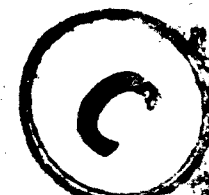


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Government of Madras

Administration Report
of the Electricity
Department For

1937-38



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GOVERNMENT OF MADRAS

**ADMINISTRATION REPORT
OF THE ELECTRICITY
DEPARTMENT FOR
1937-38**

MADRAS
PRINTED BY THE SPT., GOVERNMENT PRESS

1938

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ADMINISTRATION REPORT OF THE ELECTRICITY DEPARTMENT FOR 1937-38

SECTION I—GENERAL REVIEW OF TEN YEARS' PROGRESS.

INTRODUCTION.

In September 1927 the Hydro-Electric Development branch—from which in April 1932 the present Electricity department grew—was set up to examine and report on the hydro-electric possibilities of this Presidency and more particularly of the Pykara scheme already examined in some detail. So much successful progress has been since made that a short review of the activities and achievements of the department during the past ten years will be of interest.

1. In the first year, the surveys of the reservoirs, dam and power-house sites, penstock, profile and part of transmission lines connected with the Pykara scheme were completed and estimates prepared. With the object of securing the railway load, several conferences were held with the representatives of the Railway Board and their Consulting Engineers and matters relating to the electrification of sections of the South Indian Railway were discussed. Although the Consulting Engineers of that railway issued a report definitely recommending the electrification of certain sections, the Railway Board did not confirm those recommendations.

2. Concurrently the Ootacamund Municipal Council was in great need of more energy than could be supplied from its then source the Karteri Falls Power Station, and Government were investigating nearby schemes to supplement that supply. The construction of the Glen-Morgan Project was consequently undertaken in order that a start could be made on the electrical development of the Nilgiris, and a source of power made available for construction purposes for the Pykara project. Efforts were also made to interest private firms to apply for licences to distribute energy to a group of towns rather than one and such a move was then expected to result in quicker development and more favourable load for the hydro-electric power when it became available.

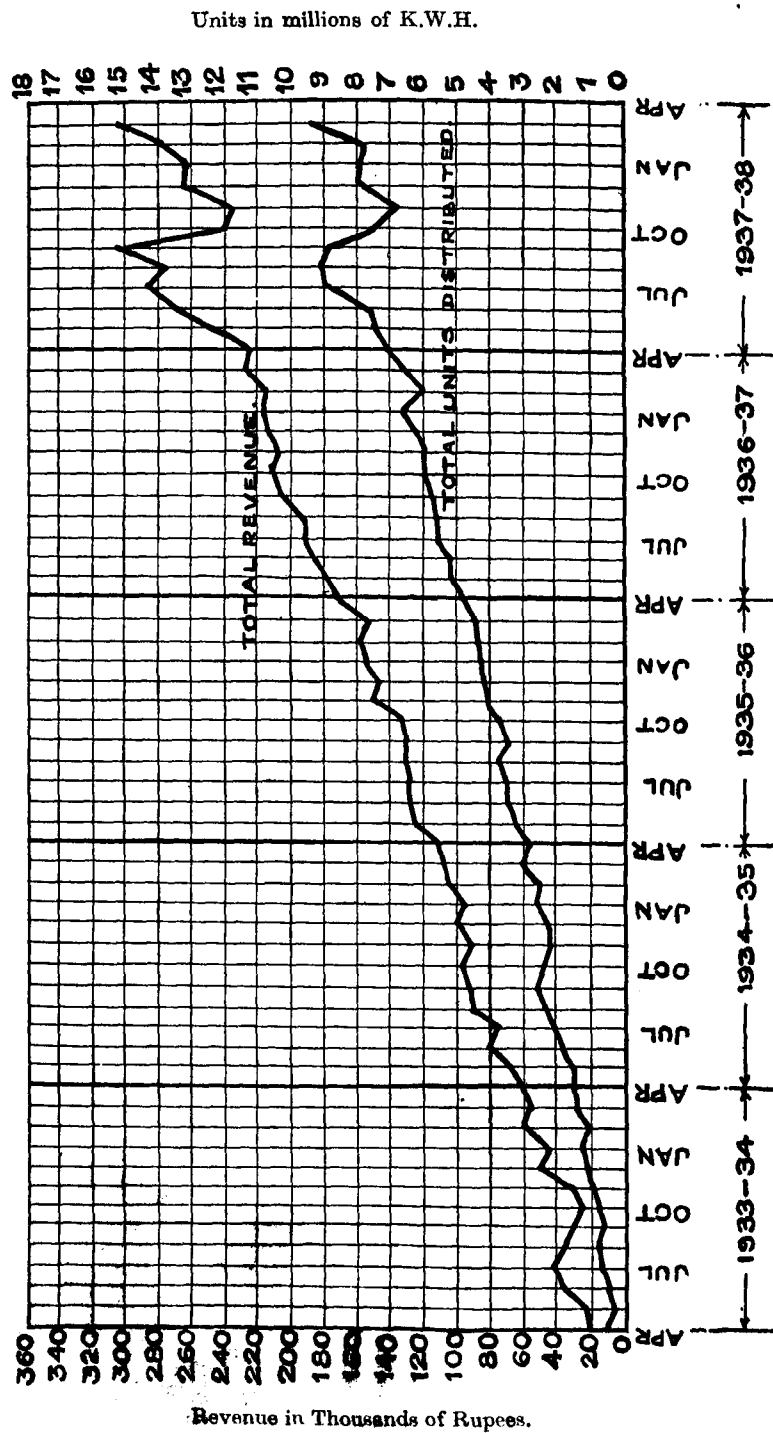
THE PYKARA ELECTRICITY SYSTEM.

3. *General.*—The year 1929!30 marked a definite move by Government to develop the hydro-electric resources of the province and to sell the energy direct to the public. In September 1929 the Secretary of State for India sanctioned the Pykara Hydro-Electric Scheme for supplying power to the Nilgiris and Coimbatore districts at an estimated cost of Rs. 126·40 lakhs. The then general business depression was of definite advantage to the project as very favourable prices were obtained for the machinery and

equipment. The works were completed well within the scheduled time and commercial supply to Coimbatore was commenced in October 1932. The technical features of the scheme are that power is generated at 11,000 volts and transmitted to consuming centres at 66,000 volts on the main lines and at 22,000 and 11,000 volts on the branch lines; the principal sub-stations are located at Coimbatore, Tiruppur, Udamalpet, Sembatti and Madura and minor ones are Ootacamund, Coonoor, Palghat, Pollachi and Iyerpadi.

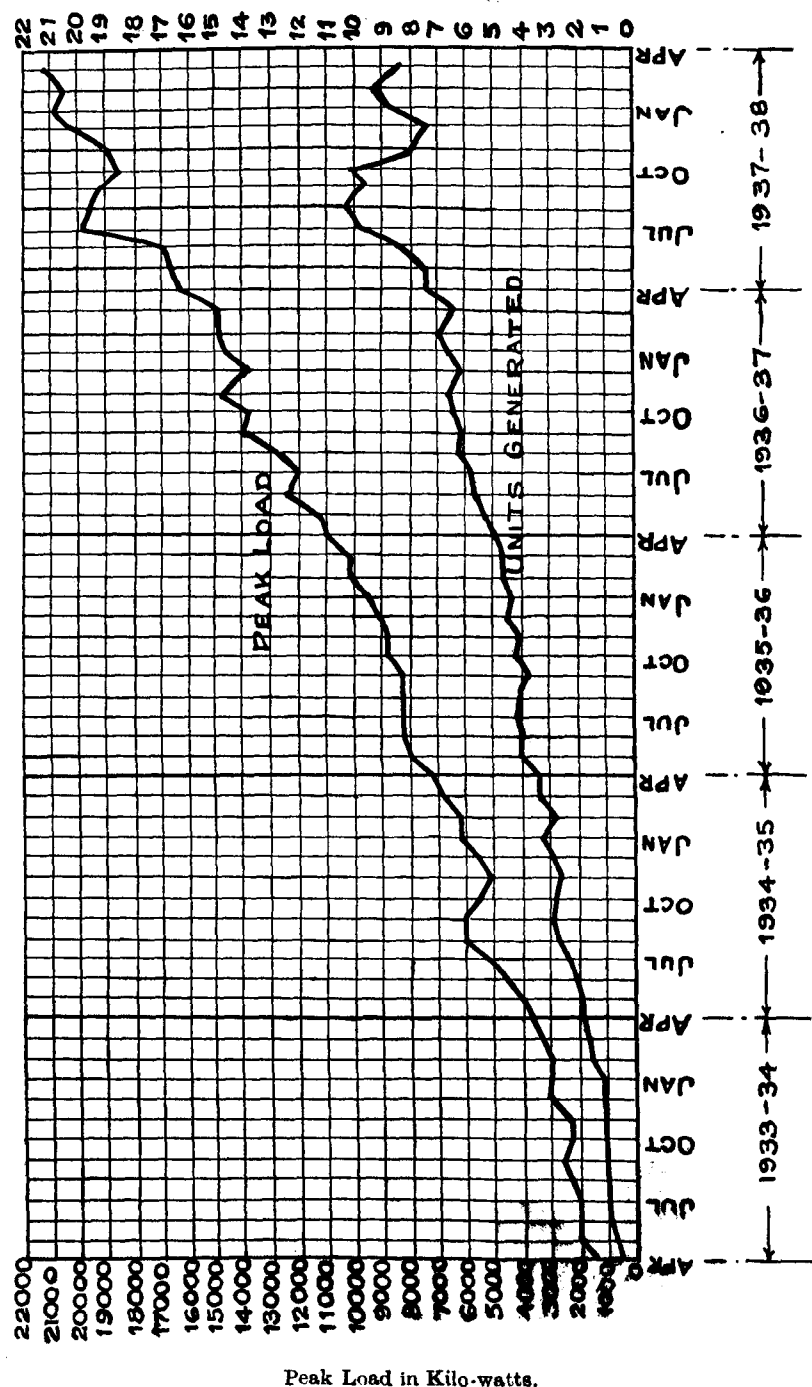
4. Considerable opposition was encountered in negotiating the change over of the existing Coimbatore Mills to electric drive, the vested interests of oil and coal suppliers and oil engine manufacturers all doing their utmost by temporarily reducing prices to dissuade consumers from converting. The uphill fight was won however and load conditions soon became most favourable. The transmission line was extended from Erode to Trichinopoly in 1934-35 to supply the progressive licensee there and also the South Indian Railway's large workshops at Golden Rock. To meet the requirements of the Indian Steel Rolling Mills at Negapatam the line was further extended in 1935-36 to Tanjore-Tiruvarur-Negapatam with a branch to Kumbakonam. Previously in 1929 a 22 KV line had been constructed from Mettur to Erode and Salem to supply the Salem-Erode licensees with power purchased from the Mysore Government. Those extensions in the Trichinopoly, Tanjore and Salem districts though started as parts of the Pykara scheme were subsequently transferred to the Mettur Hydro-Electric System on its completion in 1937. The desirability of supplying the city of Madura with hydro-electric power had long been recognized, as also that Pykara could help development of load in the Madura area but it was considered inadvisable to so extend the Pykara system until the Erode-Trichinopoly-Negapatam loads were taken over by Mettur. This transfer was scheduled to take place in 1937 and a scheme costing Rs. 33.50 lakhs, involving a double circuit 66 KV line 125 miles long was therefore sanctioned in 1935. That line was completed during 1937-38 and regular supply to Madura commenced on 3rd February 1938. With the transfer in June 1937 of the Erode-Trichinopoly-Negapatam area to Mettur and with the completion of the Coimbatore-Madura line, further extensions to the transmission line system were considered. The load prospects of the Ramnad district having proved satisfactory it was decided to extend the system south and east of Madura. The Srivilliputtur taluk licensees influenced the establishment of a textile mill in their area and the Sassoon Mills at Koilpatti agreed to electrify their mills. Estimates for extension from Madura to Virudhunagar thence to Rajapalayam and Sattur and Koilpatti were sanctioned in 1937-38 and construction was started at once. The East-Ramnad licensees in collaboration with the Karaikudi, Kanadukathan and Devakottah licensees all in that district applied for the supply of hydro-electric power and a scheme for the extension of the transmission lines from Madura to Sivaganga-Manamadura-Karaikudi was approved by Government early in 1938. The

CHART 2.
UNITS DISTRIBUTED AND REVENUE.



Units in Millions of K.W.H.

CHART 1.
PEAK LOAD AND ENERGY GENERATED.



investigation of supply of Pykara power to the West Coast which had long been engaging the attention of the Department was taken up again at the beginning of 1938-39 and it is hoped to produce a profitable scheme in the near future.

5. The rapid growth of the Pykara load in 1934 necessitated the early construction of the Mukurti Dam, which is the first large storage contemplated in the original scheme. This was sanctioned in January 1935 at an estimated cost of Rs. 21.25 lakhs. The work was commenced in February 1935 and completed in March 1938. The dam as completed with open spill way stores 1,400 million cubit feet water but the capacity can be increased to 1,800 million cubit feet when required later.

6. A review in 1936 of the needs of the Pykara power area indicated that additional generating plant would be required by 1939, even after the transfer of the Erode-Trichinopoly-Negapatam area to the Mettur system. A scheme costing Rs. 45 lakhs providing for the third penstock pipe and two 12,500 KVA generating units was therefore sanctioned by Government in December 1936. The civil works and penstock erection were in good progress at the end of 1937-38 and the plant is expected to be in operation by April 1939.

7. *Financial results.*—The financial position of the Pykara system is most satisfactory. The third year revenue was more than that expected in the tenth year of the forecast and the system has proved a splendid investment to the State. The position at the end of 1937-38 is summarized below. The Coimbatore-Madura line was brought into regular operation from 1st April 1938 and neither the capital outlay thereon nor the revenue derived therefrom are included in the figures furnished below:—

	RS.
(1) Capital outlay (including interest during construction) ..	1,73,81,731
(2) Gross revenue	25,47,511
(3) Operation and maintenance expenses	4,57,776
(4) Contribution to depreciation	4,09,017
(5) Contribution to special reserve fund	1,63,607
(6) Total expenses (3 + 4 + 5)	10,30,400
(7) Net revenue (2 — 6)	15,17,111
(8) Net return on capital outlay	8.5 per cent.

8. *Power demand.*—The growth of demand on the Pykara power station has continued steadily until the full capacity of the plant was reached; the figures from the commencement of operation are extracted—

Year.	Peak demand in K.W.	Units generated in million K.W.H.
1933-34	3,150	10.9
1934-35	6,600	30.0
1935-36	10,100	50.3
1936-37	14,900	75.6
1937-38	16,500	82.4

9. The connected load on the system under different categories for 1936-37 and 1937-38 are given in the following table:—

Description.	Connected load in KW. on		Per cent increase.
	31st March 1937.	31st March 1938.	
Textile industry	12,500	15,400	23
Cement works	2,000	2,300	15
Licensees	9,100	6,400 *	..
Tea factories	2,750	3,350	22
Agricultural and miscellaneous	5,750	7,600	32
Workshops and other industries	1,950	†	..
	34,050	35,050	

* Lower figure is due to transfer of part load to Mettur system and also excludes the Madura load.

† Last year's load transferred to the Mettur system.

10. *Industrial development.*—It may be observed that nearly half the load on the Pykara system is due to the requirements of the textile mills. In the Coimbatore vicinity, at the time of the commencement of operation of Pykara, there were eight textile mills. All those mills soon closed down their steam or oil engine plants and changed over to the Government hydro-electric supply. Many new mills have also since been established. At the end of 1937-38 there were 28 mills connected to the Pykara system, 5 more were under construction and 4 more registered. Many existing mills increased their plants and power demands. Apart from the Coimbatore district a new mill started working at Rajapalayam and another was being constructed at Dindigul. Negotiations with the textile mills in Madura are progressing satisfactorily and three of the larger mills will take Government supply before the end of 1938. But for the availability of the cheap hydro-electric power there would not have been such a rapid development in industrial load. Further, the Government policy regarding loans for conversion and construction which enabled money to be advanced to both old and new mills for the purchase of electrical machinery and equipment was also responsible for the large and rapid increase in the number of mills erected. The low rates for power with the guaranteed maximum charge of .66 anna per unit, the security of supply and the service features of the Government power system all make for an appreciated supply and rapidly growing demand. It is gratifying to note that since the availability of hydro-electric power no new mill has installed its own power plant. The increase in the number of textile mills in Coimbatore created some nervousness as to the possibility of over-production of yarn. Almost all the mills are working night shifts and the possibility of a reduction to one shift per day has always to be faced. The mill-owners although becoming anxious at the increasing demands of labour appear to be satisfied that owing to the low cost of production there will continue a steady market for their yarn although the demand for cloth may fluctuate. It is therefore desirable that other industrial enterprises should be established if the revenue from the sale of power is to be assured of progressive increase.

11. Next to textile mills there is a cement factory at Madukarai which is the largest individual consumer of the department. It started operation in the year 1934-35 taking a minimum load of 1,000 KW and has now increased its demand to 2,000 KW.

12. A rubber factory is under erection at Coimbatore and it is expected to take supply in 1938.

13. *Tea estates.*—At the time when the Glen-Morgan plant was supplying the power requirements of the Pykara construction works, enquiries were received from four tea estates in the Nilgiris and the surplus power was supplied to them. The electrification of those factories aroused much interest among the tea planting community not only in the Nilgiris but also in the Anamalais and the transmission line was extended from Pollachi to Iyerpadi in 1932. The demand from this source has continued to grow satisfactorily and at the end of 1937-38 the total number of tea factories connected to the Pykara system was 32 inclusive of the three connected during the year.

14. *Agricultural and rural load.*—Agricultural pumping has great possibilities, but in the Coimbatore area nervousness was expressed in the early days as to the effect on subsoil water levels. Government ordered that electric pumping should be restricted to wells in existence prior to June 1934 and situated outside the area commanded by the Lower Bhavani Irrigation Project. In spite of this restriction and the fact that the agriculturist, with the conservatism characteristic of his calling was slow to appreciate the advantages and economy of electric pumping, the development of this class of load was most encouraging. The following table gives an idea of the rate of progress:—

Year.	Total number of consumers.	Total number of horse-power connected.
1933-34	8	61
1934-35	97	811
1935-36	269	1,879
1936-37	543	3,680
1937-38	970	5,927

Along with agricultural load in rural areas power is supplied for street lighting, domestic and small industrial purposes. Thirty-one villages were added to the system during the year 1937-38 and the total number of villages and townships receiving electric supply from the department is now over 100.

15. *Conversion fund.*—As pointed out in paragraph 10 above the 'Conversion fund' inaugurated by the department contributed much to load development and a short note on the subject is furnished in this paragraph. In order to afford facilities for steam and oil engine driven mills and agricultural pump sets to change over to electric drive, the department with the sanction of Government instituted a 'Conversion fund' from which advances are granted for the supply of electrical plant and equipment on the hire-purchase system. The advances are repayable in easy monthly or annual instalments ranging from three to five years. The

scheme was most popular and many loans were advanced to textile mills. The hire-purchase facility was extended to new mills also but this has now been discontinued.

16. The salient features of the fifth year of operation of the Pykara electricity system may be summarised as follows:—

The load on the system rose to 16,500 KW which is above the safe-carrying capacity of the power station; and the erection of additional generating plant is now in progress; 82 millions of units of energy were generated; the system earned a revenue of Rs. 25½ lakhs being over 14 per cent of the capital outlay; rural electrification made good progress; and the system continued to operate satisfactorily and to retain the confidence of the consuming public.

THE METTUR ELECTRICITY SYSTEM.

