., 1 ph.	356	102	5	9.1.28
Mt. Martha	E/M.	A.C., 1 ph.	421	160	5	1.8.30
Mt. Waverley	E/M.	A.C., 1 ph.	154	40	5	1.6.28
Myer's Flat	Bend.	A.C., 1 ph.	20	6	5	29.6.40
Myrtlebank	Gipps.	A.C., 1 ph.	50	39	5	3.3.38
Myrtleford	N/E.	A.C., 3 ph.	850	251	5	2.12.40
Nalangil	S/W.	A.C., 1 ph.	100	23	5	19.12.24
Nanneella	N/E.	A.C., 1 ph.	513	115	5	17.10.38
Nar-Nar-Goon	Gipps.	A.C., 1 ph.	250	72	5	23.5.34
Narracan East	Gipps.	A.C., 1 ph.	50	8	5	23.7.40
Narre Warren	E/M.	A.C., 1 ph.	120	42	5	13.11.28

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Country—*continued.*						
Narre Warren North	E/M.	A.C., 1 ph.	105	14	5	10.11.38
Nathalia	N/E.	A.C., 3 ph.	1,051	214	5	1.10.31
Nayook	Gipps.	A.C., 1 ph.	80	17	5	15.1.35
Neerim	Gipps.	A.C., 1 ph.	180	38	5	15.1.35
Neerim East	Gipps.	A.C., 1 ph.	90	47	5	21.12.36
Neerim Junction	Gipps.	A.C., 1 ph.	150	37	5	3.5.35
Neerim North	Gipps.	A.C., 1 ph.	50	18	5	11.4.38
Neerim South	Gipps.	A.C., 1 ph.	485	194	5	15.1.35
New Gisborne	Mid.	A.C., 1 ph.	248	33	5	1.3.29
Newry	Gipps.	A.C., 3 ph. and 1 ph.	350	72	5	25.10.26
Newstead	Mid.	A.C., 3 ph.	387	80	5	20.4.37
Nicholson	Gipps.	A.C., 1 ph.	80	3	5	12.12.34
Nilma	Gipps.	A.C., 1 ph.	180	50	5	23.12.27
Noble Park	E/M.	A.C., 3 ph.	1,474	259	3	5.12.24
Noojee	Gipps.	A.C., 1 ph.	135	37	5	15.1.35
Noorat	S/W.	A.C., 3 ph. and 1 ph.	320	86	5	5.12.24
North Wonthaggi (portion only)	Gipps.	A.C., 1 ph.	30	5	5	17.2.41
Notting Hill	E/M.	A.C., 1 ph.	195	40	5	21.7.27
Numurkah	N/E.	A.C., 3 ph.	1,611	394	5	1.10.31
Nyora	Gipps.	A.C., 1 ph.	200	49	5	1.10.35
Oaklands Junction	Metro.	A.C., 1 ph.	30	6	5	10.12.35
Ocean Grove	Geel.	A.C., 1 ph.	300	117	5	27.9.24
Officer	E/M.	A.C., 1 ph.	170	44	5	12.4.28
Olinda	E/M.	A.C., 1 ph.	457	194	5	30.9.27
Orrvale	N/E.	A.C., 1 ph.	(See Shepparton East)		5	20.2.36
Outtrim	Gipps.	A.C., 1. ph.	200	23	5	13.11.39
Pakenham	E/M.	A.C., 1 ph.	550	158	5	18.6.28
Panmure	S/W.	A.C., 1 ph.*	200	25	5	3.9.37
Paynesville	Gipps.	A.C., 3 ph. and 1 ph.	450	53	5	25.2.38
Penshurst	S/W.	A.C., 1 ph.	720	114	5	16.9.38
Penshurst Rural	S/W.	A.C., 1 ph.	400	78	5	16.9.38
Picola	N/E.	A.C., 1 ph.	180	13	5	1.11.40
Pirron Yallock	S/W.	A.C., 1 ph.*	50	6	5	21.12.36
Point Cook (portion only)	Metro.	A.C., 1 ph.	28	7	5	1.7.40
Point Lonsdale	Geel.	A.C., 3 ph. and 1 ph.	250	162	5	30.12.23
Pomborneit North	S/W.	A.C., 1 ph.	100	20	5	1.9.26
Pomborneit South	S/W.	A.C., 1 ph.*	90	12	5	1.9.26
Poowong	Gipps.	A.C., 3 ph. and 1 ph.	360	116	5	11.9.30
Poowong East	Gipps.	A.C., 1 ph.	50	23	5	17.10.38
Portarlington	Geel.	A.C., 1 ph.	800	136	5	27.2.24
Port Fairy	S/W.	A.C., 3 ph.	1,850	397	5	21.12.28
Port Fairy North	S/W.	A.C., 3 ph. and 1 ph.	(See Port Fairy)		5	—.7.36
Port Fairy Rural	S/W.	A.C., 3 ph. and 1 ph.*	560	115	5	10.11.30
Port Franklin	Gipps.	A.C., 1 ph.	150	30	5	23.7.38
Portsea	E/M.	A.C., 3 ph.	493	155	5	1.10.27
Powlett River (portion only)	Gipps.	A.C., 1 ph.	40	8	5	17.1.41
Queenscliff	Geel.	A.C., 3 ph.	2,950	546	5	30.12.23
Ranceby	Gipps.	A.C., 1 ph.	60	4	5	23.6.41
Raywood	Bend.	A.C., 3 ph.	160	33	5	3.7.40
Red Hill	E/M.	A.C., 3 ph. and 1 ph.	388	78	5	30.6.37
Research	E/M.	A.C., 1 ph.	96	5	5	24.5.40
Riddell	Mid.	A.C., 3 ph. and 1 ph.	416	61	5	7.3.29
Ringwood	E/M.	A.C., 3 ph. and 1 ph.	3,774	990	6	1.4.25
Rochester	N/E.	A.C., 3 ph.	1,826	391	5	1.8.35
Rockbank	Mid.	A.C., 3 ph. and 1 ph.	121	20	5	3.4.39
Rokeby	Gipps.	A.C., 3 ph. and 1 ph.	50	8	5	4.4.35
Romsey	Mid.	A.C., 3 ph. and 1 ph.	750	125	5	19.3.29
Rosebrook	S/W.	A.C., 1 ph.*	180	12	5	30.9.36
Rosebud	E/M.	A.C., 3 ph. and 1 ph.	1,632	495	5	8.12.27
Rosedale	Gipps.	A.C., 1 ph.	500	89	5	15.8.27
Rubicon	N/E.	A.C., 1 ph.	62	2	5	4.9.27
Ruby	Gipps.	A.C., 1 ph.	70	26	5	19.4.28
Rutherglen	N/E.	A.C., 3 ph.	1,402	322	5	15.10.26
Ryanstown	Gipps.	A.C., 1 ph.	150	7	5	14.1.41
Rye	E/M.	A.C., 1 ph.	292	94	5	16.12.27
Sale	Gipps.	A.C., 3 ph.	6,000	1,145	3	1.7.24
Sale Rural	Gipps.	A.C., 1 ph.	250	65	5	12.12.28
Sassafras	E/M.	A.C., 3 ph. and 1 ph.	591	195	5	9.7.27
Scarsdale	Ball.	A.C., 1 ph.	230	9	5	5.9.39
Scoresby	E/M.	A.C., 1 ph.	103	22	5	23.9.37
Seaford	E/M.	A.C., 3 ph. and 1 ph.	1,062	304	6	21.2.28
Selby	E/M.	A.C., 1 ph.	92	43	5	12.12.35
Shepparton	N/E.	A.C., 3 ph.	7,590	1,877	3	1.1.25
Shepparton East	N/E.	A.C., 1 ph.	1,263	212	5	25.2.36
Sherbrooke	E/M.	A.C., 1 ph.	162	43	5	29.7.27
Shoreham	E/M.	A.C., 1 ph.	29	5	5	24.5.40
Silvan	E/M.	A.C., 3 ph. and 1 ph.	208	40	5	13.6.28
Skipton	Ball.	A.C., 3 ph. and 1 ph.	588	69	5	27.10.39
Smeaton	Ball.	A.C., 1 ph.	200	36	5	16.4.38
Smythesdale	Ball.	A.C., 1 ph.	280	14	5	2.9.39
Somers	E/M.	A.C., 1 ph.	192	63	5	24.12.35
Somerton	Metro.	A.C., 3 ph. and 1 ph.	90	8	5	22.7.38

