



GOVERNMENT OF MADRAS

REPORT
OF THE
MADRAS ELECTRICITY BOARD
COMMITTEE, 1935-36

VOLUME I

MADRAS
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GOVERNMENT OF MADRAS
PUBLIC WORKS DEPARTMENT
(Electricity)

From

W. SCOTT BROWN, Esq., I.C.S.,
Secretary to the Electricity Board Committee,

To

THE SECRETARY TO GOVERNMENT,
PUBLIC WORKS DEPARTMENT,
Dated Stonehouse Hill, the 6th June 1936.

SIR,

I am directed by the Madras Electricity Board Committee appointed in G.O. No. 2436 W., dated 12th November 1935, to submit herewith their report on the questions referred to them in connexion with the supply of electricity in the Presidency. The report is divided into two parts—Volume I containing the report proper and Volume II the evidence of witnesses.

I have the honour to be,

Sir,

Your most obedient servant,

W. SCOTT BROWN,
Secretary to the Committee.

REPORT OF THE MADRAS ELECTRICITY BOARD COMMITTEE.

Introductory.

We were appointed in November last year to review the problem of the supply of electricity in the Madras Presidency, the task entrusted to us being governed by the following terms of reference :—

I. To examine whether the existing arrangements for the generation and distribution of energy in the Madras Presidency as a whole and for the administration and control of company and municipal undertakings are efficient and satisfactory, and if not, whether they are such as to retard the progress of electrical development generally to the detriment of industrial expansion.

II. To consider and report—

(a) what steps should be taken to ensure that there shall be an adequate and economical supply of electric power for all classes of consumers in the Presidency ;

(b) whether the constitution of a statutory body such as the Central Electricity Board in Great Britain or the Electricity Supply Commission in the Union of South Africa or similar bodies elsewhere to take over the control and administration of electric supply is desirable or necessary ; and

(c) what should be the constitution and powers, administrative and financial, of such a body.

2. The Committee decided to issue a questionnaire to the various municipal and company licensees operating in the Presidency and to municipalities where company licensees were operating ; to all Collectors and to the heads of the Electricity, Industries and Agricultural Departments of Government ; to Chambers of Commerce, Associations, Companies, Boards and certain individuals connected with Industry, Commerce, Railways and Harbours and to a

limited number of prominent public men. A questionnaire was drafted and issued in December, but the last part dealing with the constitution and financial and other powers of any control body proposed was sent only to a limited number of officials and non-officials regarded as specially qualified to advise on such matters. The questionnaire included a note on the existing arrangements for the generation and distribution of electricity in the Madras Presidency and notes on the arrangements in force in Great Britain and South Africa. It was hoped to receive replies by the end of January, but most of them were belated and it was not found possible to print them and meet for further deliberation until 11th March 1936. It was decided to examine a limited number of witnesses representing various interests and various points of view, but it was not found possible to take that evidence until late in April. We wish to express our deep sense of indebtedness to those public bodies, associations and individuals who furnished written statements of their views. We have had valuable assistance from the personal evidence of the following witnesses examined :—

M.R.Ry. Diwan Bahadur A. Ramaswami Mudaliyar
Avargal, B.A., B.L., Member, Special Tariff Board,
representing prominent public men.

Mr. H. Burkinshaw, Chief Engineer, Madras Electric
Supply Corporation, representing the Madras
Electric Supply Corporation.

M.R.Ry. Rao Bahadur C. V. Krishnaswami Chetti
Garu, Electrical Engineer, Corporation of Madras.

M.R.Ry. C. V. Venkataramana Ayyangar Avargal,
B.A., B.L., F.R.S.A., Mill owner and Director of
Coimbatore Cement Works, representing large
consumers.

M.R.Ry. N. Subrahmanya Ayyar Avargal, B.A., B.L.,
Municipal Councillor, Coimbatore, representing
municipal interests.

Mr. H. M. Hood, C.I.E., I.C.S., representing Collectors.
Mr. L. B. Green, Director of Industries, representing
industrial interests.

Mr. V. Seshasayee, representing the Licensees' Asso-
ciation.

Mr. J. W. Atkins, representing the Licensees' Asso-
ciation and also representing Messrs. Octavius
Steel & Co.

M.R.Ry. L. Subba Rao Garu, B.A., B.L., Municipal Chairman, Cocanada, representing municipal interests and the needs of the Telugu districts.

We have also had most valuable assistance from our technical adviser, Mr. H. G. Howard, C.I.E., Chief Engineer for Electricity to the Government of Madras.

Present position in the matter of generation and distribution and the policy of Government.

3. Prior to 1924 the Government had no definite policy in regard to electrical development either from water power sources or from thermal electric stations. A few small company and municipal licences existed within limited areas and the Government had also granted concessions to certain private interests to develop electric power from water sources.

