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GOVERNMENT OF MADRAS
ELECTRICITY DEPARTMENT

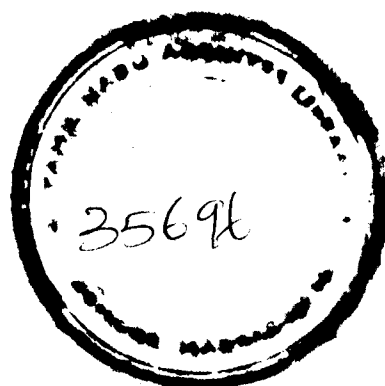
ADMINISTRATION REPORT
FOR THE YEAR
1935-36

MADRAS
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1936

CONTENTS

	PAGE
SECTION I—GENERAL REVIEW—	
Introductory	1
Pykara Hydro-Electric system—General	1
Pykara Hydro-Electric system—Growth of load	3
Mettur Hydro-Electric scheme	4
Thermal stations	5
Government-managed municipal undertakings	5
Construction	6
Investigation and designs	6
Licences and inspection	7
General Engineering	7
Organization	7
Administration	8
Madras Local Authorities Electrical Service	8
Finance	8
Electricity Board	9
Future progress	9
Construction programme	10
Acknowledgments	11
SECTION II—DETAILED REPORT—	
Pykara system—	
Civil and hydraulic works	12
Power station	12
Operation	12
Transmission lines	12
Distribution systems	13
Trichinopoly-Negapatam extension	14
Udamalpet extension	14
Pollachi-Iyerpadi section—	
(22 K.V. line duplication)	15
Municipal undertakings	15
Extensions	17
Administration	18
Mukurti dam	20
Mettur Hydro-Electric Scheme—	
Power-house plant	21
Transmission lines	22
Sub-stations	22
Erode-Trichinopoly-Negapatam extensions	22
Power-house construction	22
Camps and workshops	23
Transmission line surveys	23
Thermal schemes—	
Theni-Periyakulam-Bodinayakkanur distribution scheme	25



B
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1136 28

	PAGE
SECTION II—DETAILED REPORT— <i>cont.</i>	
Other activities of the Department—	
Hydro-metric studies	25
Investigations	25
Designing and estimating	25
Purchase of material	25
Administration of the Indian Electricity Act and Rules—	
Licences and inspections	26
Testing	27
Cinomas	27
Revenue	28
Accidents	28
Prosecutions	29
General	29
Electrical installations in Government buildings—	
Estimates prepared and checked	29
Works in progress or completed	30
Installation schemes under investigation	31
Staff	31
TABLES—	
1 Growth of load and revenue of the Pykara system—Comparative statement	2
2 Transmission lines and transformer capacity in service on the Pykara system	13
3 Government-managed municipal undertakings—Pykara supply—Operating results	16
4 Government Thermal Generating Stations—Operating results	24
5 Government-managed municipal undertakings—Thermal supply—Operating results	24
6 Electrical installations in Government buildings—Financial statement	29
APPENDICES—	
A. Construction work undertaken with expenditure incurred	33
B. Budget provision for capital works in 1936-37	34
C. Details of establishment charges of the department and fees earned	35
D. Statistics of the working of electric supply undertakings in the presidency for the year	36
E. Total capacity of plants of electric supply undertakings working during the year	38
F. (1) Licensed areas where supply is available	39
(2) Licences brought into use during the year	39
(3) Licences granted and under construction in the year	40
(4) Applications received and under consideration in the year	40
G. Licensees who reduced their rates during the year	41

LIST OF ILLUSTRATIONS.

1 THE MADRAS GRID MAP	Frontispiece
2 TRICHINOPOLY SUBSTATION	(Facing) page 6
3 33 KV. LINE FROM TANJORE TO PAPANASAM	12
4 NEGAPATAM SUBSTATION	14
5 SYNCHRONOUS CONDENSERS AT TRICHINOPOLY SUBSTATION	15
6 MUKURTI DAM UNDER CONSTRUCTION	20
CHARTS.	
I GROWTH OF PYKARA PEAK DEMAND AND ENERGY GENERATED	2
II GROWTH OF PYKARA REVENUE AND ENERGY DISTRIBUTED	4

GOVERNMENT OF MADRAS.
ELECTRICITY DEPARTMENT.

ADMINISTRATION REPORT FOR THE YEAR 1935-36.

Section I.—General Review.

Introductory.—The report for the year shows general and satisfactory progress. The salient facts are:—

- (a) The Pykara System earned Rs. 16·17 lakhs in the year, an increase of 61 per cent over the previous year. Energy supplied exceeded 50 million units. The system became self-supporting within its third year of operation.
- (b) Construction work to the extent of Rs. 42·24 lakhs was undertaken and completed by the department. Progress at Mettur Power House was up to official programme; it was hoped at one time to accelerate that programme but due to late deliveries of steel work this has not been possible.
- (c) New schemes and extensions costing Rs. 80 lakhs were planned. Important among these, the proposal to extend Pykara power to Madura costing Rs. 33·5 lakhs was sanctioned by Government in April 1936. The Vizagapatam Thermal Scheme estimated at Rs. 31·6 lakhs with an initial outlay of Rs. 18·7 lakhs awaits sanction.
- (d) Power supply by generating licensees amounted to 43·7 million units, an improvement of 15 per cent over the previous year.
- (e) The proposal for the formation of an Electricity Board to control and co-ordinate the electrical activities in the Presidency was taken up, together with a draft Bill, and referred to a Committee for examination and report.

2. *Pykara Hydro-Electric System.*—The system continued to operate in a satisfactory manner. The standard of design and construction has been well tried out in practice and proved sound. The water situation a year ago promised to be serious but, due to the efforts and good organization of the Construction Branch, rapid progress was made on the construction of the Mukurti Dam with the result that the water requirements of the power plant were fully met and a possible considerable loss of revenue avoided.

3. The load and revenue situation of the system continues to be satisfactory. The progress made is best seen from Table No. 1 below, comparing the actual results for the past three years of operation with the Project forecast for the same period.

Table No. 1.

1933-34.

	Project estimate.	Actuals including the Karur, Trichinopoly and Negapatam extensions.
1 Demand on Power Station .. K.W.	3,290	3,150
2 Generation K.W.H.	6,879,000	10,928,920
3 Distribution "	6,534,000	9,669,203
4 Capital outlay to end of the year .. Rs.	1,30,94,940	1,23,01,359
5 Gross Revenue "	3,38,160	3,82,083
6 Operation and maintenance expenses (excluding depreciation) .. Rs.	2,62,000	2,52,368
7 Balance "	76,160	1,29,715
8 Percentage of return .. Per cent	0.6	1.05

1934-35.

1 Demand on Power Station .. K.W.	4,900	6,600
2 Generation K.W.H.	10,090,000	30,014,218
3 Distribution "	9,593,200	29,697,347
4 Capital outlay to end of the year .. Rs.	1,31,53,780	1,45,07,870
5 Gross Revenue "	4,69,360	10,04,921
6 Operation and maintenance expenses (excluding depreciation) .. Rs.	2,68,000	3,07,576
7 Balance "	2,01,360	6,97,345
8 Percentage of return .. Per cent	1.5	4.81

1935-36.

1 Demand on Power Station .. K.W.	6,820	10,100
2 Generation K.W.H.	11,510,000	50,281,812
3 Distribution "	13,935,400	50,022,606
4 Capital outlay to end of the year .. Rs.	1,31,53,780	1,77,91,909
5 Gross Revenue "	6,63,980	16,17,351
6 Operation and maintenance expenses (excluding depreciation) .. "	2,78,000	3,85,732
7 Balance "	3,85,980	12,31,619
8 Percentage of return .. Per cent	2.93	6.92

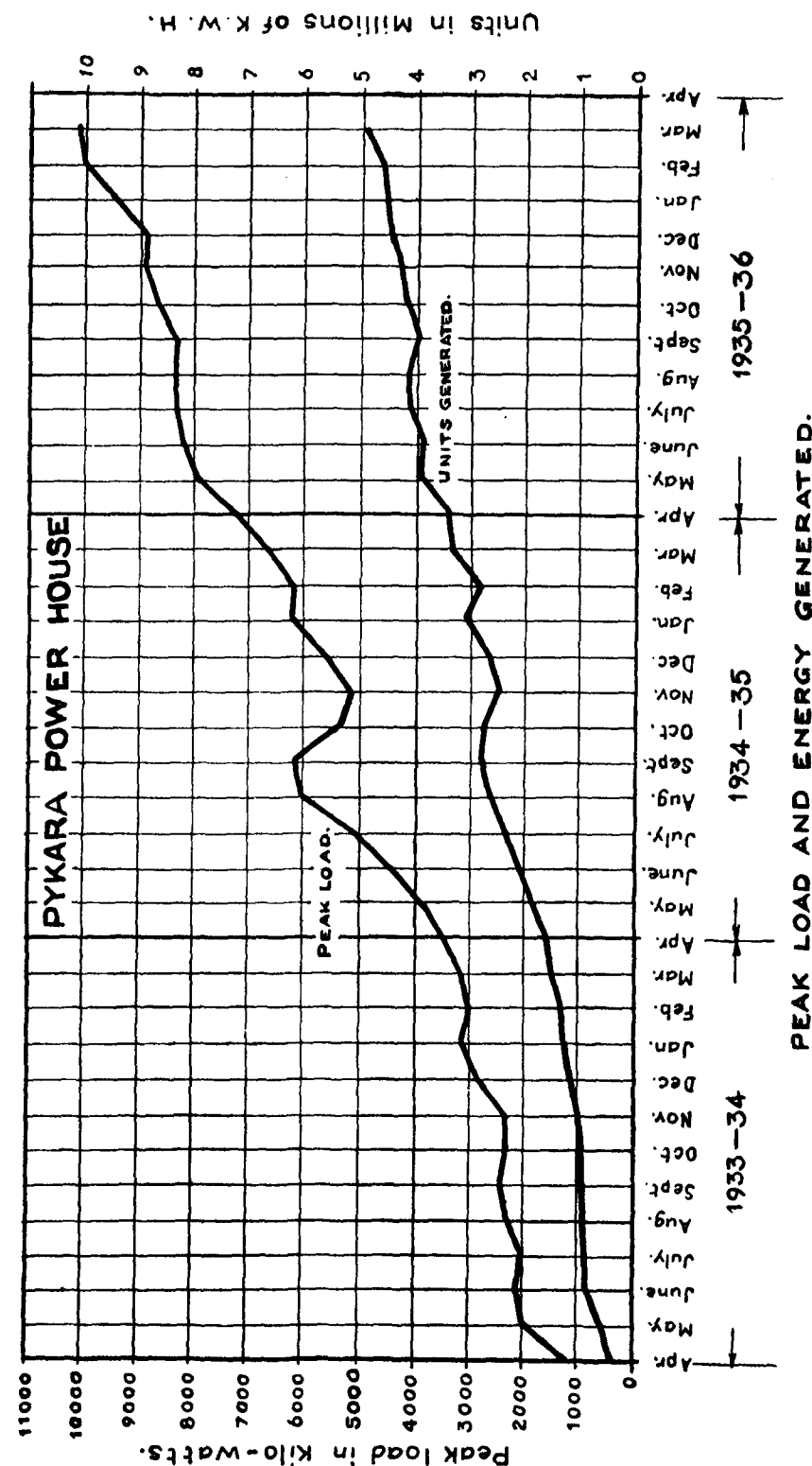
It may also be noted that the demand in the third year was more than that forecasted for the eighth year of operation in the estimate and that the third year revenue was more than that expected in the tenth year of the forecast.

The actual financial position of the Pykara System from the commercial standpoint is as follows for 1935-36:—

	Including Trichinopoly and Negapatam Extensions.
	RS.
Capital expenditure including arrears of interest ..	2,02,62,111
Gross Revenue	16,17,351
Operation and maintenance	3,85,732
Balance	12,31,619
Interest at 5½ per cent	8,88,239
Surplus	3,43,380

The whole of this surplus should be applied to a reduction of the interest deficits accumulated during the past two years of operation. The figures show that after every charge is met, the

CHART I.



System pays about six per cent on the total investment within three years of commencement. This is a very satisfactory state of affairs for a project of this magnitude. It is recognized however that this prosperity can be attributed mainly to the co-operation received from the consumers of the department, particularly the industrialists of Coimbatore. A very favourable factor is the working of double shifts in the textile mills, a condition which may however be transient. The rate structure is constantly under examination to see how far it is possible to share the dependable surplus with the consumers without jeopardizing the financial stability of the undertaking.

4. *Growth of Load.*—Chart No. I indicates the growth of the peak demand on Pykara power-station and of the energy generated there since the commencement in 1933. Chart No. II similarly shows the growth of the amount of energy distributed and of the revenue obtained for the Pykara System.

The uses to which Pykara energy was being put and the approximate proportion of each class of load to the demand on the power plant are set out below:—

Type of load.							Percentage of demand.
Textile	..	..	..	..	..	..	56
Cement, rolling mills and workshops	..	..	..	..	..	..	15
Licenses	..	..	..	..	..	..	16
Tea factories	..	..	..	..	..	..	6
Agriculture and miscellaneous	..	..	..	..	..	..	7
Total ..							100

It will be noted that although more than half the load on the Pykara System is due to the requirements of textile mills, it is not expected that this percentage will appreciably increase in future at the expense of the other classes of load.

All the original oil-engine driven mills have now completely changed over to electric supply from Pykara. The last remaining steam-driven mill has recently contracted to take electric supply; connexion is being given and initial supply is expected to begin early in 1936–37.

5. The growth of textile mill load can be assessed from the figures given below:—

Old mills, all now supplied by pykara	..	..	8
New mills	..	..	10
Mills under construction	..	..	10
Mills registered	..	..	4
Total ..			32

No new mill has installed its own power plant and it is also encouraging to note that in almost every case additional machinery (usually 5,500 spindles) is ordered whilst the initial plant is under erection.

The tariff for large industrialists was reduced during the year, the revision coming into force from 1st June 1935. The slight reduction in revenue is more than offset by the added confidence

of the consuming public in the commercial intentions of Government. Agitation for reduction of rates, although now almost non-existent, occurs occasionally but the user of Government electricity appears to be generally satisfied with his low power costs and improved production.

6. Agricultural load continues to develop in a most encouraging manner. During the year, 172 pumping sets aggregating 1069 H.P. have been installed making a total of 269 sets and 1879 H.P. connected to the System. The development of village street and domestic lighting and rural industries is also noticeable. Over 30 villages are now supplied with electricity.