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7. Column No.	Date Supply First Undertaken by Commission.
Country—*continued.*						
Somerville	E/M.	A.C., 3 ph. and 1 ph.	371	75	5	19.12.26
Sorrento	E/M.	A.C., 3 ph. and 1 ph.	1,361	426	5	1.10.27
South Belgrave	E/M.	A.C., 1 ph.	147	14	5	17.2.37
South Gisborne	Mid.	A.C., 3 ph. and 1 ph.	(See Gisborne)		5	1.5.37
South Purrumbete	S/W.	A.C., 1 ph.	200	4	5	25.5.39
Southern Cross	S/W.	A.C., 1 ph.*	20	6	5	31.8.38
Springhurst	N/E.	A.C., 3 ph.	229	47	5	6.9 26
Springvale	E/M.	A.C., 3 ph. and 1 ph.	2,214	585	5	5.12.24
St. Albans	Mid.	A.C., 3 ph. and 1 ph.	953	130	5	14.2.30
St. James	N/E.	A.C., 3 ph.	260	31	5	14.2.40
Stanhope	N/E.	A.C., 3 ph.	402	106	5	14.6.38
Stavely	S/W.	A.C., 1 ph.*	20	2	5	8.11.40
Stoneyford	S/W.	A.C., 1 ph.*	100	9	5	20.12.37
Stony Creek	Gipps.	A.C., 1 ph.	70	30	5	14.9.36
Stratford	Gipps.	A.C., 3 ph. and 1 ph.	900	164	5	20.12.26
Strathallan	N/E.	A.C., 1 ph.	30	2	5	5.11.35
Strathmerton	N/E.	A.C., 1 ph.	170	18	5	19.2.35
Streatham	S/W.	A.C., 1 ph.*	180	22	5	28.9.39
Sunbury	Mid.	A.C., 3 ph.	1,270	236	5	1.5.26
Swan Marsh	S/W.	A.C., 1 ph.*	100	15	5	4.6.37
Swan Reach	Gipps.	A.C., 1 ph.	120	33	5	11.7.30
Sydenham	Mid.	A.C., 3 ph. and 1 ph.	97	20	5	14.10.38
Talbot	Mid.	A.C., 1 ph.	442	71	5	27.8.38
Tallangatta	N/E.	A.C., 3 ph.	850	222	5	1.11.40
Tallygaroopna	N/E.	A.C., 3 ph.	228	15	5	22.10.33
Tally Ho	E/M.	A.C., 3 ph.	50	40	5	9.3.28
Tambo Upper	Gipps.	A.C., 1 ph.	100	14	5	24.12.37
Tandarook	S/W.	A.C., 1 ph.	50	4	5	25.5.39
Tangambalanga	N/E.	A.C., 3 ph.	170	29	5	12.4.39
Tangil South	Gipps.	A.C., 1 ph.	100	30	5	27.5.37
Tarago	Gipps.	A.C., 1 ph.	50	13	5	23.8.38
Tatura	N/E.	A.C., 3 ph.	1,506	336	5	1.11.26
Tecoma	E/M.	A.C., 3 ph.	(See Belgrave)		3	3.9.28
Teetora Road	Gipps.	A.C., 1 ph.	50	15	5	27.5.41
Terang	S/W.	A.C., 3 ph. and 1 ph.	2,350	594	5	7.3.24
Terang Rural	S/W.	A.C., 3 ph. and 1 ph.	900	268	5	9.1.36
Tesbury	S/W.	A.C., 1 ph.*	200	3	5	15.5.39
The Basin	E/M.	A.C., 1 ph.	242	22	5	13.9.39
Thomastown	E/M.	A.C., 3 ph.	145	36	5	1.6.28
Thornton	N/E.	A.C., 1 ph.	170	62	5	19.7.27
Thorpdale	Gipps.	A.C., 1 ph.	170	42	5	23.12.37
Tinamba	Gipps.	A.C., 1 ph.	330	112	5	11.7.28
Tongala	N/E.	A.C., 3 ph.	478	206	5	12.9.26
Toolamba West	N/E.	A.C., 1 ph.	(See Ardmona)		5	1.12.39
Toongabbie	Gipps.	A.C., 1 ph.	200	27	5	11.3.29
Toora	Gipps.	A.C., 3 ph. and 1 ph.	450	146	5	10.5.38
Tooradin	Gipps.	A.C., 1 ph.	200	46	5	14.1.37
Toorloo Arm	Gipps.	A.C., 1 ph.	50	5	5	13.2.40
Torquay	Geel.	A.C., 3 ph.	300	172	5	1.9.30
Torwood	Gipps.	A.C., 1 ph.	50	18	5	22.1.40
Tourello	Ball.	A.C., 1 ph.	14	2	5	10.8.38
Tower Hill	S/W.	A.C., 1 ph.*	40	6	5	30.6.35
Trafalgar	Gipps.	A.C., 3 ph.	1,150	346	5	16.10.23
Trafalgar Rural	Gipps.	A.C., 1 ph.	400	127	5	3.4.28
Traralgon	Gipps.	A.C., 3 ph. and 1 ph.	3,350	951	3	24.11.23
Traralgon Rural	Gipps.	A.C., 1 ph.	200	21	5	27.11.28
Traralgon South	Gipps.	A.C., 1 ph.	120	24	5	12.8.37
Tremont	E/M.	A.C., 1 ph.	402	100	5	2.9.27
Trentham	Mid.	A.C., 3 ph.	890	169	5	8.5.39
Triholm	Gipps.	A.C., 1 ph.	70	18	5	17.10.38
Tullamarine (portion only)	Metro.	A.C., 1 ph.	36	8	5	18.3.39
Tungamah	N/E.	A.C., 3 ph.	308	61	5	14.2.40
Tyabb	E/M.	A.C., 1 ph.	254	41	5	20.1.28
Tyers	Gipps.	A.C., 3 ph. and 1 ph.	260	66	5	15.10.23
Tylden	Mid.	A.C., 1 ph.	256	23	5	6.7.39
Tynong	Gipps.	A.C., 1 ph.	300	67	5	14.1.29
Upper Beaconsfield	E/M.	A.C., 1 ph.	310	62	5	—.8.34
Upper Ferntree Gully	E/M.	A.C., 3 ph. and 1 ph.	1,087	256	5	24.8.25
Upper Maffra West	Gipps.	A.C., 1 ph.	250	41	5	6.10.37
Upwey	E/M.	A.C., 3 ph. and 1 ph.	1,437	416	3	24.8.25
Valencia Creek	Gipps.	A.C., 1 ph.	100	13	5	11.6.38
Violet Town	N/E.	A.C., 3 ph.	680	125	5	2.3.36
Waaia	N/E.	A.C., 1 ph.	50	12	5	5.11.40
Wahgunyah	N/E.	A.C., 3 ph.	560	94	5	1.2.26
Wallace	Ball.	A.C., 3 ph.	150	22	5	17.5.40
Walpa	Gipps.	A.C., 1 ph.	50	12	5	16.5.35
Wangaratta	N/E.	A.C., 3 ph.	5,721	1,377	3	12.3.27
Wangaratta North	N/E.	A.C., 3 ph.	26	9	5	20.5.36
Wangaratta South	N/E.	A.C., 3 ph.	57	1	5	3.5.38
Wangoom	S/W.	A.C., 1 ph.*	200	4	5	9.5.39
Wantirna	E/M.	A.C., 3 ph.	86	21	5	1.2.28
Warncoort	S/W.	A.C., 1 ph.*	30	7	5	19.12.25
Warragul	Gipps.	A.C., 3 ph. and 1 ph.	3,100	850	3	1.12.30
Warragul Rural	Gipps.	A.C., 1 ph.	100	86	5	19.6.28