Water power sources.—In the case of three of the concessions granted to develop water power sources (the Periyar concession, the Kundah river concession and the Kathuvadi Ar concession) no progress was made and the concessions were terminated. The Pykara concessionaires, however, did take up investigation and incurred some expenditure. (In 1924 the Government appointed Mr. Forbes, then Chief Electrical Engineer of Mysore, to investigate and report on the hydro-electric sources in the Presidency. In his report Mr. Forbes pointed out that the water power resources of a country belong to the people of the country who are entitled to the fullest benefits to be derived from their development. He also pointed out that hydro-electric developments are in nearly every case highly profitable undertakings, and that the country should benefit by that profit, surplus revenues being used for the reduction of taxation or the development of the country.) He therefore recommended—

- (1) that the Government of Madras should develop, according to a regular programme to be worked out, its water power projects, transmit power to the consuming centres and sell it to the ultimate consumer, large and small, where there are no existing licensed suppliers, and where such licensees exist force them to take hydro-electric power in bulk ;
- (2) that no more concessions should be granted for the development of any of the water power projects in the Presidency ; and

- (3) that every effort should be made to induce all concession-holders to cancel their concessions, the rights reverting to Government.

When the demand for hydro-electric surveys was moved in the Legislative Council in March 1924, it was stated that the policy of the Government was that they should themselves be in charge of hydro-electric surveys and projects as far as possible, that if private companies applied for grant of rights for the starting of hydro-electric schemes, Government would normally take the line that those rights ought not to be increased and that Government would be very careful to see whether there was any necessity to grant such concessions to private companies.

(In pursuance of that policy Government bought back the Pykara concession in 1924 from the concessionaires and subsequently took up and completed the Pykara scheme which is now being worked as a State enterprise. The Mettur hydro-electric scheme has also been taken up and is under construction.)

Thermal stations.—Until the Government Pykara Hydro-electric System started operation in April 1933, electricity was generated at thermal stations and distributed by companies or municipalities licensed by Government under section 3 of the Indian Electricity Act, 1910. In 1905 there was only one licensee, the Madras Electric Supply Corporation. The next licences to be granted were the Cochin, Bellary and Ootacamund Electric Licences in 1921 but none of these commenced supply till 1924 or later. Now there are 34 company and 27 municipal and panchayat board licensees of which 25 companies and 25 local bodies have commenced supply. The table in Appendix I shows the years in which the various licences were granted and also their system of supply. It is clear that in the matter of supply practically all the development outside Madras City has taken place in the last ten years and more particularly in the last five. It is also noteworthy that since serious development began ten years ago all licensees, with one exception, have adopted a uniform system of supply, A.C. 400/230 volts, 3-phase 50 cycles.

It may be pointed out in passing that so far no District Board has applied for or obtained such a licence and only four Panchayat Boards have in the course of the last two or three years obtained distributing licences, all getting

bulk supply from the Madras Electric Supply Corporation. The licences granted to local bodies have therefore been chiefly to Municipal Councils and except in five cases where the capital required by the Hospet, Masulipatam, Coimbatore, Tiruppur and Pollachi licensees was borrowed from the District Boards concerned, and in two cases where the Nellore and Guntur licensees' debentures were taken up by the District Boards concerned, the municipal licensees in question have applied to Government for loans either for their original electrical works or for extensions. In the case of the Coimbatore, Pollachi and Tiruppur municipal licensees, loans have even been obtained from Government to pay off the District Board loans. Government have always taken the opportunity of considering the applications for such licences carefully from the point of view of the financial position of the local body and its ability to repay the loan. The schemes prepared by applicants for licences are also carefully examined from the stand-point of the Electricity Department. Frequency and pressure are fixed, compulsory areas are prescribed, provision is made for a change over to bulk supply in certain circumstances (this provision has been gradually modified to make the liability more definite) and as far as possible initially and in operation the efficiency of the station is watched.

When the electric supply industry was in its infancy the practice was to issue licences to companies or municipal councils in urban areas only, e.g., Calicut, Bezwada, Bellary, etc. Later on, however, the areas worked by certain private companies were extended to cover a few miles round urban areas, e.g., Vellore, Tinnevely-Tuticorin, Salem-Erode, etc., and in some cases new company licences also covered more than a municipal area. Within the last three years there has been a still further development and areas covering hundreds of square miles have been included in company licences, e.g., the South Arcot District licence and the East Tanjore District licence. In some cases also the areas of existing company licences have been extended to cover whole revenue taluks, e.g., Trichinopoly, Srirangam, Kumbakonam, etc.