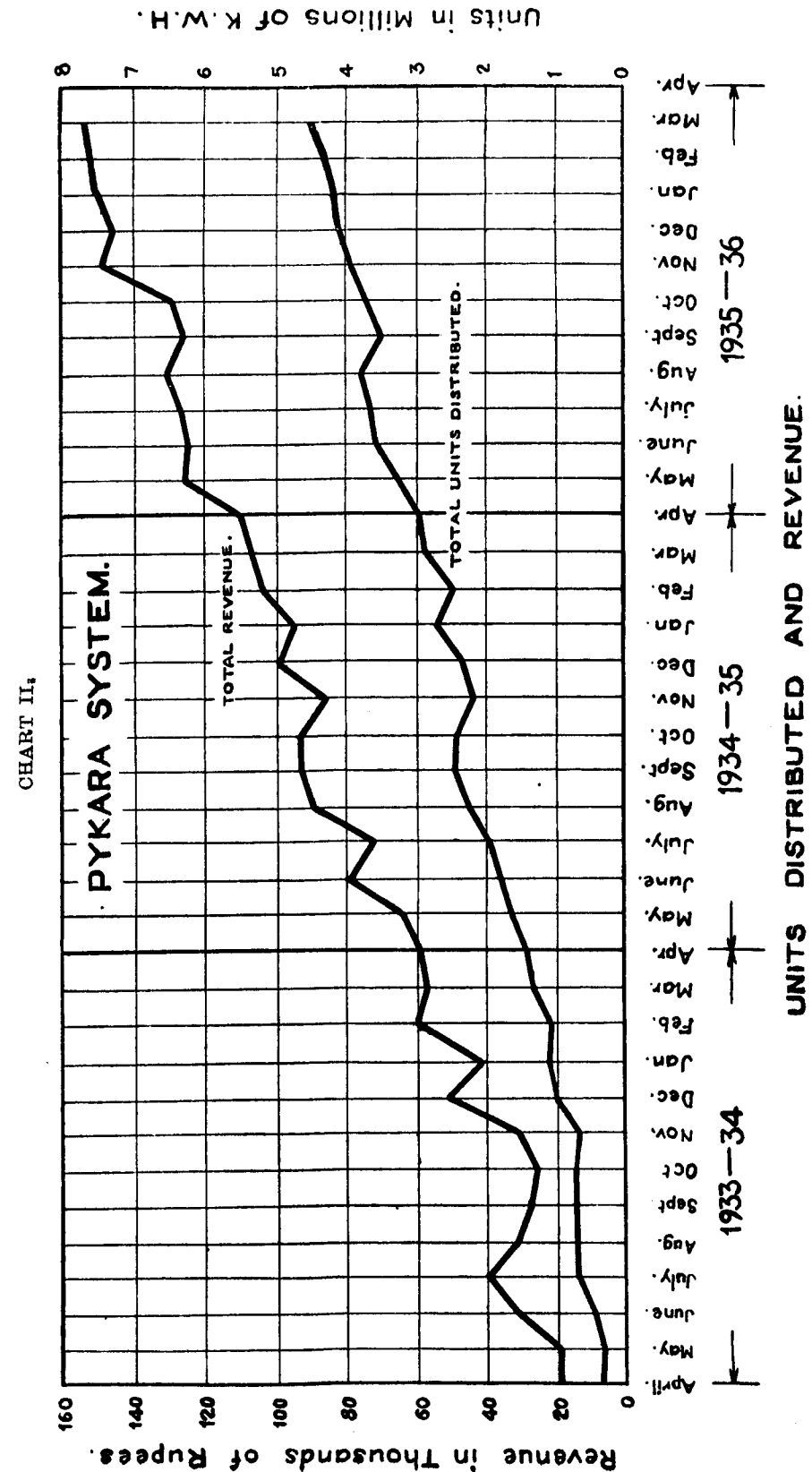
7. Supply to tea factories continues to show a steady increase, especially in the Anamalais Hills, where seven additional factories and also the Valparai township have commenced to take supply during the year. Of the 54 factories in the Pykara area, 26 are now connected to Pykara, five have their own hydro-electric plant and the remainder are not electrified. With the tea restriction in force, continued development of connexions at the present rate cannot be expected for some time. There are indications, however, that electricity will probably be increasingly applied to the withering and fermenting processes and increased consumption may reasonably be expected on this account. The rates for power to tea estates were revised during the year. This resulted in less wood fuel and oil being used. A cheap off-peak rate for heating was also introduced and this has tended further to interest the planters in the application of electric heating.

8. The total connected H.P. on the System including the Trichinopoly and Negapatam extensions but excluding the cordite factory load, is 24140 as against 13500 last year. The cordite factory load is about 1000 H.P. In the case of licensee consumers served from the System, only the maximum demand converted to H.P. and not the larger figure of connected H.P. is included in the above figures.

9. *Mettur Hydro-Electric Scheme.*—The scheme was sanctioned in January 1935 and specifications for the main generating and transforming plant and switchgear were prepared in Madras and issued from London in May 1935. The Chief Engineer in consultation with the Director-General of Stores and Messrs. Rendel, Palmer and Tritton, examined the tenders while on leave in England and the contracts were placed by the Director-General, India Store Department, in August and September. Their value was around Rs. 20 lakhs.

Tenders for transmission lines and substations were invited in India and orders for their supply and erection were placed in January and March 1936, respectively, the contract figures totaling Rs. 23.6 lakhs.

The camp site was organized and fair progress has already been made in foundations for the power-house. This work was delayed for some time as the construction engineers' foundation plans were not received in time.



The surveys of transmission lines, land acquisition proceedings, etc., have, however, proceeded according to schedule.

10. *Thermal Stations.*—The thermal stations at Dindigul and Virudunagar have entered on their second year of operation. The year has been one of steady progress and marked by an appreciable improvement in generation, demand and distribution.

The thermal station at Palni started regular operation at the beginning of the year, but, due mainly to the disappointing performance of the engines and their small size, the financial results of this station are not up to expectations. The change over to Pykara supply next year should lead to better results.

11. *Government-managed municipal undertakings.*—The Municipal Electricity undertakings managed by the department and in regular operation have in most cases shown good progress during the year, with a general increase in load and revenue, the trading results of the Coimbatore undertaking being particularly satisfactory. The undertakings at Karur and Palni have been in regular operation from April 1935, but the results at Palni have not been entirely satisfactory, as additional power load could not be taken on by the engines.

As the Coimbatore and Tiruppur undertakings have now been brought on to a remunerative basis, it has been proposed that they should be handed over to the respective councils.

The load and revenue results of the seven undertakings in regular operation during the year are given in Tables 3 and 5 on pages 16 and 24 respectively.

The Municipal undertaking at Udamalpet entered the operation stage in August, 1935 and those at Periyakulam and Bodinayakanur in December 1935 but the period to end of March 1936 has been treated as the test period from construction to operation according to the usual practice.

12. The progress of some of these municipal undertakings has been handicapped by the difficulty experienced in obtaining loans from Government in order to provide working capital. The case of Udamalpet was particularly serious as sufficient funds were not available to connect up potential consumers to the distribution system. Such procedure results in postponing the remunerative period. It would seem reasonable to grant loans on the potential earning power or credit of the Electricity undertaking rather than on the credit of the municipal council, which might conceivably be spending large sums on worthy but unremunerative schemes with prejudice to its credit. On the other hand the municipality might be genuinely poor, in which case, there is more reason to bring the Electricity undertaking to a remunerative basis as quickly as possible.

In the management of these Council undertakings the Department has continued to receive the co-operation and support of the various Chairmen and Commissioners.

13. *Construction.*—Extensive construction work costing Rupees 42.24 lakhs was undertaken during the year. The Construction and Civil Engineering Branch was in charge of all major construction works, whilst extensions to the Pykara distribution system were handled by the Engineer-in-charge, Pykara System.

The Mettur Hydro-Electric Scheme, which is a major project, was started early in the year, the Mukurti Dam construction was continued and work on the Udamalpet extension and Theni-Periyakulam-Bodinayakkanur Schemes was completed and supply arranged in the respective areas. The extension to Tanjore, Negapatam and Papanasam was completed and supply given to Tiruvarur and Negapatam. Two 2,500 K.V.A. synchronous condensers were installed at Trichinopoly substation to improve the system regulation. It may be of interest to note that power at 66 K.V. is now transmitted satisfactorily direct from Pykara to Negapatam, a distance of 273 miles. In addition, considerable extensions to the distribution systems were carried out. High tension lines covering 257 miles of equivalent single circuit were constructed during the year of which 120 miles were for 66,000 volts. Transformer installations of 9,750 K.V.A. capacity were erected, of which 8,750 K.V.A. were for 66,000 volts. A more detailed account of the construction work is given in Section II, and details of cost are given in Appendix A.

14. *Investigations and Designs.*—During the year under review, several schemes and extensions were investigated in the field and studied in the Technical Section. The following were the more important ones:—

Hydro-Electric Schemes—

- (1) Mekadatu Hydro-Electric Scheme.
- (2) Papanasam Hydro-Electric Scheme.
- (3) Lammasinghi Hydro-Electric Scheme.

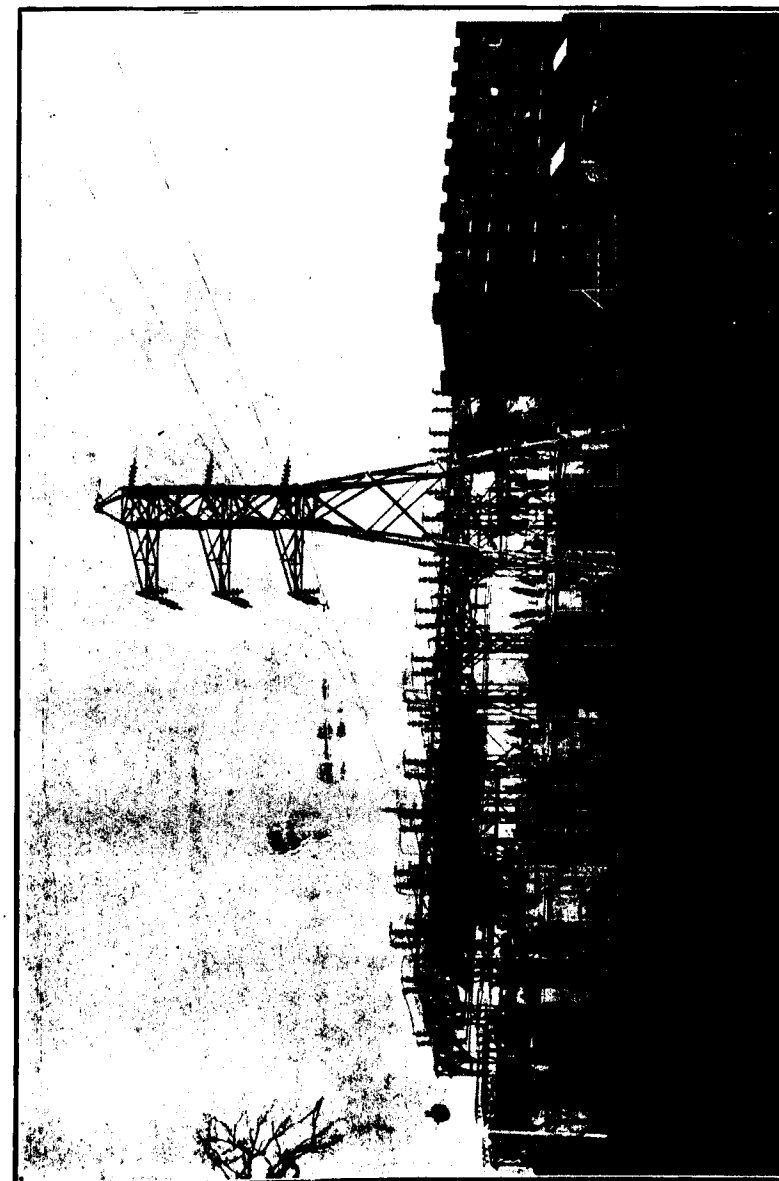
Thermal Schemes—

- (1) Vizagapatam Scheme.
- (2) Bezwada Scheme.

Extensions—

- (1) Coimbatore-Madura Extension.
- (2) Kotagiri and Cordite Factory Extension.
- (3) Rasipuram Extension.
- (4) Calicut and Cannanore Extension.

In addition, the Technical Sections were kept busy preparing designs, estimates, specifications and working drawings in connexion with the Mukurti Dam and the Mettur Power House plant, transmission lines and substations and other transmission and distribution schemes. A detailed account of the work handled in the Technical Sections is given in Section II of the report. It is to be noted that the expenses of the technical office at Madras were, as in the previous year, more than met by the contributions from the various construction works in progress and the fees earned by managing the several municipal electricity undertakings. Details as to the cost of establishment and fees earned will be found in Appendix C.



Trichinopoly sub-station.

15. *Licences and inspections.*—The number of licensed undertakings giving supply at the beginning of the year was 42. Twelve applications for licences were under consideration, eleven licensed concerns were under construction and eight licensees commenced supply during the year, thus making a total of 50 licensed undertakings in service at the end of the year. This compares with 21 in 1930–31 and 35 in 1933–34 and is an indication of the rapid growth of electrical development in the Presidency. Energy sold from licensees' generating stations during the year was 43·7 million units, recording an increase of 15 per cent over the previous year's figure.

The supervision of all these undertakings coupled with the meter and relays testing of the Pykara System and standardization of instruments had increased so appreciably the work and responsibilities of the Electrical Inspector as to necessitate the transfer of the Meter and Relays Section to the control of the Engineer in Charge, Pykara System, from 1936–37.

A more detailed account of the division is given under section II and certain statistics on the working of all the electric supply undertakings in the Presidency are given in parts I and II of appendix D. Last year an attempt was made to collect and publish certain useful statistical information of all licensed electricity undertakings in the Presidency. Such information is available to the public in most countries. Unfortunately the statistics are not as complete as desired owing to the unwillingness of some private licensees to give the necessary data.

The population given in column 2 of appendix D refers, as nearly as it is possible to determine, to the number of people in the area served and not necessarily to the number in the whole licensed area. Attention is drawn to the revised figures for the Trichinopoly Undertaking showing a larger unit consumption per capita than given in last year's report.

16. *General Engineering.*—The work in connexion with electric installations in Government buildings is steadily increasing. During the past year, new works costing Rs. 1·85 lakhs were constructed bringing the total capital cost of these works to Rs. 43·16 lakhs; the total maintenance charges amounted to Rs. 1·62 lakhs or 3·8 per cent of the total capital cost. The Electrical Engineer (General) in charge of the above work, was also supervising the management and operation of the thermal stations and connected distribution systems. The volume of work and responsibilities attached to this division had much increased and a small additional staff was sanctioned.

17. *Organization.*—During the year under review several important changes in organization were made. The Pykara charge was confined to the operation of the Pykara System and a construction organization was formed to handle all major

construction works of the department. The status of the officers in charge of these two distinct organizations was raised to that of Superintending Engineers.

A Divisional Engineer was posted to Singara to be in charge of the operation and maintenance of the civil works and power station and the headquarters of the Engineer-in-Charge, Pykara System, were moved to Coimbatore. The Mettur construction organization comprising Executive and Assistant Engineers and subordinate staff was formed early in April 1935.