17. A scheme to develop power from the head of water made available by the Mettur Dam was approved by the Secretary of State for India in January 1935 and construction was taken up on 1st April 1935. Four pipes penetrate the dam and the original scheme contemplated installing 12,500 KVA machines on only two of these in the first stage of construction. Owing to promising load conditions however and a favourable tender for a third unit if ordered along with the other two, three were installed and the power house built to the full size to ultimately accommodate the fourth. The turbines operate under a variable head of from 60 to 160 feet developing a maximum of 16,000 horse-power each under the latter. The machines are horizontal and consist of twin overhung turbines one on each side of the alternator. They contain several new features notably gear driven governors and hydraulic brake drums. The power-house is an imposing building 320 feet in length and contains appropriate but inexpensive architectural features in keeping with the solid background of the dam. Both the building and general layout were designed departmentally. As in the Pykara system power is generated at 11,000 volts and transmitted to consuming centres at 66,000 volts on the main line and 22,000 and 11,000 volts on the branch lines. The main lines from Mettur to Singarapet and Erode are insulated however for an eventual operation voltage of 110,000 and the former will later be extended to Madras. The sub-stations are at Erode, Karur, Trichinopoly, Tanjore, Tiruvarur, Negapatam, Papanasam and Salem in the southern area and Singarapet, Tirupathur, Ambur, Vadakattipatti, Vellore and Chittoor in the northern area.

18. During the year 1937-38 the construction of civil works and the erection of the electrical machinery were completed. The first generating unit was put into commission and paralleled with the Pykara system in June 1937. The load of Erode-Trichinopoly-Negapatam area was transferred from that system, giving much needed relief to the Pykara plant. During the part of 1937-38, 17.4 million units were generated; the peak load was 5,700 KW and the revenue earned Rs. 3.45 lakhs.



METTUR POWER-HOUSE

19. The load prospects are encouraging. A textile mill and an electro-chemical factory are under construction at Mettur and are expected to take supply in 1938. Due to load development in the South Arcot and Conjeeveram licensees' areas extensions to Villupuram, Conjeeveram and also to Arkonam were taken up. The Tirumalai-Tirupathi Devasthanam has agreed to close down its generating station and to take Mettur power and an extension of the transmission line from Chittoor to Pakala and Tirupathi was sanctioned by Government.

20. The scope of development of rural and agricultural load is limited as of the large area covered by the system the major portion is contained in the areas of supply of various licensees. The balance available for development by the department is thus restricted. In spite of this handicap a total of thirty pump sets aggregating 168 horse-power had already been connected to the system. Several rural distribution schemes were either under construction or investigation and important among them are Valluvambakkam, Dharmapuri, Krishnagiri, Arni, Tirukkoyilur, and Polur. Specific mention should be made of the Trichinopoly-Srirangam Electric Supply Corporation, the East Tanjore Electric Supply Corporation, the Kumbakonam Electric Supply Corporation and the South Arcot Electricity Distribution Company Limited, all of whom are making useful progress on rural distribution in their respective areas.

The following table shows the types and KW of load connected at the end of 1937-38:—

	Type of load.						Connected load in KW.
Industrial	..	..	..	..	..	..	855
Licensees	..	..	..	..	..	..	11,830
Agricultural	..	..	..	..	..	..	126
Railways	..	..	..	..	..	..	1,592
Miscellaneous	..	..	..	..	..	..	307

THE PAPANASAM HYDRO-THERMAL ELECTRIC SCHEME.

21. The policy of the department must be to plan ahead and to investigate further schemes for future development. Not only has the inevitable growth of the existing systems to be met but there also remain vast areas which cannot economically be covered by them. The requirements industrial and general of the Presidency are enormous and we are but on the fringe of the development of a public utility which can become the mainstay of the revenues of the Presidency. On the approaching completion of Pykara and Mettur, the Papanasam scheme was finalised. It is designed to develop the power resources of the Tambraparni River in the Tinnevely district with a view to supplying the needs of the Tinnevely, Ramnad and Madura districts. Further it will create a third power system in the southern part of the province providing an interchange of power when necessary, resulting in increasing availability and stability. A scheme costing Rs. 179 lakhs initially rising to Rs. 258 lakhs was sanctioned by Government at the end

of March 1938. The preparation of specifications and estimates for some of the preliminary works such as camp buildings, roads and water-supply were at once begun by the existing technical staff and construction of these is being begun in June 1938.

THERMAL SCHEMES.

22. In order primarily to build up load for future hydro-electric schemes and incidentally to find markets for the displaced oil engines in the Pykara area Government erected thermal stations at Dindigul, Virudhunagar, Palni and Theni between 1933 and 1935. The first three supplied those municipalities and the Theni plant supplies the Periyakulam and Bodinayakanur municipalities as well as the Theni panchayat area. In July 1937 the Palni plant was closed down and the load transferred to the Pykara system. The Srivilliputtur taluk licensees who contracted with Government for the bulk supply of Pykara power at Rajapalayam applied for an advance supply from the Virudhunagar power station until the Pykara power became available; a limited supply was given from November 1937. The Sivakasi municipality is also being supplied from the same plant. The Virudhunagar and Dindigul generating stations have been closed down in the summer of 1938. The generating plant in the former place will be transferred to Papanasam for construction and camp purposes while the Dindigul plant has been sold. As the load at Theni grew beyond the capacity of the plant in 1938 sanction for the construction of a transmission line from Sembatti to Batlagundu-Periyakulam was obtained and the work taken up immediately.

23. The department has not been unmindful of electrical development in the northern part of the province. The question as to how the immediate power needs of the Andhra districts could be supplied was carefully examined. There are water power resources in the Agency tracts but they are incapable of economic development unless a minimum load much above the present needs is forthcoming. Industrial development cannot afford to wait indefinitely for these hydro-electric schemes and will be retarded if cheap power is not made available sooner. Thermal stations of a temporary character offered the only practicable solution of the problem and these are being erected at Vizagapatam and Bezwada. They will enable an early supply of power to be given and will also foster development of demand so that in course of time the utilization of the natural water power resources can be undertaken.

24. The Vizagapatam Thermal scheme was sanctioned in July 1936 at an estimated cost of Rs. 18.70 lakhs initially and Rs. 31.60 lakhs ultimately. The scheme contemplates the purchase of the Vizagapatam Harbour authority's power-house and steam generating plant, the extension of that building to accommodate two new turbo sets—one 750 KW and another 1,500 KW capacity—and the construction of transmission lines to Vizianagaram, Bimlipatam, Chittavalesa, Garbham and Kodur mines, Bobbili and Anakapalle.

At the end of March 1938 the works were in good progress and the 750 KW set had been put into commission and is now supplying the needs of the harbour and of the Vizagapatam licensee. The erection of the 1,500 KW turbo set was also completed and a trial run given. The transmission line construction was nearing completion.

25. The sister scheme at Bezwada was sanctioned in September 1936 at an estimated cost of 17.35 lakhs initially and Rs. 25.00 lakhs eventually. The scheme comprises the purchase of the existing municipal power-house with 300 KW oil engine set, the erection of a new power-house having two 1,500 KW turbo sets, and the construction of transmission lines to Masulipatam, Ellore, Gudivada, Nuzvid, Guntur and Tenali. Delay in the delivery of steel work has greatly retarded the progress. However, at the end of the year the Bezwada-Gudivada-Ellore transmission line had been completed and the surplus power available at the municipal power station at Bezwada was being supplied to Gudivada and Ellore.

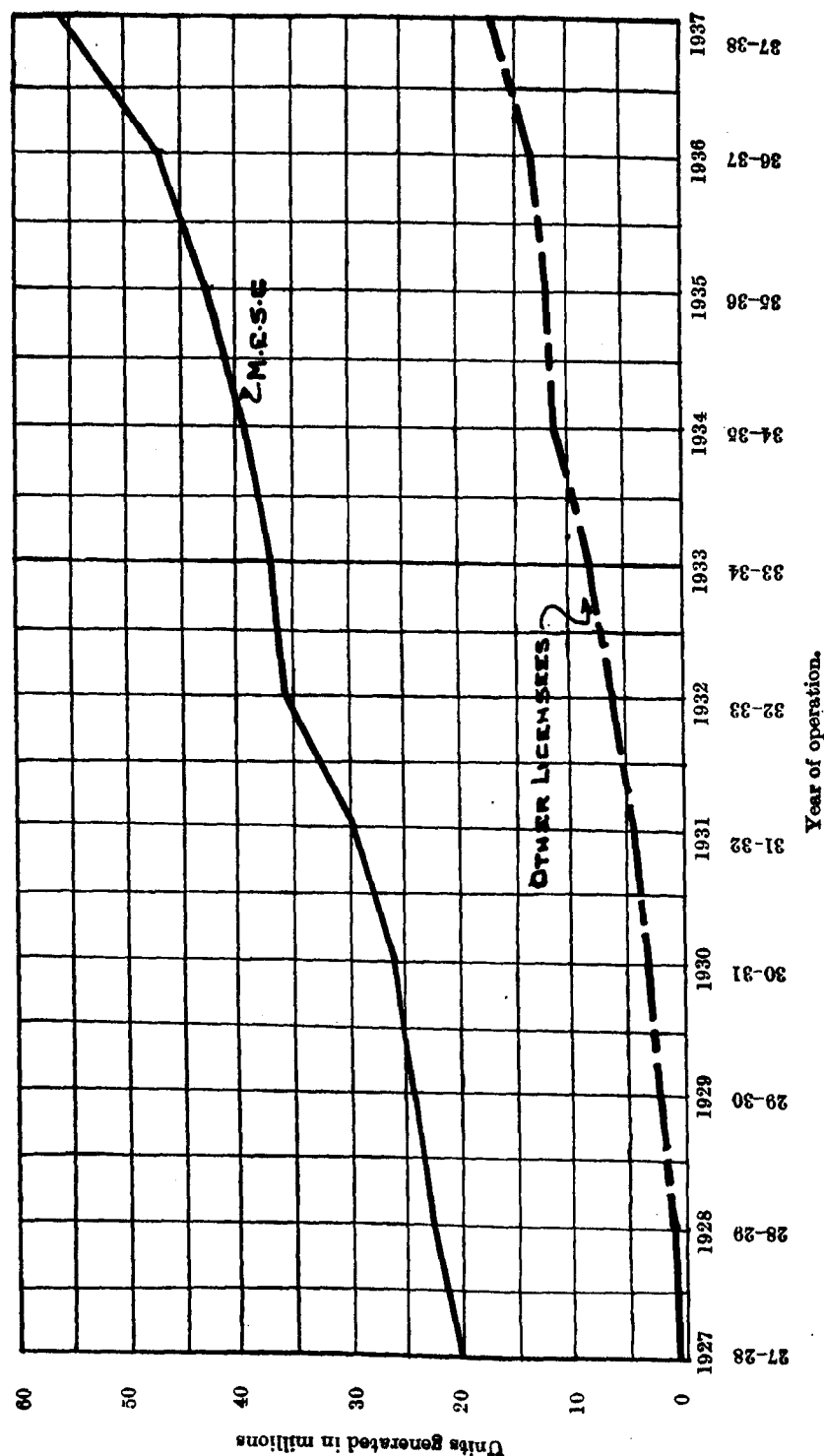
26. It was decided to take over and extend the municipal generating station at Cocanada in order to supply Cocanada, Pithapuram, Samalkot, Mandapeta, Ramachandrapur and other places. The scheme was sanctioned by Government in March 1938.

MUNICIPAL UNDERTAKINGS UNDER THE MANAGEMENT OF THE GOVERNMENT.

27. The management of the municipal electric supply undertakings during construction and early stages of distribution is a feature of the activities of the department. In the matter of distribution of Pykara power in the Coimbatore district Government enunciated a policy by which all high-tension supply in urban areas was retained in their hands and such municipal councils as were willing to take them were given licences for the distribution of low-tension power subject to the condition that they agreed to their undertakings being managed by the Electricity department of the Government for a period of not less than three years. The Municipal Councils of Coimbatore, Tiruppur and Pollachi agreed to the managing agency terms and distributing licences were granted to them. The construction of the respective distribution systems was done by the department and the undertakings worked satisfactorily. The distribution systems at Coimbatore and Tiruppur have reached the profit earning stage and in accordance with the terms of the managing agency were transferred to respective councils from 1st April 1937. The managing agency system has become popular and many councils have taken advantage of it; at the end of 1937-38 the following undertakings were under the management of the department:—

Pykara area.	Mettur area.	Thermal areas.
Pollachi.	Karur.	Virudhunagar.
Udamalpet.	Tirupattur.	Dindigul.
Dharapuram.	Tiruvannamalai.	Palni.
		Sivakasi.
		Periyakulam.
		Bodinayakanur.

CHART 3.
UNITS GENERATED BY THE MADRAS ELECTRIC SUPPLY CORPORATION AND OTHER LICENSEES.



THE CEDED DISTRICTS.

32. Owing to the paucity of industrial enterprise and to general poverty it is not economically feasible to project the construction of large central stations as in the Andhra districts. As a trial however, two schemes for the electrification of Tadpatri and Nandyal were prepared for submission to Government's sanction.

33. *Borewells scheme.*—The department undertook to carry out investigations for sinking borewells in the Cuddapah district for irrigation and drinking purposes by boring to 300 feet below ground level. The first experimental bore sunk in Ambavaram village near Cuddapah was satisfactory. The yield of the subterranean water-supply from that well was tested to nearly 100 gallons per minute and the report of the Government Analyst on the sample water and soil was satisfactory. It was originally intended to operate the borewells electrically but on account of the high cost of the transmission line from Cuddapah this was not found feasible and an oil engine has been installed instead. The well and pumping installation were ready for handing over to the Revenue department for operation by the end of May 1938 but unfortunately the arrangements for beginning this important practical demonstration were delayed and no use had been made of the supply two months after the cultivation season had begun. If this borewell proves a success it should produce far-reaching results in the Ceded districts. Work on the second experimental borewell is still in progress.

LICENSED SUPPLY UNDERTAKINGS.

34. Prior to the formation of the Electricity department on 1st April 1932 there were 26 towns in the province with an electricity supply. On 31st March 1938 the number of licensees giving supply was 66 of which 30 are local bodies and the remaining 36 companies. During the year under review 16 licensees commenced supply, 10 undertakings were under construction, and eight applications for licences were under consideration.

35. The total installed generating plant in service in the whole province amounted approximately to 131,000 KVA and the total energy output was 174 million units, made up as follows:—

	Installed capacity.		Energy output.	
	KVA.	Per centage of total.	KWH. in millions.	Per centage of total.
Government power stations ..	60,900	† 48	101.3*	58
Madras Electric Supply Corporation ..	53,750	42	56.1	32
All other generating licensees ..	13,350	10	16.6	10

* Includes 1.5 millions generated from the department's small generating stations.

† Represents the capacity of Pykara and Mettur stations only and excludes Thermal generating stations.

THE INDIAN ELECTRICITY ACT AND INSPECTIONS.

36. The number of inspections of licensees' and non-licensees' works and tests carried out during 1937-38 was 752. Seventy-nine electrical accidents were reported during the year of which 36 were fatal. On 1st April 1937 the revision of the Indian Electricity Rules came into force.

ELECTRIFICATION OF PUBLIC BUILDINGS.

37. With the increase in towns with electricity supply the work in connection with electric installation of Government buildings has grown considerably. During the year 1937-38 new works costing Rs. 2.43 lakhs were executed bringing the total capital cost of these works to Rs. 47.30 lakhs. The total maintenance charges amounted to Rs. 1.77 lakhs or 3.74 per cent of the capital cost. The Electrical Engineer (General) supervised the operation and management of the thermal stations and their distribution systems up to 1936-37 but during 1937-38 that work was gradually transferred to the Superintending Engineer, Pykara Electricity System.

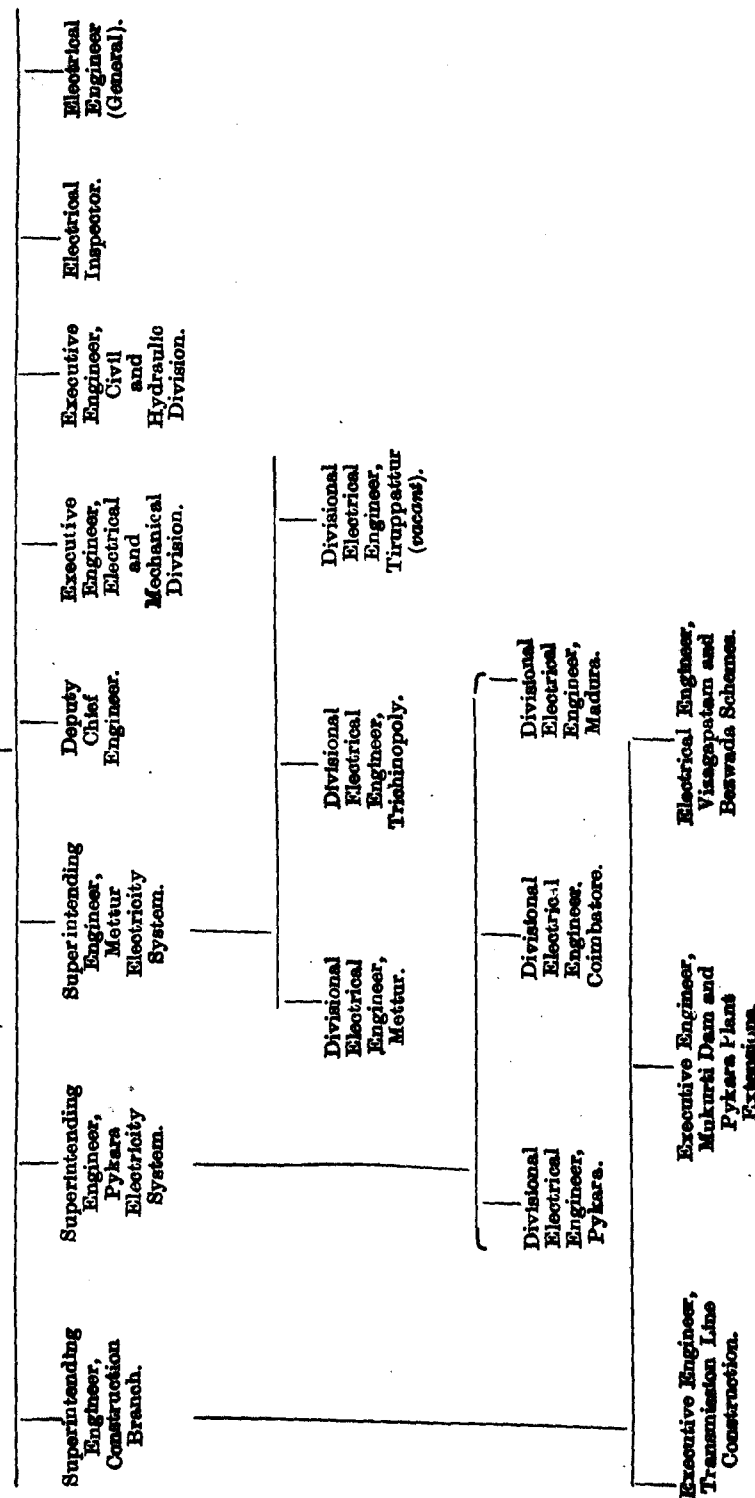
ORGANIZATION.