CENTRES SERVED BY STATE ELECTRICITY COMMISSION OF VICTORIA—*continued.*

Municipality or Centre.	Branch.	System of Supply.	Population.	Number of Consumers.	Tariffs as per Appendix No. 7, Column No.	Date Supply First Undertaken by Commission.
Country—*continued.*						
Warrandyte	E/M.	A.C., 1 ph.	288	139	5	21.12.35
Warrion	S/W.	A.C., 1 ph.	80	16	5	18.8.24
Warrnambool	S/W.	A.C., 3 ph. and 1 ph.	9,500	2,296	3	30.12.23
Warrnambool Rural	S/W.	A.C., 3 ph. and 1 ph.*	250	29	5	9.1.36
Warrong	S/W.	A.C., 1 ph.*	20	3	5	20.4.40
Watsonia	E/M.	A.C., 3 ph.	83	34	5	24.3.26
Waubra	Ball.	A.C., 1 ph.	110	15	5	18.12.40
Weerite	S/W.	A.C., 3 ph.	30	8	5	8.6.28
Welshpool	Gipps.	A.C., 3 ph. and 1 ph.	330	71	5	15.8.38
Werribee	Metro.	A.C., 3 ph. and 1 ph.	2,920	688	3	10.4.24
Werribee South	Metro.	A.C., 3 ph. and 1 ph.	540	90	5	24.11.36
Westbury	Gipps.	A.C., 1 ph.	50	11	5	27.5.37
Westmere	S/W.	A.C., 1 ph.*	50	12	5	30.9.38
Wheeler's Hill	E/M.	A.C., 1 ph.	124	23	5	1.2.26
Whittlesea	E/M.	A.C., 1 ph.	360	82	5	28.9.37
Willatook	S/W.	A.C., 1 ph.*	20	3	5	23.5.40
Willaura	S/W.	A.C., 1 ph.	400	91	5	23.9.38
Willaura Rural	S/W.	A.C., 1 ph.	1,000	154	5	23.9.38
Willowgrove	Gipps.	A.C., 1 ph.	60	32	5	22.5.39
Winchelsea	S/W.	A.C., 1 ph.	700	107	5	30.6.24
Wiseleigh	Gipps.	A.C., 1 ph.	130	7	5	24.10.30
Wodonga	N/E.	A.C., 3 ph.	3,381	594	5	1.11.33
Wonga Park	E/M.	A.C., 1 ph.	79	4	5	18.5.38
Woodend	Mid.	A.C., 3 ph. and 1 ph.	1,466	315	5	1.8.29
Woodglen	Gipps.	A.C., 1 ph.	30	7	5	16.4.40
Wool Wool	S/W.	A.C., 3 ph.	30	8	5	15.10.24
Woorndoo	S/W.	A.C., 1 ph.*	40	5	5	8.12.38
Wunghnu	N/E.	A.C., 1 ph.	210	19	5	—.10.33
Wy Yung	Gipps.	A.C., 3 ph. and 1 ph.	50	8	5	28.9.28
Yackandandah	N/E.	A.C., 3 ph.	363	93	5	20.12.39
Yallook	Gipps.	A.C., 1 ph.	100	10	5	25.11.37
Yangery	S/W.	A.C., 1 ph.*	120	6	5	22.6.38
Yannathan	Gipps.	A.C., 1 ph.	270	83	5	8.2.36
Yan Yean	E/M.	A.C., 1 ph.	110	18	5	28.9.37
Yarra Glen	E/M.	A.C., 1 ph.	315	59	5	15.3.34
Yarragon	Gipps.	A.C., 3 ph. and 1 ph.	600	177	5	1.11.23
Yarrawonga	N/E.	A.C., 3 ph.	2,874	534	5	1.8.25
Yering	E/M.	A.C., 1 ph.	15	12	5	24.2.34
Yeringberg	E/M.	A.C., 1 ph.	20	10	5	7.7.33
Yinnar	Gipps.	A.C., 3 ph. and 1 ph.	450	142	5	28.11.27

* = 230 V. only. † = Non-permanent supply.

ABBREVIATIONS.

Abbreviations.	Branch Title.	Location of Branch Headquarters.	Telephone.
Metro.	Metropolitan	238–242 Flinders-street, Melbourne	Cent. 10310 JM 1525
Ball.	Ballarat	1–7 Wendouree-parade, Ballarat	1825
Bend.	Bendigo	Cr. Hargreaves and Williamson streets, Bendigo	1700
E/M.	Eastern Metropolitan	197 Lonsdale-street, Dandenong	182
Geel.	Geelong	Corio-terrace, Geelong	1941
Gipps.	Gippsland	108–116 Franklin-street, Traralgon	114
Mid.	Midland	40 Lyttleton-street, Castlemaine	238
N/E.	North-Eastern	80 Bridge-street, Benalla	192
S/W.	South Western	119–121 Murray-street, Colac	660

System of Supply.—A.C. Single-phase—Metropolitan area, 200–400 volts.
Other areas, 230–460 volts.
A.C. Three-phase, 230–400 volts.
D.C. Three-wire, 230–460 volts.

ELECTRICITY SUPPLY UNDERTAKINGS (MUNICIPAL AND PRIVATE).