Owing to the increasing need of additional superior technical supervision over the important Trichinopoly and Negapatam Extensions, it is proposed to submit proposals for the creation of a new operating division. It is too much to expect one Engineer to be responsible as at present for the detailed technical supervision, required of modern transmission systems, over an extensive area which includes the Coimbatore, Trichinopoly and Tanjore districts.

The more important changes in the superior staff of the department are given at the end of this report.

18. *Administration*.—As mentioned in the previous report the difficulty in securing the necessary extra staff to cope with additional work has been increasing. It is gratifying, however, to note that the procedure for the recruitment of the Electrical Subordinate Services has recently been simplified by making the Chief Engineer and not the Services Commission responsible therefor. Further staff could now be engaged on a temporary basis for a maximum period of three months without resort to recruitment. Six months would, however, have been more practicable. It is hoped that these changes would help to minimize the delays mentioned in the previous report. If Government would be prepared however to judge administrative questions and relax rules for a Commercial department in a manner as generous as their present financial policy towards the department, many of the administrative difficulties with which the Chief Engineer has now to contend would disappear.

19. *Madras Local Authorities Electrical Service*.—In order to regulate the recruitment of electrical engineers for the municipal owned undertakings and to exercise control over them, this service has recently been formed and placed under the Chief Engineer for Electricity. Proposals for the admission of members into the service are under study. By this measure, uniformity in pay and prospects and security and freedom from interference in the discharge of duties are expected to accrue to the members with resulting efficiency in their work.

20. *Finance*.—A uniform and progressive policy has been adopted by Government in regard to original schemes and in the matter of affording hire-purchase facilities to consumers. This

has directly led to the rapid expansion of the power systems controlled by the department and the satisfactory financial returns already noticed.

There is an important matter which might be referred to. The rule requiring a 6 per cent return for productive schemes would seem to justify modification. When $2\frac{3}{4}$ per cent Government loans are oversubscribed within 5 minutes after the lists are opened, insistence on a 6 per cent return appears unduly high and unnecessarily retards development. Reduction of the rate to 4 per cent would not appear to involve much risk. There is also the economic advantage resulting from the indirect return from a large development work to be considered.

21. *Electricity Board*.—Government decided to submit the proposals for a Statutory Electricity Board and the tentative draft Bill, prepared by the department last year, to a representative committee for examination and report. A committee was formed with the Hon. the Law Member as chairman. Several meetings were held towards the close of the year, but the evidence of witnesses has yet to be heard. Unexpected opposition from various sources to the creation of such a Board is, however, already apparent.

22. *Future Progress*.—A further general increase in load and revenue is expected during the year and continued progress in electrical development all over the Presidency. A factor, however, which has tended to retard the increase of small industrial power in towns is the attitude of the local Public Health authorities in refusing licences for small motors. Several communications have been addressed to Government on the subject. It seems strange that small motors are allowed to be installed in the commercial centres of London, Paris, New York, etc., and yet are often refused in the towns of this Presidency.

The expenditure of public money on public water-supply and drainage pumps operated by thermal engines, to the detriment of the local electricity supply undertaking, seems economically unsound when it is realized that public money has already defrayed the cost of the construction of the generating stations of municipal owned and Government undertakings while, in the case of private licensees, who are not at present being supplied from a Government source of power, indications are that they will ultimately be supplied with State electricity. It is for consideration whether Government could not lay down a policy that all new or reconstructed public water or drainage works should be electrically driven.

23. Certain of the schemes envisaged for future construction contemplate the closing down of small generating stations of private licensees and substituting a Government electricity supply in bulk. Difficulty in some cases is anticipated, particularly where modern and high speed types of machinery have been

recently installed, unless the machinery is taken over by Government. This could be easily arranged without prejudice to public interests, if, in future, Government would not grant loans of public money to local authorities for new generating stations or extensions to existing ones, until it has been ascertained whether plant, already replaced by a Government electricity supply, could not be utilized.

24. Owing to the continued expansion of the department the need for special investigations and studies in connexion with the operation of the various systems such as voltage surges, lightning protection, problems of stability, special measurements, tests, etc., will be increasingly felt. The engineers of the department have not the time for such studies, but it is believed that considerable assistance of a technical nature may be obtained by closer co-operation with the College of Engineering, Guindy, as soon as the high tension laboratory is completely equipped with the necessary apparatus.

25. *Construction Programme.*—A revised map of the proposed Madras Grid is shown on the frontispiece in order that the latest plans of the department may be known. The most important change from last year is a modification of the previous plans for the distribution of electricity in the Ceded Districts. Even now these plans must be considered tentative as preliminary surveys and studies have not yet been taken up in detail.

It may also be noted that the transmission system south of Madura has been extended and a scheme has already been worked out and is being submitted to Government for sanction.

26. The following programme indicates the important works expected to be executed in the year 1936-37:—

Mettur.—Completion of power-house building and all machinery and equipment under erection. 90 per cent completion of the transmission system and of substations.

Pykara.—66 K.V. oil circuit breakers replaced by 110 K.V. breakers. Usual extensions to distribution systems undertaken.

Mukurti Dam.—Completion up to height giving storage of 500 million cubic feet.

Madura Extension.—Line surveys completed. Contracts for lines and substations let and 50 per cent work done. Early supply of power to Palni and Dharapuram is expected to be given about January 1937.

Virudunagar Extensions.—Specifications for transmission lines and substations issued, contracts let and work commenced.

Rasipuram Extension.—Will be completed.

Kotagiri Extension.—80 per cent will be completed.

Vizagapatam Thermal Scheme.—Issue of specifications for power plant, transmission lines and sub-stations and contracts therefor entered into. Power House extensions begun and part of the machinery received.

Bezwada Thermal Scheme.—Negotiations with prospective consumers and preparation of schemes and estimates for Government sanction. Preparation of specifications for power plant, transmission lines and sub-stations.

Papanasam and Lammasingi Hydro-Electric Schemes.—Investigations completed and reports under preparation.

Pumping Scheme for Ceded Districts.—A small scheme involving a survey by means of deep bore wells, of the extent of the underground water supplies of a portion of the Ceded Districts is to be taken up with the idea of ascertaining whether a more extensive survey would be justified. The grant allotted is Rs. 20,000 and very little actual boring can be carried out for such a small amount.

Budget provision made for 1936-37 for these works is given in Appendix B.

27. *Acknowledgments.*—I should like to acknowledge the assistance received from the Director-General, India Store Department, and Messrs. Rendel, Palmer and Tritton, Consulting Engineers to the Government of India, whilst I was in London in connexion with the Mettur Scheme and other work of the Department. All inspection work in connexion with orders for machinery, etc., placed in Europe was satisfactorily undertaken, as in the past, by the India Store Department, London, while the Consulting Engineers prepared the working drawings of the Mettur Power House from details furnished by the various contractors and assisted, when required, with other technical details of the scheme.

I should also like to record my deep appreciation of the work of the staff during the past year. Without the unstinted assistance, which is obtained from the majority of them, such progress as the Department has been able to make, would not have been possible.

28. A more detailed report of the work of the various sections of the Department follows.

Section II.—Detailed Report.

Pykara Hydro-Electric System.

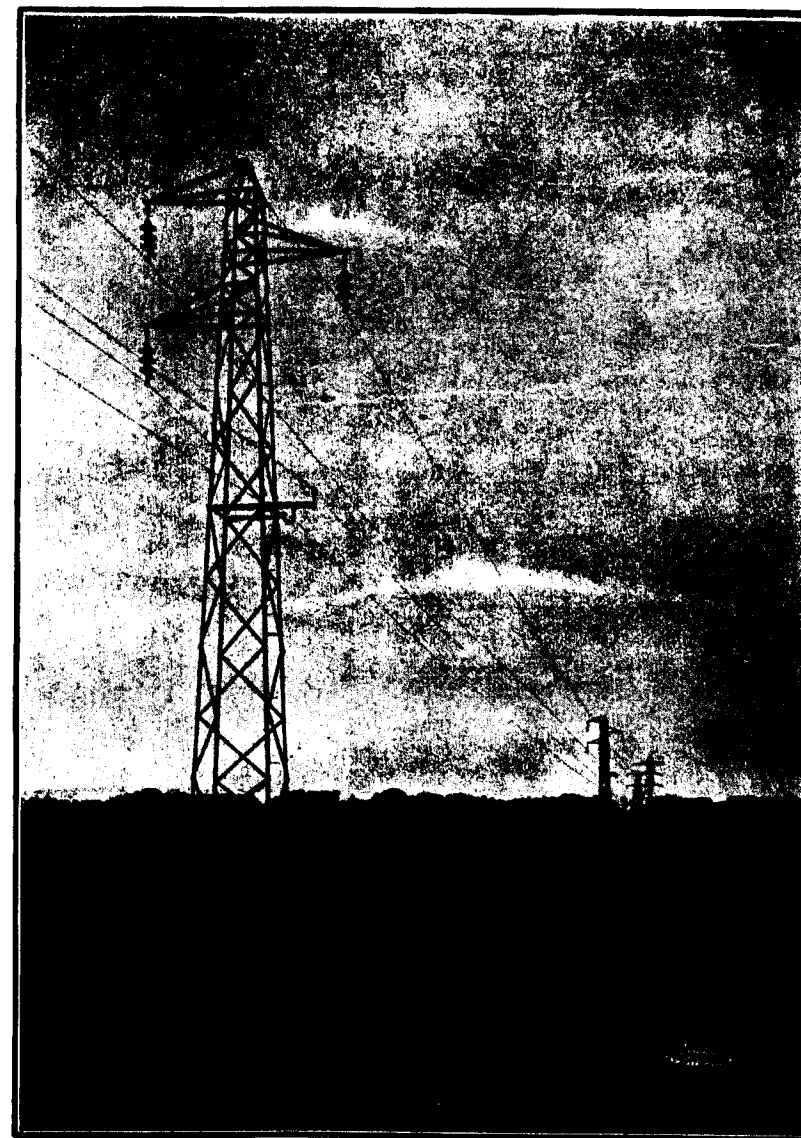
29. The year under report was the third year of operation of the system. The progress during the year has been gratifying with regard to load conditions and revenue. The operation and maintenance of all the stations in the system have been satisfactory and the service to consumers has been good. There have been no avoidable interruptions to supply.

30. *Civil and Hydraulic Works.*—The water conditions in the Pykara river necessitated close watching. The dry weather continued to persist and the rainfall was precarious. The total rainfall during 1935 was 68.24 inches which was 7.66 inches short of the previous year's. The minimum flow in the river in December 1935 was 36.25 cusecs. There was no rain in January, 0.14 inch in February and 3.1 inches in March 1936. The average consumption at the Power House exceeded 33 cusecs and the Mukurti Reservoir was drawn upon when necessary, the storage at the end of the year being 130 m.c.ft. The rains in March 1936 rendered the water situation generally safe and there is more storage available now at Mukurti, than anticipated. All civil and hydraulic works were maintained in condition. There was a slip on the riverside along the main flume, which involved the construction of protective works.

31. *Power Station.*—The service and regulation have been maintained satisfactorily throughout the year. The output of the station was 50 million units with a peak load of 10,100 K.W. as against 30 million units and 6,600 K.W. respectively for the previous year. The load factor of the station for March 1936 was 56 per cent. The number of interruptions to main service were only two in the whole year. One was for half a minute and the other for two minutes.

32. *Operation.*—The regulation of the system has been improved by the installation of two 2,500 K.V.A. Synchronous condensers at Trichinopoly and of 1,000 K.V.A. booster regulators at Ootacamund and Iyerpadi. Owing to the shortage of water within the Kateri-Ketti catchment, the Cordite Factory was compelled to take an emergency supply of electricity from Pykara and in spite of the fact that the local 11 K.V. lines were not designed to carry this heavy additional load, regulation was maintained more or less satisfactorily by operating the generators at the Kateri Power Station as Synchronous condensers. To provide for conditions of increased loading in the immediate future, arrangements have been made to install a 5,800 K.V.A. transformer with on-load tap changing gear at the Coimbatore Receiving Station and two automatic booster regulators at the Pollachi sub-station.

33. *Transmission Lines.*—Considerable extensions to the transmission and distribution systems have been made during the year. The most important addition is the 66 K.V. line from Trichinopoly to Negapatam, comprising 35 miles of double circuit up to Tanjore 50 miles of single circuit therefrom to Negapatam. A 33 K.V. branch from Tanjore to Papanasam was also completed. The 22 K.V. line between Pollachi and Iyerpadi was duplicated and the Anamalai lines were extended by 9 miles so as to reach all the incoming factories. An independent 11 K.V. rural line was constructed to feed the agricultural area of Vellankinar and the textile mills of Perianaickenpalayam. Work in



33 K.V. line from Tanjore to Papanasam.

connexion with raising the insulation of the Pykara-Erode line from 66 K.V. to 110 K.V. was in progress. Material for the raising of the insulation of the Pykara-Coimbatore section from 66 K.V. to 110 K.V. has been mostly received and the work started in March.

34. The length of the transmission lines constructed and the capacity of the transformers (excluding distribution transformers) installed during the year and the totals of these in service at the end of the year are given in Table 2 below. It will be seen therefrom that the high tension lines in service total 986 miles of equivalent single circuit and that the station transformer capacity (excluding distribution transformers) amounts to 59,380 K.V.A.:—

Table No. 2.

Total lengths of transmission lines and installed capacity of transformers.

Voltage.	Constructed during the year.				Total in service.			
	Single circuit.	Double circuit.	Equivalent single circuit.	Transformer in-stalled capacity/station transformer.	Single circuit.	Double circuit.	Equivalent single circuit.	trans-station transformer.
	MILES.	MILES.	MILES.	K.V.A.	MILES.	MILES.	MILES.	K.V.A.
66,000 ..	50	35	120	8,750	50	223	494	52,680
33,000 ..	18	..	18	1,000	18	18	18	1,000
22,000 ..	57	..	57	..	147	61	269	5,700
11,000 ..	56	3	62	..	175	15	205	..
	181	38	257	9,750	390	317	986	59,380

35. *Distribution Systems.*—The demand for power in rural areas, especially for agricultural load, has increased appreciably. During the year, power supply has been extended to the following places, in addition to 98 smaller extensions carried out from the existing H.T. and L.T. distribution lines:—

- | | |
|------------------------------|-------------------------|
| (1) Oddapalayam. | (5) Oomareddiyur. |
| (2) Chittoor (Pollachi). | (6) Ravathur-Nilambur. |
| (3) Kottur-Malayandi-patnam. | (7) Gudalur (Nilgiris). |
| (4) Telungupalayam. | (8) Pudur (Tiruppur). |
| | (9) Ganapathi village. |

In addition, the following rural schemes were investigated, sanctioned and under execution:—

- | | |
|---------------------------|--------------------------------|
| (1) Kannarpalayam. | (5) Ganapathipalayam. |
| (2) Sengalipalayam. | (6) Kannampalayam. |
| (3) Thekkampatti-Kallar. | (7) Terrace Estate (Nilgiris). |
| (4) Idigarai-Attupalayam. | |

36. *Trichinopoly-Negapatam Extension.*—It will be recalled that at the close of last year the contracts for the transmission lines and the sub-stations had been awarded and work was in progress in the Tanjore-Tiruvarur, Tanjore-Papanasam, and Tiruvarur-Negapatam sections. The line in these sections runs almost wholly through wet lands on low ground, and hence was taken up in advance in the dry season and completed by the end of July. The Trichinopoly-Tanjore section which runs mostly on dry lands was taken up later and completed by the end of October. The completion of the foundations and the erection of the towers over the wet lands during the dry months was a work above the average and was due to the excellent organization of the contractors—Messrs. Callenders Cable and Construction Company.