38. When the Hydro-Electric Development department was created in September 1927, Major H. G. Howard was appointed its Chief Engineer. He took over the small staff which had been on hydro-electric surveys under the Irrigation Branch of the Public Works Department and set up a separate branch with an electrical assistant and two investigation divisions, the Pykara Project Division and the Hydro-Electric Surveys Division. To facilitate the investigation and preparation of hydro-electric schemes the department was reorganised in 1928 into one Electrical and Mechanical Division and one Civil Engineering Division with appropriate establishment. A resident engineer was appointed in August 1928 for the construction of the Glen-Morgan Scheme and when the Pykara construction was taken up in the following year he continued in that with the expanded establishment.

In 1932 occurred the formation of the Electricity department proper amalgamating the activities of the hydro-electric development with those of the Electrical Inspector and the Electrical Engineer (General) formerly of the Public Works Department. When the Pykara scheme was brought into commercial operation in April 1933, it was placed in charge of the previous Resident Engineer (Construction) stationed at Glen-Morgan with a divisional electrical engineer at Coimbatore. The rapid load growth necessitated a change in the following year and the system was then placed in charge of a superintending engineer at Coimbatore assisted by two divisional electrical engineers stationed at Coimbatore and the Nilgiris. When the Coimbatore-Madura line was approaching completion a new division with headquarters at Madura was formed in addition in November 1937.

With the sanction of the Mettur hydro-electric development in April 1935 a construction branch was created with headquarters at Mettur for charge of all the major construction works of the department. In addition to the Mettur development these included the Mukurti Dam, the two thermal schemes in the Andhra districts and various high-tension transmission lines. During 1937-38 an operation system was formed for Mettur with a superintending engineer at Mettur and divisional electrical engineers at Mettur and Trichinopoly. After the commencement of Mettur operation, the headquarters of the construction branch was transferred to Madras.

CHART 4.
ORGANIZATION OF THE DEPARTMENT.
SUPERIOR STAFF.
Chief Engineer.



At the end of 1937-38 in anticipation of completion of the Bezwada and Vizagapatam schemes a permanent operating staff with two divisions, one at Bezwada and the other at Vizagapatam, was sanctioned by Government for the two power areas under the Senior Electrical Engineer still in charge of the construction.

In the year 1932 a specialized apprentice course was started to give systematic training for a period of one year to the electrical engineering students of the College of Engineering, Guindy, and also to facilitate recruitment to the department. Students from other colleges are also admitted to the course. It originally commenced with six students and in 1937-38 there were twenty-four students undergoing training.

Early in 1936 the Madras Local Authorities Electrical Engineers Service was constituted initially with twelve posts to regulate the recruitment of electrical engineers for the municipal-owned undertakings and to exercise control over them. By this measure, uniformity in pay and prospects and security and freedom from interference in the discharge of duties accrue to municipal electrical engineers with marked improvement in their work. The total strength of the service towards the end of 1937-38 was 16.

The framework of the organization of the department at the end of 1937-38 is indicated in Chart 4.

CONSTRUCTION PROGRAMME.

39. The programmed of work for 1938-39 is summarized below:—

- (i) The erection of the third penstock line and additional generating machinery at Pykara will be completed. This will be accompanied by the changeover from 66 KV to 110 KV transmission between Singara and Coimbatore.
- (ii) The Sembatti-Periyakulam line will be completed and Pykara supply given. This supply has already been given to Dindigul, Virudhunagar, Sivakasi, Rajapalayam and Kovilpatti and all thermal stations in the southern area will be closed down.
- (iii) The extensions to Villupuram, Conjeeveram, Pakala and Tirupati should be completed and bulk supply to those licensees commenced.
- (iv) The Vizagapatam and Bezwada schemes should both be completed and in operation.
- (v) The construction of the Cocanada Central Station and connected transmission lines will be in progress.
- (vi) Papanasam.—Construction of camps and roads will be completed. Foundation work on the dam and diversion wire will be begun and most of the equipment and machinery specifications will be prepared and issued.

The construction programme is framed so as to bring the power plant into initial operation by June 1941 and to complete the Thambraparni Dam to provide full storage by June 1943.

- (vii) The survey for the Pykara transmission line to the West Coast will be completed and report and estimate submitted.
- (viii) The second and remaining borewell in the Ceded districts will be completed and handed over to the Revenue department for operation and demonstration.

ELECTRICAL DEVELOPMENT IN GENERAL AND THE NEED OF AN ELECTRICITY BOARD.

40. At the beginning of the decade there were only a few licensees in this Presidency and owing to lack of experience and to want of sound commercial policy progress was slow. To improve matters later licences contained clauses providing more detailed control over rates and the obligation to extend the supply, and at the same time Government initiated the granting of loans to local authority electrical undertakings. As a result the next few years saw a large number of such undertakings soon followed by many company undertakings.

Although there are fortunately a few outstanding exceptions, the majority of licensees are still only interested in developing their areas under conditions in which a substantial immediate profit can be realized. For this reason rural extensions are generally neglected in most licensed territories. To assist licensees in this respect Government in G.O. No. 2478 W., dated 18th November 1935, agreed to bear the cost of such extensions on a return of $12\frac{1}{2}$ per cent being guaranteed. This form of loan is now being used considerably and it is to be hoped will become more generally popular in future.

The aim of the department is to provide electricity at uniformly low rates throughout the province and its organization and relationship with Government and the public has been the subject of considerable thought. Direct control by Government itself with its inevitable restrictions of rules and regulations is unsatisfactory in many respects, particularly where quick commercial decisions are required to enable business opportunities to be taken.

In order to safeguard the future interests of the Provincial Government in electrical undertakings and to ensure to the State a profitable return on its investments the Chief Engineer has for some years advocated the formation of an electricity board or commission to control development. In November 1935 Government appointed a committee to examine this proposal. Their report was issued in June 1936 and though it did not recommend the creation of such a board at once it agreed that it might be desirable at a future date. Subsequent experience and administration have further convinced the department of the necessity for the constitution of such a control and proposals will therefore be again submitted.

ACKNOWLEDGMENTS.

41. Valuable assistance was received from the Director-General, India Store Department, London, and the inspections and tests of stores were carried out by his technical staff most satisfactorily. The assistance received from the Indian Telegraph

department which carried out the erection of the department's telephone lines with expedition and economy is also greatly appreciated. The Chief Engineer desires to record his warm appreciation of the services rendered by the whole staff of the department throughout the period.

TOTAL CAPITAL OUTLAY.

42. The total capital outlay to end of 1937-38 incurred by the department on its hydro-electric and thermal systems including sanctioned estimates for schemes in progress but excluding Papanasam is Rs. 3,26,47,462.

43. A more detailed report of the work of the various sections of the department during 1937-38 is contained in the following Section II.

SECTION II—DETAILED REPORT.

PYKARA ELECTRICITY SYSTEM.

44. *Civil and hydraulic works.*—The civil and hydraulic works were maintained in good condition.

Water conditions were satisfactory and due to the additional storage provided by the Mukurti reservoir the dry weather supplies both in April 1937 and March 1938 were more than sufficient. Rainfall during the year was 82.25 inches as against 78.86 inches in 1936. The average consumption of water at the power-house reached a maximum of 55 cusecs in June 1937. The programme of improvements to the main flume was continued and the major portion of the channel has now been rendered safe against leaks even when the flow increases.

45. *Pykara Power Station.*—The output of the station was 82.5 million units with a peak load of 16,500 KW as against 75.6 million units and a peak load of 14,900 KW in the previous year. In the early part of the year when the peak load became more than 16,000 KW, the Glen-Morgan auxiliary plant had to be run in addition during peak hours taking about 800 KW.

The Glen-Morgan plant was shut down in June when the Mettur Power-house was put in commission and relieved the Pykara station by taking over the load in the Trichinopoly-Erode area.

After the separation of Erode and Trichinopoly areas from Pykara, the peak load of the Pykara Power-house again rose to 16,100 KW in January 1938 and necessitated the transfer of the Tiruppur load to Mettur in February. The progressive increase in load is still maintained and it will be necessary soon to transfer more to Mettur.

46. *Operation and maintenance.*—During February 1938 the insulation of the end coils of No. 1 Generator showed signs of deterioration. These were retaped and further examination and

experience has since shown that all three machines require re-tapping. Arrangements are being made to do this early in 1939 as soon as the new units come into operation.

47. *Additions and improvements.*—The Kattabettu 66/11 KV sub-station on the main Pykara-Coimbatore transmission line was brought into use with a 750 KVA transformer and two feeder cubicles, one for supplying Kotagiri and the other for supplying the Cordite Factory and Coonoor tea estates. The Coonoor tea estates which were till then fed from a tapping of the Ootacamund-Coonoor line at Coonoor were supplied from Kattabettu. Arrangements for an emergency supply to the Cordite Factory were completed. A control and metering cubicle was erected at the point of crossing of the Kattabettu tea estates line and the Ootacamund-Coonoor municipal line to effect this.

Pykara supply was made available at Madura towards the end of 1937, intermittently from 30th October 1937 and continuously from 3rd February 1938.

Modifications in the Coimbatore Receiving Station consequent on the addition of the Coimbatore-Madura line were completed during the year. The capacity of this station was increased from 17,000 KVA to 23,000 KVA by the replacement of three of the 3,000 KVA transformers by 5,000 KVA units in addition to the one already erected in the previous year. The 66 KV oil circuit breakers at Pykara and at Coimbatore have been replaced by 110 KV ones in connexion with the programme of work for raising the transmission voltage.

In Tiruppur sub-station the two 1,000 KVA transformers were replaced by 1,750 KVA units to cope with the increase in load. Improvements to Iyerpadi sub-station and the changeover to the 22 KV feeder of the tea estates in the western arm of the Anamalais distribution were completed. The changeover of the eastern arm will be completed this year.

In view of the importance of the mill loads in Coimbatore and the necessity to improve the regulation, an additional mill ring was constructed in 1936-37. Subsequently it was found desirable that the rural loads should be separated from the mill feeders and the provision of a separate rural ring was sanctioned by Government in the year under review; about 50 per cent of the work is completed.

The 66/22 KV sub-station at Udamalpet on the transmission line from Coimbatore to Madura was brought into use and the Udamalpet load which was till then being supplied through the Coimbatore-Pollachi 22 KV line was fed from the 66 KV line.

Table No. 1 gives the length of transmission lines constructed and brought to operation during the year as also the capacity of the transformers (excluding distribution transformers) in service. The total length of the high tension line is 917 miles or 1,238 miles of equivalent single circuit.



UDAMALPET SUBSTATION.

Table No. 1.

Total lengths of transmission lines and installed capacity of transformers.

Voltage.	Constructed during the year 1937-38.				Total in service.			
	Single circuit.	Double circuit.	Equivalent single circuit.	Installed capacity of station transformers.	Single circuit.	Double circuit.	Equivalent single circuit.	Installed capacity of station transformers.
	MILES.	MILES.	MILES.	KVA.	MILES.	MILES.	MILES.	KVA.
66,000	..	140	280	10,500	..	246	492	53,430
22,000	.. 90.5	..	90.5	..	286.5	61	408.5	5,700
11,000	.. 73.8	2.1	78.0	..	309.8	14.1	338.0	..
	163.85	142.1	448.05	10,500	596.3	321.1	1,238.5	59,130

48. *Important additions in load*—(a) *Industrial*.—The Coimbatore Textile Mill load continues to grow satisfactorily, 2,165 KW of additional connected load in seven factories being made during the year. Vysia Mills which was in difficulties changed management and is working satisfactorily. The construction of the Asher Textile Mills in Tiruppur is progressing rapidly. Three more mills, Kumaran, Kothari Textiles and Kasturi Mills, are expected shortly at Coimbatore. The position of the Dwaraka Mills is still uncertain. Conversion of the Coimbatore Spinning and Weaving Mills and the Radhakrishna Mill has been completed. A new mill—Balasubramanya—took supply during the year.

(b) *Rural electrification*.—Extensive development of rural distribution was a feature of the year. About 90 miles of 22 KV lines, 78 miles of 11 KV lines together with about 150 miles of low-tension distribution lines were built departmentally. Four hundred and twenty-seven pumpsets with a connected load of 2,247 horse-power of agricultural load were installed during the year bringing the total number of sets to 970 and the connected horse-power to 5,987.

49. *Commercial*.—The activities of the commercial branch were continued and a number of profitable schemes were put forward. Among these may be mentioned—

- (1) Gobichettipalayam extensions.
- * (2) Namakkal.
- (3) Anamalai-Vettakaranpudur extension.
- (4) Neikkarapatti extension.
- (5) Peddapampatti extension.
- (6) Madampatti extension.
- (7) Malamachanpatti-Chettipalayam.
- (8) Kolathur-Athappagoundenpudur extension.
- (9) Lakshmapuram-Erasampatti extension.
- (10) Adivalli extension.

* Since transferred to Mettur area.

All these have since been sanctioned and work is in progress.

The number of extensions brought to operation during the year total 164 of which 51 cost more than Rs. 1,000 each and the rest less.

Practically the whole of the rural load has been for pumpsets. Use of electric power for cottage industries has yet to be popularised and some propaganda in that behalf was done during the year.

50. *Meter and relay testing.*—The meter and relay testing branch at Coimbatore has been working most satisfactorily. Due to the expansion of areas supplied with power, the number of the meters, relays and instruments tested has increased by nearly 50 per cent since the previous year. The testing work in the Mettur system and in the thermal areas (south) was also undertaken by this section.

Additional equipment for carrying out tests in situ and for testing current transformers has been sanctioned. A specially fitted van for the use of the Testing section is shortly to be purchased.

51. *Municipal undertakings.*—The steady development of the Government-managed municipal concerns continued in the year under review. The Pollachi Municipal Distribution was handed over to the municipality on 1st April 1938.

The Palni Municipal Distribution was changed over from thermal supply to Pykara power on 11th July 1937. Since then, the demand which had been dormant at 48 KW rose to 80 KW at the end of the year.

Certain modifications in the layout of high-tension lines in Udamalpet distribution were carried out consequent to the supply being changed over from the new 66/22 KV sub-station.

The construction of Dharapuram Municipal Distribution Scheme was undertaken by this department. The major portion of the work has been completed. Supply was commenced to Dharapuram on the 27th March 1938 through the Udamalpet-Dharapuram line. The work is expected to be completed in all respects by end of April.

The Sivakasi Municipal Distribution has been taken over after construction, and supply is now given from the Virudhunagar Power House through Virudhunagar-Rajapalayam line. Progress is satisfactory.

The Karur Distribution was transferred to the Mettur system during the year.

The Municipal Distribution at Dindigul, Virudhunagar, Periyakulam and Bodinayakanur were transferred during the year to the Pykara system from the Electrical Engineer (General) for management.

Progress at Dindigul was insignificant; but is expected to improve with the advent of Pykara power and consequent lower

Virudhunagar showed considerable increase in the industrial load and consumption; the units sold were 494,000 during the year as against 315,000 for the previous year.

Both Dindigul and Virudhunagar Distribution Schemes were declared during the year to have reached the profit earning stage and were ordered to be handed to the municipal councils for management from 1st April 1938.

Periyakulam and Bodinayakanur distributions showed slight improvement during the year but the revenues were still inadequate to meet the operation and maintenance expenses. Pykara power at cheaper rates is expected to reach this area shortly and then more satisfactory development should proceed.

A survey of the operation results of the Government managed municipal distribution schemes is given in Table II.

52. *Thermal schemes.*—The Thermal Generating Stations at Dindigul, Virudhunagar and Theni were handed to this system for management by the Electrical Engineer (General) during the year.

Table III on page 22 summarises the operating and financial results of the thermal undertakings and compares them with the previous year.

The load at Dindigul showed little improvement the peak being 155 KW against the previous year's 142 KW. A 11 KV feeder line to Dindigul from the Sembatti sub-station on the Coimbatore-Madurai line was under construction during the year and on its completion Dindigul will change over to Pykara and the thermal station will be shut down.

The load growth at Virudhunagar was very satisfactory. The station peak rose from 165 KW at the beginning of the year to 300 KW at the end. This was mainly due to new industrial connexions at Virudhunagar, supply to the new Virudhunagar water works and supply to the distribution schemes at Sivakasi and Rajapalayam which were completed during the year. The load is nearing the capacity of both the engines, but relief will come when the Madurai-Virudhunagar 66 KV line under construction is completed in July 1938 and supply from Pykara made available at Virudhunagar. The thermal station will then be shut down.

The Theni Power Station showed good progress, its peak rising from 92 KW in the previous year to 148 KW. This was due mainly to the addition of two ginning factories and one huller factory at Theni. The station gave satisfactory service but the peak is nearing the maximum capacity of the two sets comprising the plant and relief will be needed before the end of 1938. Sanction for the construction of a line from Sembatti to Periyakulam has been accorded by Government and construction work is being expedited. When the line is completed Pykara power will be supplied and the thermal station shut down. This region is full of possibilities of industrial and agricultural development.

Table No. 2.

Load and revenue results of municipal electricity undertakings managed by the department for the years 1936-37 and 1937-38.

(1)	Follachi.		Udamalpet.		Karur.		Palni.	
	1936-37.	1937-38.	1936-37.	1937-38.	1936-37.	1937-38.	1936-37.	1937-38.
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 Peak load in KW	315	294	75	110	90	90	57	72
2 Units purchased in KWH	751,368	826,667	169,988	202,499	178,412	257,000	106,051	155,104
3 Units sold or distributed	660,494	727,433	147,083	174,103	176,301	242,798	97,462	130,761
4 Total connected load in KW	945	1,074	177	303	279	388	166	262
5 Number of consumers	567	591	211	291	402	430	128	206
6 Cost per unit purchased	0.69	0.64	0.83	0.79	0.83	0.74	1.8	0.79
7 Cost per unit sold	1.56	1.50	1.90	1.38	2.53	1.38	2.77	1.9
8 Total capital expenditure up to end of year	187,757	198,033	65,428	74,553	86,858	98,800	46,553	47,419
9 Gross revenue	66,526	70,921	18,600	21,426	29,112	34,883	17,350	19,743
10 Operating and maintenance expenses (including agency fees)	50,829	52,034	18,176	20,242	20,796	23,526	17,200	18,155
11 Interest at 5½ per cent on capital	10,318	10,892	3,523	4,100	4,761	6,908	2,068	2,608
12 Balance for sinking fund, depreciation, reserve, etc.	4,838	7,985	—	3,167	3,003	2,964	—	1,020

	Virudhunagar.		Dindigul.		Periyakulam.		Bodinayakanur.	
	1936-37.	1937-38.	1936-37.	1937-38.	1936-37.	1937-38.	1936-37.	1937-38.
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1 Peak load in KW	167	300	145	155	35	37	45	45
2 Units purchased in KWH	361,428	572,633	314,069	444,365	70,016	83,001	50,804	62,680
3 Units sold or distributed	315,828	494,014	280,750	392,816	59,611	72,107	46,720	58,582
4 Total connected load in KW	570	636	532	611	102	139	76	91
5 Number of consumers	452	515	530	617	124	181	75	161
6 Cost per unit purchased	1.17	1.06	1.21	1.14	1.82	1.65	2.06	2.24
7 Cost per unit sold	2.53	2.11	3.04	2.6	3.12	3.02	3.34	3.36
8 Total capital expenditure up to end of year	163,978	175,450	131,266	147,628	68,462	68,512	49,881	53,372
9 Gross revenue	50,768	65,300	51,335	64,200	11,898	13,606	9,740	12,346
10 Operating and maintenance expenses (including agency fees)	41,858	51,700	37,890	50,128	16,594	16,460	12,512	17,094
11 Interest at 3½ per cent on capital	8,740	9,645	6,870	8,210	3,248	3,768	2,267	2,937
12 Balance for sinking fund, depreciation, reserve, etc.	..	3,095	6,040	5,952	..	..	..	..

Table No. 3.
Thermal schemes—Financial results.