Municipality or Centre.	Supply Authority.	System of Supply.	Population.	Number of Consumers.	Tariffs.	
METROPOLITAN.						
Supplied in Bulk by State Electricity Commission.						
City of Melbourne (excl. Flemington)	Melbourne City Council ..	D.C., 230–460 v. / A.C., 3 ph., 230–400v.	74,900	26,918	Metropolitan Standard Tariffs apply in all these territories with the exception of that of the Melbourne City Council, which has the following Metropolitan Standard Tariffs only :—Residential, All-Purposes, Night Rate Water Heating. In addition to the above, the Melbourne City Council has Tariffs different from Standard for commercial and industrial lighting, radiators, and power and heating.	
Box Hill, Blackburn and Mitcham Shire	Box Hill City Council ..	A.C., 3 ph., 230–400 v.	24,120	7,298		
Brunswick ..	Brunswick City Council ..	A.C., 3 ph., 230–400 v.	55,000	14,590		
Coburg ..	Coburg City Council	A.C., 3 ph., 230–400 v.	46,407	12,192		
Footscray and part of Braybrook Shire	Footscray City Council ..	A.C., 3 ph., 230–400 v.	58,000	13,980		
Heidelberg (excl. Greensborough)	Heidelberg City Council ..	A.C., 3 ph., 230–400 v.	26,250	7,751		
Northcote ..	Northcote City Council ..	A.C., 3 ph., 230–400 v.	42,395	11,682		
Port Melbourne	Port Melbourne City Council ..	A.C., 3 ph., 230–400 v.	13,000	3,517		
Preston ..	Preston City Council ..	A.C., 3 ph., 230–400 v.	35,500	10,096		
Williamstown ..	Williamstown City Council ..	A.C., 3 ph., 230–400 v.	22,850	6,960		
			398,422	114,984		
COUNTRY.					Lighting.	Power.
Apollo Bay ..	H. A. Block	D.C., 230 v. ..	500	134	1s. 3d. to 1s. ..	6d. to 2½d.
Ararat ..	Ararat Borough Council ..	A.C., 3 ph., 230–400 v.	5,500	1,220	gd.	3½d.
*Aspendale, Chelsea, and Carrum	Carrum E.S. Co. Ltd. ..	A.C., 3 ph., 230–400 v.	8,500	2,894	Similar to State Electricity Commission's Frankston centre.	
Beaufort ..	Ripon Shire Council	A.C., 3 ph., 230–400 v.	1,500	275	9d.	3d.
Beechworth ..	Beechworth Shire Council ..	A.C., 3 ph., 230–400 v.	1,850	472	1s.	6d.
Berriwillock ..	Wycheproof Shire Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Wycheproof)	11d. to 9d. ..	5d. to 2d.
Beulah ..	Karkarooc Shire Council ..	D.C., 230–460 v. ..	550	156	1s. 3d. ..	4d.
Birchip ..	Birchip E.S. Co. Ltd. ..	D.C., 230 v. ..	700	205	1s.	6d. to 4d.
Boort	Boort Co-op. Butter and Ice Co. Ltd.	D.C., 230 v. ..	700	195	1s. 3d. to 9d.	6d. to 4d.
Broadford ..	Broadford Shire Council ..	D.C., 230 v. ..	1,000	231	9d.	6d.
Cardross ..	Mildura City Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Mildura)	9½d. to 6¾d. ..	Dom. 2¾d. Ind. 4¾d. to 1d.
Casterton ..	Casterton E.S. Co. Pty. Ltd. ..	D.C., 230 v. ..	1,800	434	9d. to 7d. ..	4d. to 1·1d.
Charlton ..	Charlton E.L. and P. Co. Ltd.	D.C., 230 v. ..	1,400	354	1s. to 7d. ..	5d. to 3d.
Cohuna ..	Gunbower Co-op. Butter Factory and Trading Co. Ltd.	A.C., 3 ph., 230–400 v.	1,050	321	1s. to 9d. ..	6d. to 2d.
Coleraine ..	Hamilton E.S. Co. Ltd. ..	A.C., 3 ph., 230–400 v.	900	246	11d.	6d. to 1·65d.
——— ..	Corindhap Hydraulic G.S. Co. N.L.	A.C., 3 ph.	..	..	No supply to consumers	
Corryong ..	Shire of Upper Murray ..	A.C., 3 ph., 230–400 v.	500	177	1s. 3d. ..	6d. to 3d.
Culgoa ..	Wycheproof Shire Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Wycheproof)	11d. to 9d. ..	5d. to 2d.
Dimboola ..	Dimboola Shire Council ..	D.C., 230–460 v. ..	1,650	453	1s. to 8d. ..	6d. to 3d.
Donald ..	Donald Shire Council ..	D.C., 230 v. ..	1,500	376	1s.	6d. to 2¾d.
*Doncaster and Templestowe	Doncaster Shire Council ..	A.C., 1 ph., 200–400 v.	2,750	545	7d.	4d.
Dumosa ..	Wycheproof Shire Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Wycheproof)	11d. to 9d. ..	5d. to 2d.
Edenhope ..	Edenhope E.S. Co. Pty. Ltd.	D.C., 230 v. ..	650	77	1s. 3d. ..	9d.
Elmore ..	Elmore E.L. and P. Co. Ltd.	D.C., 230 v. ..	700	181	1s.	6d.
Goroke ..	Goroke Butter and Freezing Co.	D.C., 230 v. ..	350	45	1s. 4d. to 9d. ..	6d. to 3d.
Gunbower ..	Gunbower Co-op. Butter Factory and Trading Co. Ltd.	D.C., 230 v. ..	220	40	1s. to 9d. ..	6d. to 2d.
Hamilton ..	Hamilton E.S. Co. Ltd. ..	D.C., 230 v. / A.C., 3 ph., 230–400 v.	6,000	1,462	6d. to 5d. ..	5d. to 1d.
Heathcote ..	McIvor Shire Council ..	D.C., 230–460 v. ..	1,500	226	1s.	6d. to 4½d.
Heywood ..	S. F. Block	A.C., 3 ph., 230–400 v.	550	123	1s. 3d. to 1s.	6d to 3d.
Hopetoun ..	Karkarooc Shire Council ..	D.C., 230 v. ..	710	197	10d. ..	4d.
Horsham ..	Horsham Borough Council ..	D.C., 230–460 v. / A.C., 3 ph., 230–400 v.	6,100	1,463	9d. to 6d. ..	4d. to 1¼d.
Inglewood ..	Inglewood Borough Council ..	D.C., 230 v. ..	1,000	214	1s. to 9d. ..	6d. to 2d.
Irymple ..	Mildura City Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Mildura)	9½d. to 6¾d. ..	Dom. 2¾d. Ind. 4¾d. to 1d.
Jeparit ..	S. F. Block	D.C., 230 v. ..	600	220	1s. to 9d. ..	6d. to 4d.
Kaniva ..	Kaniva Shire Council ..	A.C., 3 ph., 230–400 v.	1,200	200	1s.	6d. and 5d.
Kerang ..	Kerang Shire Council ..	A.C., 3 ph., 230–400 v.	3,000	709	7d. to 4d. ..	4d. to 1½d.
Kilmore ..	Kilmore Shire Council ..	D.C., 230 v. ..	1,000	237	10d. to 6d. ..	4d. to 2d.
Koondrook ..	Kerang Shire Council ..	A.C., 3 ph., 230–400 v.	600	96	1s. 3d. ..	9d. to 3½d.
Korong Vale ..	Korong Shire Council ..	A.C., 3 ph., 230–400 v.	..	(See Wedderburn)	1s.	5d. to 4d.
Manangatang ..	J. Andrews	D.C., 230 v. ..	350	43	1s. 4d. ..	9d. to 1d.
Merbein ..	Mildura City Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Mildura)	9½d. to 6¾d. ..	Dom. 2¾d. Ind. 4¾d. to 1d.

* Supplied in bulk by State Electricity Commission.