4. At about the same time as the announcement of policy regarding the development of hydro-electric schemes was made in 1924, the Government also declared that, with a view to encourage electrical enterprise in the Presidency and to assist local bodies to undertake electric supply

schemes, such schemes would be investigated, drawn up and executed by the electrical officers of Government, as in the case of sanitary schemes, as at that time there were practically no private electrical engineers from whom local bodies could get assistance.

In pursuance of that policy the Government have prepared schemes for local bodies which applied for such help and granted licences to them and in cases where local bodies were not forthcoming to undertake such schemes licences were granted to private companies. In the case of private companies, however, the Government have not given either technical or financial assistance. Even at this period, the Government contemplated the possibility and probability of linking up the areas for which licences were being granted with some big hydro-electric or other bulk supply systems and accordingly imposed the following condition in the licences issued from 1925 :—

“Should a supply of electrical energy in bulk become available at any future date from a hydro-electric or other source of supply at such rates that the rates of supply of distributed energy under this licence could be reduced, the licensees shall obtain their supply from such source and shall reduce the rates specified in the above sub-clauses by amounts which shall be approved by Government.”

This condition has undergone a gradual modification and in licences recently granted it reads as follows :—

“Should a supply of electric energy in bulk become available at any future date from a Government power system or other source of supply at such rates, that the rates of supply of distributed energy under this licence could be appreciably reduced, the licensees shall obtain their supply from such system or sources of supply within six months from the date from which notice is given by Government that such supply is available.

“When the source of power is a hydro-electric system of the Government, it shall be obligatory for the licensees to cease generating their own power (except for bona fide emergency purposes) and take all their requirements from Government within six months of the availability of the supply.

“In cases where energy is obtained from a Government power system the licensees shall conform in resale rates and in conditions of working to such regulations as may be issued by the Government. If a bulk supply is

obtained from a source other than a Government power system, the licensees shall reduce the rates charged to consumers and also the maxima specified in the * * * annexure of this licence to such extent as may be directed by the Government."

5. No private company or municipal undertaking in the Presidency holds a licence for the generation of hydro-electric power for distribution to the public. The Pykara Hydro-electric System, which has been in operation since 1933, is worked by Government while the Mettur hydro-electric scheme which is under construction is to be worked similarly. Where Government carries out an electric supply scheme no licence is required as it is assumed that Government will, as a matter of course, do nothing contrary to the public welfare †. Under the Pykara system the Government generate power and supply it in bulk to licensees (companies or local bodies) for retail distribution. Here also the system of supply is A.C. 3 phase 50 cycles though the voltage is naturally higher and has to be transformed for low tension supply. All power in rural areas in the Coimbatore and Nilgiris districts is also distributed by Government direct without the intervention of a licensee. Thus, the Government function both as a generating and distributing agency in certain areas.

6. Before the Pykara Hydro-electric Project was completed the question of how best distribution and sale of power could be arranged arose. It was felt that, in order that a market for power generated from hydro-electric power stations may be found and developed on proper lines so that revenue may be realized quickly, the distribution of power should be left in the hands of efficient and experienced commercial companies who are also in a position to extend their distribution systems and build up load. It was on this principle that a licence for the distribution of power in Salem and Erode was granted to a private company (Messrs. Octavius Steel and Company) in spite of protests from the local authorities concerned. Doubts were however subsequently felt as to the soundness of this policy of granting a licence to a private company against the wishes of the local authorities and when there was strong opposition from local bodies in the Coimbatore district to the grant of a distributing licence to a private

† Section 30 of the Indian Electricity Act which controls the transmission and use of energy is, however, binding on the Crown and the rules must be complied with in Government installations.

company, the Government adopted the following principles for the distribution and sale of power in the Coimbatore district from the Pykara Project :—

- (1) Licences under the Indian Electricity Act, 1910, will be granted to those municipal councils which desire them for the distribution of low-tension power within their own limits, subject to the main conditions—
 - (a) that the Government will undertake the construction of the distribution system on behalf of the municipal councils, and
 - (b) that the undertaking will be managed by the Government on behalf of and at the cost of the councils until the scheme is satisfactorily established and in any case for a period of three years.
- (2) The distribution of high-tension power within municipal areas and of all power in rural areas will be undertaken by Government direct.

There are now ten municipalities in which Government manage the distribution of energy on this principle and two of the undertakings, Coimbatore and Tiruppur, are about to be handed over to the Councils.

In cases where local bodies express no desire to take up distribution work, distributing licences are granted to private companies, provided Government are satisfied in regard to their financial position and technical experience.

7. The next stage in the development of policy was in connexion with generation and distribution in areas to be commanded by Mettur and similar future hydro-electric schemes. The question arose in connexion with an application made for a licence for generating and distributing energy by a municipal council. The Chief Engineer brought to notice the availability of oil engines taken over from certain industrialists at Coimbatore who had changed over to Government power and the desirability of developing load and preparing power markets in places which lie in future hydro-electric areas.