The sub-station buildings were also completed by the end of October. The transformers at the sub-stations were erected during September, but owing to a delay of 2-3 months in the delivery of outdoor switchgear by the contractors, Messrs. English Electric Company, the Tanjore and Papanasam Sub-stations were not completed in December as originally anticipated. The Tiruvarur and Negapatam structures were however completed in time. For voltage regulation, two-2,500 K.V.A. synchronous condensers were installed at the Trichinopoly Sub-station during October and November and were tested and taken over in December.

37. Pykara supply was given to the Trichinopoly-Srirangam Electric Supply Corporation on June 1st, 1935. A temporary 11 K.V. supply from Pykara was given over the new line to the Negapatam licensee on 13th September and to Tiruvarur in November. Regular 66 K.V. supply began from January 1936. The feeder line at Tanjore from the Government Sub-station to the municipal power house was completed in February 1936 but the municipality is not yet ready to receive supply. The 33 K.V. line from Tanjore to Papanasam and the 11 K.V. line from Papanasam to Kumbakonam were completed in October and March respectively. The work on the 11 K.V. feeder line from Trichinopoly Sub-station to the Golden Rock was just being begun at the end of March.

The departmental telephone line required for the operation of the above transmission system has been erected by the Telegraph Department and taken over. The telephone equipment for the sub-stations and the linemen's huts on the transmission lines arrived at site at the end of March and are being installed.

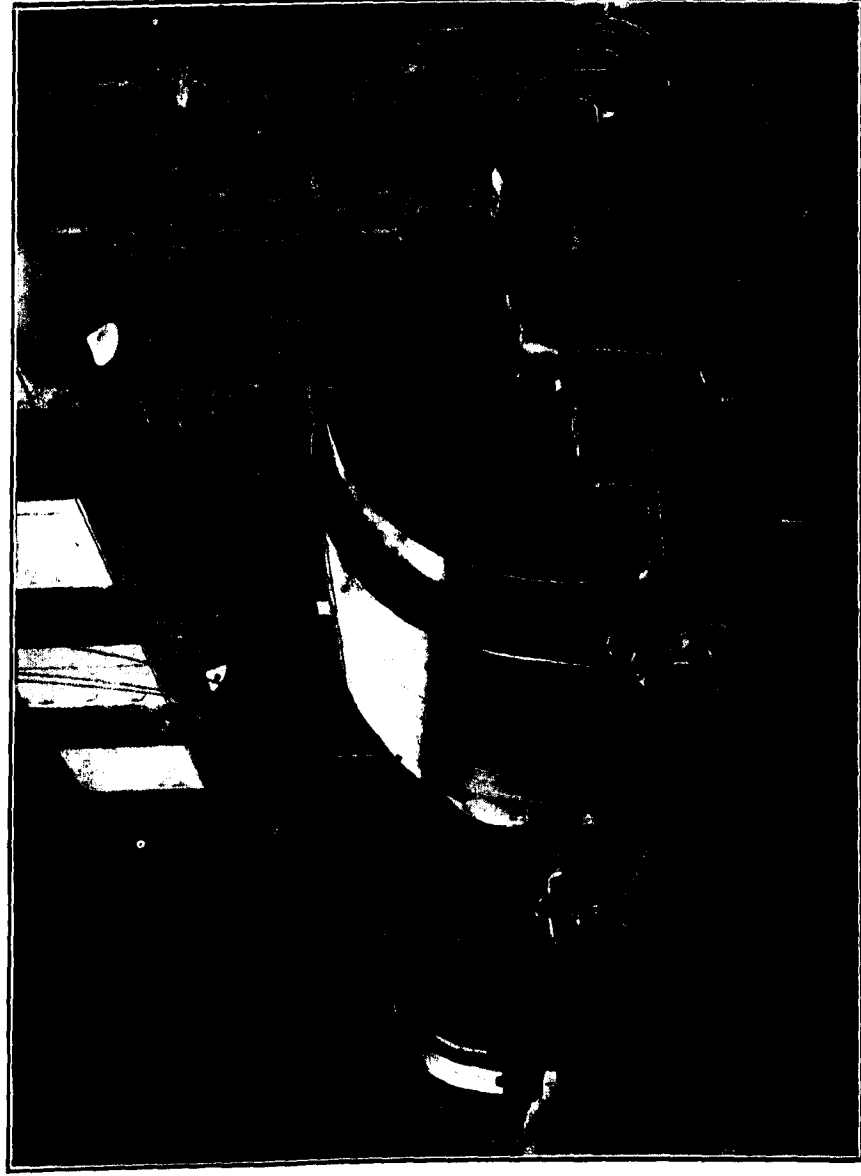
38. *Udamalpet Extension.*—This consists of—

- (i) Pollachi-Udamalpet 22 K.V. Transmission Line; and
- (ii) Udamalpet Municipal Distribution.

The erection of the transmission line was begun in January 1935 and completed in June, while the distribution works were begun in March and completed in July. The lines were charged with Pykara power from the beginning of August 1935.



Negapatam sub-station.



Synchronous condensers at Trichinopoly sub-station.

39. *Pollachi-Iyerpadi Section*.—Double circuiting of the 22 K.V. line from Pollachi to Iyerpadi in the Anamalai Hills was completed with the exception of one small section on the ghat which will be completed in April. This was very largely a live line work and has been carried out in a very satisfactory manner without accident and in good time.

40. *Municipal Undertakings*.—The Municipal Electricity Undertakings served by the Pykara system and managed by the department have shown satisfactory progress. There has been a general increase in load during the year in all the undertakings. A summary of the operating result is given in Table 3 below :—

Table No. 3.

Load and revenue results of municipal electricity undertakings served by the Pykara System and managed by the department for the years 1934-35 and 1935-36.

	Coimbatore.		Pollachi.		Tiruppur.		Karur.	
	1934-35.	1935-36.	1934-35.	1935-36.	1934-35.	1935-36.	1934-35.	1935-36.
1 Peak load ..	420	516	200	230	290	380	..	57.5 K.V.A.
2 Units generated or purchased ..	1,027,111	1,323,988	433,995	686,205	736,065	876,820	..	97,614
3 Total units sold or distributed ..	950,635	1,221,564	375,682	585,515	610,194	833,865	..	85,388
4 Total connected load ..	1,293	1,672	537	897	834	976	..	208.5
5 Total capital expenditure up to end of year ..	4,75,424	5,16,910	1,68,135	1,80,989	1,47,307	1,68,736	..	76,806
6 Gross revenue ..	1,44,348	1,94,686	40,345	59,252	54,169	75,647	..	17,771
7 Operating and maintenance expenses (including agency fees) ..	86,426	94,712	31,153	44,920	41,952	54,450	..	10,873
8 Interest at 5½ per cent on capital ..	25,118	27,779	10,302	9,314	7,725	9,087	..	5,056
9 Balance for sinking fund, depreciation reserve, etc. ..	32,804	72,195	— 1,110	4,518	4,492	12,110	..	1,842

Udamalpet Municipal Undertaking commenced operation in August 1935, but the period to end of March 1936 is treated as test period.

41. *Extensions under construction or investigated.*—During the year under review, several extensions were investigated and arrangements made to proceed with the construction of some of them. Details of the more important ones are given below:—

Kotagiri and Tea Estates (Nilgiris).—With a view to supply the Government loads on the Coonoor side of the Nilgiris without the intervention of another agency (in this case the Ootacamund Municipal Council) several schemes were investigated and it has been finally decided to erect a sub-station at Kattabettu on the existing Pykara-Coimbatore transmission line and to supply direct therefrom to Kotagiri on the one side and the Cordite Factory and the Tea Estates on the Droog and in the Kullakombai area on the other side. Materials are being collected and the work will be put in hand and completed within the calendar year 1936.

West Coast.—In view of the demand for electricity in the Nilgiri-Wynaad a preliminary load survey has been taken for a line from Singara to Maipadi continuing thence to Calicut with a branch line to feed a large group of estates at Manantoddy and then on to Cannanore.

Karamadai-Annur.—The fertile valley lying between Karamadai on the Mettupalayam road and Annur and passing through Puttur has been investigated and a scheme prepared for sanction. The agriculturists in this area are very eager to have electric supply for pumping, cane-crushing and rice mills.

Rasipuram.—A scheme for supply of power to Rasipuram Panchayat (Salem district) has been sanctioned and work will be taken up in 1936-37.

Coimbatore.—Consequent upon the large increase in the industrial load by reason of the increase in the number of mills and expansion of existing mills it has become necessary to reinforce the supply arrangements and a scheme has been sanctioned for the construction of an inner ring main with change-over arrangements so that full load of the mills can be carried with safety and service secured in the event of failure of one of the lines. This work has been started and will be completed by the middle of 1936.

Coimbatore-Madura Extension.—The importance of supplying Madura with hydro-electric power had long been recognized and proposals for developing the neighbouring Periyar Scheme were submitted to Government in 1933. Pending its approval, Pykara could help development of

load in the area but it was not considered advisable to extend the Pykara System to Madura until the Erode-Trichinopoly-Negapatam loads were taken over by Mettur. This transfer is now scheduled to take place in 1937 and it is proposed to build a 66 K.V. double circuit line from Coimbatore to Madura via Udamalpet, a distance of 125 miles, with sub-stations at Udamalpet, Sembatti and Madura. Supply to Palni and Dharapuram will be through 22 K.V. lines from Udamalpet and supply to Dindigul through 11 K.V. lines from Sembatti. The scheme is estimated to cost Rs. 33.5 lakhs and was sanctioned by Government in April 1936. Power is expected to be available at Madura before the end of 1937. Line survey work was started in February 1936 and sub-station sites have been selected. The specifications for the lines and sub-stations should be ready for issue about June 1936.

42. *Administration. Accounting.*—As far as possible with the imposition of Government system of accounts the organization of the Central Office is now commercialized and commercial accounts are maintained alongside the Government accounts. There has been considerable improvement and a better appreciation of the essentially commercial character of the office during the year but it can by no means be said that the side by side system is satisfactory or conducive to efficiency. The appointment of a Chief Accountant of gazetted rank and with specific powers has relieved the Engineer-in-charge of considerable amount of responsibility for the details of accounting work but the expansion of the system has been so rapid that this relief is at least counterbalanced by increased office work in other directions. The grant of powers of purchase and sanction to the Engineer-in-charge has accelerated execution of works but has necessarily increased the work of the office and this together with the increased work on account of expansion has necessitated additional staff for all sections of the office.

Stores.—With the expansion of the system new branch offices and sub-stores have been opened at important centres, e.g., Pollachi, Udamalpet and Trichinopoly. These offices and, in fact, all sub-offices and stores render initial accounts direct to the head office at Coimbatore for incorporation in the accounts of the system.

Territorial charge.—At the beginning of the year, the headquarters of the Engineer-in-charge, Pykara System, were transferred from Glen Morgan to Coimbatore with satisfactory results as regards general superintendence of field work, accounts and commercial activity. The additional post of Divisional Electrical Engineer has resulted in increased capacity for activity on extensions and control over operation and maintenance. The extension of the system to Madura will necessitate the appointment of a third Divisional Electrical Engineer in the very near future. During

the year the system of territorial responsibility for Assistant Engineers has been gradually introduced and is found to be decidedly effective both as regards actual works and economy.

Testing branch.—Arrangements have been made to take over the meter and relay testing branch at Coimbatore from the Electrical Inspector on the 1st April 1936. This, since it makes for centralization and elimination of unnecessary agencies, will considerably facilitate the work of the system.

Conversion fund.—The system of granting loans from Conversion Fund is working very satisfactorily and all instalments have been paid up to date. Most of the loans are to textile mills. The total amount of loans advanced to end of the year is Rs. 4,83,073 out of which a sum of Rs. 1,21,858 has been repaid. The operation of the fund since its inception is given below:—

Year.						Loans advance.
						RS.
1933-34	..	..	..	..	..	1,27,725
1934-35	..	..	..	..	..	1,06,861
1935-36	..	..	..	..	..	2,48,487
						4,83,073

Propaganda.—During the year, a pamphlet entitled “Electricity in Agriculture” was prepared and circulated. It has been well received and has aroused considerable local interest. Several printed leaflets of instructions were issued to consumers during the year.

Medical and sanitation.—The general conditions of health in the camps on the Nilgiris were satisfactory throughout the year. There were no epidemic or infectious diseases. As a precaution against a suspected case of smallpox, vaccination was carried out at Singara and Glen Morgan. The usual anti-malarial operations were carried out at the Singara camp and there has been an appreciable reduction in the incidence of this disease but, owing to the fact that the adjacent estates take no precautions whatsoever, more extensive work will be required before the Singara camp can be considered to be free from malaria. The staff at Nelli-thorai, Attakatti and Iyerpadi camps continue to have frequent attacks of malaria. As regards Nelli-thorai, the staff is being attended to by the Medical Officer attached to the Local Fund Hospital at Mettupalayam. As the Valparai hospital has been closed down and other arrangements have not yet been made by the Medical department, the staffs at Attakatti and Iyerpadi are compelled to take treatment at the several estate hospitals or at the distant Pollachi hospital. This subject is under correspondence with the District Medical Officer. The health at the other camps on the system was very satisfactory.