ELECTRICITY SUPPLY UNDERTAKINGS (MUNICIPAL AND PRIVATE)—*continued.*

Municipality or Centre.	Supply Authority.	System of Supply.	Population.	Number of Consumers.	Tariffs.	
					Lighting.	Power.
COUNTRY—*continued.*						
Mildura ..	Mildura City Council ..	A.C., 3 ph., 230–400 v.	14,500	3,714	City, 7d. to 5¾d.; District, 9½d. to 6¾d.	City — Dom. 2d., Ind. 4½d. to 0·9d. Dist. —Dom. 2¾d., Ind. 4¾d. to 1d.
Minyip ..	Dunmunkle Shire Council ..	D.C., 230 v. ..	700	181	1s.	8d. to 2d.
Mitiamo ..	C. W. Sims Jnr.	D.C., 230 v. ..	150	28	1s. 3d. ..	1s. 3d. Optional Tariff—4s. per month, plus 1s. per unit for first 12 units and 6d. per unit for all over.
Murchison ..	Waranga Shire Council ..	A.C., 3 ph., 230–400 v.	650	136	1s. 2d. to 9d. ..	5½d. to 2d.
Murrayville ..	Walpeup Shire Council ..	A.C., 3 ph., 230–400 v.	375	66	1s. 3d. ..	6d. to 2d.
Murtoa ..	Dunmunkle Shire Council ..	D.C., 230 v. ..	1,240	309	9d.	4d. to 2d.
Nagambie ..	Goulburn Shire Council ..	D.C., 230–460 v. ..	800	196	10d. ..	6d.
Natimuk ..	H. C. Woolmer	A.C., 230–400 v. ..	500	103	1s. 3d. to 1s.	6d. to 3d.
Nhill	Lowan Shire Council ..	D.C., 230–460 v. ..	1,990	492	9d.	5d. to 2d.
Nullawil ..	Wycheproof Shire Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Wycheproof)	11d. to 9d. ..	5d. to 2d.
Omeo	Omeo E.S. and Motor Co. Pty. Ltd.	A.C., 3 ph., 230–400 v.	500	121	1s. 6d. ..	6d.
Orbost ..	Orbost Butter Produce Co. Ltd.	D.C., 230 v. ..	1,600	401	10d. to 8d. ..	5d. to 3d.
Ouyen ..	Walpeup Shire Council ..	D.C., 230–460 v. ..	900	240	11d. ..	3d. to 2d.
Phillip Island ..	Phillip Island Shire Council ..	A.C., 3 ph., 230–400 v.	1,200	130	1s. 1½d. ..	7d.
Portland ..	Portland Borough Council ..	A.C., 3 ph., 230–400 v.	3,000	773	10d. to 7d. ..	5d. to 3d.
Pyramid ..	Gordon Shire Council ..	A.C., 3 ph., 230–400 v.	450	96	1s. 3d. to 6d.	6d. to 3d.
Quambatook ..	Kerang Shire Council ..	D.C., 230 v. ..	500	115	1s. 1d. to 1s.	6d. to 4d.
Rainbow ..	Rainbow E.L. Co.	D.C., 230 v. ..	1,000	187	1s. to 8d. ..	6d.
Red Cliffs ..	Mildura City Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Mildura)	9½d. to 6¾d. ..	Dom. 2¾d. Ind. 4¾d. to 1d.
Rupanyup ..	Dunmunkle Shire Council ..	D.C., 230 v. ..	600	160	1s. 1d. to 8d.	8d. to 2d.
Rushworth ..	Waranga Shire Council ..	D.C., 230 v. ..	1,200	297	8d.	3½d. to 2d.
Sea Lake ..	Wycheproof Shire Council ..	A.C., 3 ph., 230–400 v.	..	(Incl. in Wycheproof)	11d. to 9d. ..	5d. to 2d.
Serviceton ..	C. C. Wallis	D.C., 230 v. ..	170	30	1s. 3d. ..	6d.
Seymour ..	Seymour Shire Council ..	A.C., 3 ph., 230–400 v.	5,000	754	10d. ..	3d. to 2d.
Stawell ..	Stawell Borough Council ..	A.C., 3 ph., 230–400 v.	4,500	1,164	9d.	4d. to 3d.
St. Arnaud ..	St. Arnaud Borough Council ..	A.C., 3 ph., 230–400 v.	3,000	691	10d. to 9d. ..	4d. to 1¾d.
Swan Hill (Borough) ..	Swan Hill Borough Council ..	A.C., 3 ph., 230–400 v.	4,800	1,000	1s.	3·25d.
Swan Hill (Rural Supply)	Swan Hill Shire Council ..	A.C., 3 ph., 230–400 v.	1,180	550	1s. 1d. to 6d. ..	5d. to 3d.
Underbool ..	A. J. Gloster	D.C., 230 v. ..	250	33	1s. 3d. ..	6d.
Warburton ..	Upper Yarra E.S. Co. Pty. Ltd.	A.C., 3 ph., 230–400 v.	1,200	248	8d.	4d.
Warracknabeal ..	Warracknabeal E.L. Co. Ltd. ..	A.C., 3 ph., 230–400 v.	2,800	651	10d. ..	6d. to 3d.
Wedderburn (Incl. Korong Vale)	Korong Shire Council ..	A.C., 3 ph., 230–400 v.	1,510	Wedderburn, 164 Korong Vale, 83	1s.	5d. to 4d.
Wonthaggi ..	State Coal Mine	A.C., 3 ph., 240–415 v.	7,300	1,413	7d.	3d. to 1½d.
Wycheproof (Incl. Sea Lake and Intermediate Towns)	Wycheproof Shire Council ..	A.C., 3 ph., 230–400 v.	2,300	527	11d. to 9d. ..	4d. to 2¼d.
Yarram ..	Yarram H.E. Co. Ltd. ..	A.C., 3 ph., 230–400 v.	5,000	470	11d. ..	4d. to 1d.
Yea	Yea Shire Council	A.C., 3 ph., 230–400 v.	950	257	10d. to 9d. ..	4d. to 3d.

NEW SOUTH WALES UNDERTAKINGS (BULK SUPPLIES).

(Not included in Summary.)

Municipalities of Albury, Berrigan, Coreen, Corowa, and Moama purchased from the State Electricity Commission of Victoria 10,446,529 kWh. during the year.

STATE ELECTRICITY COMMISSION OF VICTORIA.

COUNTRY UNDERTAKINGS ACQUIRED—INCREASED DEVELOPMENT SINCE ACQUISITION.

Location.	Acquisition Date.	After Acquisition. Year 1941-42.		Prior to Acquisition.			Average Revenue per kWh. Sold.	
		kWh. Sold.	Revenue.	kWh. Sold.	Revenue.	For Year Ended.	1941-42.	Prior to Acquisition.
			£		£		*d.*	*d.*
Metropolitan Branch.								
Werribee	10.4.24	1,847,798	14,170	61,190	2,575	30·9·23	1·84	10·10
Ballarat Branch.								
Ballan	1.3.40	44,390	989	13,261	964	30.6.39	5·35	17·45
Daylesford	31.10.40	820,170	6,533	184,853	5,091	30.10.40	1·91	6·61
Hepburn Springs	1.10.40	84,709	1,659	46,002	1,701	30.6.40	4·70	8·87
Wallace	17.5.40	99,595	479	1,320	90	30.6.39	1·15	16·36
Bendigo Branch.								
Eaglehawk	1.2.36	275,429	5,030	198,580	4,472	30.9.35	4·38	5·40
Eastern Metropolitan Branch.								
Dandenong	1.10.23	2,508,757	20,154	77,300	4,006	30.9.23	1·93	12·44
Frankston	21.2.28	2,610,911	21,855	293,000	8,859	30.9.27	2·01	7·25
Healesville	1.4.33	732,372	8,585	108,910	4,196	30.9.31	2·81	9·24
Lilydale	1.4.25	1,307,855	7,230	39,950	1,816	30.9.24	1·33	10·91
Mornington	1.8.30	1,264,304	12,054	120,000	4,634	30.9.28	2·29	9·26
Ringwood and Croydon ..	1.4.25	1,852,956	16,847	181,600	4,393	30.9.24	2·18	5·81
Sorrento and Portsea	1.10.27	955,457	11,900	47,500*	2,440	30.9.27	2·99	12·33*
Gippsland Branch.								
Bairnsdale	1.4.27	1,462,335	13,858	100,272	2,948	30.6.23	2·27	7·06
Drouin	3.10.24	689,595	4,460	19,500	743	30.9.21	1·55	9·15
Garfield	1.8.29	49,940	649	8,864	465	30.12.27	3·12	12·59
Inverloch	1.10.34	55,197	822	4,000*	200	30.6.34	3·57	12·00*
Koo-wee-rup	1.8.35	478,426	4,356	17,481	686	9.8.33	2·19	9·42
Korumburra	1.12.24	1,158,162	8,011	85,000	3,427	30.9.23	1·66	9·68
Leongatha	15.2.24	785,683	7,562	50,640	2,012	30.6.23	2·31	9·53
Maffra	1.9.24	2,383,586	11,684	62,000	2,651	30.9.22	1·18	10·26
Morwell	1.4.26	7,066,251	22,462	52,062	1,772	30.9.25	0·76	8·17
Neerim South–Noojee	15.1.35	823,893	6,846	59,550	1,193	30.6.33	1·99	4·81
Sale	1.7.24	2,005,097	16,877	114,155	3,687	30.6.24	2·02	7·75
Toora–Foster	1.5.38	446,536	4,375	116,330	2,348	30.6.36	2·35	4·84
Thorpdale	23.12.37	40,791	517	5,000*	312*	23.12.37	3·04	14·98*
Warragul	1.12.30	1,350,184	12,319	150,000*	4,830	30.11.30	2·19	7·73*
Welshpool	13.8.38	46,585	698	5,280	172*	13.8.38	3·60	7·82*
Midland Branch.								
Avoca	1.8.40	85,330	1,586	46,410	1,922	30.6.40	4·46	9·94
Bacchus Marsh	2.6.41	890,242	7,143	253,913	4,225	30.9.40	1·93	3·99
Castlemaine	31.12.29	2,020,641	14,673	175,904	7,130	31.12.28	1·74	9·73
Dunolly	1.4.38	62,731	1,186	32,667	1,188	30.9.37	4·54	8·73
Gisborne	1.10.28	128,516	1,511	17,000	1,074	30.9.27	2·82	15·16
Kyneton	1.10.29	697,549	7,735	143,340	5,433	30.9.27	2·66	9·09
Maryborough	1.10.37	1,539,877	13,859	421,013	10,215	30.9.37	2·16	5·82
Sunbury	1.5.26	348,499	4,172	58,501	2,490	30.9.24	2·87	10·21
Trentham	8.5.39	80,038	1,296	21,000*	989	30.9.38	3·89	11·30*
Woodend	1.8.29	246,720	3,111	51,000	2,555	30.9.27	3·03	12·02
North-Eastern Branch.								
Alexandra	11.4.27	245,516	2,753	64,000*	1,875	30.9.26	2·69	7·00*
Benalla	1.5.26	1,449,148	14,871	70,800	3,373	30.9.24	2·46	11·43
Cobram	1.10.28	145,244	2,053	19,500	1,416	30.9.27	3·39	17·43
Euroa	20.3.28	289,564	4,714	46,618	1,782	30.9.25	3·91	9·17
Kyabram	1.12.26	503,292	4,892	92,312	3,462	4.7.25	2·33	9·00
Mansfield	1.6.28	190,432	2,363	25,000	1,341	30.9.27	2·98	12·88
Mooroopna	1.10.26	910,823	5,047	40,000	1,457	30.9.25	1·33	8·74
Myrtleford	1.12.40	148,112	2,220	59,260	2,089	30.6.40	3·60	8·46
Nathalia and Numurkah ..	1.10.31	514,484	6,045	96,763	3,619	30.9.31	2·82	8·97
Rochester	1.8.35	341,644	3,910	191,310	4,223	31.7.35	2·75	5·30
Rutherglen	15.10.26	1,825,248	9,673	28,392	1,377	30.9.24	1·27	11·64
Shepparton	1.1.25	2,652,713	23,346	163,400	4,625	30.6.24	2·11	6·79
Stanhope	14.6.38	89,640	1,090	5,150*	341	14.6.38	2·92	15·89*
Tallangatta	1.11.40	168,440	2,417	118,033	3,119	30.9.40	3·44	6·34
Tatura	1.11.26	385,698	3,695	40,000	1,710	30.6.25	2·30	10·26
Violet Town	1.3.36	60,892	1,120	14,650*	1,160	30.9.35	4·41	19·00*
Wahgunyah	1.2·26	59,380	777	7,233	263	30.9.22	3·14	8·73
Wangaratta	12.3·27	6,127,012	28,145	151,600	4,788	30.9.25	1·10	7·58
Wodonga	1.11·33	427,372	5,213	64,500*	3,000*	30.6.33	2·93	11·16*
Yarrawonga	1.8·25	925,608	6,830	47,000	2,149	30.9.24	1·77	10·97
South-Western Branch.								
Camperdown	1.1.24	884,607	8,548	97,664	4,122	30.9.23	2·32	10·13
Colac	1.9.23	1,743,094	17,773	99,000	2,673	30.9.22	2·45	6·48
Koroit	1.12.28	212,247	2,320	50,000	2,319	30.9.28	2·62	11·13
Lorne	15.12.36	296,965	3,231	24,000	1,658	30.9.36	2·61	16·58
Mortlake	16.5.24	200,362	2,282	35,306	1,626	30.9.22	2·73	11·05
Terang	4.3.24	486,799	6,203	78,839	3,439	30.9.23	3·06	10·47
Total	..	60,631,443	470,784	5,174,678	172,910	..	1·86	8·02