It was decided that in the financial interests of these future hydro-electric schemes, the policy of Government in respect of electric light and power schemes for the places or areas lying within the region likely to be commanded by any State hydro-electric scheme should be to retain in their own hands the generation and bulk supply of power

and to apply to such schemes the principles and procedure adopted in the case of the urban and rural areas in the Coimbatore district. This policy has been adopted in the case of Virudunagar, Dindigul, Palni, Periyakulam and Bodinayakkanur where, pending the advent of hydro-electric power, Government have established oil engine stations to generate and supply energy in bulk to the municipal councils in addition to constructing the distribution systems and managing the undertakings as they do in the Pykara area for certain municipalities. No supply to rural areas in these parts is given by Government from their oil engine stations with the recent exception of Theni nor have any private companies applied for licences for distribution in urban or rural areas.

8. The question was further considered when private companies applied for licences for areas lying within the area of the Mettur hydro-electric scheme. The first was for a major portion of the South Arcot district and the second for a considerable portion of the Tanjore district. The municipalities in these areas did not apply for distributing licences, nor did they oppose the grant of such licences to private companies. The Chief Engineer recommended the issue of licences for the areas applied for, with suitable provisions in the licences regarding the taking of bulk supply from Government as soon as they were in a position to give it. The South Arcot District Licence and the East Tanjore District Licence were accordingly granted and the distribution systems have been so planned as to fit in with the plans of the Electricity Department.

9. In conformity with this principle of linking up various distribution centres with a bulk supply and eventual grid system, the Government are insisting on the closing down of small generating stations already existing in a hydro-electric area, if the licensees apply to Government for an extension of the area served by their stations, e.g., Vellore.

10. Having thus dealt with the planning and co-ordination of electrical development in hydro-electric areas, existing and future, in the south, the Government have turned their attention to the northern districts and are contemplating the erection of thermal power stations at suitable load centres, e.g., Vizagapatam and Bezwada. The construction of such a station at Vizagapatam is about to be taken up. It is expected that the construction of a similar large thermal station at Bezwada

will be taken up later this year. The load in this part of the Presidency is poor and does not justify the Government taking up any large hydro-electric scheme and spending large sums on it immediately, although the investigation of one such scheme at Lammasinghi in the Vizagapatam district has been taken up and, if expectations are justified, it is hoped to take it up some years hence after load has developed. A smaller water power scheme at the Chettipet weir is also in contemplation. In order, however, to build up load on proper lines from the commencement, with a view to any future hydro-electric scheme, thermal generating stations are to be erected at suitable places and supply given in bulk to the existing distributing licensees in the area. Further licences in these areas will have suitable conditions incorporated to enable them to be linked up with a bulk supply system.

Capital invested in the industry.

11. Before passing on to a consideration of the evidence given regarding the position of the industry and stating our own views on its development, it will be appropriate to mention briefly at this stage the capital invested in the various municipal and company undertakings and their total installed capacity and annual output where they do not take power in bulk. This information is given in Appendix II.

Government have so far invested in the Pykara system Rs. 1,81,12,969 (which includes Rs. 44.50 lakhs spent on the transmission systems in Salem, Trichinopoly and Tanjore districts which will be taken over under the Mettur system) and there is budget provision in the current year for a further expenditure of Rs. 38,04,300 on it. The installed capacity at present is 18,750 K.W. and the annual output in 1934-35 was 30,014,218 units.

The expenditure contemplated on the Mettur system, now under construction, is Rs. 81,32,800, excluding the expenditure already incurred on the transmission systems in Salem, Trichinopoly and Tanjore districts (Rs. 44.50 lakhs) and about Rs. 2 lakhs on buildings taken over from Cauvery-Mettur Project and Rs. 10.80 lakhs cost of hydro-electric pipes. The installed capacity is to be 37,500 K.W. and the annual output initially is expected to be 23,000,000 units. On the various thermal schemes so far constructed by Government and under construction, the expenditure comes to about Rs. 27,94,834.