Serial number and description	Virudhunagar.		Dindigul.		Theni.	
	1936-37.	1937-38.	1936-37.	1937-38.	1936-37.	1937-38.
1 Peak load ..	165	300	142	155	92	148
2 Units generated ..	421,473	698,694	374,103	509,527	174,084	273,403
3 Units sold ..	361,438	619,492	314,089	444,365	142,233	231,276
4 Cost per unit generated ..	0.73	0.58	0.75	0.62	1.13	0.97
5 Revenue per unit sold ..	1.32	1.14	1.38	1.15	2.24	1.89
6 Total capital expenditure including arrears of interest up to the end of the year ..	158,339	143,109	143,571	138,383	161,282	172,527
7 Gross revenue ..	29,813	44,147	27,134	32,066	19,881	27,330
8 Operation and maintenance expenses excluding interest on capital and depreciation ..	18,224	26,396	17,754	19,515	12,375	16,496
9 Balance ..	10,599	18,753	9,380	12,551	7,506	10,824
10 Interest at 5½ per cent on capital ..	8,708	8,146	7,896	7,631	8,871	9,489
11 Surplus ..	1,881	10,607	1,484	4,940	—	1,345

53. *Administration—(a) Accounting.*—During the year, an additional division with headquarters at Madura was formed for the charge of the Madura extensions and of the Thermal schemes in the southern area transferred to the Pykara system from 1st November 1937. The Dindigul Accounting Office continued, however, to be an independent account-rendering unit till 31st March 1938, from which date all the accounting and commercial work was centralized at Coimbatore.

(b) *Construction.*—A construction subdivision was organized from January 1938 with headquarters at Coimbatore and the execution of all major line construction works was entrusted to it. This has relieved the territorial assistant engineers, who are busily engaged in operation and maintenance, of much of their construction work.

(c) *Stores.*—Seven more distributions and two construction stores were added to the Pykara system during the year, viz., those of Madura, Sombatti, Theni, Virudhunagar, Bodi, Periakulam and Dharapuram and the work in the Stores Branch has considerably increased. Proposals for the revision of the reserve limit of stock are being worked out.

54. *Conversion fund.*—The total disbursement of hire-purchase loans during the year amounted to Rs. 89,999 and total repayments were Rs. 1,84,697. The following table gives yearly figures:—

			Loan advanced.	Repayments.
			Rs.	Rs.
1933-34	..	..	301,295	17,805
1934-35	..	..	106,861	55,003
1935-36	..	..	253,487	52,739
1936-37	..	..	272,626	118,194
1937-38	..	..	89,999	184,697
Total	..	..	924,268	428,698

55. *Accidents.*—There were 42 accidents during the year of which six were departmental and non-fatal and 36 non-departmental of which 15 were fatal. Compensation of Rs. 3,160 was paid during the year towards departmental accidents. Printed notices and pictorial posters warning all against the dangers of meddling with electric wires were widely distributed with the help of the Revenue department. Ten of these accidents were in Madura district, a new area, and as the people are now becoming educated less accidents may be expected in future. A major portion of the accidents occurred in Coimbatore district and most of them were on new lines.

METTUR ELECTRICITY SYSTEM.

56. *Power station.*—All civil works and machinery and equipment erection were completed. Preliminary tests of the plant including load tests on a large water rheostat were conducted. No. 1 generator was brought into beneficial use and paralleled with the Pykara system on 13th June and was continued in operation till the No. 2 unit was ready. No. 2 generator set was put into commercial service on 21st August. No. 3 generator was completed in all respects on 21st January 1938.

The whole load from Erode to Negapatam was transferred from Pykara to Mettur in July.

On 15th February 1938, when Pykara was completely shut down for relay tests, the Mettur Generating Station supplied the whole of Pykara and Mettur area for two hours. The maximum load taken was 10,200 KW at 0.8 power-factor load and two machines were in service. Two synchronous condensers were in service at Trichinopoly but the load on each condenser was only 250 KW load. The voltage regulation at the tail-ends was satisfactory.

From 8th February 1938, on account of increased demand of supply from Pykara Power House, the supply to Tiruppur area with a maximum load of 1,200 KW was taken over by the Mettur Power House.

57. *Service Interruptions.*—The supply has had a few interruptions of a momentary nature. The cause of interruptions and particularly so on the Singarappet line was the fouling of the insulators by birds; and in twenty cases five were fatal—due to accidental electrocution of villagers by tampering with the lines. The protective relays required much attention before an assured supply was possible.

58. *Transmission and distribution lines.*—Seventy miles of single circuit and 99.5 miles of double circuit of 66 KV, 22 miles of 33 KV, 20.5 miles of 22 KV and 78.4 miles of 11 KV transmission and distribution lines were constructed and brought into service during the year. The total length of high-tension lines in operation in this system at the end of the year was 867.25 miles.

59. *Rural electrification.*—Throughout the year, an active commercial policy was pursued and a large number of extension schemes prepared. The following schemes were sanctioned and were either under execution or ready for being taken up soon for execution :—

- | | |
|---------------------|-------------------------------|
| (1) Dharmapuri. | (9) Polur. |
| (2) Krishnagiri. | (10) Arni. |
| (3) Namakkal. | (11) Nerinjipet and Pulampet. |
| (4) Tiruvannamalai. | (12) Tirupati. |
| (5) Valluvambakkam. | (13) Arkonam Water-works. |
| (6) Kaveripakkam. | |
| (7) Vettavalam. | |
| (8) Tirukkoyilur. | |



INTERIOR VIEW OF THE METTUR POWER-HOUSE.

Distribution schemes for the following places were prepared and submitted for sanction:—

- | | |
|-------------------------------|---------------------------|
| (1) Kalambur. | (7) Takkolam. |
| (2) Arkonam distribution. | (8) Tiruttani and Nagari. |
| (3) Namagiripet. | (9) Pakala. |
| (4) Andiyur-Viralikattur. | (10) Ellampalli. |
| (5) Ammapet. | (11) Kuppam. |
| (6) Wandiwash-Tiruvettipuram. | (12) Christu-kula Ashram. |

The Vellore-Conjeeveram line, Kaveripakkam-Arkonam line and Tiruvannamalai-Polur-Arni line were under erection. There is good scope for agricultural load development in the taluks of Polur, Cheyyar, Wandiwash and Arkonam. Investigations as to the feasibility of extensions to rural areas in the Chingleput district were on hand.

The villages receiving electric supply are listed in Appendix G.

A list of schemes for which power has been extended by the department during the year and schemes for which supply is expected by the department in the ensuing year is given below:—

Schemes for which power was supplied during 1937-38—

- | | |
|------------------------|--|
| (1) Chittoor. | (6) Kalbai-Thalapalavam. |
| (2) Vellore. | (7) MacDonald's Choultry-Tiruchengode-Edapady. |
| (3) Gudiyattam. | (8) Tiruvarur-Nedumbalam. |
| (4) Ambur. | |
| (5) Karur-Kattuputhur. | |

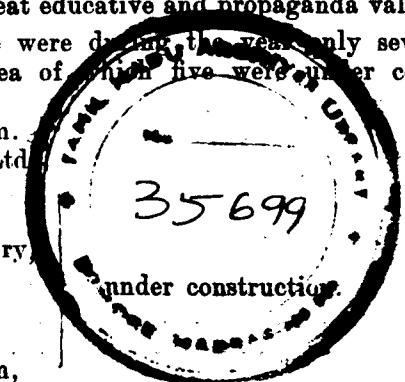
Schemes for which supply is expected in 1938-39:—

- | | |
|----------------------------|----------------------------------|
| (1) Nesinipet area. | (11) Kaveripakkam. |
| (2) Thengalpalayam. | (12) Polur. |
| (3) Malayampatti. | (13) Arni. |
| (4) Singalandapuram. | (14) Krishnagiri. |
| (5) Kasarimangalam. | (15) Dharmapuri. |
| (6) Ellumpalli. | (16) Pernambattu. |
| (7) Jambai and Olagadam. | (17) Tiruppattur-Jalarpet. |
| (8) Namagiripet. | (18) Arkonam Water-works. |
| (9) Andiyur-Viralikattur. | (19) Arkonam Distribution. |
| (10) Kattuputhur-Namakkal. | (20) Chittoor-Pakkala Tirupathi. |

The department took part in the Tiruvannamalai exhibition held in November 1937 with great educative and propaganda value.

60. *Industrial load.*—There were during the year only seven mills and factories in this area of which five were under construction:—

- (1) Rajendra Mills, Salem.
- (2) Trichinopoly Mills, Ltd.
- (3) Pullicar Mills, Tiruchengode.
- (4) Dalmia Cement Factory, Trichinopoly.
- (5) Mettur Industries.
- (6) Mettur Chemicals.
- (7) Jawahar Mills, Salem.



61. *Mettur workshop*.—The Mettur workshop completed its third year of working under the management of the Electricity department. The following manufacture and repair works were undertaken during the year:—

- (1) Line materials, such as crossarms, guysets, clamps, etc.
- (2) Gang-operated switches, switch-fuses, isolating links, horn-gaps, etc.
- (3) Repairs to transformers switches and motors.
- (4) Metal-framed windows and ventilators.
- (5) General such as bridge sections, steel racks for stores; and sundry office furniture.

The total value of work done during the year was Rs. 2,19,700 as against Rs. 76,000 in 1935-36 and Rs. 1,48,000 in 1936-37.

Experiments were conducted on the working of a galvanising plant made locally; the plant will be put into commercial use shortly.

CONSTRUCTION.

62. The capital works in progress and the expenditure thereon will be found in Appendix A.

63. *Pykara System*—(a) *Mukurti Dam Construction*.—At the commencement of the year under report the non-spillway sections had been built to a little below top level. The spillway had been raised to 12 feet below crest and the right flank corewall and side filling to about 40 feet below top.

The non-overflow sections and the corewall were completed before the monsoon. The spillway was purposely left 9 feet below its designed height for the monsoon in order that the dam should not be subjected to full pressure during the first season. Work on the spillway was resumed in January 1938 and practically completed by the end of March.

The earthen bund at the low saddle was also completed. Some of the temporary camp buildings have been dismantled and the materials used in connexion with the Pykara plant extensions. The rest of the temporary camps will be cleared and the works handed over to operation in May 1938.

The accounts have not yet been finalised but it is expected that the whole cost of the works will not exceed 15½ lakhs against the sanctioned estimate provision of 21½ lakhs.

The overall rate for masonry on this dam worked out to the low figure of Rs. 1.2 per cubic foot; the corresponding rate for the Glen-Morgan dam was Rs. 1.6.

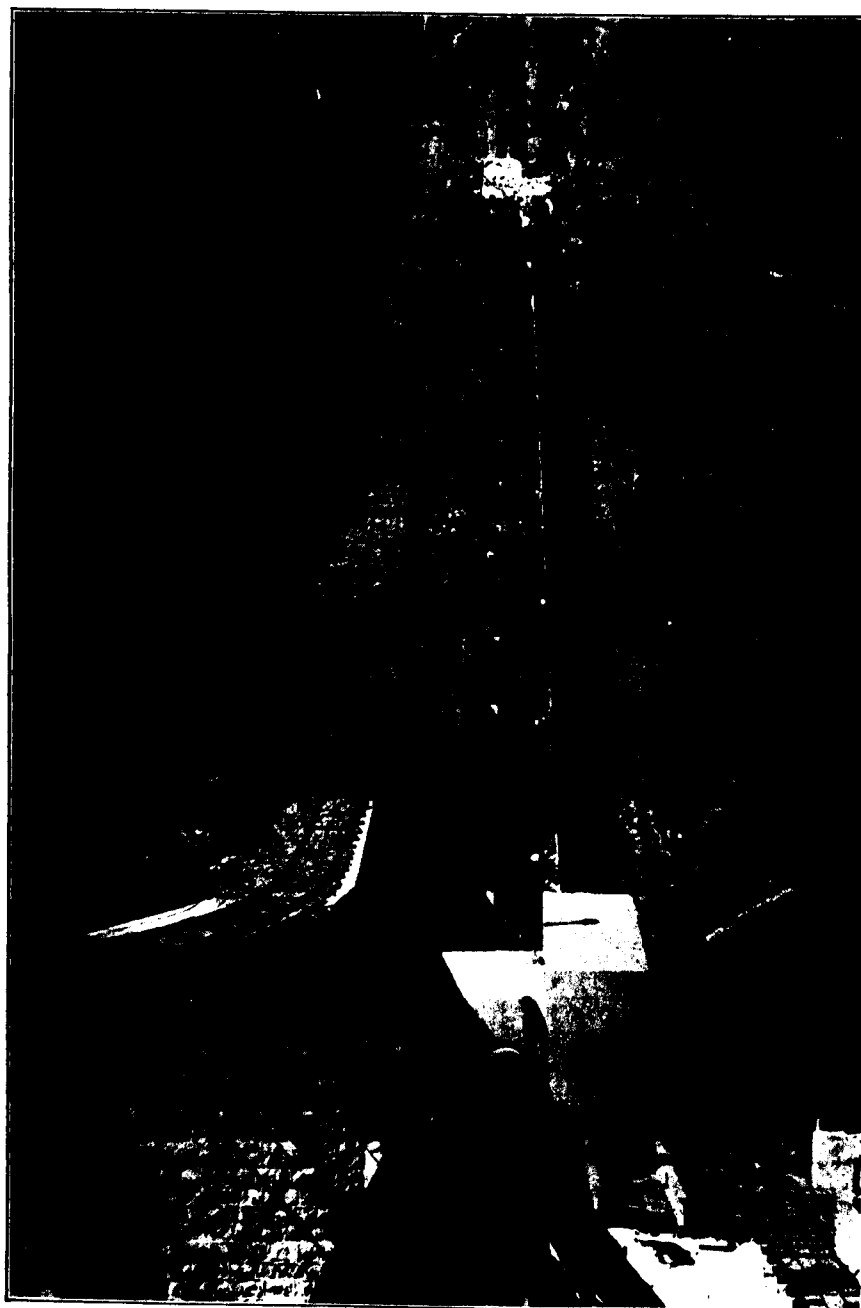
(b) *Pykara Plant Extensions*.—Contracts for the machinery and civil works were awarded and preliminary works on additional quarters required had been started in January 1937.

The following are the main contracts:—

- (1) Penstock line and valve—Messrs. Boving & Co., London, for Messrs. Ferrum, Poland.



VIEW OF MUKURTI DAM AND LAKE.



PYKARA PIPE LINE ERECTION IN PROGRESS BETWEEN ANCHORS 14 AND 16

- (2) Power Plant-Turbines—Messrs. Escher Wyss, Zurich—
Generators—Messrs. Metropolitan Vickers, Ltd.
- (3) Switchgear & Transformers—Messrs. Associated Electrical Industries, Ltd.

The whole of the haulage track was relaid in its re-aligned position by August 1937.

Excavation and grading for the new penstock line were completed in the second quarter. Foundations for anchors and construction of piers were nearly completed.

The penstock pipes commenced to arrive in December 1937; about half had been received by the end of March. Erection was begun in January 1938 and was making good progress.

The transformer yard had been prepared and foundations laid; structural materials and electrical equipment were arriving and the erection had started.

Excavation for the power-house extension was commenced in July 1937. Foundations for the steel structure were laid in September and erection completed in December 1937. The masonry walls had been built to half their height and the roof concrete completely laid. Foundations for machines were being prepared.

(c) *Coimbatore-Madura 66 KV Transmission Line—126 miles.*—Construction started in January 1937 was completed in October 1937. The contractors were Messrs. Callender's Cable and Construction Company. The work was executed expeditiously and power from Coimbatore was made available at Madura on 29th October. The sub-stations at Udumalpet and Sembatti were completed and handed over to the Pykara electricity system for operation and maintenance.

The sub-station at Madura was nearing completion. Erection of the circuit breakers and the synchronous condensers is expected to be completed in May 1938. Construction of the control house was delayed owing to late arrival from England of steel for the stanchions. Continuous supply to the municipality was ensured however by local co-ordination of permanent and temporary equipment.

(d) *Madura-Virudhunagar-Rajapalayam Extension—57 miles.*—The contract for the line from Madura to Virudhunagar was awarded to Messrs. Callender's Cable and Construction Company, and the line from Virudhunagar to Rajapalayam to Messrs. P. Natesan & Co., 80 per cent of the former work should have been completed by the end of the year but due to non-arrival of the towers from England the work is delayed and is expected to be completed by the end of June 1938. Arrangements for the diversion of other line material had been made.

The Virudhunagar-Rajapalayam line was completed and supply at 11 KV from the Virudhunagar Power House given to the licensee at Rajapalayam on 8th December when the line was handed over to the Pykara system for operation and maintenance.

The Gurumurthinaickenpatti-Sivakasi line was completed and power to water-works at Sivakasi was supplied from Virudhunagar Power House on 2nd September. This is the first electrification of a water-works undertaken by this department on behalf of the Public Works Department.

(e) *Virudhunagar-Koilpatti 66 KV line*.—The survey of the line was completed during the year. The contract for the line construction was awarded to Messrs. P. Natesan & Co., in January 1938. In order to employ Indian manufactured materials and local labour to a greater extent than heretofore, the order includes reinforced concrete pole structures instead of the usual steel lattice towers. The contracts for the staff quarters at Sattur and Koilpatti were under award.

(f) *Virudhunagar-Aruppukottai 11 KV line—12 miles and distribution scheme*.—To supply power to Aruppukottai where the distribution work was in progress a 11 KV line from Virudhunagar is under construction and is nearly completed.

(g) *Madura-Sivaganga-Karaikudi surveys*.—The licensees in East Ramnad area having agreed to close down their generating stations and to take a bulk supply from the department a scheme for a transmission line from Madura to this area was sanctioned by Government in November 1937; the survey for the lines was taken up and is in good progress; the sub-station sites at Sivaganga, Karaikudi and Manamadura had been selected. Tenders for the construction of the line and sub-stations had been called for.

64. *Mettur system*.—(a) The construction of the Mettur Power House was completed and the first unit brought into operation in June 1937.

(b) The 66/110 KV transmission lines Mettur-Erode and Mettur-Singarapet-Vellore was completed and brought into operation.

(c) *Vellore-Chittoor 33 KV line*.—The line was completed by March 1937 and a temporary supply to Chittoor given from the Vellore Licensees' Power House until energy was available from Mettur in June 1937.

(d) *Vellore-Conjeeveram 33 KV line*.—The surveys were completed during the year. The contract for construction was awarded to Messrs. Callender's and completion is expected by May 1938. The staff quarters at Ranipet and Conjeeveram are nearly completed and those at Kaveripakkam are in rapid progress.

(e) *Kaveripakkam-Arkonam 33 KV line*.—The survey was completed by March 1938. The contract for the line had just been awarded to Messrs. Crompton Engineering Company and construction is to be started in May 1938. Tenders for the sub-station equipment at Arkonam had been called for. Proceedings for acquisition of land at Arkonam for the sub-station site were in progress.

(f) *Singarapet-Tiruvannamalai-Villupuram 66 KV line*.—The contract for this line had been awarded at the end of the previous year but the work has been delayed owing to the difficulty of getting deliveries of steel. All stubs had been set by the end of the year however and tower materials were just being shipped. The staff quarters at Tiruvannamalai were nearly completed, at Villupuram completed and at Vettavalam in good progress. The electrical equipment for the sub-stations will not be delivered until the latter half of 1939.

(g) *Tiruvannamalai-Arni 33 KV line*.—The contract was awarded to Messrs. Callender's and the line is expected to be completed by the end of June 1938. The contracts for the staff quarters at Polur and Arni were awarded and work was in progress. The electrical equipment had not yet arrived at site.