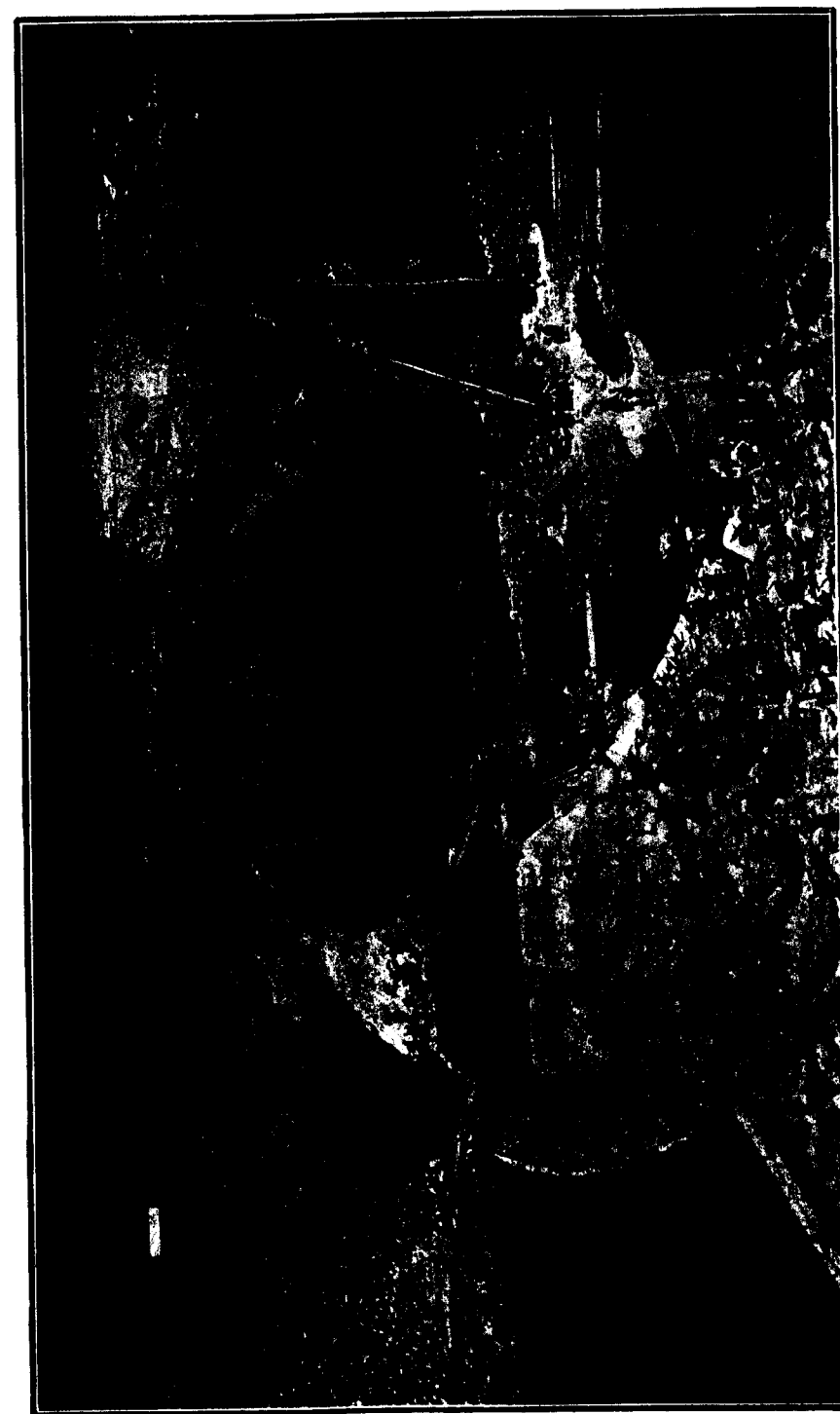
Accidents.—Accidents of all kinds to the staff and other employees of the system have been very rare but electrical accidents to non-employees continue. With a view to educating the public as to the danger of climbing transmission structures an

illustrated poster has been prepared and, with the co-operation of the Revenue Department, has been circulated to and posted in all the villages adjacent to our transmission lines throughout the system and it is hoped that this will have the desired effect. There have been 12 fatal and 25 non-fatal accidents during the year, of which 2 fatal and 3 non-fatal occurred to employees of the department.

MUKURTI DAM.

43. At the end of March 1935, 6½ miles of service road to the dam had been formed, the labour camp partly built, foundations for the dam in the river bed partly excavated and prepared, and some of the construction plant erected.

The Pykara load growth and the shortage of water in the catchment necessitated a construction programme which would provide storage to a height of 26 feet with a reservoir capacity of 230 million cubic feet by the end of the year to meet the requirements of the dry weather for 1936. To enable this water to be accumulated, it was necessary to provide storage by the beginning of November and in view of the impossibility of working during the monsoon, an intensive construction programme had to be carried out both before and after. From April to June, the road including the Mukurti bridge was completed, machinery and plant transported and the staff and labour quarters built and occupied. On April 3rd, 1935, masonry in the dam foundation on the right half of the river bed was begun, the flow being diverted to the left bank. The right half was built up to bed level and the river turned through on May 13th, the programmed date. Foundations of the left half were then prepared and the front face of the dam raised to about 6 feet above bed level by the middle of June, when work had to be stopped on account of the monsoon. Seventy-three thousand cubic feet of masonry were built during this time. This was mostly on the front but was given a sufficient breadth of foundation to enable the face to be raised to 28 feet height immediately after the monsoon. The hillside of the right flank consists of soft earth and the masonry was continued into this for a sufficient depth and height to prevent the monsoon floods working round. During the monsoon, quarrying, drilling, and the complete overhaul of the plant most of which had been worked continuously for the previous three months were carried out when weather permitted. Construction was resumed on 2nd September but had to be abandoned three days later until the 12th owing to heavy rains which brought down a flow of 2,150 cusecs which was the heaviest of the season. Owing to the extreme urgency of getting the front face up to 28 feet in height, a water tight timber crib had to be built round the lowest monsoon spillway section to back up the flow and so give a head of about 10 feet which was required to enable the two outlet pipes to pass the full discharge of the catchment. Storage was begun on October 27th and the front face was completed up to 28 feet height by November 6th. Supply for power was begun to be drawn off on January 20th, 1936, and up to the end of March about 50 million cubic feet of



Mukurti Dam under construction.

storage had been utilized. Between November and March, masonry was continued over the full breadth of the dam and the flanks raised to a height of 36 feet to confine the 1936 monsoon floods to the spillway section. Difficulty was experienced due to slips of the porous earth in the deep excavation on the right flank and heavy timbering had to be resorted to. By the end of March, the foundations for the front face had been completed for the full length of the dam and were nearing completion for the last portion on the down-stream side. About half of the total quantity of dam masonry has been built. The core wall has been redesigned as a reinforced concrete diaphragm, and work on this can only be commenced in January next when the ground has dried out after the monsoon.

The dispensary was fully employed throughout the year attending to about 15 per cent of the total population, weekly.

The average number of workmen employed was 1,200 rising to a maximum of 1,900.

The expenditure on the work during the year was Rs. 7,57,000.

METTUR HYDRO-ELECTRIC SCHEME.

44. Details of this major project were given in the last report and mention was made that the sanction of the Secretary of State was received in January 1935. The work was officially started on 1st April 1935.

45. *Power-house plant.*—Specifications for the power-house plant were completed and forwarded to the Director-General of Stores, London, for invitation of tenders. In view of the size and importance of the equipment selection of tenders was made in England by the Chief Engineer in consultation with the Director-General of Stores and Messrs. Rendel Palmer and Tritton, who reported to the Secretary of State on the scheme. Several discussions with the manufacturers and visits to their works preceded the award of the contracts. Only two generating units each of 12,500 K.V.A. were originally intended to be ordered but with a view to secure unified understructure construction in the power-house and also in view of the prevailing tendency for prices to rise it was decided, with the approval of Government to order a third unit as well immediately.

The main items of contract placed in England are given below:—

Item number and order.	Cost.	Contractor.
	RUPES IN LAKHS.	
* 1 Turbines	7.10	English Electric Company, Limited.
2 Generators	7.48	Metropolitan Vickers, Limited.
3 Step-up transformers ..	1.45	British Thomson Houston Company, Limited.
4 Switchgear	4.54	Do.
Total ..	20.57	

* Of Item No. 1, the valves and turbine runners are being manufactured in Sweden and the in let piping by Messrs. Richardson and Cruddas of Bombay.

46. *Transmission lines contract.*—Tenders for the supply and erection of the main 66/110 K.V. transmission lines were invited in India and contract therefor was let to Messrs. Callenders Cable and Construction Company in January 1936 to a value of Rs. 17.67 lakhs.

47. *Sub-station contracts.*—Tenders for the main 66 K.V. sub-stations were also invited in India and contracts awarded as follows in March 1936:—

Order.	Value.	Contractor.
	RUPREES IN LAKHS.	
Erode sub-station 110 KV. oil	1.08	Associated Electrical Industries (India), Limited.
circuit breakers ..	1.52	
Singarappet sub-station	1.45	General Electric Company (India), Limited.
Tirupattur do.		
Ambur do.		
Vadakkethupatti do.		
Vellore sub-station..	0.70	Crompton Engineering Company (India), Limited.
Transformers ...	1.18	
Total ..	5.93	Ferrantis.

48. *Erode-Trichinopoly-Negapatam Extensions.*—These, though started as parts of the Pykara System essentially belong to Mettur and the capital expenditure incurred thereon to the value of Rs. 12,19,410 was transferred to Mettur accounts.

49. *Power-house construction.*—A coffer-dam was constructed and the construction area dewatered in April and May 1935. All loose overburden was excavated and the area prepared for beginning foundation work as soon as contracts for machinery had been entered into and plans received. In August, however, owing to shortage of irrigation supplies in the Tanjore delta, Government ordered the hydro-electric pipes to be opened and the foundations had consequently to be flooded again. They were closed on the 17th September and excavation of foundation was again resumed, and carried out in the absence of plans to a limited extent. The Consulting Engineers' foundation plans were received only in February and the work was again resumed and proceeded with as fast as possible. At the end of the year, the excavation for the foundations to about 90 per cent of the power-house area had been completed. The masonry walls at the eastern end of the building had been built up to level 630 and the concrete foundations for No. 1 unit and half of No. 2 ready to receive the draft tube linings, had been put in. The demolition of the dam masonry to receive the inlet pipes for No. 1 unit was practically completed and the existing pipes downstream of the needle valve removed. A second emergency gate was ordered in August and arrived at site at the end of March. Owing to the delay in the order for turbines being finalized, the foundation drawings and deliveries of the first materials such as draft tube linings, inlet pipes, and power-house stanchions are some months late. Deliveries of machinery, power-

house steel, and equipment are expected between June and December and detailed arrangements for construction and erection were being worked out at the end of the year.

The expenditure during the year on power house and connected works was Rs. 3,02,000.

50. *Camps and workshops.*—The buildings necessary for construction and subsequently for the operation and maintenance of the Mettur generating station were taken over from the Public Works Department in April 1935.

The Public Works Department Workshops, built and equipped for the construction of the Mettur Dam, were also taken over and reorganized with a view to serve the needs of the Mettur construction as well as the other branches of the department. All high-tension and low-tension transmission line materials like cross-arms guy sets, gang operated switches, etc., required for the Pykara System are manufactured here. The cost of such materials supplied to the Pykara System during the year was about Rs. 60,000.

51. The whole of the Mettur electrical distribution system was also taken over from the Public Works Department on a joint account basis and is run as a separate commercial unit.

52. The Government have ordered the formation of an *ad hoc* committee for the civic administration of the Mettur township with the Executive Engineer, Civil and Hydraulic Construction division, as the Chairman. Proposals regarding the staff required and kindred matters to be settled before the Committee begins to function, have been submitted to Government by the Public Works Department in consultation with this department and their orders are awaited.

53. *Transmission line surveys.*—A transmission line survey subdivision was formed in June 1935, and the following lines completely surveyed:—

Mettur-Singarappet ...	63.5 miles.
Singarappet-Vellore ...	70 "
Mettur-Erode ...	34 "

A preliminary reconnaissance of the Singarappet-Tiruvannamalai-Villupuram line was also made.

Sub-station sites at Bommidi, Singarappet, Tirupattur, Ambur and Vellore were selected, surveyed and acquired.

THERMAL SCHEMES.

54. The Dindigul and Virudunagar Schemes entered their second year of operation and Palni its first year. The trading results while satisfactory on the Municipal distribution side could not be said to be entirely so in regard to Government generation. The position is summarized in Tables Nos. 4 and 5 and shows that a progressive improvement is being made. The losses on the Government side are to a certain extent attributable to the low

load factor resulting in high oil consumption figures. Furthermore at Palni trouble was experienced with the engines at first which delayed progress by restricting supply to 21 hours in the day. The tariffs to the Municipal Councils were low in order to encourage electrical development. The Virudunagar and Dindigul undertakings should however be self-supporting in the fourth year of operation when interest deficits may be capitalized or gradually paid back.

So far as the municipal side of the ventures is concerned, there has been steady progress and a net surplus of Rs. 8,905 at Dindigul and of Rs. 1,953 at Virudunagar was available after meeting all charges excluding depreciation. This is satisfactory for the second year of operation. At Palni, there was a deficit of Rs. 3,238 which is not so bad considering that it is in its first year.

55. The main purpose of these ventures had been to develop load in areas eventually to be supplied with hydro-power and this has been well served so far. Palni will be reached by Pykara power towards the end of 1936 from Udamalpet and supply to Dindigul is part of the Coimbatore-Madura extension under construction. A scheme for extending Pykara supply to the Virudunagar-Rajapalayam area has been investigated and a report with estimates submitted to Government. If it is sanctioned, Virudunagar would get hydro-power before the middle of 1938.

Table No. 4.

Thermal schemes.

		Virudhunagar.		Dindigul.		Palni
		1934-35.	1935-36.	1934-35.	1935-36.	1935-36.
1 Peak load	K.W.	100	145	90	128	55
2 Units generated ..		203,649	366,974	204,666	332,579	74,280
3 Units sold		174,420	316,390	169,573	277,258	67,694
4 Total capital expenditure ..	Rs.	1,50,296	1,61,170	1,37,725	1,45,761	66,504
5 Gross revenue	Rs.	10,955	22,926	10,308	21,040	8,095
6 Operation and maintenance ..	Rs.	16,303	20,865	12,760	18,911	11,731
7 Balance (5) — (6)	Rs.	— 5,348	2,661	— 2,457	2,129	— 3,636
8 Interest at 5½ per cent on capital	Rs.	7,878	8,071	7,216	7,287	8,489
9 Surplus (7) — (8)	Rs.	— 13,226	— 5,510	— 9,673	— 5,158	— 7,125

Table No. 5.

Load and revenue results of municipal undertakings served by Thermal stations and managed by the department for the years 1934-35 and 1935-36.

		Dindigul.		Virudunagar.		Palni.
		1934-35.	1935-36.	1934-35.	1935-36.	1935-36.
1 Peak load	K.W.	90	128	100	145	55
2 Units purchased	K.W.H.	169,573	277,258	174,420	316,390	67,694
3 Units sold	K.W.H.	120,736	243,542	135,613	272,567	61,486
4 Total connected load	K.W.	324	420	313	446	150
5 Total capital expenditure to end of year	Rs.	1,09,705	1,24,400	1,48,523	1,50,920	40,000
6 Gross revenue	Rs.	26,317	48,950	24,805	45,970	12,500
7 Operating and maintenance expenses (including Managing Agency Fees)	Rs.	17,690	33,582	18,542	35,717	13,588
8 Interest on capital at 5½ per cent	Rs.	7,389	6,463	9,649	8,900	2,200
9 Balance	Rs.	1,238	8,905	— 3,386	1,968	— 3,238

56. *Theni-Bodinayakkanur-Periyakulam Distribution Scheme.*—This scheme consists of a Thermal Power House at Theni (South Indian Railway) with two 165 b.h.p. Mirrlees Diesel alternator sets transferred from the Mettur Irrigation Project, two 11 K.V. transmission lines from Theni to Periyakulam and Theni to Bodinayakkanur about 10 miles long each, and town distribution systems at the three places. Two transformers, 150 K.V.A. each, 400/11,000 volts, and the necessary controlling 11 K.V. switchgear were purchased new and installed. The whole of the above work was begun in June 1935 and completed and put into operation in December. For the accommodation of the operating Assistant Engineer and foreman, a suitable building was purchased from the South Indian Railway Company.