The position as regards the various undertakings including Mettur which is expected to start operation next year may be summarized as follows :—

Undertaking.	Capital investment.	Installed capacity. K.W.	Units generated.
RS.			
A. Government—			
Pykara—			
In operation	1,81,12,969	18,750	* 50,281,812
Under construction (i.e., extensions contemplated in 1936-37 Budget Estimate).	38,04,300	..	..
Mettur—			
In operation	Nil.	..	..
Under construction	81,32,800	† 37,500	‡ 23,000,000
Thermal schemes—			
In operation	5,24,834	1,025	600,000
Under construction	22,70,000	2,000	‡ 2,000,000
Total ..	3,28,44,903	59,275	75,881,812
B. Company—			
In operation	2,78,26,242	46,495	47,579,641
Under construction	18,00,000	1,600	1,000,000
Total ..	2,96,26,242	48,095	48,579,641
C. Municipal—			
In operation	58,75,647	9,241	8,196,724
Under construction	1,00,000	150	75,000
Total ..	59,75,647	9,391	8,271,724
Grand total (in operation only) ..	5,23,39,692	75,511	106,658,177
Grand total (including under construction)	6,84,46,792	116,761	132,733,177

Action taken by Government to assist development.

12. Government have, up to date, spent on their electrical schemes the following amounts :—

Year.	Capital expenditure in lakhs.
RS.	
To end of 1931-32	90.31 (actuals).
1932-33	24.69 („).
1933-34	18.22 („).
1934-35	22.77 („).
1935-36	50.61 (revised estimate).
1936-37	106.93 (budget estimate).

They have also advanced a total sum of Rs. 57,25,285 to various local bodies for their electric supply undertakings as shown in Appendix II under Municipal Councils.

* For the year 1935-36.

† Initially, and 50,000 K.W. ultimately.

‡ Initially as estimated.

13. Other steps which Government have taken to give an impetus to electrical development may be briefly referred to under three main heads :—

- (a) Blanket grant.
- (b) Hire purchase facilities.
- (c) Construction of transmission lines in licensees' areas.

(a) In all Government departments, expenditure on any single item of new work in excess of Rs. 10,000 is treated as a new service, and the vote of the Council is necessary for the provision of funds either in the budget estimates, if the expenditure can be foreseen at the time the budget is prepared (in which case it will be dealt with as a Part II Scheme), or in the course of the year (in which case a supplementary demand is moved in the Council). In 1932 the Chief Engineer for Electricity pointed out that if an extension of supply was found necessary to a new place in the course of the year and if there was no provision in the budget and the work had to wait till funds were provided, the load might be lost and never recovered and he suggested the provision of a lump or "blanket" grant to meet the expenditure on possible extensions to the distribution systems under Pykara. The Public Accounts Committee was consulted and, with a view to enable the Electricity Department to comply promptly with new demands for electric supply from consumers, provision was made in the budget estimates for 1933-34 and 1934-35 of a sum of Rs. 2,50,000 each year to meet expenditure on unforeseen extensions of transmission lines and other connected works. Expenditure from this provision on schemes expected to bring in an adequate return was, if the estimated cost did not exceed Rs. 75,000, sanctioned by Government, schemes estimated to cost more than Rs. 75,000 being treated as "new services" requiring the specific vote of the Legislative Council. This lump-sum provision has, from 1935-36, been increased to Rs. 7.5 lakhs. The previous restriction limiting the expenditure from the provision to schemes coming strictly under the category of extensions to the Pykara distribution or transmission system has also been removed, so that the lump-sum provision can now be utilized for all works connected with the Government electric power schemes. It has also been ordered that no work sanctioned against the provision should be treated as a "new service" unless

the cost is over Rs. 2 lakhs. These changes have been accepted by the Public Accounts Committee.

With a view to enable the Chief Engineer to sanction reappropriation of funds for such schemes the lump-sum provision of Rs. 7.50 lakhs has been split into two portions, (1) for minor works costing Rs. 10,000 and less—Rs. 2 lakhs, and (2) for major works costing over Rs. 10,000—Rs. 5.50 lakhs. The Chief Engineer has also had powers delegated to him to sanction schemes costing Rs. 10,000 and less, and the Engineer-in-charge, Pykara Hydro-Electric System, to sanction schemes costing Rs. 2,000 and less, subject to the usual conditions.

The position, therefore, at present is as follows:—

The Government have relaxed the rule which requires that expenditure on “new schemes” should be subject to the vote of the Council in the case of the Electricity Department first up to Rs. 75,000 and then up to Rs. 2,00,000.

The Government can sanction expenditure on any schemes costing Rs. 2,00,000 and less at any time in the year without going to the Council for funds.

The Chief Engineer has been authorized to accord sanction to schemes up to Rs. 10,000 and the Engineer-in-charge, Pykara Hydro-Electric System, up to Rs. 2,000.

The Chief Engineer has been empowered to sanction reappropriation of funds from the blanket grant up to Rs. 10,000 for each work.