(h) *Tiruvannamalai Municipal Distribution scheme*.—The contract was awarded to Messrs. Rameen & Co., Madras. The work had just been started and is expected to be completed by the end of August 1938, by which time the Singarapet-Tiruvannamalai section of the main line will also be ready.

(i) *Singarapet-Kariamangalam-Dharmapuri 33 KV line*.—The surveys of the line were started and completed during the year. The contract for construction from Singarapet to Kariamangalam and from Kariamangalam to Krishnagiri and Dharmapuri has been awarded to Messrs. P. Natesan & Co. Land acquisition proceedings were in progress.

(j) *Karur-Kattuputtur line—Kattai bed regulator*.—A part of the Karur-Kattuputtur line, crossing the Cauvery at Mayanoor was constructed in May 1937. Special foundations for planting the poles were devised and with the permission of the Chief Engineer for Irrigation the line was taken over the Kattalai bed regulator. This work was completed and the line taken over by the Mettur Electricity System.

(k) *Additional equipment at Negapatam sub-station*.—Owing to increase in demand by the contemplated installation of two large electric furnaces in the Indian Steel Rolling Mills, two of the existing 1,000 KVA transformers at this sub-station will be replaced by 2,500 KVA units and 1,000 KVA units thus released will be dismantled and re-erected at Koilpatti sub-station. The necessary additional switchgear equipment have been ordered from Messrs. Crompton Engineering Company; the order of the transformers has been placed with Messrs. A.C.E.C. (India), Ltd.

THERMAL SCHEMES.

✓ 65. *Vizagapatam*.—(a) *Power station*.—Construction work was in progress throughout the year.

At the end of the last year, pile caps were being concreted and beams and rafts laid. On completion of this work in May 1937 steel work erection and masonry superstructure was started and the main items completed in August.

Material for the two smaller boilers and the chimney commenced to arrive in June and construction has been in progress since then.

There were occasional delays for want of material. The work was completed in January 1938 and steam supplied to the 750 KW turbine on 27th February 1938.

The material for the third boiler of 22,000 lb. evaporation is at site. As soon as the supply is changed over to the new installation, the second of the two existing boilers of the harbour plant will be dismantled and the new boiler installed in its place. Foundations for the 1,500 KW turbine presented some difficulty as they were close to the existing harbour engines which were in daily use. A further delay occurred over the reduction gears for this set which had been shipped in a slightly damaged condition. In the preliminary runs of the 750 KW turbine frothing and flooding of the lubricating oil was experienced.

The erection of 1,500 KW set was started in January 1938. The indoor switchgear has been erected with the exception of the exciter panels and the voltage regulators which are expected shortly. The outdoor switchgear and transformers have been erected.

It has been decided that the operation office should be in the power-house compound and the necessary additions and alterations have been made to the existing buildings. A 23 feet by 22 feet store room has been added to the main office block and the outhouse block has been reconditioned to be suitable for a small workshop, coal testing laboratory and Shift Supervisor's room.

The control of the Vizagapatam Harbour Power House and responsibility for supply was taken over by the department on 26th March 1938. The 750 KW turbo-set was then put into regular commission, and the old harbour plant is kept as a standby and will not be dismantled till the 1,500 KW set is ready for service.

(b) *Transmission lines.*—The transmission lines included in the scheme as at present sanctioned consists of 265 miles of multi-circuit line including three towers 61 feet high in the Vizagapatam Port area for crossing the manganese dumps, 19 miles of 11 KV single-circuit line to Anakapalle, 47 miles of 33 KV single-circuit line to Vizianagram and Penubarti with two 65 feet towers for crossing the Nellimarla River, 8 miles of double-circuit 11 KV line to Garbham, 19 miles of 11 KV single-circuit line to Bobbili and two 11 KV single-circuit spurs from Penubarti to Kodur 1.7 miles and Chitavalasa to Bimilipatam 2.8 miles.

Construction work was started by Messrs. Henleys in October 1937, and good progress was made for about two months when a temporary check occurred by the non-supply of 33 KV crossarms from England due to the steel position. The 11 KV line to Anakapalle, 19 miles, has been completed except for two railway crossings. Nineteen miles of 11 KV line from Garbham to Bobbili have

been completed with the exception of one river and two railway crossings. The double-circuit 11 KV line, 8 miles, from Penubarti to Garbham is being strung.

The contracts for the line structures and switchgear have been awarded to Messrs. General Electric Company for all the stations. The 33 KV structures are of reinforced concrete and the 11 KV structures will be constructed with steel poles. About 50 per cent of the 11 KV structure work has been completed.

(c) *Equipment*.—There are three transformer stations, at Chittivalasa, Vizianagram and Penubarti, and five switching and receiving stations at Anakapalli, Bimlipatam, Kodur, Garbham and Bobbili.

Metering and control cubicles have been delivered to respective sub-station sites and are awaiting installation. The latest advice from the contractors is that a number of essential items are held up in England.

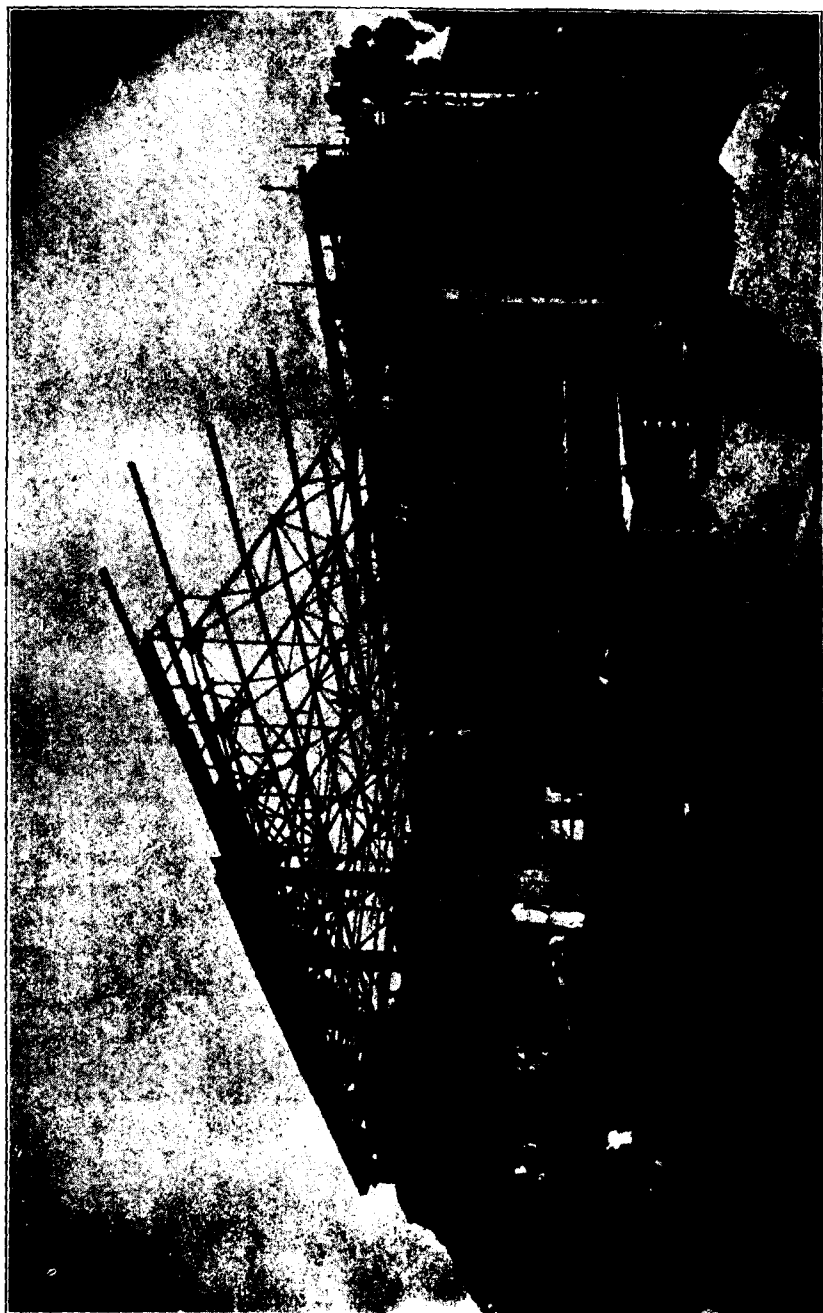
The general experience on the Vizagapatam construction is that nearly all the contractors are experiencing difficulty in keeping to contract dates owing to preoccupation of European countries with the rearmament programme. The position is most acute with regard to steel.

Quarters for the line operation staff are under construction at the various sub-stations.

✓ 66. *Bezwada Thermal Scheme*—(a) *Power-house*.—The contract for the power-house construction was awarded to Messrs. Gannon, Dunkerley with Messrs. Simplex as sub-contractors for piles and Messrs. Richardson and Cruddas for steel-work. Work on piles was commenced on 30th June and completed by November. Work on the boiler erection was held up owing to the unexpected non-receipt of the steel girders for the stokers. Chimney foundations construction work was in progress. Steel work for the engine room was received in January 1938 nearly five months after the agreed date; work on erection was commenced immediately. The boiler house steel work is also at site and was being erected at the end of the year. The contracts for the construction of the cooling water tank and for excavating the make-up well were awarded; and the work has been in progress for two months. The consolidation and filling for its bed have been completed and the bottom raft is being laid. Dry excavation has been commenced on the well. Work has been put in hand on the circulating water pipe trench and transformer yard. Major part of the construction work above ground however is expected to be done in April, May and June 1938.

(b) *Transmission lines*.—Materials were delayed but the lines were completed and handed over in November and the sub-station equipment in December.

Sanction has been accorded to the construction of a 33 KV line (nineteen miles) from Bezwada to Tenali to supply Messrs. Guntur Power and Light, Ltd., at their sub-station at Tenali. Government have decided to undertake distribution in Nuzvid town.



BEZWADA POWER-HOUSE IN CONSTRUCTION

The Gudivada Electric Supply Corporation erected their network and temporary supply from the Bezvada Power House was given through the lines from 1st November.

The Ellore Electric Supply Corporation were also given a similar supply from 5th January.

INVESTIGATIONS.

67. (a) *Hydro-metric work*.—Hydro-metric observations and rainfall and riverflow records were continued in all catchments which had previously been under measurement.

(b) *Lammasinghi Hydro-Electric Scheme*.—The field investigation was completed at the end of the previous year.

(c) *Cauvery Pumping Schemes*.—A rough inspection on the field has been made to study the possibility of pumping water from the Cauvery at convenient places for irrigating high level lands adjacent to the river in Tiruchengode and Namakkal taluks in Salem district. One or two schemes appear feasible and proposals are being worked out.

OTHER ACTIVITIES OF THE DEPARTMENT.

68. *Designs and estimates*.—The technical divisions of the Chief Engineer's office were enlarged in January 1937 to meet the increasing volume of work. Among the interesting and important work may be mentioned the preparation of schemes, the drafting of specifications, the letting of contracts, the purchase of materials and the technical side of all operation. Based on experience gained in the last seven years of construction and operation and by the greater use of Indian materials, considerable reduction in the cost of lines and sub-station structures has been made. For example the cost per mile of certain 66 KV lines has been reduced from Rs. 14,600 to Rs. 10,700, and for certain 33 KV lines from Rs. 9,600 to Rs. 6,600 whilst the total cost of thirteen sub-station structures has been reduced from Rs. 1,22,000 to Rs. 49,000. The use of treated wood poles has been under consideration and trial for some time and arrangements are now being made to use them on a more extensive scale than has been possible before.

69. The following schemes were the more important of the eighteen totalling Rs. 46,58,200 completed during the year:—

	Rs. Lakhs.
(1) Virudhunagar-Rajapalayam 33 KV line and Sivakasi 11 KV line	1.740
(2) Coimbatore-Madurai, 66 KV line	17.170
(3) Udumalpet and Sembatti sub-stations	2.290
(4) Extensions to Kotagiri Cordite Factory, Tea estates, etc. ..	2.182
(5) Telephone lines and equipment for the Mettur Hydro-Electric System (initial stage)	2.681
(6) Erode sub-station extensions and sub-stations at Singarappett, Tirupattur, Ambur, Vadakattappatti and Vellore	8.210
(7) Bezvada-Ellore, 33 KV line	2.132
(8) Sitaranapuram-Gudivada-Masulipatam 33 KV line	2.000

Contracts have been awarded and construction work was proceeding on the following schemes with a total contract price of Rs. 68,06,500 :—

Item number and description.	Approximate contract amount in lakhs of rupees.
(1) Additional switch gear and transformers, Pykara	4.410
(2) Singarappett-Villupuram and Madurai-Virudhunagar 66 KV line.	8.551
(3) Virudhunagar-Aruppukottai 11 KV line	0.341
(4) Virudhunagar-Kovilpatti 66 KV line	2.406
(5) Telephone lines and equipment for Madurai-Virudhunagar-Kovilpatti extensions	2.756
(6) 110 KV change over at Coimbatore, Nallithoral, Kattabettu, etc.	4.847
(7) Larger switchgear and transformers at Coimbatore	3.230
(8) Aruppukottai distribution scheme	0.711
(9) Dharapuram distribution scheme	0.443
	(supply of materials only).
(10) Madurai receiving station	4.284
(11) 66 KV and 33 KV sub-stations at Virudhunagar, Kovilpatti, Sattur, Tiruvannamalai, Vottavalam, Polur, Arni, Gurumurthinaickampatti, Rajapalayam, Kaveripakkam, Ranipet and Conjeevaram	5.322
(12) Vellore-Conjeevaram and Tiruvannamalai-Arni 33 KV lines ..	3.869
(13) Singarappett-Karimangalam, Dharmapuri-Krishnagiri and Kaveripakkam-Arkonam 33 and 11 KV lines	2.738
(14) Singarappett-Villupuram telephone line	1.043
(15) Additional equipment at Negapatam	12.93
(16) Tirupattur Municipal distribution scheme	0.786
(17) Tiruvannamalai Municipal distribution scheme	0.878
(18) Vizagapatam 33 and 11 KV lines and sub-stations	6.138
(19) Bimlipatam Government distribution scheme	0.330
(20) Vizagapatam power-house equipment	6.008
(21) Bezvada-Tenali 33 KV lines	0.969
(22) Bezvada power-house equipment	6.712
	68.065

NOTE.—(1) Contracts for items (10), (20) and (22) were awarded in the year 1936-37 and are still in progress.

(2) The above values do not include ironwork for the contracts, under items (3), (8), (11) and switches for some of the sub-stations for the contract under item (11) which were supplied departmentally and also concrete for foundations.

(3) The supply of ironwork including cross-arms and erection, not included in the values under items (9) and (21) will be done departmentally.

Technical reports and estimates were prepared or checked and the materials ordered for sixty extensions to the department's supply mains with a total value of Rs. 12,44,800.

Technical reports including preliminary estimates and financial forecasts were prepared for thirty schemes to an aggregate cost of Rs. 63,04,400. A few of the more important schemes were :—

Item number and description.	Estimate of initial cost in lakhs of rupees.
	RS.
(1) Chittoor-Chandragiri extension	2.700
(2) East Ramnad extension scheme	5.290
(3) Tinnevely extension scheme	16.000
(4) Cocanada Thermal scheme	3.710
(5) Cocanada Thermal scheme—Government distributions at Samalkot, Poddapuram, Pithapuram, Ramachandrapuram and Mandapettah	3.516
(6) Palakol Thermal scheme—	
(a) Government	2.918
(b) Municipal	0.653
(7) Supply of power to Kolankonda cement factory from Bezvada including extensions to the power-house equipment	7.450
(8) Batlagundu-Periyakulam extension scheme	2.400
(9) Gobichettipalayam extension	2.392
(10) Dharmapuri and Krishnagiri extension scheme	4.704

70. *Stores.*—The following table gives the cost of the materials purchased in India through the Electrical and Mechanical division :—

Table.

	RS.
(1) For operation and maintenance	82,700
(2) For extensions	8,99,800
(3) For new schemes including additional transformers and switch-gear for Pykara	41,32,200
(4) Extras for schemes for which contracts were awarded in 1936-37.	1,28,900
Total	52,43,600

The above table does not include the cost of additional generating plant for Pykara and spares for the Pykara and Mettur Hydro-Electric Systems covered by English indents ordered by the Director-General, India Stores Department, London. The approximate total amount of such indents are given below :—

	British.	Foreign.	Total.
	RS.	RS.	RS.
(1) Additional generating plant for Pykara	5,04,900	1,83,400	6,88,300
(2) Spares for Pykara and Mettur systems	7,500	3,000	10,500
Total	5,12,400	1,86,400	6,98,800

ADMINISTRATION OF THE INDIAN ELECTRICITY ACT AND RULES.

71. *Licences.*—The number of licensees giving supply in the Presidency is 66 of these 30 are local bodies and 36 are companies. Ten licensees have not yet started supply and eight applications for licences are under consideration—vide Appendix F, 1, 2 and 3 attached. During the year under review sixteen licensees commenced supply—Appendix F-4.

Appendix E shows the total generation capacity of plant of all the electric supply undertakings in the Presidency now amounting to approximately 131,000 KVA of which the Madras Electric Supply Corporation, Ltd., Madras, own 53,750 KVA and the Madras Government's Pykara and Mettur Power Stations 63,550 KVA.

Appendix F-5 gives the names of licensees who reduced their tariffs in 1937-38 and also those who were asked to reduce the tariffs and the action taken by them.

Appendix F-6 gives the names of licensees who charge more than 6 annas per unit.

The ban imposed on the Masulipatam undertaking from adding further loads was removed. The ban on Hindupur still exists. The Kurnool municipality has been permitted to develop additional loads after the fourth generating set now under erection is brought into use.

72. The Indian Electricity Rules, 1937, came into legal operation from 1st April 1937 and steps have been taken to bring into effect the new laws.

73. Due to the advent of Mettur and the Thermal schemes and the correlated enthusiasm in neighbouring areas, a large number of licences came under operation during this year. Vellore, Chittoor, Ellore and Madura which were previously generating their own power changed over to the Government supply during the year.

74. Useful statistical data concerning all licensed undertakings are given in Appendix D. Table of Electric supply costs and records. An examination of the accounts of the various undertakings reveals that in the case of the older ones, the capital as shown in their books is considerably in excess of the actual market values. The principal reasons are the greater economy of modern constructions and the steady fall in prices of electrical goods with the increase in demand and the rapid rise in the number of undertakings. As depreciation funds and other reserves are contributed based on the capital as shown in the books, they are often more than what is actually needed for the purpose in view and consequently a wasteful locking up of capital results. It appears advisable therefore in order to hasten the reduction of rates that in the case of older undertakings a systematic revaluation of the assets be carried out as early as possible.

75. *Inspection and tests.*—The number of inspections made was :—

Inspections and tests of works notifiable under the Act 752

Excepting one, all inspections of licensees works scheduled for the year were duly carried out.

Orders were passed during the year authorizing the Electrical Inspector to include all the Government areas under his jurisdiction for regular inspection.

During this year a systematic check of the line voltages and the condition of the house service meters as maintained by various licensees was conducted by the division. The majority of the meters tested at site were found inaccurate.

The total number of tests carried out in the Electrical Standards Laboratory at Madras and at site in the licensees' areas was 752 made up as follows:—

Sub-standards	..	..	..	..	..	..	102
Meters and instruments	..	..	..	..	..	..	388
Oil tests	..	..	..	..	..	..	35
Voltage and earth	..	..	..	..	..	..	165
Fire extinguishers	..	..	..	..	..	..	62
Total	..	..	..	..	..	..	752

Of the 102 sub-standards, 34 were from licensees, 33 from the Government Pykara system and the rest of the Laboratory. During the year all licensees except twelve sent their sub-standards for calibration and adjustment.