A low-tension extension to Allinagaram which is 1½ miles from Theni was 60 per cent completed at the end of the year.

OTHER ACTIVITIES OF THE DEPARTMENT.

57. *Hydro-metric studies.*—Existing stations were maintained and records kept throughout the year with the exception of the Mukurti catchment in which eight out of the ten rain-gauge stations were dismantled in October when storage was commenced and it became no longer possible to make accurate run-off measurements. One measuring weir and four additional rainfall stations were opened at the end of March in the Lammasingi catchment.

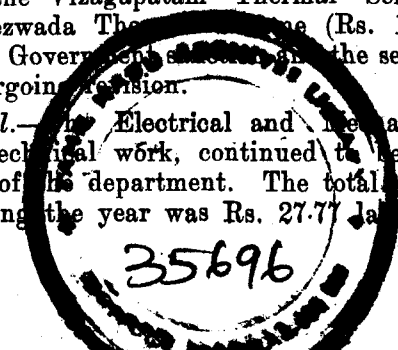
The hydro-metric field work was transferred from the Engineer in charge, Pykara System, to the Construction and Civil Engineering Branch in July 1935.

58. *Investigations.*—Preliminary reconnaissance reports were prepared on the Mekadatu and Lammasingi Hydro-Electric Schemes and a large amount of detailed work was done on a combined hydro-electric and irrigation scheme at Papanasam. The field investigation of the Lammasingi scheme in the Vizagapatam district was ordered to be taken up at the end of the year and staff posted.

59. *Designing and estimating.*—The technical section at the headquarters was very busy throughout the year. Specifications for plant and materials were prepared and contracts let to a total value of Rs. 24.95 lakhs. Technical reports and estimates were prepared and materials ordered for 32 small distribution extensions to a value of Rs. 5.8 lakhs. Preliminary estimates and financial forecasts were got out for big schemes costing Rs. 72.3 lakhs, the more important ones being the Coimbatore-Madura extension (Rs. 33.5 lakhs), the Vizagapatam Thermal Scheme (Rs. 18.7 lakhs) and the Bezvada Thermal Scheme (Rs. 17.35 lakhs). The first has received Government sanction and the second awaits it. The third is undergoing revision.

60. *Purchase of material.*—The Electrical and Mechanical division in addition to its technical work, continued to be the principal purchasing agency of the department. The total value of the materials ordered during the year was Rs. 27.77 lakhs of

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which Rs. 22.56 lakhs were for new schemes including Mettur transmission lines and sub-stations, Rs. 3.43 lakhs for extensions and Rs. 0.78 lakhs for operation and maintenance.

ADMINISTRATION OF THE INDIAN ELECTRICITY ACT AND RULES.

61. *Licences.*—The growth of electrical activities in the Presidency is reflected in the following figures:—

	1934-35.	1935-36.
(1) Licences (under construction and operation)	49	61
(2) Undertakings by local bodies	20	25

The number of licensees giving supply in the Presidency was 50 at the end of the year. Of these 25 were local bodies and the rest companies. Eight licensees have commenced supply, eleven licences granted have not yet started supply and twelve applications for licences were under consideration. Appendices F-1, 2, 3 and 4 give full details of the licences under operation, construction and consideration.

The total generating plant of all the electric-supply undertakings in the Presidency now amounts to nearly 65,000 K.W. of which the Madras Electric Supply Corporation and the Pykara Hydro-Electric Power Station have nearly 86 per cent. Full details of the plant are given in Appendix E.

The total units of electricity generated by public utilities in the Presidency was:—

	1929-30.	1934-35.	1935-36.
(1) Government—			
(a) Hydro		30,014,318	50,281,862
(b) Oil		408,315	773,833
Total		30,422,633	51,055,695
(2) Municipal councils—			
Oil		928,621	4,254,614
Total		928,621	4,254,614
(3) Companies—			
(a) Steam		24,496,160	38,989,867
(b) Oil		965,872	6,908,721
Total		25,462,032	45,898,588
Grand total		80,575,835	104,529,451

62. The number of inspections and tests made during the year was as follows:—

	1934-35.	1935-36.
(a) Inspection and test of works notifiable under the Act	1,551	1,879
(b) Tests of meters, instruments, fire extinguishers, voltage and the like	2,666	3,692

The increase is due to the advent of more licensees and also their welcome tendency to take greater advantage of the facilities offered by the testing laboratory.

The prohibitions against connecting up additional consumers placed on Calicut, Hindupur, Bezwada and Conjeeveram were withdrawn but a prohibition had to be imposed on Masulipatam due to the breakdown of a generating plant. The prohibitions on Kurnool and a portion of Sembiam still continue.

63. Tariffs were reduced by 14 of the licensees during the year of which ten were voluntary. This indicates a more enlightened view on the part of the licensees. A list of such reductions is given in Appendix G. The rates for lighting still continue to be high and more than 6 annas per unit are charged for lighting and fans in the twelve undertakings named below:—

Cochin.	Nattarasankottai.
Devakottai.	Okkur.
Hindupur.	Palni.
Hospet.	Proddatur.
Kanadukathan.	Tirupati.
Karaikudi.	Vellore.

It is hoped that these licensees will announce reductions at a very early date. Palni under Government management is expected to adopt 4 annas per unit for lighting and fans before the end of this year.

64. *Testing.*—The total number of tests carried out in the Electrical Standards Laboratory at Madras and the Meter and Relay Section at Coimbatore was 3,707 (against 2,666 of last year) as follows:—

Sub-standards		65
Service meters		3,299
Voltage tests		106
Fire extinguishers and other pressure tests		237
		<u>3,707</u>

All licensees are being advised to provide themselves with suitable and efficient meter testing equipments in their own interests.

Extra high-pressure tests were conducted on the double circuit 66,000 volts line (35 miles long) from Trichinopoly to Tanjore; the single circuit 66,000 volts line (50 miles long) from Tanjore to Negapatam and the 33,000 volts line (25 miles long) from Tanjore to Papanasam, before these lines were brought into beneficial use. Two portable kits, one for testing relays and another for testing meters in situ, have been purchased to facilitate tests being done on high-tension consumers' meters at situ without interrupting supply. An electric standards master clock with a seconds slave and other instruments found necessary have been provided in the Madras Laboratory.

The increase in the work of the Testing branch has necessitated the employment of an additional Junior Engineer.

65. *Cinemas.*—The total number of cinemas in the Presidency is 225, of which 125 are permanent and 100 are travelling. Practically all cinemas have been converted into talkies. The total

number of inspections made during the year was 355 (as against 202 of last year). A special committee examined rule 39 of the Madras Cinema Rules and approved the materials to be classified as fire resisting.

66. *Revenue*.—A total revenue of Rs. 26,220 has been realized as follows:—

	RS.
Fees for inspections	21,000
Professional assistance to local bodies	371
Arbitration	275
Tests	2,574
Licence fees	2,000
	26,220

The decrease in the revenue from electrical inspections is due to the revision of rules restricting periodicity of inspections.

67. *Accidents*.—During the year 60 accidents were reported of which 24 were fatal:—

Pykara System.—Twelve accidents occurred on the high-tension transmission lines due to persons climbing up transmission towers deliberately out of curiosity, insanity or intentions to commit suicide.

A lineman got electrocuted at Trichinopoly sub-station due to accidentally touching a live O.C.B. which he wrongly presumed to be dead.

East Tanjore.—On the 28th June, gardener, Somasundaram, on night duty was electrocuted due to coming into contact with a fence in the licensee's power house, which had become accidentally alive.

Madras.—On 21st May, a coolie, Govindarajulu, while descending after work at Underwood Gardens, touched a L.T. fuse, fell down and died due to fall.

Kurnool.—On 10th May, a mason working in the compound of the Convent came in contact with live wires and died.

Virudunagar.—On 26th April, a workman touched a broken service line and got electrocuted.

Anamalais.—On 28th May, a coolie was electrocuted while closing a switch on the Waterfalls Ropeway Station.

Madura.—On 17th December, one Chellayya came in contact with a live wire and died instantaneously.

On 7th August, one Kuppan, while working on a ladder in the Cinema Popular, got a shock and a person who was holding the ladder pulled it away intending to extricate the workman. Unfortunately, Kuppan fell off the ladder and died.

On 25th September, a wireman in the American College, Madura, while up a ladder, received a shock at 230 volts and fell to the ground fracturing his skull.

On 4th July, one Tirumalai Pillai died of electric shock in attempting to cut the wires to prevent the fire spreading to Gopalakrishna Kone's bookshop.

Guntur.—On 7th February, one reinforced concrete pole in Brodipet suddenly leaned due to the foundation having been washed off by a heavy rain. The wires sagged and a woman got electrocuted by touching them.

68. *Prosecutions*.—Ten cases under the Indian Electricity Act and Rules were brought into court, of which five resulted in conviction, two were subsequently withdrawn and the remaining three are pending disposal.

Five prosecutions were instituted under the Cinematograph Act, of which three resulted in conviction and the other two are pending.

69. *General*.—The draft of the proposed revisions in the Indian Electricity Rules, 1922, were studied in detail and comments offered. Standard forms were made out to facilitate preparation of accounts in the manner prescribed under the Electricity Act and Government Orders obtained.

The volume of licensees' accounts requiring scrutiny by the Electrical Inspector is on the increase and takes a considerable proportion of his time. If now the work of control and supervision of the newly formed Madras Local Authorities Electrical Engineers Service is to be added, additional staff would be absolutely necessary.

ELECTRICAL INSTALLATIONS IN GOVERNMENT BUILDINGS.

70. The Electrical Engineer (General) was in charge of electrical installations in Government buildings and he was also in charge of the Thermal Systems at Virudunagar, Dindigul and Palni whose operation during the year has already been reviewed. The Theni System with power house at Theni and distribution schemes at Periyakulam and Bodinayakanur was completed during the year and handed to this division for operation.

71. *Estimates prepared and checked*.—The work in connexion with electrical installations in buildings continues to increase rapidly. About 830 estimates were prepared and scrutinized during the year. The value of the works handled could be seen from Table 6 below.

Table No. 6.

Details.	1933-34.	1934-35.	1935-36.
	RS. LAKHS.	RS. LAKHS.	RS. LAKHS.
1 Total capital cost to end of the year ..	39.5	41.31	43.16
2 Cost of New Works constructed in the year	1.50	1.82	1.85
3 Total maintenance charges in the year excluding current consumption charges.	1.33	1.35	1.62
4 Total current consumption charges paid in the year	2.1	2.2	2.33
5 Percentage of maintenance charges on the total capital cost	3.38	3.3	*3.76
	per cent.	per cent.	per cent.

* The slight increase in percentage is due to some urgent repairs (Reserved and Transferred) carried out during the year as the machinery and equipment were found very old.

72. *Works in progress or completed.*—The following are some of the more important works and installations undertaken:—

- (1) His Royal Highness The Prince of Wales Hospital for Children, Triplicane, Madras.
- (2) New Archaeological Laboratory in Government Museum, Egmore.
- (3) Electric installation to Madras Volunteer Guards' Institute.
- (4) Electric installation to the Collector's bungalow, Cuddalore.
- (5) Electric installation to Executive Engineer's bungalow, Cuddalore.
- (6) Electric incubators and refrigerators at King Institute, Guindy.
- (7) Electric installation to the bungalow of the Deputy Superintendent of Police, Tuticorin.
- (8) Electric installation to the quarters of the Jailor and Deputy Jailor, Penitentiary, Madras.
- (9) Electric installation to the District Judge's bungalow, Palamcottah.
- (10) Electric installation to the Collector's bungalow, Vellore.
- (11) Electric installation to the District Judge's bungalow, Vellore.
- (12) Electric installation to the bungalow of the District Superintendent of Police, Vellore.
- (13) Electric installation to the Executive Engineer's bungalow, Vellore.
- (14) Electric installation to the bungalow of the Principal, Police Training School, Vellore.
- (15) Electric installation to the quarters of the Law Instructor, Police Training School, Vellore.
- (16) Electric installation to the Sergeant's quarters, Police Training School, Vellore.
- (17) Electric installation to the Sanitary Spurs, General Hospital, Madras.
- (18) Electric installation to the bungalow of the District Medical Officer, Palamcottah.
- (19) Electric installation to the bungalow of the District Superintendent of Police, Palamcottah.
- (20) Electric installation to the Executive Engineer's bungalow, Palamcottah.
- (21) Electric installation to the quarters of the District Forest Officer, Palamcottah.
- (22) Electric clocks in Pathology Institute, Medical College, Madras.
- (23) Remodelling Scheme at the General Hospital, Madras.

Special mention may be made of the work done in connexion with the Remodelling Scheme at the Barnard Institute of Radiology, General Hospital, Madras. An air conditioning plant has been installed to control the temperature and humidity of the air in the hospital and lecture rooms. The plant is connected to the

film developing and washing cabinets. The institute has a supply of both alternating and direct current for operation of the several X-Ray apparatus used in both treatment and photography.

73. *Installation schemes under investigation.*—Proposals from all Government departments in the various towns of the Presidency where electric supply has recently become available, are being received in large numbers and investigated.

STAFF.

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

Mr. H. G. Howard, Chief Engineer (Electricity) was on leave out of India from 26th April to 4th October 1935. During this period, the duties attached to the office, excluding the portion pertaining to the administration of the Indian Electricity Act, were discharged by Lieut.-Col. M. G. Platts, in addition to his duties as Superintending Engineer, Construction and Civil Engineering Branch, and those relating to the administration of the Indian Electricity Act were dealt with independently by Mr. E. J. B. Greenwood, Electrical Inspector.

Lieut.-Col. M. G. Platts, Engineer-in-Charge, Civil Engineering Division, was appointed as Engineer-in-Charge, Construction and Civil Engineering Branch, from 1st April 1935 and placed in charge of the Mettur Hydro-Electric Scheme, Mukurti Dam and other major construction works of the department as well as the Civil Engineering Section of the Technical offices at Madras. His headquarters were transferred to Mettur from 25th April 1935. From 1st October 1935, his status was raised to that of a Superintending Engineer in the Indian Service of Engineers.

Mr. L. Henshaw, Resident Engineer, Pykara Hydro-Electric System, was appointed from 1st April 1935 as Engineer-in-Charge, Pykara System, and his headquarters were transferred to Coimbatore from 15th April 1935. He was raised to the rank of Superintending Engineer from 12th August 1935.

The services of Mr. V. A. M. Bulow, Broadcasting Adviser to Government, were terminated from 25th April 1935 and the division closed on that date.