(b) In his Project Report on the Pykara Scheme the Chief Engineer for Electricity brought to notice the necessity for the establishment, as in other parts of the world, of a Conversion Fund to facilitate the change over to electricity of the installations of the smaller power users (who might not be able to do it without assistance) within the first years of operation. After the Pykara scheme was sanctioned by the Secretary of State, the question of provision of funds for this purpose was examined and in 1931 it was decided that a sum of Rs. 4.17 lakhs might be sanctioned for the purpose. It was not intended that this fund should be utilized solely for the purpose of helping mills and factories which were using other forms of power to change over to Pykara power (as the name of the fund indicated) and the rules issued for the purpose specifically provided that the fund might be utilized for purchasing electrical

motors and other equipment and issuing them to agriculturists and industrialists on hire-purchase terms. The installations are put up at Government cost in the first instance at the industrialists' factory or the agriculturists' well as the case may be, and the cost is recovered from the hire-purchaser in monthly or annual instalments over a period of three to five years. The interest on the cost of the equipment was originally fixed at $7\frac{1}{2}$ per cent on the analogy of the loans sanctioned to co-operative building societies, etc., at that time. In 1932, the rate was reduced and fixed at $\frac{1}{2}$ per cent over that charged by the Government of India to the Madras Government for that year. In 1935, in view of the extensive use that was made of the facilities provided, the Government directed that the limit fixed previously should be removed and that the provision for each year should be made according to the requirements anticipated for that year.

A number of industrialists, both large and small, and agriculturists have taken advantage of the hire-purchase facilities offered by Government. The amounts actually utilized on this account during the last few years are as follows :—

1933-34—		RS.	
Actuals		3,78,718	(outstandings after recoveries).
1934-35		2,21,322	(do.)
1935-36, Revised Estimate—			
Advances		3,35,100	
Recoveries		48,000	
Net provision		<u>2,87,100</u>	
1936-37, Budget Estimate—			
Advances		3,08,600	
Recoveries		1,16,000	
Net provision		<u>1,92,600</u>	

According to the Chief Engineer, the hire-purchase arrangements are working smoothly. All the instalments have been paid up to date and most of the loans are to textile mills.

In addition to the facilities offered by supplying electrical apparatus on hire-purchase terms, the Government have permitted the free installation of transformers for industrialists changing over from oil-engines, for five years in the first instance, the installation thereafter being hired from Government or bought outright at a fair valuation.

(c) Another facility given by Government is by way of construction of transmission lines by Government in hydro-electric licensed areas where the licensees see no prospect of extending their lines themselves in the near future. In 1935 the Government approved a proposal made by the Chief Engineer that in order to develop load in hydro-electric licensed areas the Government should, where it was considered desirable to do so and where the capital cost of the extension was considerable (not less than Rs. 10,000), construct in those areas high tension lines of 11 K.V. or over and deliver electricity in bulk at the normal voltage of the line at the standard rates. A guaranteed minimum revenue is required and the licensees undertake the operation and maintenance of the extension.

Criticisms of the existing arrangements.

14. The criticisms of the existing system are already familiar to the public by reasons of the views expressed by the Chief Engineer for Electricity in recent Administration Reports. Briefly they might be stated in the words of the Chief Engineer's written evidence and administration reports as follows :—

- (a) "Some of the company undertakings, particularly the smaller ones, cannot be considered as altogether satisfactory. The Electrical Inspector has classified these undertakings and pointed out what he considers the principal defects in each. Generally speaking it would seem that the more important defects are—
- (1) lack of experienced supervision and of up-to-date commercial methods, and costly management ;
 - (2) insufficient capital to provide for the legitimate electrical requirements of the area ;
 - (3) a tendency to forget that an electricity undertaking is or should be a public utility and not solely a business enterprise.

A few of the larger and older established undertakings can be considered on the whole as satisfactory as a great improvement has been noticed in their management during the past year or so."

- (b) "Municipal management is probably less satisfactory than private companies, but it is capable of great improvement when the Municipal Service of Electrical Engineers, together with reasonable

regulations regarding the technical and financial control, are introduced. In fact it is quite possible that in a few years the management of municipal undertakings by the local authority will be the most satisfactory form of distribution in retail of electricity. This, however, will depend entirely upon the manner in which the councils are encouraged, assisted and educated by Government, and also the way in which they co-operate with the department."

"Activities in the case of these licensees are confined to municipal areas which is not the most economical area for electric supply." "Experience in this Presidency during the past few years has led me to the conclusion that Municipal Councils in this Province at present find it difficult to manage and direct local electricity undertakings in a manner which will ensure healthy electrical development and a maximum of benefit to the community. Even the most efficient councils leave much to be desired in that respect."

(c) "I do not consider that Government, as now constituted, is a suitable agency for the generation and supply of electricity to the public or for carrying on any commercial undertaking. This fact is so generally recognized that it would seem superfluous to comment upon it. Apart from political considerations and patronage which may or may not have to be contended with, the administration must necessarily be slow, unwieldy and costly. Commercial undertakings, as is well known, cannot be administered solely by rules and regulations and the average Government official has no commercial training nor experience, hence it is difficult for him to exercise that judgment so necessary in a large business and take real interest in a commercial undertaking; furthermore they are not usually in touch with public and business opinion.