76. *Administration of the Indian Cinematograph Act.*—The total number of working cinemas in the Presidency was 372 of which 189 were permanent and 183 travelling. The number of inspections made during the year was 473.

There has been a sudden and rapid increase in the number of cinemas during the year which has considerably increased the work of the staff.

A serious fire occurred in the Regal Talkies, Ootacamund, due to unsatisfactory state of the Cinema particularly in storing films; fortunately the fire was brought under control before serious damage was done.

77. *Control of the Local Authorities Electrical Engineers Service.*—Though the Local Authorities Electrical Engineers Service was formulated under G.O. No. 727, L. & M., dated 22nd February 1936, it came into effective force under the control of the Chief Engineer for Electricity from 1st April 1937 only. There were thirteen municipal undertakings at the end of the previous year and during the present year three more, viz., Coimbatore, Tiruppur and Kodaikanal, were added on to the service. A separate Assistant Engineer is used for controlling the services.

A periodical and systematic inspection of each of the undertakings was made by the Assistant Engineer who studied at site the existing conditions (administrative, technical and financial) as also the maintenance of office and accounting records. Based on the findings during such inspections instructions and recommendations are given to the concerned municipalities with a view to bring them up to date in accordance with the rest of the Presidency.

Ten local authorities' undertakings were inspected on the above lines during this year.

During the examination of accounts of some of the local body undertakings a possibility of electrical loan funds being diverted for other requirements without being checked till at a very late stage was brought to notice. In one local body undertaking a loan amply sufficient for all works was sanctioned and received from Government; but at the end of the work, the contractors were not paid for want of funds.

Specifications for the electricity undertakings at Kollegal and Rameswaram were prepared on behalf of the respective boards on payment of fees.

78. *Revenues.*—As against an expenditure of Rs. 57,600 a total revenue of Rs. 48,250 both subject to later adjustment, was realized as follows:—

	RS.
Fees for inspections under the Indian Electricity Act	.. 18,007
Do. cinema inspections	 21,415
Do. meter test	 2,382
Do. advice	 1,622
Do. arbitration	 256
Do. miscellaneous	 862
Do. licensees	 5,000
To. the use of Government water for the generation of electricity	 600
	50,144
Deduct refunds	.. 1,893
	48,251
	or
	48,250

It will be seen that a large per centage of the total revenues is due to the cinema inspections.

79. *Accidents.*—There were 79 accidents reported during the year of which 36 were fatal. Twenty were in the Government supply areas and sixteen on licensees' works. The details of the fatal accidents are analysed—

Areas.	Em- ploy- ees.	Non- em- plo- yees.	Animals.	Total.
1 Hydro-electric system		19	1	20
2 Licensees		6	10	16
Total		6	29	36

Serial number and cause.	66,000 volts.	33,000 volts.	22,000 volts.	11,000 volts.	230 volts. L.T.	Total.
1 Climbing of poles and towers out of curiosity or intention to commit suicide	17	1	..	3	3	24
2 Climbing of poles in spite of warning	..	..	..	..	2	2
3 Faulty wiring	..	..	..	..	3	3
4 Snapping of conductors	..	..	1	..	1	2
5 Development of potential in poles, stays, etc., due to faulty earthing	..	..	..	..	2	2
6 Accidental (other causes)	1	..	..	..	2	3
	18	1	1	3	13	36

ELECTRICAL INSTALLATIONS IN GOVERNMENT BUILDINGS.

80. Due to the rapid spread of electric supply undertakings an increasingly large number of proposals for electrification of Government buildings in the mufassal have been received and these together with the maintenance of a larger number of electrical installations has made the year one of exceptional strain. The total expenditure in the division was Rs. 4.45 lakhs as against Rs. 3.75 lakhs in the previous year. The total value of all installations the value of new work of maintenance and of energy charges are as follows:—

Details.	1935-36.	1936-37.	1937-38.
	RS.	RS.	RS.
	LAKHS.	LAKHS.	LAKHS.
(1) Total capital cost to end of the year ..	43.16	44.87	47.30
(2) Cost of new works constructed during the year	1.85	1.71	2.43
(3) Total maintenance charges in the year excluding current consumption charges	1.62	1.62	1.77
(4) Total current consumption charges paid during the year	2.33	2.33	2.4
	PER CENT.	PER CENT.	PER CENT.
(5) Percentage of maintenance charges on the total capital cost	3.76	3.6	3.74

NOTE.—The above figures exclude the works carried out and debited to other Public Works Department divisions against grants held in those divisions.

81. *Works completed and in progress.*—Illumination of important public buildings in connexion with Their Majesties' Coronation was a special feature in the work of this division during the year. The provision of loud speaker equipment in the Madras Legislative Assembly was satisfactorily carried out in spite of the short time available. A few of the more important works completed during the year are—

- (1) Leper Settlement at Tirumani.
- (2) Collector's offices at Bellary, Nellore, Saidapet, Tinnevely, and Ramnad at Madura.

- (3) Hospitals at Madras (General), Rayapuram, Trichinopoly and Madura.
- (4) Jails at Cuddalore and Vizagapatam.
- (5) Tuberculosis Sanatorium, Tambaram.
- (6) New official residences at Adyar.
- (7) Borstal School at Palamcottah.

On completion most of the works in the mufassal are handed over to the Executive engineers of the respective divisions for maintenance.

In addition to the works executed during the year the usual annual maintenance including a number of special repairs and rewiring of old installations were undertaken and all the installations were maintained very efficiently. A few of the works which were under progress are—

- (1) Court-houses at Guntur and Masulipatam.
- (2) Hospitals at Nellore, Bezwada and Masulipatam.
- (3) Quarters of the District Medical Officer at Calicut, the Collector at Cuddapah, the Sub-Collector at Kadambadi and Public Works Department, Bezwada.

Preparation of estimates.—During the year under review about 1,150 estimates were prepared and scrutinized, 135 revised and 910 sanctioned. The total cost of the estimates prepared is roughly 8.5 lakhs. A few of the more important estimates were—

- (1) New Dining Hall, Collonade and Pergola, Government House, Madras.
- (2) Improvements in Government House, Guindy.
- (3) Extensions to the Electrical Engineering Laboratory, Engineering College, Guindy.
- (4) Central and Presidency Jails at Vellore.
- (5) District Court buildings at Salem and official residences at Salem, Vellore, Cocanada.

STAFF.

82. Important changes in the superior staff of the department during the year were as follows:—

Lieut.-Col. M. G. Platts, Superintending Engineer, Construction and Civil Engineering Branch, Mettur, proceeded on seven months' leave out of India on April 30th, charge of the branch being divided as follows:—

Construction in connexion with the Mettur scheme and the office and accounting for the whole branch were taken over by the newly appointed Superintending Engineer, Mettur system. Civil Engineering design and direction of construction of works other than those connected with the Mettur scheme were taken over by the Chief Engineer. On Lieut.-Col. M. G. Platts' return on November 29th he resumed charge of the

Construction Branch with its headquarters moved to Madras. The Civil and Hydraulic Division, responsible for civil engineering design, was subsequently continued as part of the Chief Engineer's office but for purposes of convenience the work was directed by the Superintending Engineer, Construction Branch.

Major H. G. Howard, Chief Engineer (Electricity), went on leave out of India for eight months from 2nd March 1938 and Lieut.-Col. M. G. Platts, Superintending Engineer, Construction Branch, was appointed to officiate as Chief Engineer in his place.

Mr. L. Henshaw, Superintending Engineer, Pykara Electricity System, was transferred to the Construction Branch in place of Lieut.-Col. M. G. Platts.

Rao Bahadur Sri G. Sundaram, Executive Engineer and Personal Assistant to the Chief Engineer (Electricity), was promoted in April 1937 as Superintending Engineer and posted to Mettur. Mr. E. J. B. Greenwood, Electrical Inspector, was appointed Personal Assistant to the Chief Engineer (Electricity) and Sri M. Subrahmanyam appointed as Electrical Inspector. In February 1938 Rao Bahadur Sri G. Sundaram was transferred to Pykara system in place of Mr. L. Henshaw.

The designation of the post of Personal Assistant to the Chief Engineer (Electricity) was changed in February 1938 to Deputy Chief Engineer and Mr. E. J. B. Greenwood continued therein. In March 1938 on the departure on leave of Major H. G. Howard, Mr. E. J. B. Greenwood was appointed Electrical Inspector to Government with the rank of Superintending Engineer.

Sri P. V. Chari, Electrical Engineer (General), was promoted as Superintending Engineer and posted to Mettur in February 1938 in place of Rao Bahadur Sri G. Sundaram.

Mr. A. C. D. Rozario, Assistant Electrical Engineer, was appointed as Electrical Engineer (General) in place of Sri P. V. Chari.

Sri N. R. Narasimhamurthi, Sri M. B. Kandaswami Mudaliyar and Sri A. R. Narayana Rao were also promoted as Divisional Electrical Engineers during the year and posted to the newly formed divisions at Mettur, Madura and Trichinopoly, respectively.

Mr. V. E. Lazarus was appointed as Divisional Electrical Engineer on contract and placed in charge of Vizagapatam steam station.

Sri P. Natesa Ayyar, Executive Engineer, Civil and Hydraulic Division, proceeded on leave from February 1938 preparatory to retirement; Sri G. Krishnaswami Ayyar was appointed to officiate in his place.

The following officers were admitted to full membership of the service during the year:—

Class I—Category 1 (Superintending Engineers)—

L. Henshaw.

Category 2—Executive Engineer (Electrical)—

M. Subramaniam.

Category 3—Assistant Engineer (Electrical)—

V. K. Govinda Menon.

J. F. T. Rozario.

P. V. A. Narayanamurthi.

A. R. Narayana Rao.

K. R. Kuruvilla.

C. E. Prager.

Class II—Assistant Engineer (Civil)—

P. M. Chengappa.

Class IV—

B. Suryanarayanamurthi.

The following appointment of Assistant Engineers and Chief Accountant were made during the year:—

Class I—Category 3—

S. Padmanabhan.

V. K. Sethuraman.

T. N. Rajagopal.

N. Nagappa Nayak.

T. R. Krishnamurthi.

T. Ramaswami.

K. Srinivasaraghavan.

P. K. Narayana Rao.

S. Krishnaswami.

V. Venugopalan—appointment under emergency rules.

Class II—Assistant Engineers (Civil)—

K. Y. S. Menon (on contract).

K. R. Rajagopalan.

E. V. Seshan—emergency appointment under rule 4 (c) of the general rules.

Class III—Assistant Engineer (Mechanical)—

S. V. Chellam.

Class IV—

N. Gopalakrishnan.

M. G. PLATTS,
Chief Engineer for Electricity.

12th August 1938.

APPENDIX A.

List of constructions undertaken with expenditure to end of
1937-38.

Name of schemes.	Expenditure during 1937-38.	Total expenditure to end of 1937-38.
	RS.	RS.
Capital expenditure.		
I. Government schemes—		
(1) Pykara Hydro-Electric project—		
79. I.A. (i) Pykara Hydra-Electric scheme	69,307	1,18,08,681
Additional generating machinery at Pykara	10,76,214	11,79,404
Distribution of power in the Pykara system (Major and Minor extensions)	7,98,200	17,54,925
Supply of power to Virudunagar and Rajapalayam	3,50,156	3,53,843
Mukurti Dam	1,38,879	15,01,933
Supply of electric power to Madura	7,95,986	11,10,706
Supply of power to Kovilpatti	852	852
Total, Pykara system ..	30,90,980	1,77,10,344
(2) Mettur Hydro-Electric scheme—		
79. I.B. (1) Mettur main scheme	4,96,394	69,11,630
	+ 5,02,111	+ 5,02,111
(2) Erode-Trichinopoly extensions	4,411	11,79,467
(3) Trichinopoly-Negapatam extensions	12,344	20,90,330
(4) Karur Electric Supply Scheme	51	79,567
(5) Extension of supply to Ranipet, Kaveripakkam and Conjeeveram	1,50,392	1,51,696
(6) Extension of supply to Arkonam	580	580
(7) Distribution of power in the Mettur system	1,66,357	1,66,357
(8) Cost of works transferred from Pykara system	9,80,467	9,80,467
Total, Mettur system ..	23,13,107	1,20,62,205
(3) Thermal schemes—		
79. II-a. (1) Dindigul Electric Supply scheme	9	1,33,303
(2) Virudunagar scheme	381	1,47,863
(3) Palni scheme	3,224	66,701
b. Theni, Periyakulam and Bodinayakanur	10,782	1,66,694
c. Vizagapatam Thermal Station.	14,36,048	14,59,779
d. Bezwad do.	8,52,501	9,00,572
Thermal schemes ..	23,02,927	28,74,912

APPENDIX A—cont.

List of constructions undertaken with expenditure to end of
1937-38—cont.

Name of schemes.	Expenditure during 1937-38.	Total expenditure to end of 1937-38.
	RS.	RS.
Capital expenditure—cont.		
II. Municipal schemes—		
Pollachi	10,431	1,98,033
Udamalpet	10,492	74,553
Karur	12,240	98,800
Dindigul	15,478	1,47,628
Virudunagar	14,100	1,75,450
Palni	6,535	47,419
Periyakulam	9,450	68,512
Bodinayakanur	9,988	53,372
Dharapuram	33,995	33,995
Sivakasi	53,032	53,032
Tirupattur	54,327	54,327
Tiruvannamalai	58,275	58,275
III. 50. Civil Works—New Electrical Works	2,43,000	47,30,000

APPENDIX B.

Budget provision for Capital works in 1938-39.

	1938-39 (budget).
	RS.
Capital expenditure.	
I. Hydro-Electric schemes—	
A. Pykara Hydro-Electric Project—	
Pykara Hydro-Electric scheme	2,65,900
Additional generating machinery at Pykara	18,32,800
Distribution of power in the Pykara system	5,900
Supply of power to Virudunagar and Rajapalayam	2,21,600
Mukurti Dam	2,32,200
Supply of electric power to Madura	1,900
	1,000
Supply of power to Kovilpatti	22,000
Supply of electric power to Periyakulam, Theni and Bodinayakanur	100
Supply of electric power to Gobichettipalayam and five other villages	4,71,000
Supply of electric power to Ramnad district	2,29,700
Construction of transmission lines and other works for supply to intending consumers	2,30,000
Pension charges	4,88,000
	5,50,000
	11,500
	700
Total, 79. I.A. Pykara Hydro-Electric Project ..	45,32,000
Voted and charged ..	..

APPENDIX B—cont.

Budget provision for Capital works in 1938-39—cont.

	1938-39 (budget). RS.
<i>Capital expenditure—cont.</i>	
79. I.B. Mettur Hydro-Electric Project—	
Mettur Main scheme	11,18,400
Erod; Trichinopoly extension Charged ..	5,800
Trichinopoly-Negapatam extension	2,200
Extension of supply to Ranipet, Kaveripakkam and Conjeeveram	1,13,600
Extension of supply to Arkonam Charged ..	94,400
Distribution of power in the Mettur system	700
Supply of electric power to Pakala and Tirupati	1,71,000
Construction of transmission lines and other works for supply of power to intending consumers	1,00,000
Pension charges	2,70,000
Total, 79. I.B. Mettur Hydro-Electric Project ..	4,00,000
79. I.C. Papanasam Hydro-Thermal Project—	7,700
Papanasam Hydro-Thermal Project	22,83,800
79. II. Thermo-Electric schemes—	
79. II-A. Dindigul-Virudunagar Electric Supply schemes.	22,22,200
B. Thent-Periyakulam-Rodinayakkanur Electric Supply schemes	— 1,48,100
C. Vizagapatam Thermal Station. Supply of electric power to Bobbili-Vizianagaram Government distribution	— 1,36,200
D. Bezwada Thermal Station, Extension to Tenali	4,51,000
E. Cocanada Thermal Station	6,77,000
F. Palacole do.	3,60,000
Total, Thermo-Electric Schemes ..	2,32,000
Grand total ..	14,36,800
Deduct lump sum for probable savings ..	1,04,62,900
Total, 79. Capital outlay on Electric schemes ..	— 7,24,600
	97,38,300

APPENDIX C.

Details of establishment charges of the department and fees earned during 1937-38 and estimated for 1938-39.

	Expenditure in 1937-38 (final modification). RS.	1938-39 (Budget). RS.
Electrical Engineer (General)—		
Salaries, allowances, etc.	75,200	74,500
Revenue	..	..
Net cost ..	75,200	74,500
Electrical Inspector—		
Salaries, allowances, etc.	57,400	54,500
Revenue	38,500	38,500
Net cost ..	18,900	16,000
Revenue from water-power	..	..
Royalty from Mysore Government	1,000	61,000
Chief Engineer's office including Technical section—		
Salaries, allowances, works, etc.	2,04,800	1,73,900
Revenue (charges recoverable from Governments and departments).	1,92,000	2,20,900
Net cost ..	12,800	47,000
Pykara Hydro-Electric system—		
Salaries, allowances, etc.	2,71,200	2,91,400
Less charges payable to or recoverable from Governments and departments.	97,000	70,700
Net salaries and allowances ..	1,74,200	2,20,700
Operation and maintenance expenditure	8,87,300	9,30,000
Revenue	27,58,000	29,58,000
Net surplus ..	16,96,500	18,07,300
Mettur Hydro-Electric system—		
Salaries, allowances, etc.	44,600	1,98,800
Less charges payable to or recoverable from Governments and departments.	12,100	3,300
Net salaries and allowances ..	32,500	1,95,500
Operation and maintenance expenditure	40,200	1,25,100
Revenue	2,31,000	7,81,400
Net surplus ..	1,58,300	4,60,800

APPENDIX C—cont.

Details of establishment charges of the department and fees earned during 1937-38 and estimated for 1938-39—cont.

	Expenditure in 1937-38 (final modification).	1938-39 (Budget).
	RS.	RS.
Dindigul, Virudhunagar and Palni Government schemes—		
Salaries and allowances	15,500	1,700
Less charges payable to or recoverable from Governments and departments.	— 14,800	..
Net salaries and allowances ..	700	1,700
Operation and maintenance expenditure	43,100	6,000
Revenue	87,400	9,000
Net surplus ..	23,600	1,300
Theni Government scheme—		
Salaries and allowances	11,000	10,500
Less charges payable to or recoverable from Governments and departments.	— 9,700	— 6,900
Net salaries and allowances ..	1,300	3,600
Operation and maintenance expenditure	14,800	14,100
Revenue	25,000	25,800
Net surplus ..	8,900	8,100
Vizagapatam Thermal scheme—		
Salaries and allowances	..	31,900
Charges payable to Governments and departments.	..	3,800
Net salaries and allowance ..	..	35,700
Operation and maintenance expenditure	..	55,400
Revenue	..	89,700
Net surplus ..	..	— 1,400
Bezwada Thermal scheme—		
Salaries and allowances	..	28,700
Charges payable to or recoverable from Governments and departments.	..	— 6,000
Net salaries and allowances ..	..	22,700
Operation and maintenance expenditure	..	42,200
Revenue	..	79,000
Net surplus ..	..	14,100

APPENDIX D-1.

APPENDIX D-1.

Table of electric supply costs and records—companies.