* Approximate only.

COMPARISON OF TOTAL FIGURES.

	kWh. Sold.	Revenue. £	Average Revenue per kWh. *d.*
After acquisition	60,631,443 ..	470,784 ..	1·86
Prior to acquisition	5,174,678 ..	172,910 ..	8·02
Increase in sales and revenue ..	1,071·7% ..	172·3% ..	Decrease 6·16 = 76·8%

APPENDIX No. 10.

STATE ELECTRICITY COMMISSION OF VICTORIA.

TRANSMISSION AND DISTRIBUTION SYSTEMS.

Description.		Increase during Year ended 30th June, 1942		Total at 30th June, 1942.	
		Route Miles.	Cable Miles.	Route Miles.	Cable Miles.
OVERHEAD LINES.					
Yallourn to Yarraville	132 kV.	..	..	110·0	660·0
Yallourn to Richmond	132 kV.	..	..	80·0	480·0
Yarraville to Geelong	66 kV.	..	..	45·3	136·0
Sugarloaf to Thomastown	66 kV.	..	..	62·0	345·0
Thomastown to Bendigo	66 kV.	..	..	93·4	436·8
Newport to Ballarat	66 k.V.	54·5	163·5	54·5	163·5
Main Metropolitan Transmission Lines	66 kV.	..	..	16·0	64·5
	22 kV.	3·3	9·8	165·4	550·0
Branches—					
Metropolitan	22 kV.	3·6	10·5	43·5	127·6
	7·2, 6·6, 4·16 kV.	11·5	43·3	312·8	886·5
	Low tension	23·0	103·4	1,505·6	6,391·6
Ballarat	22 kV.	..	— 0·1	136·9	401·2
	6·6 kV.	— 0·7	— 1·2	34·6	101·5
	Low tension	3·9	17·2	172·4	624·6
Bendigo	22 kV.	3·7	15·8	59·0	182·3
	Low tension	2·0	7·9	132·9	573·0
Eastern Metropolitan	22 kV.	13·3	32·8	369·5	956·6
	6·6 kV.	— 5·8	— 16·4	113·6	269·0
	Low tension	26·4	71·1	558·5	1,772·2
Geelong	22 kV.	6·3	11·3	86·4	226·0
	6·6 kV.	2·1	— 2·6	58·6	219·6
	Low tension	2·9	8·4	172·1	619·1
Gippsland	22 kV.	21·8	72·3	957·5	2,373·9
	6·6 kV.	..	..	0·9	1·7
	Low tension	20·8	58·0	592·3	1,948·1
Midland	22 kV.	10·2	17·7	253·2	689·2
	6·6 kV.	..	..	1·6	4·7
	Low tension	4·3	11·1	199·0	655·6
North-Eastern	66 kV.	13·3	39·8	200·7	614·6
	22 kV.	12·4	29·6	659·5	1,933·3
	Low tension	5·0	23·7	346·7	1,202·0
South-Western	44 kV.	0·1	0·1	116·3	487·5
	22 kV.	48·2	125·6	688·2	1,491·6
	6·6 kV.	— 8·8	— 20·7	109·1	271·0
	Low tension	8·2	22·7	301·3	791·5
Yallourn	6·6 kV.	0·4	1·1	4·9	14·7
	Low tension	0·3	1·1	11·0	31·8
Summary—	132 kV.	..	..	190·0	1,140·0
	66 kV.	67·8	203·3	471·9	1,760·4
	44 kV.	0·1	0·1	116·3	487·5
	22 kV.	122·8	325·3	3,419·1	8,931·7
	7·2, 6·6, 4·16 kV.	— 1·3	3·5	636·1	1,768·7
	Low tension	96·8	314·6	3,991·8	14,609·5
		286·2	846·8	8,825·2	28,697·8

UNDERGROUND CABLES.	Cable Miles.	Cable Miles.
22 kV.	6·35	139·68
11, 7·2, 6·6, 4·16 and 3·3 kV.	4·15	450·72
Pilot, telephone, and supervisory	5·45	62·81
Low tension	1·19	106·48
	17·14	759·69

SUB-STATIONS.	Number.	Capacity kVA.	Number.	Capacity kVA.
Terminal Stations	..	— 9,450	6	382,450
Main Metropolitan Transmission Sub-stations	4	31,000	28	328,750
Distribution Sub-stations at Line Voltage	..	..	13	27,530
Branches—				
Metropolitan	28	10,160	718	182,945
Ballarat	— 1	— 1,775	97	6,390
Bendigo	4	1,365	45	15,265
Eastern Metropolitan	26	617	467	15,426
Geelong	10	2,078	139	21,395
Gippsland	25	2,360	719	18,035
Midland	13	605	170	14,230
North-Eastern	33	— 1,960	391	36,790
South-Western	45	1,301	595	23,838
Yallourn	1	50	11	1,315
	188	36,371	3,399	1,074,359

STATE ELECTRICITY COMMISSION OF VICTORIA.