Mr. John Kuriyan, Officiating Divisional Electrical Engineer, Coimbatore, was confirmed as Divisional Electrical Engineer from 1st April 1935 and transferred to the Nilgiris Division, with headquarters at Glen Morgan from 15th April 1935.

M.R.Ry. M. Subrahmanyam, Assistant Engineer (Distribution), Coimbatore, was appointed Divisional Electrical Engineer, Coimbatore, from 8th April 1935. He was transferred to Madras as Electrical Inspector from 5th March 1936, vice Mr. E. J. B. Greenwood, granted leave.

M.R.Ry. Rao Sahib N. Krishnamurti, permanent Assistant Engineer of the Public Works Department, was appointed as temporary Executive Engineer, Civil and Hydraulic Construction Division, Mettur, with effect from 11th April 1935.

M.R.Ry. B. Ramasomayajulu, Operating Engineer, Pykara, was appointed from 1st February 1936 as Officiating Divisional Electrical Engineer, Coimbatore, vice M.R.Ry. M. Subrahmanyam granted leave and transferred to Madras as Electrical Inspector.

M.R.Ry. P. Natesa Ayyar, temporary Assistant Executive Engineer, Technical Section (Civil), was confirmed as Assistant Executive Engineer, Technical Section (Civil), from 1st April 1935.

The following officers were appointed as permanent Assistant Engineers of the department:—

- (a) M.R.Ry. N. R. Narasimhamurthi.
- (b) „ M. R. B. Rao.
- (c) „ K. Ramamurti.

The following appointments of Assistant Engineers were made during the year:—

- (a) Mr. K. M. Kuruvilla.
- (b) „ J. F. T. Rozario.
- (c) „ C. E. Prager.
- (d) „ T. Krishnaswami.
- (e) „ S. N. Ramachandra Rao.
- (f) „ P. R. Sundaram.
- (g) „ K. V. Krishnaswami.

M.R.Ry. B. Suryanarayanamurti, B.A., was appointed as Chief Accountant of the department from 25th February 1935.

H. G. HOWARD,
Chief Engineer (Electricity).

APPENDIX A.

List of constructions undertaken with expenditure to end of 1935-36.

Name of schemes.	Expenditure during 1935-36 (March preliminary).	Total expenditure to end of 1935-36.
	RS.	RS.
Capital expenditure.		
I. Government schemes—		
(1) Pykara system—		
58 a. Pykara Hydro-electric scheme ..	1,75,634	1,15,99,861
58 b. Supply of electric power to Salem and Erode	3,009	4,30,985
58 c. Distribution of power in Coimbatore district	4,47,219	16,04,636
58 d. Supply of electric power to Palghat. ..	..	1,21,131
58 e. Supply of electric power to Devarshola	..	66,475
58 j. Supply of electric power to Firth Hall Tea Factory	..	6,105
58 m. Supply of electric power to Komarapalayam	3,745	26,303
58 q. Mukurti dam	7,16,863	7,79,433
Total, Pykara system ..	13,46,470	1,46,34,929
(2) Mettur Hydro-electric scheme—		
58 k (i) Mettur Hydro-electric scheme (Main)	4,79,500	14,47,631
58 k (ii) Supply of power to Trichinopoly. ..	1,33,386	11,77,412
58 k (iii) Supply of power to Negapatam. ..	17,89,364	18,94,933
58 k (iv) Supply of power to Karur ..	1,984	71,799
Total, Mettur system ..	24,04,234	45,91,775
(3) Thermal schemes—		
58 f. Dindigul electric supply scheme ..	1,250	1,32,495
58 g. Virudunagar electric supply scheme	3,495	1,46,777
58 h. Palni electric supply scheme ..	6,896	63,689
58 l. Theni, Periyakulam and Bodi-nayakkanur	1,47,094	1,47,847
Total, Thermal schemes ..	1,58,735	4,90,808
II. Municipal undertakings—		
Coimbatore	41,838	5,16,910
Tiruppur	21,146	1,68,737
Pollachi	12,319	1,80,990
Udamalpet (Revised estimate for 1935-36) ..	12,000	12,000
Karur	22,057	76,806
Dindigul	14,696	1,24,400
Virudunagar	2,397	1,50,920
Palni (Revised estimate for 1935-36)	2,600	40,000
Total, Municipal schemes ..	1,29,053	12,70,763
III. 41. Civil Works—New electrical works		
	1,85,000	43,16,000
	42,23,492	2,53,04,275

APPENDIX B.

Budget provision for capital works in 1936-37.

	1936-37 Budget.
Capital expenditure.	
Pykara system—	Rs.
58 a. Pykara Hydro-electric scheme	3,33,300
58 b. Supply of electric power to Salem and Erode	..
58 c. Distribution of power in Coimbatore district	2,36,000
58 m. Komarapalayam	..
58 q. Mukurti dam construction	5,27,000
58 r. Supply of electric power to Rasipuram	1,05,000
58 s. Supply of electric power to Madura	18,00,000
58 u. Construction of transmission lines and other works of supply of electric power to intending consumers	5,50,000
Total, Pykara system ..	35,51,300
Mettur Hydro-electric scheme—	
58 k (i) Mettur Hydro-electric scheme (Main)	64,03,200
58 k (ii) Supply of power to Trichinopoly	80,000
58 k (iii) Supply of power to Negapatam	1,64,000
58 k (iv) Supply of power to Karur	9,000
Total, Mettur Hydro-electric scheme ..	66,56,200
Thermal schemes—	
58 f. Dindigul electric supply scheme	2,200
58 g. Virudunagar electric supply scheme	2,200
58 h. Palni electric supply scheme	1,200
58 l. Theni, Periyakulam and Bodinayakanur	20,100
58 t. Vizagapatam Thermal scheme	11,90,000
Total, Thermal schemes ..	12,15,700
Grand total ..	1,14,23,200
Deduct lump sum for probable savings	— 7,40,000
	1,06,83,200
41. Civil Works—Electric installation in Government Buildings—	
Works	1,28,600
Grand total ..	1,08,11,800

APPENDIX C.

Details of establishment charges of the department and fees earned during 1935-36 and estimated for 1936-37.

	Expenditure in 1935-36 (final modification.)	1936-37 budget.
	Rs.	Rs.
Electrical Engineer (General)—		
Salaries, allowances, etc.	63,800	70,100
Revenue	..	..
Net cost ..	63,800	70,100
Electrical Inspector—		
Salaries, allowances, etc.	53,100	60,400
Revenue	34,000	33,300
Net cost ..	19,100	27,100
Revenue from water-power	..	..
Royalty from Mysore Government	77,200	75,000
Chief Engineer's office including Technical Section—		
Salaries, allowances, etc.	1,19,600	1,44,600
Revenue (charges recoverable from Governments and departments)	1,70,100	1,77,300
Net cost ..	— 50,500	— 32,700
Pykara Hydro-Electric System—		
Salaries, allowances, etc.	2,26,700	2,41,800
Less portion of common staff recovered from works and municipalities	— 37,400	— 29,400
Net salaries and allowances ..	1,89,300	2,12,400
Operation and maintenance expenditure	1,84,000	1,95,700
Revenue	16,20,200	21,30,000
Net surplus for capital charges ..	12,46,900	17,21,900
Dindigul, Virudunagar and Palni Government Schemes		
Salaries, allowances, etc.	18,000	19,700
Less portion of common staff recovered from works and municipalities	— 14,600	— 13,200
Net salaries and allowances ..	3,400	6,500
Operation and maintenance expenditure	48,700	56,100
Revenue	52,400	58,000
Net surplus or deficit ..	300	— 4,600
Theni Government Scheme—		
Salaries, allowances, etc.	..	12,000
Less portion of common staff recovered from works and municipalities	..	— 7,000
Net salaries and allowances ..	..	5,000
Operation and maintenance expenditure	..	10,800
Revenue	..	11,000
Net surplus or deficit ..	..	— 4,800

APPENDIX D.

PART I.

Statistics of company-managed electric supply undertakings in the Madras Presidency for the year 1935-36.

Serial number and name.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		Population.	Number of consumers.	Number of consumers per 100 of population.	Agency.	Year of commencement of operation.	Number of years in operation.	Accounts for the year to which the figures relate.	Peak load K.W.	Annual Generation K.W.H.	Auxiliaries and other losses K.W.H.	Generation less auxiliaries and other losses K.W.H.	Distribution per head of population K.W.H.
1 Madras ..	680,267	10,695	1.57	Company-managed.	1909	27	1935	1935-36	12,400	42,786,966	7,476,821	35,310,145	52 *
2 Kanadukathan.	28,200	..	..	Do.	1924	13	1935-36	1935-36	152	278,152	90,061	188,091	6.8
3 Devakottai ..	20,378	..	..	Do.	Do.	12	Do.	Do.	102	213,492	24,693	188,799	9.3
4 Cochin ..	22,818	129	0.6	Do.	1925	11	Do.	Do.	38	137,113	18,446	108,667	4.8
5 Trichinopoly.	171,035	2,631	1.54	Do.	1927	9	Do.	Do.	720	3,300,149	402,231	2,897,918	17 †
6 Srirangam.	63,526	..	..	Do.	1929	8	Do.	Do.	164	415,020	68,719	346,301	5.45
7 Rajahmundry ..	..	..	..	Do.	Do.	..	Do.	Do.	220	486,000	157,000	329,000	..
8 Calicut ..	..	..	..	Do.	Do.	..	Do.	Do.	115	277,156	58,331	218,825	10.2
9 Karaikudi ..	21,282	..	..	Do.	1930	6	Do.	Do.	..	Not available from licensee.	..	..	..
10 Vellore ..	61,173	..	..	Do.	1931	5	Do.	Do.	85	285,305	84,088	201,217	8.7
11 Tirupati ..	23,189	190	0.82	Do.	1932	4	Do.	Do.	373.3	1,030,209	175,827	854,382	6.3
12 Salem-Erode ..	135,851	..	..	Do.	Do.	4	Do.	Do.	K.V.A.	..	..	..	..
13 Nattarasankottai.	16,954	..	..	Do.	Do.	4	Do.	Do.	43	106,979	28,005	78,974	4.6
14 Mangalore ..	67,000	..	..	Do.	1933	3	Do.	Do.	456.7	686,035	168,886	517,149	7.7
15 Palghat ..	49,100	382	0.78	Do.	Do.	3	Do.	Do.	K.V.A.	174,801	27,409	147,392	3.0
16 Tinnevely-Tuticorin-Palamcottah.	169,500	..	..	Do.	Do.	3	Do.	Do.	349	679,957	247,491	432,466	2.52
17 Guntur ..	65,179	803	1.23	Do.	1932	4	Do.	Do.	250	426,420	120,984	305,436	4.7
18 Kumbakonam..	62,317	972	1.56	Do.	Do.	4	1935	1935	210	522,510	112,088	410,422	6.6
19 Visagapatam ..	57,303	..	..	Do.	1934	2	Do.	Do.	180	367,000	33,000	334,000	5.7

2

19 Nellore ..	45,895	..	..	Do.	Do.	2	1935-36	1935-36	124	260,789	49,566	211,223	4.6
20 East Tanjore ..	94,000	..	..	Do.	Do.	2	Do.	Do.	162	402,501	74,830	327,671	3.5
21 South Arcot ..	..	..	..	Do.	1935	1	Do.	Do.	200	545,000	172,700	372,300	..
22 Chittoor ..	22,018	152	0.69	Do.	Do.	1	Do.	Do.	48	73,074	21,916	51,158	2.3
23 Negapatam ..	45,527	..	..	Do.	Do.	1	Do.	Do.	235	90,858	7,768	83,102	1.7
24 Okkur ..	..	15	..	Do.	1935 (end)	1	Do.	Do.	9	10,675	5,585	6,090	..
25 Proddatur ..	20,124	..	..	Do.	1936	1	Do.	Do.	18	8,709	937	7,778	0.39

PART II.

Statistics of local bodies' electric supply undertakings in the Madras Presidency for the year 1935-36.

1 Ootacamund ..	24,616	952	3.85	Municipal.	1923	13	1935-36	1935-36	754	727,648	165,133	562,515	22.8
2 Madura ..	182,018	..	..	Do.	1928	8	Do.	Do.	610	1,646,821	295,044	1,351,777	7.4
3 Bellary ..	47,573	636	1.33	Do.	1927	9	Do.	Do.	190	399,340	149,331	250,009	5.25
4 Coenada ..	65,952	465	0.71	Do.	1929	7	Do.	Do.	180	454,287	63,244	391,043	5.9
5 Tanjore ..	66,889	..	..	Do.	Do.	7	Do.	Do.	170	562,941	90,055	472,886	7.1
6 Coonoor ..	14,226	176	1.24	Do.	1930	6	Do.	Do.	114	210,890	35,496	175,394	12.2
7 Hindupur ..	14,211	..	..	Do.	Do.	6	Do.	Do.	29.5	60,065	9,999	50,066	3.5
8 Sembian ..	33,127	119	0.36	Panchayat Board.	Do.	6	Do.	Do.	67.8	176,303	27,787	148,516	4.5
9 Kurnool ..	35,314	..	..	Municipal.	Do.	6	Do.	Do.	130	336,904	46,554	290,350	8.3
10 Bezwada ..	60,427	..	..	Do.	Do.	6	Do.	Do.	230	664,940	93,993	570,947	9.5
11 Conjeevaram.	65,258	..	..	Do.	1931	5	Do.	Do.	146	355,482	50,910	304,572	4.6
12 Tiruvotaiyur ..	10,500	..	..	Panchayat Board.	1933	3	Do.	Do.	43.2	78,884	12,095	66,789	6.35
13 Masulipatam ..	56,928	325	0.59	Board.	Do.	3	Do.	Do.	88	202,285	43,880	158,405	2.78
14 Hospet ..	21,673	..	..	Do.	1935	1	Do.	Do.	13	13,700	12,700	11,000	0.51
15 Alandur ..	13,500	20	0.15	Panchayat Board.	Do.	1	Do.	Do.	49.5	24,311	2,576	21,735	1.6
16 Coimbatore ..	95,198	1,882	2	Government managed.	1933-34	3	Do.	Do.	516	1,323,988	102,424	1,221,564	13 †
17 Pollachi ..	22,112	519	2	Do.	Do.	3	Do.	Do.	230	686,205	100,690	585,515	26 †
18 Tiruppur ..	18,059	531	3	Do.	Do.	3	Do.	Do.	380	876,820	42,955	833,865	46 †
19 Karur ..	19,850	327	1.7	Do.	1935-36	1	Do.	Do.	57.5	97,614	12,226	85,388	4.3 †
20 Udumalpet ..	43,617	458	1.05	Do.	1936-37	..	Do.	Do.	K.V.A.	..	..	..	..
21 Dindigul ..	33,081	366	1.1	Do.	1934-35	1	1935-36	1935-36	128	277,258	33,716	243,542	5.6
22 Virudumagar.	18,899	125	0.66	Do.	Do.	1	Do.	Do.	145	316,390	43,823	272,567	8.23
23 Palai ..	..	..	..	Do.	1935-36	..	Do.	Do.	55	67,694	6,208	61,486	3.25
24 Periyakulam ..	..	..	..	Do.	1936-37	..	Do.	Do.	..	..	..	..	..
25 Bodinayakanur.	..	..	..	Do.	Do.	..	Do.	Do.	..	..	..	..	..