It is however possible for Government commercial undertakings to be managed and administered with greater efficiency than at present by removing some of the administrative restrictions with which all heads of departments have to contend, and simplifying rules for the recruitment of officers and establishment."

Briefly, the restrictions to which he alludes are the following :—

Before a project or a scheme (either original or extension) is taken up sanction of Government has to be obtained, and funds provided after obtaining the vote of the Council if the expenditure exceeds a certain limit. This takes some time. After sanction to the project is accorded, and funds are provided the formalities that have to be gone through in securing the services of suitable technical officers on the standard scales of pay approved by Government contribute to further delay in taking up the works.

(d) “The present system of un-co-ordinated electricity development by means of scattered licensed areas, selected in a rather haphazard manner mainly to conform to local and private interests, must prejudice to a great extent normal electrical development in the Presidency. I am of the opinion that had a planned system of electrical development and management been started 10 years ago, the province would not have been so electrically backward as it is to-day. To a certain extent this state of affairs may have resulted in restricting industrial development, by rendering adjoining Indian States more attractive to the industrialists, and caused considerable waste of capital which might have been more economically utilized under better organized conditions. In such an unorganized industry national interests have to give way to parochial ideas and local convenience.”

Views of witnesses on the existing arrangements.

15. In the written and oral evidence given before us conflicting views have been expressed on the question whether the existing arrangements of supply by means of one or two State undertakings and a large number of scattered private and municipal licensees, most of them small, may be regarded as satisfactory and adequate and whether more co-ordination and planning is possible and necessary.

The Licensees' Association considers that the present state of electrical development in the Presidency is neither unsatisfactory nor inadequate having regard to the short period of its history and the general economic condition of the Presidency. It has pointed out that the total area

managed by municipal councils is very small and that all other areas practically are administered by the Government or by some six other managing agents who in the matter of policy and rating are under Government control. It is claimed that practically all the districts south and south-west of Madras are in the hands of six or seven companies while a similar tendency is developing in the Telugu districts. It is also claimed that so far as private licensees are concerned there has been planned development and co-ordination between the various undertakings and that interlinking of the present systems is quite possible as the type and frequency of supply are the same in all undertakings with one or two exceptions. The Association, on the information before it, thinks municipal undertakings are also generally satisfactory. Messrs. Octavius Steel & Co., however, think that municipal enterprises are and must inevitably be less successful than private companies. The Chief Engineer, Madras Electric Supply Corporation, has not committed himself to any opinion on the state of development outside his own area, beyond pointing out that most of the undertakings are small and that more co-ordination and planning is desirable. As regards its own areas, however, the Madras Electric Supply Corporation claims to be able to supply any demand made upon it and even to supply a large block of energy to a grid system immediately if required.

Municipal Councils are divided in their opinions. Those running undertakings of their own regard them generally as efficient and satisfactory but even most of these and a majority of the others consider there is need for co-operation and planned development.

The Chambers of Commerce are rather divided in opinion, some thinking the present position, especially as regards small company and municipal licensees, is not satisfactory while others consider that development has been reasonably rapid, economical and satisfactory. It is significant that three of the big interests represented in the Madras Chamber of Commerce are of the latter view. The Madras Port Trust and the Agents, Madras and Southern Mahratta and South Indian Railways, think that progress has been slow and not altogether satisfactory although they have no complaint about the service they get. The Madras Trades Association thinks that development under the present system has been in many ways satisfactory having regard to the nature of the country and its economic

limits. All these bodies emphasize the need for planned development and co-ordination of undertakings. There is a considerable volume of opinion that Government is not a suitable body for operating a commercial undertaking.

A certain number of the prominent public men consulted regard the progress so far achieved as not unsatisfactory, but the majority emphasize the need for co-ordination and planned development. Of the twelve gentlemen who have given their views, six consider that the present state of electrical development under the existing agencies is satisfactory, in view of the short period during which the industry has been in operation, the want of industrial consumers, the purely agricultural character of the Province and the general poverty of the people. Six consider that development has not been satisfactory because of the parochial character of the existing undertakings and because of the profit-making policy of private company licensees on the one hand and want of experience and inadequate finance on the part of municipal licensees. They have also pointed out that the private licensees charge high rates, and are slow to extend supply to rural areas where the load is thin. All these six gentlemen consider a satisfactory state of development can be expected only when Government take over all generation and bulk supply as far as possible, leaving retail distribution to local bodies and private interests.