SUPPLEMENT TO TWENTY-THIRD ANNUAL REPORT

MITIGATION OF ELECTROLYSIS IN VICTORIA.

INTRODUCTION.

Under the State Electricity Commission Act No. 3776 (Section 27) the Commission may, by regulation, prescribe precautions to prevent or minimize injurious interference by electrolytic action on underground metallic pipes or cables.

Brief reference has been made in previous Annual Reports to the activities of the Melbourne Electrolysis Committee. The following records the circumstances leading up to the formation of the Committee in 1927, its investigations in the field of electrolysis mitigation and the success of the remedial measures it has introduced.

Since 1929 the total reports of damage to underground installations has been reduced by two-thirds. This marked achievement covers a period throughout which there has been a considerable increase in the underground cable and pipe networks in Melbourne and of loading on tramway and railway tracks. The result is the more notable because it has been obtained solely by co-operation of the public bodies concerned, and notwithstanding that some had opposing interests. There has been no recourse to special legislation or regulation, and unless there is some unforeseen change in outlook by individual bodies such statutory requirements will be unnecessary.

In short, the problem is only soluble by the co-operation of those utilities which, on the one hand, create the nuisance, and those which are potential sufferers.

It would be idle to speculate on the extent of stray current damage that would have occurred in Melbourne had the Electrolysis Committee not been formed, but it is clear that a very serious situation has been avoided. The benefits of the Committee's activities can be measured in the reduction in the number of faults and, more importantly, in the training of many engineers in the technique of electrolysis mitigation.

Electrolysis in Melbourne.

The electrified transportation systems in Melbourne, in common with the majority of systems elsewhere, use conducting rails uninsulated from the general mass of the earth. Under operating conditions the rail returns have an electric potential gradient impressed across them, and, where these rails are at a positive potential compared with the ground, a leakage current flows, its magnitude depending upon the potential and the leakage resistance of the rail-earth path. At other points the rails are below earth potential and at these points collect the current that has escaped elsewhere. Some of this earth leakage current finds its way to buried metal pipes and cables, and, where in due course it leaves these conduits on its return to the rail system, it corrodes the metal wall of the pipe or cable at a rate depending upon several factors, some of which are very difficult to measure. A fundamental factor, not generally appreciated until it was established by careful experiment, is the relationship between the electric potential applied across a metal-liquid (moist soil) boundary and the resulting current. With the commercial metals used in rails, pipes and cables it appears that any potential, however small, impressed across a metal-liquid interface will cause a corroding current to flow. In other words, there is no threshold potential below which these metals are immune from electrolysis attack; this fact makes it impossible to fix a safe limitation for rail potentials. While it is recognized that rail potentials should not be "excessive," remedial measures cannot be applied exclusively to the traction system.

The Electrolysis Investigating Board.

In 1919 corrosion was becoming apparent, and was difficult to assign to the offending transport system because, at that time, the Victorian Railways Commissioners began the electrification of the suburban railway system, and the then recently constituted Melbourne and Metropolitan Tramways Board was in the process of consolidating several independent street traction systems.

In 1922 some alarm was caused by the discovery that a reinforced concrete structure near a railway viaduct had apparently been damaged by electrolytic action. Tests made in September, 1922, disclosed that it was a special case and not likely to be repeated elsewhere. Nevertheless, public attention was focussed upon the subject, and in November, 1922, the State Electricity Commission of Victoria was asked by the Government to report upon the matter. The Commission called a conference of the interested utilities and formed an Electrolysis Investigating Board, with the following terms of reference :—

1. To discuss generally the question of electrolysis in the metropolis and to propose measures for ascertaining the present extent, nature, and causation of damage (if any) due to electrolytic action.
2. To draft regulations, suitable for adoption by the Commission, directed towards securing the adoption by public authorities responsible for electric traction, of reasonable preventive and remedial measures.
3. To draft regulations, suitable for adoption by the Commission, directed towards requiring public bodies and private persons liable to suffer damage from electrolytic action to adopt reasonable protective measures.
4. To report generally upon the whole question.

In November, 1923, draft regulations governing the operation of electric tramways were drawn up by the Investigating Board which, in the process, considered the regulations of the British Board of Trade and many foreign countries. A limited amount of field work was undertaken and an attempt made to bring electrified railways operating on their own right-of-way within the ambit of similar regulations. There was no precedent, and as about 90 per cent. of the telephone cable faults were occurring in areas where the Postmaster-General's existing regulations were complied with, some other approach to the problem was necessary. Moreover, currents originating in railway operations found their way to tramway rails ; for these reasons it was difficult to apply satisfactory limits to each traction system.

The Melbourne Electrolysis Committee.

Surveys were then undertaken by the Investigating Board. By September, 1925, the damage to telephone cables alone was £20,000 per annum. On 1st June, 1926, the Board suggested that a co-operative committee of the affected parties should be established with the primary object of bringing about a working relationship, for practically none existed. On 11th November, 1926, the Board presented its final report, which included a strong recommendation that a permanent committee be set up. This committee was formed by the State Electricity Commission.

The Committee first met on 30th November, 1927, the constituent bodies then being :—

Postmaster-General's Department.
Victorian Railways Commissioners.
Melbourne and Metropolitan Board of Works.
Melbourne and Metropolitan Tramways Board.
Metropolitan Gas Company.
State Electricity Commission of Victoria.

In October, 1929, the Melbourne City Council's Electricity Supply Department was added. The late Mr. F. W. Clements, then a Commissioner of the State Electricity Commission, was the first chairman.

The Constitution provided for a Technical Sub-Committee, consisting of a suitably qualified representative of each constituent body, to carry out detailed investigations and to report to the Main Electrolysis Committee, which was to be an advisory and consultative body only. After about eighteen months' exploratory work, it was decided on the 27th May, 1929, to appoint Mr. C. M. Longfield, M.E., B.Com., as a full-time engineer to advise the Committee and to act as chairman of this Sub-Committee, and generally to direct and to correlate the work.

The objects of the Committee as declared in its Constitution are :—

(*a*) To receive and investigate complaints from any body or person, or such complaints as may be referred to it by the State Electricity Commission, as to injury alleged to be caused by electrolytic action.

(*b*) Where such injury appears to be established, or is anticipated, to :—

(i) determine the immediate cause of same, and the works responsible therefor ;

(ii) together with the parties interested, consider and advise upon the most suitable methods for minimizing or removing, as far as possible, such cause as determined under (i) ;

(iii) receive evidence which may be tendered by any party as to any inconvenience or monetary loss alleged to have been actually incurred in consequence of electrolysis and to assess the amount of such loss ;

(iv) receive evidence which may be tendered by any party as to the cost of remedial measures carried out in accordance with (ii) above, and to assess the amount of such cost ;

(v) confer with and advise interested parties as to a fair apportionment between them of any loss or costs as assessed under (iii) and (iv) above.

(*c*) If thought fit, to advise the State Electricity Commission as to any amendment of existing State Regulations affecting electrolysis, or any additions to or extensions of the same, which the Committee might deem advisable.

This Constitution and organization still holds after fifteen years.

An active programme of field surveys, an examination of the fault map and a series of laboratory investigations into the electro-chemical fundamentals of the problem were then undertaken. Attention was given not only to the measures that might be applied to the traction systems, but also to the pipe and cable networks. It was found that the routes taken by the latter in relation to the traction rails and, in particular, in relation to the converting sub-stations were of great importance.

The Committee was faced with a heavy task, as the following summary at 1930 indicated :—

(1) Reported telephone cable faults—

Year.	No. of Faults.
1927 ..	.. 158
1928 ..	.. 184
1929 ..	.. 195
1930 ..	.. 180

About 5,000 subscribers per annum experienced service interruptions as a result of this damage.

(2) Water main faults were occurring mainly on the large steel trunk mains.