Name of undertaking.	(1)	(2)	(3)	(4)	(5)	(6)	Revenue.			Gross profit.		
							(7)	(8)	(9)	(10)	(11)	(12)
Year of accounts to which the figures refer.	Year of operation.	Population of area of supply.	System and voltage of supply.	Capital—Total expenditure at the end of year.	From electric supply.	From meter-rents and other sources.	Costs—Working costs.	Before interest and depreciation.	Interest during the year averaged.	Percent to capital outlay.	PER UNIT.	
1 Madras	30th ..	680,207	DC. 450/225 V AC. 440/250 V 50 ~	1,523,391	265,543	8,697	200,806	154,894	10-5	10-5	48	
2 Kanadukathan	14th ..	28,200	AC. 400/230 V 50 ~	4,80,298	60,758	12,770	61,186	34,112	7-3	7-3		
3 Devakottai	12th ..	20,378	DC. 400/230 V 50 ~	2,44,777	46,284	2,744	36,521	25,145	11-05	11-05		
4 Cochin †	12th ..	22,818	AC. 400/230 V 50 ~	77,794	10,338	653	9,565	1,824	2-34	2-34		
5 Trichinopoly-Srirangam	10th ..	171,035	Do.	18,03,194	3,54,803	34,158	3,56,250	2,02,592	15-4	15-4		
6 Rajahmundry	9th ..	63,526	Do.	4,17,899	83,825	6,659	68,463	54,723	13-15	13-15		
7 Calicut	1936-37 ..	90,273	Do.	9,86,866	1,31,172	7,914	91,530	64,454	6-72	6-72		
8 Karakudi	1936-37 ..	21,282	Do.	3,13,065	74,820	11,057	56,676	48,120	16-2	16-2		
9 Vellore	1936-37 ..	61,173	Do.	3,08,312	1,03,102	10,254	76,234	58,948	16-6	16-6		
10 Guntur	1936-37 ..	62,179	Do.	6,43,394	79,417	6,328	65,400	33,697	5-65	5-65		
11 Kumbakonam	1936-37 ..	62,317	Do.	5,11,287	1,07,414	8,250	80,952	65,177	14-2	14-2		
12 Nattarasankottai	1936-37 ..	18,954	Do.	2,12,289	25,140	8,423	29,901	6,783	3-23	3-23		
13 Salem-Erode	1936-37 ..	136,651	Do.	7,60,716	1,77,787	25,118	1,71,705	72,966	11-6	11-6		
14 Mangalore	1936-37 ..	46,100	Do.	1,42,579	36,624	3,227	29,390	23,585	5-02	5-02		
15 Palghat	1936-37 ..	164,000	Do.	13,25,869	1,61,350	23,302	2,48,815	16,466	11-9	11-9		
16 Tinnevely-Tuti-Palam	1936-37 ..	44,500	Do.	10,19,186	1,27,260	24,224	1,04,557	77,328	2-64	2-64		
17 East Tanjore	1936-37 ..	44,500	Do.	2,74,137	37,393	3,618	31,890	15,275	5-5	5-5		
18 Madurai	1936-37 ..	23,189	Do.	† 6,10,439	50,110	2,488	59,136	22,670	3-75	3-75		
19 Tirupati-Tirumala	1936-37 ..	22,018	Do.	1,12,176	16,812	1,890	27,442	22,670	3-75	3-75		
20 Chittoor	1936-37 ..	22,018	Do.	1,12,176	16,812	1,890	27,442	22,670	3-75	3-75		

21 Negapatam	2nd ..	1936-37 ..	48,527	2,46,421	57,428	3,423	57,144	12,578	5-32	5-32		
22 Ottur	2nd ..	1936-37 ..	20,000	2,63,488	9,221	938	26,316	..	..	..		
23 Pondicherry	2nd ..	1936-37 ..	20,124	78,191	11,730	1,412	18,722	..	..	..		
24 South Arcot	2nd ..	1936-37 ..	150,000	7,10,392	1,05,499	6,351	1,13,668	32,067	4-92	4-92		
25 Visagapatam	3rd ..	1936-37 ..	57,303	§ 2,67,351	92,816	10,748	73,455	39,919	16-7	16-7		
26 Adoni	Accounts not available.											
27 Gudiyadam	..	..	..	..	..	..	..	..	..	..	..	..
28 Guduvada	..	..	..	..	..	..	..	..	..	..	..	..
29 Illore	..	..	..	..	..	..	..	..	..	..	..	..
30 West Ramnad	..	..	..	..	..	..	..	..	..	..	..	..
31 Narasimhapet	..	..	..	..	..	..	..	..	..	..	..	..
32 Ongole	..	..	..	..	..	..	..	..	..	..	..	..
33 Cuddapah	..	..	..	..	..	..	..	..	..	..	..	..
34 Ambar-Vaityambadi	..	..	..	..	..	..	..	..	..	..	..	..
35 Chinglepet	..	..	..	..	..	..	..	..	..	..	..	..
36 Tellicherry-Cannanore	..	..	..	..	..	..	..	..	..	..	..	..

* Includes interest, income-tax and loan repayment, etc.
† The undertaking changed hands during the year. The figures relate to the period of four months ending 31st March 1937.
‡ Excluding stores on hand.
§ Including items erroneously transferred to General Balance sheet.

APPENDIX D-1—cont. Table of electric supply costs and records—companies—cont.

Name of undertaking.	(12) Interest, special expenditure and income-tax on profits less credits.	(13) Amounts provided for depre- ciation and reserve.	(14) Financial result surplus (+) or deficit (—).	(15) Total of reserve.	(16) Dividend on ordinary shares.	(17) Number of consumers.	(18) Number of units sold.	(19) Increase (+) or decrease (—) per cent on previous year.	Cost of per unit sold.			
									Generation.			
	£	£	£	£	PER CENT.			PER CENT.	(20) Coal and other fuel.	(21) Salaries and wages.	(22) Repairs, maintenance and stores.	(23) Distribution.
1 Madras	21,459	60,000	73,435	546,901	8	12,692	45,180,373	18.7	.22	.06	.06	.13
2 Kanadukathan	4,893	20,153	10,478	143,218	..	455	247,575	31.5	.66	.28	.47	.38
3 Devakottai	3,231	10,038	21,807	79,933	4.5	473	186,799	23.1	.68	.30	.07	.08
4 Ochochin	399	763	1,707	762	..	141	38,971	19.8	.69	.55	.65	.24
5 Tiruchinopoly-Srirangam	39,002	62,893	1,15,433	261,251	4.6 (‡)	3,672	3,468,552	12.9	.53	.30	.03	.10
6 Rajahmundry	9,394	20,348	22,116	89,640	4	723	390,515	12.0	.58	.17	.19	.09
7 Calicut	898	16,000	47,697	27,610	1.15 (‡)	1,367	731,057	35.3	.51	.20	.18	.08
8 Karaikudi	5,981	13,971	29,201	95,485	9	626	296,070	32.0	.38	.29	.21	.19
9 Vellore	5,954	16,000	36,994	76,843	7.5	867	483,985	14.9	.60	.29	.23	.38
10 Quntar	18,687	Nil.	20,114	4,882	..	901	350,981	19.4	..	.39	.79	.13
11 Manjakonam	7,373	31,129	34,676	96,504	..	1,067	489,089	22.0	1.14	..	..	.25
12 Kattaramankottai	7,821	32,874	22,601 (†)	1,20,646	5	1,183	96,226	41.0	.55	.35	.26	.29
13 Salem-Erode	6,892	33,922	33,689 (—)	84,661	..	998	591,572	14.4	..	..	..	.21
14 Madurai	19,365	4,406	11,072	13,364	..	393	176,333	20.5	.75	.32	.49	.55
15 Tiruvallur-Tutty-Palam	32,677	59,598	58,163 (—)	1,56,105	..	2,389	645,007	49.2	..	.00	.00	.19
16 Tirupattur	12,410	17,830	23,404 †	47,021	2.28 (‡)	2,627	763,155	133	.51	.23	.09	.16
17 Vellore	6,132	..	9,143	..	..	474	251,089	18.2	.54	.44	.24	.31
18 Tirupattur	4,916	23,573	— 6,282	1,16,779	..	263	245,945	33.2	.84	.72	1.5	.22
19 Tirupattur-Tirumalai	4,916	5,653	8,749 (—)	5,653	..	182	68,114	33.2	..	..	..	.04
20 Chittoor	1,496	7,564	4,928	8,804	2.5	394	746,439	700	1.07	.62	1.23	.68
21 Nagapatnam	631	6,634	18,437 (—)	8,634	..	54	43,709	770	1.01	.88	.41	.43
22 Chittoor	2,406	..	5,460 (—)	..	..	167	64,766	168	.54	.14	.22	.23
23 Tiruchirappalli	317	..	31,952	..	..	1,282	680,584	..	..	..	..	..
24 South Arcot	869	..	..	..	..	..	..	..	..	..	..	..
25 Vinayapattam	1,299	8,510	30,808	17,600	..	820	444,488	36.3	Energy purchased in bulk from Harbour Power House.	..	..	3.0
26 Adoni	..	..	..	..	..	..	..	..	..	..	..	..
27 Gudiyattam	..	..	..	..	..	..	..	..	..	..	..	..
28 Gudiyattam	..	..	..	..	..	..	..	..	..	..	..	..
29 Ellore	..	..	..	..	..	..	..	..	..	..	..	..
30 West Ramnad	..	..	..	..	..	..	..	..	..	..	..	..
31 Narasaraopet	..	..	..	..	..	..	..	..	..	..	..	..
32 Ongole	..	..	..	..	..	..	..	..	..	..	..	..
33 Cuddapah	..	..	..	..	..	..	..	..	..	..	..	..
34 Ambur-Vaaliyambadi	..	..	..	..	..	..	..	..	..	..	..	..
35 Chingleput	..	..	..	..	..	..	..	..	..	..	..	..
36 Tellicherry-Cannanore	..	..	..	..	..	..	..	..	..	..	..	..

* The undertaking changed hands during the year. The figures relate to the period of four months ending 31st March 1937.
† Financial result is exclusive of ordinary dividend paid.
‡ After contribution to debenture repayment.
§ Interim dividend paid half year ending 1936-37.

APPENDIX D-1—cont.

Table of electric supply costs and records—companies—cont.

Name of undertaking.	Cost per unit sold.				Average price obtained.			Supply records (unit sold per head of population).				PER UNIT.
	(24) Rents, rates and taxes.	(25) Management salaries and insurance.	(26) Total working costs.	(27) Interest and loan repayment.	(28) Total costs.	(29) Private supply.	(30) Public lighting.	(31) Total supply.	(32) Private light, heat and domestic.	(33) Industrial power.	(34) Maximum load on undertaking.	(35) Undertaking load factor.
1 Madras ..	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	K.W.	PER UNIT.
2 Kanakakathan ..	02	014	384	00	108	384	17	145	184	497	14,400	36
3 Devakottai ..	02	38	384	70	396	74	234	458	26	11	132	214
4 Cochin ..	01	45	287	22	31	63	186	385	272	185	1025	210
5 Trichinopoly-Srirangam ..	02	1216	376	16	398	81	38	51	73	72	48	291
6 Rajahmundry ..	02	014	104	27	184	45	184	18	346	185	990	40
7 Calicut ..	03	23	24	38	28	585	40	82	137	233	182	247
8 Karaikudi ..	05	54	20	02	202	608	36	287	137	233	320	241
9 Vellore ..	03	34	274	05	306	596	217	462	633	345	320	241
10 Guntur ..	09	76	251	02	252	536	409	341	266	370	160	211
11 Kumbakonam ..	05	42	236	62	298	481	236	366	268	120	185	299
12 Nattarasankottai ..	03	64	37	13	284	60	240	380	261	120	190	211
13 Sijem-Erode ..	04	57	216	02	236	75	232	480	194	114	50	220
14 Mangalore ..	08	79	34	53	407	605	36	268	292	505	513	298
15 Palghat ..	01	51	27	02	266	592	266	318	26	505	295	23
16 Tinnevely-Tutl-Palam ..	13	123	526	81	616	51	396	261	136	168	86	234
17 East Tanlore ..	00	46	194	26	219	50	205	318	183	109	440	167
18 Nellore ..	07	56	164	32	204	55	82	243	244	26	388	258
19 Tirupati-Thirumalai ..	05	056	35	32	385	45	29	344	148	216	120	239
20 Chittoor ..	07	125	61	35	646	58	294	44	208	90	312	314
21 Nagesapatam ..	08	128	119	01	122	49	196	13	128	025	445	192
22 Otkur ..	06	135	825	88	109	80	265	374	272	08	30	164
23 Proddatur ..	11	15	45	09	462	46	194	299	190	56	55	134

24 South Arcot ..	07	58	19	02	268	52	45	284	100	133	294	26
25 Vissapatam ..	05	60	26	05	265	625	266	374	274	13	260	196
26 Adoni ..	Accounts not available.											
27 Gudlavatam ..												
28 Gudlavatam ..												
29 Gudlavatam ..												
30 West Rammed ..												
31 Karaikudi ..												
32 Oupale ..												
33 Oupale ..												
34 Oupale ..												
35 Oupale ..												
36 Talcher-Channarayana ..	07	58	19	02	268	52	45	284	100	133	294	26

* The undertaking changed hands during the year. The figures relate to the period of four months ending 31st March 1937.
† Three months during 1936.

Note—The figures in columns 6 to 35 are computed from the accounts submitted by the licensee.

APPENDIX D-2.

Table of electric supply costs and records per cent—local authority undertakings.

Serial number and name of undertakings.	(1)	Year of operation.	(2)	Year of accounts to which the figures refer.	(3)	Population of area of supply.	(4)	System and voltage of supply.	(5)	Revenue.			(9)	Gross profit.	
										From electric supply.	From other sources.	Costs—Working costs.*		Gross profit before interest and loan repayment.	Percent to capital outlay during the year, average.
										RS.	RS.	RS.	RS.	RS.	PER CENT
										Capital—Total expenditure at the end of year.	From interest, rent and other sources.	From electric supply.	From other sources.	Gross profit before interest and loan repayment.	Percent to capital outlay during the year, average.
1 Bellary ..	..	10th ..	1936-37	1936-37	47,573	AC. 400/230 V. 50	..	..	..	3,84,361	73,053	5,698	67,406	42,141	11.10
2 Madurai ..	..	10th ..	1936-37	1936-37	182,018	DC. 400/230 V. 50	..	..	..	9,83,608	2,88,104	14,203	1,83,122	1,87,937	20.1
3 Coimbatore ..	..	8th ..	1936-37	1936-37	65,952	AC. 400/230 V. 50	..	..	..	4,84,504	1,05,863	3,515	69,975	45,615	13.75
4 Karaikal ..	..	7th ..	1936-37	1936-37	60,427	Do.	..	..	..	6,05,084	1,05,863	3,888	85,007	59,021	9.80
5 Kanyakumari ..	..	7th ..	1936-37	1936-37	35,314	Do.	..	..	..	2,81,496	18,428	3,220	48,706	24,337	8.65
6 Kanyakumari ..	..	7th ..	1936-37	1936-37	14,211	Do.	..	..	..	1,83,370	18,428	3,220	48,706	24,337	8.65
7 Coimbatore ..	..	8th ..	1936-37	1936-37	65,258	DC. 400/230 V. 50	..	..	..	3,53,609	73,425	3,263	53,101	46,887	13.2
8 Masulipatam ..	..	4th ..	1936-37	1936-37	56,928	Do.	..	..	..	2,91,090	36,242	2,885	57,750	18,059	4.50
9 Hospet ..	..	1st ..	1936-37	1936-37	21,673	Do.	..	..	..	84,348	1,44,921	100	2,424	77,555	11.7
10 Ootacamund ..	..	14th ..	1936-37	1936-37	24,616	Do.	..	..	..	6,67,646	1,24,362	3,905	1,12,169	62,146	19.3
11 Tanjore ..	..	9th ..	1936-37	1936-37	66,839	Do.	..	..	..	2,78,207	45,032	3,167	1,06,033	20,006	11.05
12 Coonoor ..	..	7th ..	1936-37	1936-37	14,326	Do.	..	..	..	1,89,019	32,146	970	43,668	13,838	11.80
13 Sembiam ..	..	7th ..	1936-37	1936-37	33,127	Do.	..	..	..	1,19,574	16,886	873	12,203	7,202	13.75
14 Tiruvottiyur ..	..	4th ..	1936-37	1936-37	10,500	Do.	..	..	..	5,84,649	2,15,889	11,053	1,63,738	1,17,159	21.7
15 Pollachi ..	..	4th ..	1936-37	1936-37	95,198	Do.	..	..	..	5,84,649	2,15,889	11,053	1,63,738	1,17,159	21.7
16 Tiruppur ..	..	4th ..	1936-37	1936-37	22,112	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
17 Tirunelveli ..	..	3rd ..	1936-37	1936-37	18,059	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
18 Tirunelveli ..	..	3rd ..	1936-37	1936-37	33,081	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
19 Tirunelveli ..	..	3rd ..	1936-37	1936-37	43,617	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
20 Alandur ..	..	2nd ..	1936-37	1936-37	13,500	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
21 Karur ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
22 Udumalpet ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
23 Bodinayakanur ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
24 Bodinayakanur ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
25 Perakulam ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
26 Villivakkam ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
27 Tiruvallur ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
28 Sivakasi ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
29 Dharapuzha ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
30 Tirupattur ..	..	2nd ..	1936-37	1936-37	18,950	Do.	..	..	..	1,84,717	63,647	2,879	66,524	15,256	8.2
31 Tiruvannamalai ..	..	2nd ..	1936-37	1936-37	23,004	Do.	..	..	..	66,463	11,715	567	21,539	18,485	9.55

Commenced supply during the latter half of 1937-38 and hence no figures available.

* Includes interest and loan repayment.

APPENDIX D-2—cont.

Table of electric supply costs and records per cent—local authority undertakings—cont.

Serial number and name of undertakings.	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1 Bellary ..	RS.	RS.	RS.	RS.	RS.	RS.	RS.	PER CENT	AS.	AS.	AS.
2 Madurai ..	15,068	13,698	13,346	NIL.	NIL.	663	232,359	17	68	45	18
3 Coimbatore ..	29,553	29,200	1,19,274	NIL.	NIL.	1,371	1,480,496	9.32	37	18	21
4 Karaikal ..	14,386	11,981	13,248	6,000	6,000	602	502,657	32.3	41	2	48
5 Kanyakumari ..	19,062	15,187	24,772	NIL.	NIL.	664	700,199	22.6	41	14	29
6 Kanyakumari ..	11,559	8,887	3,891	NIL.	NIL.	419	299,768	3.25	41	3	09
7 Kanyakumari ..	5,139	3,951	668	NIL.	NIL.	207	68,327	36.5	41	61	37
8 Kanyakumari ..	10,234	12,866	23,667	NIL.	NIL.	460	329,991	8.35	44	19	19
9 Hospet ..	16,807	15,374	18,622	NIL.	NIL.	335	160,275	1.19	38	54	18
10 Ootacamund ..	5,927	3,284	9,398	NIL.	NIL.	53	9,558	(First year of operation.)	1.92	1.56	06
11 Tanjore ..	20,871	20,026	26,568	NIL.	NIL.	1,004	1,422,102	11.3	Power purchased in bulk from Government.	Do.	Do.
12 Coonoor ..	23,608	13,910	24,627	NIL.	NIL.	751	531,221	11.9	Power purchased in bulk from Government.	Do.	Do.
13 Sembiam ..	9,691	5,185	5,129	NIL.	NIL.	453	209,251	18.5	Power purchased in bulk from Government.	Do.	Do.
14 Tiruvottiyur ..	20,145	11,070	63,804	NIL.	NIL.	134	151,505	2.05	Power purchased in bulk from Government.	Do.	Do.
15 Coimbatore ..	10,956	8,178	12,902	4,300	4,300	567	660,494	10	Power purchased in bulk from Government.	Do.	Do.
16 Pollachi ..	13,580	3,178	7,762	5,016	5,016	643	1,119,702	28.5	Power purchased in bulk from Government.	Do.	Do.
17 Tiruppur ..	7,640	2,505	2,762	8,309	8,309	452	315,828	14.2	Power purchased in bulk from Government.	Do.	Do.
18 Tirunelveli ..	5,432	1,967	1,199	..	..	530	280,750	14.5	Power purchased in bulk from Government.	Do.	Do.
19 Tirunelveli ..	1,991	1,967	..	..	..	48	68,976	217	Power purchased in bulk from Government.	Do.	Do.
20 Alandur ..	6,908	827	4,136	..	..	402	175,301	89	Power purchased in bulk from Government.	Do.	Do.
21 Karur ..	1,799	4,534	5,643	..	..	142	97,462	58.5	Power purchased in bulk from Government.	Do.	Do.
22 Palani ..	1,765	994	8,617	..	..	211	147,081	..	Power purchased in bulk from Government.	Do.	Do.
23 Udumalpet ..	2,649	1,639	9,259	..	..	75	46,720	..	Power purchased in bulk from Government.	Do.	Do.
24 Bodinayakanur ..	..	..	..	..	..	134	59,661	..	Power purchased in bulk from Government.	Do.	Do.
25 Perakulam ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.
26 Villivakkam ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.
27 Tiruvallur ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.
28 Sivakasi ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.
29 Dharapuzha ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.
30 Tirupattur ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.
31 Tiruvannamalai ..	..	..	..	..	..	..	..	..	Power purchased in bulk from Government.	Do.	Do.