* Includes all high-tension lead and tramways.

† Includes all high-tension lead.

‡ Excludes all high-tension lead.

APPENDIX E.

Total capacity of plants of electric supply undertakings working during the years.

Number and name of undertaking.	Total capacity.	Details of plant.
1 Madras	34,000 K.W.	3 × 1,500; 5,000 2 × 8,000; 12,500
2 Kanadukathan	278 "	18; 2 × 65; 130
3 Devakottai	158 "	2 × 40; 18; 60
4 Cochin	72 "	2 × 31; 30
5 Ootacamund	1,200 K.V.A.	2 × 600 Receiving.
6 Trichinopoly-Srirangam	1,212 K.W. 1,800 K.W. Receiving.	200; 2 × 220; 572 3 × 800 K.W.
7 Madura	1,125 K.W.	3 × 150; 300; 375
8 Calicut	680 "	2 × 200 K.W.; 150 K.V.A.; 125 K.V.A.; 75 K.V.A.
9 Tanjore	250 "	2 × 100; 50
10 Coonoor	350 K.V.A.	Receiving.
11 Sembiam	80 K.W.	"
12 Karaikudi	200 "	2 × 60; 80
13 Conjeeveram	350 "	100; 50; 200
14 Vellore	500 "	3 × 100; 200
15 Tirupati-Tirumalai	384 "	2 × 80; 224
16 Kumbakonam	490 "	2 × 110; 270
17 Salem-Erode	1,075 K.V.A.	Receiving.
18 Coimbatore	700 "	2 " 60
19 Nattarasankottai	120 K.W.	Receiving.
20 Tiruppur	500 K.V.A.	Receiving.
21 Pollachi	400 "	"
22 Mangalore	750 K.W.	3 × 250
23 Palghat	150 K.V.A.	Receiving—50; 100
24 Tinnevely-Tuticorin	1,100 K.W.	2 × 550
25 Tiruvottiyur	150 "	Receiving 2 × 50 K.V.A.; 100 K.V.A.
26 Dindigul	380 "	2 × 190
27 Virudunagar	380 "	2 × 190
28 East Tanjore	228 "	
29 Palni	135 K.V.A.	90; 45
30 South Arcot	400 K.W.	4 × 100
31 Chittoor	96 "	2 × 48
32 Karur	"	Receiving.
33 Udumalpet	"	Do.
34 Negapatam	1,075 K.V.A.	Do.
35 Alandur	200 "	Do.
36 Okkur	90 K.W.	2 × 45
37 Periyakulam	"	"
38 Bodinayakkanur	"	"
39 Bellary	273 K.W.	2 × 55; 67; 96
40 Bezwada	563 "	2 × 112.5; 38; 300
41 Cocanada	450 "	2 × 80; 40; 250
42 Hindupur	60 "	2 × 25; 10
43 Hospet	99 "	2 × 40; 18.5
44 Kurnool	235 "	40; 60; 135
45 Masulipatam	160 "	2 × 80; 40 K.W. not br ken down.

APPENDIX E—cont.

Total capacity of plants of electric supply undertakings working during the year—cont.

Number and name of undertaking.	Total capacity.	Details of plant.
46 Guntur	350 K.W.	2 × 150; 50
47 Nellore	248 "	2 × 100; 48
48 Proddatur	96 "	2 × 48
49 Rajahmundry	436 "	2 × 100; 236
50 Vizagapatam	240 K.V.A.	Bulk supply from Harbour Power House. One In- door Receiving Plant of 300 K.V.A. capa- city.

APPENDIX F.

1. Names of licensed areas where supply was available.

Local authorities.	Companies.
1 Alandur.	1 British Cochin.
2 Bellary.	2 Calicut.
3 Bezwada.	3 Chittoor.
4 Bodinayakkanur.	4 Devakottai.
5 Cocanada.	5 Guntur.
6 Coimbatore.	6 Kanadukathan.
7 Conjeeveram.	7 Karaikudi.
8 Coonoor.	8 Kumbakonam.
9 Dindigul.	9 Madras.
10 Hindupur.	10 Mangalore.
11 Hospet.	11 Mayavaram-Mannargudi-Tiru- varur.
12 Karur.	12 Nattarasankottai.
13 Kurnool.	13 Nellore.
14 Masulipatam.	14 Negapatam.
15 Madura.	15 Okkur.
16 Ootacamund.	16 Palghat.
17 Palni.	17 Proddatur.
18 Pollachi.	18 Rajahmundry.
19 Periyakulam.	19 South Arcot.
20 Sembiam.	20 Salem-Erode.
21 Tiruppur.	21 Trichinopoly-Srirangam.
22 Tanjore.	22 Tinnevely-Tuticorin-Palam- cottah.
23 Tiruvottiyur.	23 Tirupati.
24 Udumalpet.	24 Vellore.
25 Virudhunagar.	25 Vizagapatam.

2. Names of licences brought into use during the year.

Name.	Date.	Agency.
1 Udumalpet	1st August 1935	Municipality (Government managed).
2 Negapatam	15th September 1935	Company.
3 Alandur	4th November 1935	Panchayat Board.
4 Hospet	25th October 1935	Municipality.
5 Bodinayakkanur	December 1935	Municipal (Government managed).
6 Okkur	27th December 1935	Company.
7 Proddatur	1st January 1936	Do.
8 Periyakulam	16th January 1936	Municipal (Government managed).

APPENDIX F—cont.

3. Names of licences granted and under construction.

Name.	Date of grant of licence.	Agency.
1 Ellore	2nd April 1935 ..	Company.
2 Adoni	2nd July 1935 ..	Do.
3 Ambur-Vaniyambadi.	13th August 1935 ..	Do.
4 Bobbili	24th September 1935.	Do.
5 Chingleput	15th October 1935 ..	Do.
6 Villivakkam	6th August 1935 ..	Panchayat Board.
7 Tiruvallur	15th October 1935 ..	Do.
8 Berhampur	10th December 1935.	Company—Transferred to Orissa Government from 1st April 1936.
9 Ongole	11th February 1936.	Company.
10 Gudiyattam	24th September 1935.	Do.
11 Gudivada	7th January 1936 ..	Do.

4. Applications received and under consideration in the year.

Serial number and places for which licences have been applied.	Company or local authority.
1 Vizianagram	Municipal and Company.
2 Tinnevely district	Company.
3 Ramnad district	Do.
4 Anantapur	Municipality.
5 Tellicherry-Cannanore	Company.
6 Tindivanam	Do.
7 Anakapalle	Do.
8 West Godavari	Do.
9 Narasaraopet	Do.
10 Cuddaph	Do.
11 Sivakasi	Municipality.
12 Trichinopoly and Salem districts	Company.

APPENDIX G.

Licensees who reduced rates during the year 1935-36.

Number and name of the licensee.	Lights.		Lights and fans.		Minimum.		Bazaar lamps.		Power.	
	Original.	Revised.	Original.	Revised.	Original.	Revised.	Original.	Revised.	Original.	Revised.
1 Conjeevaram	..	..	RS. A. P. 0 7 0	RS. A. P. 0 6 0	RS. A. P. 3 0 0	RS. A. P. 2 8 0	RS. A. P. 2 0 0	..	First 20 units per H.P. 4 annas per unit. Rest 2 annas per unit subject to a monthly minimum of Rs. 6 per H.P. connected with maximum Rs. 50.	First 2,000 units per menssem 1½ annas. All in excess units per menssem 1½ annas. When the monthly consumption falls below 200 units a flat rate of 2 annas. First 800 units—2 annas. Next 1,200 units per menssem —1½ annas.
2 Bellary	..	..	..	..	..	..	..	..	First 25 units per H.P. connected—2½ annas and the balance at 1½ annas per unit. Average rate not to exceed 2 annas and not to go below 1½ annas. Monthly minimum Rs. 4 per H.P. connected with a maximum of Rs. 50.	First 2,000 units—1½ annas. Next 3,000 units—1½ annas. Rest—1 anna. When the consumption is below 200 units 2 annas.
3 Cocanada	..	..	..	..	..	..	..	..	First 20 units per H.P. 4 annas per unit, the rest at 2 annas per unit—	1—200 units per menssem—2 annas. 201—1,000 units per menssem—1½ annas. 1,001—6,000 units per menssem—1½ annas. Over 6,000 units per menssem —1 anna. Between 6 p.m. and 8.30 p.m. 25 per cent in excess.
4 Kurnool	..	..	..	..	..	..	..	..	Installations up to 25 H.P.—First 20 units per H.P. 4 annas per unit, the rest at 2 annas per unit—	Three annas per unit subject to a monthly minimum consumption of 500 units.
5 Devakottai	..	..	0 10 0	0 8 0	0 8 0	0 4 0	..	..	Mixed load—Cinemas 4 annas per unit.	..

APPENDIX G—cont.

Licencees who reduced rates during the year 1935-36—cont.

Number and name of the licensee.	Lights.		Lights and fans.		Minimum.		Bazaar lamps.		Power.	
	Original.		Original.		Original.		Original.		Original.	
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	Original.	Revised.
6 Nattarasankottai.	..	..	0 8 0	0 8 0	5 0 0	3 0 0	..	..	First 5,000 units per mensem 3 annas per unit. 24 annas subject to a maximum demand of Rs. 10 per K.V.A. of maximum demand.	For the first 2,000 units—2 annas. Rest—As. 1-4. When a monthly guarantee of 1,000 units is made As. 1-4 per unit.
7 Vellore	..	..	..	..	3 0 0	2 0 0	..	..		
8 Chittoor	..	..	..	..	..	..	..	..	Mixed load of small power and light and fans. 3 annas per unit with a monthly guarantee of 500 units.	First 500 units—3 annas per unit. 501-750 units—2-5 annas per unit. 751-1,000 units—2-25 annas per unit. 1,001-2,000 units—2-00 annas per unit.
9 Trichinopoly-Srirangam.	0 6 0	0 5 0	0 6 0	0 5 0	..	..	..	..	First 80 units per mensem—2 annas per unit. Next 320 units per mensem—1 anna and 3 pies per unit. Next 600 units per mensem—1 anna per unit. Next 4,000 units per mensem—All the rest—per mensem 9 pies. Minimum Rs. 3 per K.W. of connected load with a maximum of Rs. 10. per month.	First 80 units—per mensem 2 annas. Next 920 units—per mensem 1 anna. Next 4,000 units—per mensem 10 pies. All the rest—per mensem 9 pies. Minimum Rs. 3 per K.W. of connected load with a maximum of Rs. 10. per month.
10 Madras	0 5 6	0 5 0	..	..	3 0 0	2 0 0	..	..	Up to 100 K.V.A. Rs. 8 per K.V.A. of maximum demand per month plus one anna per unit of energy consumed.	Rs. 5 per mensem per K.V.A. of M.D. plus 9 pies per unit consumed per mensem subject to a maximum charge of 1½ annas per unit without prejudice to the minimum monthly charge.

* Exceeding 10,000 units—2 annas.

11 East Tanjore	..	..	..	..	..	..	..	..	Rs. 5 per month per K.W. of connected load as a fixed charge plus 1½ annas per unit for the first 40 units consumed and 1 anna per unit for the rest per K.W. in that month.	First 80 units per mensem—2 annas per unit. Next 920 units per mensem—1 anna per unit. Next 4,000 units per mensem—10 pies per unit. Rest units—6 pies per unit. Minimum Rs. 3 per K.W. of connected load with a maximum of Rs. 10. For consumption up to 500 units per mensem 1-5 annas. Between 500-1,500 all at 1-25 annas. Between 1,500-3,000 all at 1-00 anna. When the consumption exceeds 3,000 units all in excess .75 anna.
12 Dindigul and Virudunagar.	..	..	..	..	..	..	..	..	First 2,000 units per mensem—1 anna and 3 pies. All in excess for monthly consumption falls below 1,200 units at rate of 1 anna and 6 pies per unit.	For consumption up to 500 units per month 1-75 as between 500-1,500 units per month all at 1-5 annas. Between 1,500-3,000 all at 1-25 annas exceeding 3,000 units per month all in excess at 1-00 anna.
13 Palni	..	..	..	..	..	..	..	..	First 2,000 units per month 2 annas. Next 3,000 units per month 1 anna and 6 pies. Rest per month one anna and 3 pies.	For consumption up to 500 units per month 1-75 as between 500-1,500 units per month all at 1-5 annas. Between 1,500-3,000 all at 1-25 annas exceeding 3,000 units per month all in excess at 1-00 anna.
14 Vizagapatam	..	..	..	..	..	..	..	..	High-tension rates—up to 4,000 units per month 1-5 annas. All in excess—1-25 annas.	For consumption up to 500 units per month 1-75 as between 500-1,500 units per month all at 1-5 annas. Between 1,500-3,000 all at 1-25 annas exceeding 3,000 units per month all in excess at 1-00 anna.

Government of Madras

PUBLIC WORKS DEPARTMENT

(Electricity)

G.O. No. 1958, 20th August 1936

Electricity Department—Administration Report for 1935-36—
Recorded with remarks.

READ—the following paper :—

From the Chief Engineer for Electricity, dated 27th June 1936,
No. 12-C.P./37-1.

Order—No. 1958, Electricity, dated 20th August 1936.

Recorded.

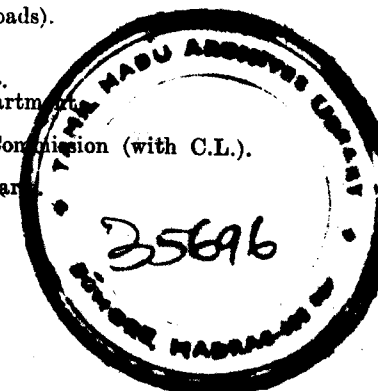
2. The Government note with satisfaction that the year under review has been one of continued steady progress in electrical development. The impetus which a cheap and reliable supply of electric power has given to industrial expansion and lift irrigation under the Pykara system is particularly gratifying.

3. His Excellency the Governor in Council desires to place on record his warm appreciation of the initiative and forethought shown by the Chief Engineer for Electricity in the planning of development and of the efficient way in which he has administered the department. He is also pleased to note the keen interest evinced by the officers of the department in the discharge of the duties entrusted to them.

(By order of the Governor in Council)

W. SCOTT BROWN,
Secretary to Government.

To the Chief Engineer for Electricity.
" Chief Engineer (Buildings and Roads).
" Chief Engineer for Irrigation.
" Development Department.
" Local Self-Government Department.
" Education and Public Health Department.
" Librarian, Legislative Council.
" Secretary, Madras Public Service Commission (with C.L.).
" Public (General) Department.
" Bibliotheque Nationale Institute, Paris.
Press.



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