In 1921, there were 31 faults in the 110 miles of large diameter steel mains laid in Melbourne. By 1930, when 47 perforations were reported, this mileage had increased to 243.

Apparently little electrolytic attack was experienced on the cast iron mains, as none was reported. Some corrosion was reported on house service pipes, but how much was due to stray traction currents could not be determined.

(3) Gas mains were usually of cast iron, and, like the cast iron water mains, appeared to suffer very little electrolytic damage. The low pressure used in gas distribution does not readily lead to the discovery of leaks, and, generally, gas pipes can be expected to last longer than water pipes of equal wall thickness.

(4) Electricity Supply cable faults were rare—about 0·15 per 100 cable-miles per annum. This was due chiefly to the cable being either laid in bitumen or protected by special coatings.

(5) The Melbourne and Metropolitan Tramways Board traction system comprised 101 route miles of track and 15 sub-stations, and the Victorian Railways suburban system of 163 route miles of electrified track and 17 sub-stations.

Remedial Measures.

Double element recording voltmeters of high sensitivity enabled the Committee to relate cause to effect and to design drainage bonds by a quite new method. Several trial installations of these bonds were installed with most satisfactory results.

Over 80 per cent. of faults occurred on telephone cables clustered within half a mile of sub-stations (or negative rail taps), while less than 50 per cent. of steel pipe faults fell within this zone. It was concluded that electric drainage had a reasonable chance of succeeding in clearing the majority of cable faults and a substantial number of water main faults. This conclusion has been amply demonstrated by experience, and the considerable success attending the Committee's work is shown by the following table :—

	Number of Faults Reported.			Total Number of Drainage Bonds Installed at Date
	Postmaster-General's Department (telephone cables).	Melbourne and Metropolitan Board of Works (water supply mains).	Total.	
1929	195	27	222	8
1930	180	53	233	14
1931	140	56	196	40
1932	103	50	153	91
1933	50	65	115	130
1934	46	64	110	155
1935	32	54	86	166
1936	26	54	80	194
1937	21	59	80	214
1938	18	68	86	231
1939	42	72	114	246
1940	15	50	62	272
1941	18	62	80	284

In the same period only fourteen faults were reported on electricity supply cables, gas mains, &c., the majority occurring more than a decade ago.

The electric drainage method consists of diverting the leakage current escaping via the earth from pipes and cables from the electrolytic path (moist soil) to a copper conductor joined between the pipe or cable and the traction negative feeder or busbar. Such bonds can be designed to remove anodes (positive zones). Where necessary, rectifying devices are inserted to prevent back flow of current through the bond, and in special cases, where the drainage current needed some assistance free use has been made of small boosters to give the bond the necessary characteristics.

The remedial measures favoured in Europe (isolation) are opposed to those adopted in North America (co-operation and drainage). It is of interest, therefore, to consider the Melbourne Electrolysis Committee's preference for drainage.

For the relatively small potentials found in practice, it is apparent that linear relationship exists between rail potential and leakage current in pipes and cables, i.e., any reduction in rail potential will lead merely to a proportionate reduction in leakage current. In attempting to remove all electrolytic damage by reducing rail potentials, the cost of remedial measures, whether in the form of negative feeders, or whether by additional sub-stations, will soon become disproportionately high. The same applies to the use of drainage bonds. The Committee's study of relative costs showed however that drainage was likely to achieve equal results at a fraction of the cost of other methods; therefore it proceeded with a planned drainage programme as a first step towards reducing stray current damage. It had in mind, too, that when the marginal point was reached in rail drop reductions, the remaining anodes would still have to be removed by drainage.

Field surveys indicated a considerable inconstancy in the polarity of cable and pipe potentials and in the direction and amount of stray current flow. This was attributed to traction sub-stations, particularly as regards load distribution among them, and was corrected to a large extent by trial and error method of machine operation, both for light and peak load conditions. A similar procedure was devised for certain outlying railway sub-stations where drooping machine characteristics were aggravated by A.C. feeder potential drop. This effect was corrected by the installation by the Victorian Railways of a special relay and a negative feeder balancing resistor, a method believed to be unique.

Another cause of corrosion—earth return currents of the telephone system—was removed by the Postmaster-General's Department in those areas where considerable earth currents were employed.

Extensive research was undertaken by the Melbourne and Metropolitan Board of Works, and a new bitumastic coating was developed for application to large diameter steel mains. Closely related to this work was the survey of soil along the proposed routes of new installations.

Soil resistivity measurements were made by a method approved by the Committee, and in the "low" areas (generally under, 1,000 ohms per c.m. cube) a double coating was applied to new mains.

In certain cases anodes were discovered beyond a reasonable drainage distance from the rail systems, and were treated by other methods, such as by the installation of zinc earth plates or by forced drainage. In the former method the battery action of zinc in contact with lead or steel and a common electrolyte produces a local voltaic current which tends to counter that due to other causes; protection of the pipe or cable is secured at the expense of the zinc plate which is, however, replaceable. In the second method, a predetermined current is forced by means of a rectifier equipment supplied from local electricity supply mains to an artificial "earth" in the form of scrap steel plates. Both of these methods have been successful in combating stray current effects and are equally beneficial in the case of attack by soil action alone.

The results of these special methods are difficult to assess and to depict, but 311 drainage bonds (101 boosted) have been installed :—

Conduit Drained.	Bonded To.	
	Melbourne and Metropolitan Tramways Board System.	Victorian Railways System.
Postmaster-General's Department cables	100	63
Melbourne and Metropolitan Board of Works water mains	56	65
Gas mains	3	4
Electricity Supply cables	15	5
	174	137

Regulations.

Because of the success which has attended its co-operative efforts, the Committee has not found it necessary to recommend statutory rules concerning electrolysis mitigation. The Commonwealth Postmaster-General's Department has also responded to the Committee's outlook and work, for, when the Department's statutory rules were extended in 1934 to electric railways operating on their own right-of-way, the rules included the following special clause which envisaged co-operative action :—

Extract from Statutory Rules No. 130 (1934) Post and Telegraph Act—

Clause 19 (2) "Where damage does result from such uninsulated return or where electrical tests indicate that it is likely to occur owing to the operation of the electric tramway or railway, such steps shall be taken as are agreed upon by the parties to remove, with the least possible delay, the cause of such damage."

The Postmaster-General's Department alone has statutory rights in this matter, and it has made a practice of recovering from the traction authorities the cost of damage to telephone cables, but in so doing has acted independently of the Electrolysis Committee.

Conditions in Country Districts and in other States.

The Melbourne Electrolysis Committee is a metropolitan body. When electrolysis damage has been reported in country districts, the Chairman of the Technical Sub-Committee has conferred with the aggrieved party and has suggested remedial measures. In particular, drainage bonds have been installed in Ballarat, Bendigo, and Geelong. Except in the first-named city there has been, for several years, complete freedom from electrolysis trouble on telephone cables.

The Chairman of the Melbourne Technical Sub-Committee acted in a consultant capacity in Adelaide (1931) and Sydney (1933) in relation to the constitution of co-operative committees in those capitals and the liaison has proved mutually beneficial. Similar committees were established in Newcastle (1938) and Brisbane (1939).

Co-operation through the Council for Scientific and Industrial Research.

In response to representations by the Melbourne Committee, the Council for Scientific and Industrial Research in 1938 agreed to act as a co-ordinating authority upon corrosion due to soil action and upon stray current electrolysis; and undertook to disseminate information on these subjects. Later, the Council set up a Corrosion Advisory Committee under the chairmanship of Dr. I. W. Wark, Chief, Division of Industrial Chemistry. Six papers and two informative publications already have been widely distributed by the Council, and further papers are in preparation.

Conclusion.

From a small and tentative beginning the work on electrolysis sponsored by the Commission in 1922 has grown into a national organization. The methods developed have received world-wide recognition by prizes awarded for papers published in the transactions of leading world professional societies. The Committee was represented at the international conference in 1937 sponsored by the National Bureau of Standards, Washington, U.S.A.

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