Commenced supply during the latter half of 1937-38 and hence no figures are available.

* Interest and loan repayments are clubbed together as annuity in the account.
N OTH.—The figures in columns (7) to (36) are computed from the accounts submitted by the lessees.

APPENDIX D-2—cont. Table of electric supply costs and records per cent—local authority undertakings—cont.

Serial number and name of undertaking.	Cost per unit sold.				Average price obtained.				Supply records.				Maximum load on undertaking.	Undertaking load factor
	Units sold per head of population.				Units sold per head of population.				Units sold per head of population.					
	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)		
	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	KW	PER CENT.	
1 Bellary ..	45	01	31	211	149	37	552	350	448	276	135	180	18.5	
2 Madurai ..	17	01	15	124	7	108	332	235	325	545	91	760	22.3	
3 Coimbatore ..	21	01	130	130	233	233	440	296	264	248	248	220	26	
4 Bangalore ..	12	01	130	130	233	233	440	296	264	248	248	220	34.4	
5 Kurnool ..	22	06	14	151	109	260	431	400	281	151	600	132	26	
6 Hindupur ..	49	09	2	261	214	475	538	313	492	135	83	35.5	44	
7 Coimbatore ..	26	09	25	146	112	258	734	373	373	112	42	170	22	
8 Masulipatam ..	47	09	28	261	317	578	555	315	391	104	56	88	21	
9 Hospet ..	9	09	125	532	1542	207	530	410	445	107	18	13	39	
10 Ootacamund ..	07	01	19	8	46	126	356	197	167	179	215	757	21.4	
11 Tanjore ..	23	13	205	205	79	32	546	345	394	312	227	185	32.8	
12 Coimoor ..	26	09	46	22	91	334	445	269	374	80	242	142	17	
13 Bangalore ..	43	02	24	204	85	307	525	300	349	75	89	120	14.4	
14 Tiruvottiyur ..	32	03	35	185	28	217	520	25	316	64	492	58-KVA	22	
15 Coimbatore ..	1	09	28	117	33	174	348	19	242	58	6	564	30.4	
16 Pollachi ..	27	04	27	124	27	161	48	202	161	342	22	315	24	
17 Tiruppur ..	17	04	15	91	19	17	4	218	135	60	250	465	27.6	
18 Virudunagar ..	22	02	41	217	54	271	62	225	257	172	425	167	21.6	
19 Dindigul ..	28	02	45	226	48	293	57	225	293	192	318	146-KVA	27.6	
20 Alandur ..	53	02	39	252	92	344	473	29	316	53	28	75	10.5	
21 Karur ..	28	02	33	194	63	266	44	204	266	288	354	90	22.3	
22 Palni ..	43	05	44	309	43	352	555	225	254	132	24	50.6 KVA	27.5	
23 Udumalpet ..	26	03	61	213	49	262	41	214	202	276	68	75 KVA	23	
24 Bodinayakanur ..	109	01	136	537	95	633	7	255	338	41	46	40 KVA	12.3	
25 Periyakulam ..	88	06	96	46	117	577	81	24	328	45	3	40 KVA	31.3	
26 Villivakkam ..														
27 Tiruvallur ..														
28 Sivakasi ..														
29 Karaikal ..														
30 Tiruppur ..														
31 Tiruvannamalai ..														

Commenced supply during the latter half of 1937-38 and hence no figures are available.

Commenced supply during the latter half of 1937-38 and hence no figures are available.

* Load factor based on 12 hours working per day.

APPENDIX E.

Total capacity of plants installed of electric supply undertakings in service.

Serial number and name of undertaking.	Total installed capacity of plant in generating or receiving stations.	Details of plant installed.
(1)	(2)	(3)
<i>Company-managed undertakings.</i>		
1 Madras ..	53,750 KVA	3 × 1,875; 1 × 6,250; 1 × 7,500; 1 × 15,625; 1 × 18,750 KVA.
2 Kanadukathan ..	370 KW.	2 × 65; 1 × 130; 1 × 110 KW.
3 Devakottai ..	140 KW DC 169 KVA AC	1 × 60 KW; 2 × 40 KW. 1 × 160 KVA.
4 Cochin ..	72 KW	2 × 21; 1 × 30 KW.
5 Trichinopoly-Srirangam ..		Receiving station.
6 Calicut ..	775 KVA	2 × 250; 1 × 150; 1 × 125; 1 × 100 KVA.
7 Karaikudi ..	350 "	2 × 75; 2 × 100 KVA.
8 Vellore ..	435 "	Receiving station—1 × 100; 2 × 30; 1 × 50; 1 × 25 KVA.
9 Tirumalai-Tirupathi ..	480 "	2 × 100; 1 × 280 KVA.
10 Kumbakonam ..		Receiving station.
11 Salem-Erode ..	2,160 KVA	2 × 215; 2 × 100; 1 × 40; 1 × 50; 1 × 30; 1 × 50; 3 × 215; 2 × 150; 2 × 75; 2 × 40; 1 × 60; 1 × 25; 1 × 100 KVA.
12 Nattarasankottai ..	165 KVA	2 × 82.5 KVA.
13 Mangalore ..	750 KW.	3 × 250 KW.
14 Palghat ..	150 KVA	Receiving station—1 × 100; 1 × 50 KVA.
15 Tinnevely-Tuticorin ..	1,000 KW.	2 × 500 KW.
16 East Tanjore ..		Receiving station.
17 South Arcot ..	537.5 KVA	4 × 125; 1 × 37.5 KVA.
18 Negapatam ..		Receiving station.
19 Chittoor ..	200 KVA	Receiving station—2 × 100 KVA.
20 Okkur ..	120 "	2 × 60 KVA.
21 Guntur ..	350 KW	2 × 150; 1 × 50 KW.
22 Nellore ..	330 KVA	2 × 133; 1 × 64 KVA.
23 Proddatur ..	132 "	2 × 66 KVA.
24 Rajahmundry ..	560 "	2 × 133; 1 × 294 KVA.
25 Vizagapatam ..	400 "	8 × 50 KVA.
26 Cuddapah ..	80 KW	2 × 40 KW.
27 Ambur-Vaniyambadi ..	150 KVA	Receiving station—3 × 50.
28 Adoni ..	630 "	2 × 190; 2 × 125 KVA.
29 North Arcot-Gudiyattam.	200 "	1 × 100; 2 × 50 KVA.
30 Narasaraopet ..	170 KW	2 × 75; 1 × 20 KW.
31 Gudivada ..	100 KVA	2 × 70 Receiving station.
32 Ellore ..	130 "	Receiving station—1 × 60; 1 × 50; 1 × 20 KVA.
33 West Ramnad ..	200 "	Receiving station—2 × 100.
34 Ongole ..	200 KW	2 × 50; 1 × 100 KW.
35 Chingleput ..	100 KVA	1 × 40; 1 × 60 KVA.
36 Tallicherry-Cannanore ..	50 "	1 × 50 KVA.

APPENDIX E—cont.

Total capacity of plants installed of electric supply undertakings in service—cont.

Serial number and name of undertaking.	Total installed capacity of plant in generating or receiving stations.	Details of plant installed.
(1)	(2)	(3)
<i>Municipal undertakings.</i>		
1 Ootacamund ..	1,200 KW	Receiving station—2 × 600 KW.
2 Coonoor ..	350 KVA	2 × 100; 1 × 50; 4 × 25 KVA—Receiving station.
3 Madura ..	825 KW	3 × 150; 1 × 375 KW.
4 Tanjore ..	2,500 KVA	Receiving station.
5 Sembiam ..	300 "	Do.
6 Conjeeveram ..	175 "	Receiving station—1 × 100; 1 × 75; KVA.
7 Coimbatore ..	467 "	1 × 66.6; 1 × 133.3; 1 × 267 KVA.
8 Tiruppur ..	900 "	Receiving station.
9 Pollachi ..	775 "	Do.
10 Tiruvottiyur ..	525 "	Do.
11 Dindigul ..	200 "	2 × 50; plus 1 × 100—Receiving station.
12 Virudunagar ..	380 KW	2 × 190 KW.
13 Palni ..	380 "	2 × 190 KW.
14 Karur ..		Receiving station.
15 Udumalpet ..		Do.
16 Alandur ..	175 KVA	Do.
17 Periyakulam ..	200 "	Receiving station—2 × 50; 1 × 100 KVA.
18 Bodinayakkanur ..	100 "	Receiving station from Theni—2 × 50 KVA.
19 Bellary ..	150 "	Receiving station from Theni—2 × 75 KVA.
20 Cocanada ..	273 KW	2 × 55; 1 × 67; 1 × 96 KW. (One set of 55 KW not serviceable).
21 Hindupur ..	450 "	1 × 40; 2 × 80; 1 × 250 KW.
22 Hospet ..	60 "	2 × 25; 1 × 10 KW.
23 Kurnool ..	133 KVA	2 × 54; 1 × 25; KVA.
24 Masulipatam ..	313 "	1 × 53; 1 × 80; 1 × 180 KVA.
25 Villivakkam ..	235 "	2 × 117.5 KVA.
26 Trivellore ..	100 "	Receiving station 2 × 50.
27 Sivakasi ..	98.5 KW	2 × 40; 1 × 18.5 KW.
28 Dharapuram ..		Receiving station.
29 Bezwada ..		Do.
30 Tiruvannamalai ..	750 KVA	1 × 250; 1 × 150; 1 × 400 KVA.
31 Tirupattur ..		Receiving station.
		Do.

Government.

1 Pykara ..	23,400 KVA	3 × 7,800 KVA.
2 Glen Morgan ..	1,125 "	3 × 375 "
3 Mettur ..	37,500 "	3 × 12,500 "
4 Dindigul ..	444 "	2 × 222 "
5 Virudunagar ..	444 "	2 × 222 "
6 Theni ..	250 "	2 × 125 "
7 Palni ..	135 "	90 KVA and 45 KVA.

APPENDIX F-1.

*Electric supply undertakings in service.**Local authorities.**Companies*

1 Alandur.	1 Adoni.
2 Bellary.	2 Ambur-Vaniyambadi.
3 Bezwada.	3 British-Cochin.
4 Bodinayakkanur.	4 Calicut.
5 Cocanada.	5 Chingleput.
6 Coimbatore.	6 Chittoor.
7 Conjeeveram.	7 Cuddalore.
8 Coonoor.	8 Devakottai.
9 Dindigul.	9 Ellore.
10 Dharapuram.	10 Gudiyattam.
11 Hospet.	11 Gudivada.
12 Hindupur.	12 Guntur.
13 Karur.	13 Kanadukathan.
14 Kurnool.	14 Karaikudi.
15 Masulipatam.	15 Kumbakonam.
16 Madura.	16 Madras.
17 Ootacamund.	17 Mangalore.
18 Palni.	18 Mayavaram-Mannargudi-Tiruvannamalai.
19 Pallachi.	19 Nattarasankottai.
20 Periyakulam.	20 Nellore.
21 Sembiam.	21 Narasaraopet.
22 Sivakasi.	22 Negapatam.
23 Tiruppur.	23 Okkur.
24 Tanjore.	24 Ongole.
25 Tiruvottiyur.	25 Palghat.
26 Trivellore.	26 Prodatur.
27 Tirupattur.	27 Rajahmundry.
28 Udumalpet.	28 South Arcot.
29 Virudunagar.	29 Salem-Erode.
30 Villivakkam.	30 Srivilliputtur.
	31 Trichinopoly-Srirangam.
	32 Tirupati-Tirumalai.
	33 Tirunelveli-Tuticorin-Palamcottah.
	34 Tellicherry-Cannanore.
	35 Vellore.
	36 Vizagapatam.

APPENDIX F-2.

** New licences granted and under construction.*

1 Bobbili.	} Licences granted during the year.
2 Anantapur.	
3 Kodaikanal.	
4 East Ramnad.	
5 Anakapalle.	
6 Chicacole.	
7 Kollegal.	
8 Udupi.	
9 Wellington Cantonment.	
10 Tiruvannamalai.	

APPENDIX F-3. *

New applications for licence received.

1 Tadpatri.
2 Nandyal.
3 East Godavari district.
4 North Tirupattur.
5 Vriddhachalam-Kallakurichi-Ulundurpet.
6 Salur-Parvatipuram.
7 Madanapalle-Vayalpad-Punganoor.
8 Ponnani taluk electric licence.

* List of licence applications received in my office for scrutiny

APPENDIX F-4.

Licensed undertakings put into service during the year.

1 Cuddapah.	9 Ellore.
2 Vaniyambadi.	10 West Ramnad.
3 Ambur-Vaniyambadi.	11 Sivakasi.
4 Adoni.	12 Ongole.
5 Gudiyattam.	13 Chingleput.
6 Narasaraopet.	14 Dharapuram.
7 Tiruvallur.	15 Tellicherry-Cannanore.
8 Gudivada.	16 Tiruppattur.

APPENDIX F-5.

Licenses who reduced their tariffs in 1937-38.

A—Company undertakings.

1 Negapatam (only in respect of power).	9 Palghat.
2 Kumbakonam.	10 Nattarasankottai.
3 Mangalore.	11 Vellore.
4 Tinnevely-Tuticorin.	12 Chittoor.
5 Salem-Erode.	13 Prodattur.
6 Trichinopoly-Srirangam.	14 Kanadukathan.
7 Tirumalai-Tirupati.	15 Okkur.
8 East Tanjore.	16 Karaikkudi.

B—Local authority undertakings which reduced their tariffs during 1937-38.

1 Conjeeveram.	7 Tanjore.
2 Kurnool.	8 Cocanada.
3 Bezvada.	9 Coimbatore.
4 Semblam.	10 Bodinayakanur.
5 Coonoor.	11 Periyakulam.
6 Madura.	

APPENDIX F-6.

Licenses who charged more than 6 annas per unit for lighting and fans.

For lighting and fans—

Company undertakings—

- 1 Nattarasankottai.
- 2 Cuddapah.
- 3 Chingleput.
- 4 Karaikkudi.
- 5 Kanadukathan.
- 6 Okkur.
- 7 Ellore.

Municipal undertakings—

- 8 Hindupur.
- 9 Hospet.

For lighting only—

- 10 Vizagapatam
- 11 South Arcot.
- 12 Gudivada.
- 13 Chittoor.

APPENDIX G.

List of villages and townships supplied with electrical energy in the Pykara and Mettur areas by Government.

1 Agrahara Samakulam.	58 Komarapalayam.
2 Ammapettai.	59 Kondayampalayam.
3 Angalakurichi.	60 Kottampatti.
4 Angeripalayam.	61 Kottur.
5 Andipalayam.	62 Krishnarayapuram.
6 Anthiyur.	63 Kuniamuthur.
7 Anuppupalayam.	64 Kurichi.
8 Arasur.	65 Kurudampalayam.
9 Athapagoundanpudur.	66 Mac Donald's Choultry.
10 Athipalayam.	67 Madukkarai.
11 Avanashi.	68 Mailampatti.
12 Ayakudi.	69 Makkinakkenpatti.
13 Bhavanl.	70 Malayandipattam.
14 Bodinatham.	71 Mangalam Vangipalayam.
15 Bodipatti.	72 Mangalagaraputhur.
16 Chikkadasampalayam.	73 Mettupalayam.
17 Chikkarampalayam.	74 Madathupalayam.
18 Chandrakavi.	75 Maniakarampalayam.
19 Chinnakumarapalayam.	76 Muthur.
20 Chinnaputhur.	77 Narasimhanakkenpalayam.
21 Chinnavalavadi.	78 Nanjundapuram.
22 Chittoor.	79 Neelikonampalayam.
23 Dasampalayam.	80 Neikarapatti.
24 Devarashola.	81 Nilambur.
25 Dhali.	82 Nellithorai.
26 Erode.	83 Nambipalayam.
27 Edayarpalayam.	84 Nilpalayam.
28 Ganapathi.	85 Odanthorai.
29 Ganapathipalayam.	86 Oddarpalayam.
30 Glen Morgan.	87 Omareddiyur.
31 Gomangalam Pudur.	88 Onnipalayam.
32 Gudalur.	89 Ondiputhur.
33 Idigarai.	90 Palathorai.
34 Ingur.	91 Papanakkenpalayam.
35 Iyerpadi.	92 Pasumalai.
36 Jakkarpalayam.	93 Peedampalli.
37 Jellipatti.	94 Perianaickenpalayam.
38 Kalapatti.	95 Peria Nagamam.
39 Kalbhavi.	96 Peria Valavadi.
40 Kalingarayanpalayam.	97 Perur.
41 Kallapalayam.	98 Perurattipalayam.
42 Kallar.	99 Pidambatti.
43 Kallipalayam.	100 Podanur.
44 Kallimadai.	101 Pottayampalayam.
45 Kaunarpalayam.	102 Pudurnatham.
46 Kannampalayam.	103 Puthur.
47 Karamadai.	104 Raghalbhavi.
48 Karimangalam.	105 Rakkipalayam.
49 Karumampalayam.	106 Rangayampalayam Pudur.
50 Kattabettu.	107 Rasipalayam.
51 Kantiyur Karatholuvu.	108 Rasipuram.
52 Kantia Goundenchavadi.	109 Ravathur.
53 Kiranatham.	110 Samathur.
54 Kil Kotagiri.	111 Samanthorai.
55 Kotagiri.	112 Saravanampatti.
56 Kollipalayam.	113 Sembanallur.
57 Kolathur.	114 Sengodagoundenpalayam.

4. The Government are pleased to place on record their warm appreciation of the continued good work done by the department during the year under review.

(By order of His Excellency the Governor)

K. RAMUNNI MENON,
Secretary to Government.

To the Chief Engineer for Electricity.
 „ Chief Engineer (General, Buildings and Roads).
 „ Chief Engineer for Irrigation.
 „ Development Department.
 „ Local Administration Department.
 „ Education and Public Health Department.
 „ Public (General) Department.
 „ Librarian, Madras Legislature.
 „ Secretary, Madras Public Services Commission (with C.L.).
 „ Statistical Officer under the Director of Industries.
 „ Principal, Agricultural College, Coimbatore.
 „ Bibliothèque Nationale, Paris.

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