Collectors of districts are rather divided in their views. Twelve of the eighteen who have expressed views on this question are definitely of opinion that, all things considered, the development of the industry has been satisfactory and the service given reasonably efficient. (There is a strong body of opinion that the rates are high considering the poverty of the people and that this impedes development.)

Officials connected with the Electricity Department who have given evidence, like the Chief Engineer, judge attainment by the standards of more progressive countries and find it meagre and think that had a planned system been started, say ten years ago, the Province would not have been so electrically backward to-day. The Director of Industries and the Electrical Inspector consider that on the whole the present state of electrical development is not unsatisfactory though better progress might have been made with planned development and co-ordination from the outset. (Mr. Greenwood, the Electrical Inspector,

sees no objection to Government owning a few large generating stations and transmitting power in bulk and he would even favour taking all municipal undertakings under Government management for a term, say of three years. The Director of Industries also sees no difficulty in Government continuing to play its present part in generation and bulk supply and undertaking even more, although if the number of large generating stations became too great he considers some other form of management might be better.

Views of the Committee on the existing arrangements.

16. The two tables below give the Electrical Inspector's analysis of the working of company and municipal undertakings :—

Serial number and companies.	Rates for energy not exceeding		Full 24 hours supply.	Percentage of revenue surplus to capital expenditure after allowing uniform depreciation.	
	Domestic—	Small power—		Between 3 per cent and 6 per cent.	Over 6 per cent.
	6 annas.	2 annas.			
1 Madras	1	1	1	..	1
2 Kanadukathan .. .. .	..	..	1	..	..
3 Devakottai .. .. .	..	..	1	1	..
4 Cochin .. .. .	..	..	1	..	..
5 Trichinopoly-Srirangam	1	1	1	..	1
6 Rajahmundry	1	1	1	1	..
7 Calicut	1	..	1	..	1
8 Karalkudi .. .. .	..	..	1	..	1
9 Vellore .. .. .	..	1	1	1	..
10 Tirupati .. .. .	..	..	1	..	1
11 Kumbakonam	1	1	1	..	1
12 Guntur	1	..	1	..	..
13 Salem-Erode	1	1	1	..	1
14 Nattarasankottai .. .. .	..	1	1	..	..
15 Mangalore	1	..	1	..	..
16 Palghat	1	1	1	..	1
17 Tinnevely-Tuticorin	1	..	1	..	..
18 Vizagapatam .. .. .	..	..	1	} Less than two years' working.	..
19 Nellore	1	..	1		..
20 East Tanjore	1	1	1		..
21 South Arcot .. .. .	..	1	1		..
22 Chittoor .. .. .	..	1	1		..
23 Negapatam	1	1	1		..
24 Okkur .. .. .	..	..	1		..
25 Proddatur .. .. .	..	..	1		..
<i>Municipal Undertakings.</i>					
1 Ootacamund	1	1	1	1	..
2 Bellary	1	1	1	1	..
3 Madura	1	1	1	..	1
4 Cocanada	1	1	1	..	1
5 Tanjore	1	1	1	..	1
6 Coonoor	1	1	1	1	..
7 Hindupur .. .. .	..	..	..	..	..
8 Sembliem .. .. .	..	..	1	..	..
9 Kurnool	1	1	1	..	..
10 Bezvada	1	..	1	1	..
11 Conjeeveram	1	1	1	..	..
12 Masulipatam	1	..	1	..	..
13 Tiruvottiyur	1	..	1	..	..
14 Alandur	1	..	1	..	..
15 Hospet .. .. .	..	..	..	} Less than two years' working.	..

He concludes that, excluding concerns working for less than two years, 9 out of 17 company concerns and 7 out of 13 municipal concerns (excluding those managed

by Government) are working satisfactorily. We agree that there may be defects in the working of a number of these concerns and that there is room for improvement. We also consider that no demonstration is needed that generation in small stations, particularly those serving only small municipalities, is uneconomic except as a temporary measure to build up load in advance for supply from a larger concern. The evidence before us is, however, very strongly in favour of a continuance and extension of the system of municipal licences especially for distribution and a considerable body of evidence is also in favour of private licences for distribution in suitable areas. On the whole, therefore, we agree with Mr. Greenwood that "what has been accomplished hitherto in this Presidency should not be completely damned; it could well be considered as useful preliminary development."

We cannot visualize a time when municipalities and possibly other local bodies and private licensees will not be required at least for distribution and in isolated cases perhaps for generation also. We consider that the powers Government are already exercising in the matter of requiring licensees to take bulk supply in due course and close down small and uneconomic generating stations are, in the case of the more recent licences at least, adequate to prevent the situation getting out of hand by the growth of small generating stations, while the powers they have exercised in prescribing the type of supply since 1924 make linking up with large generating stations or a grid practicable whenever desired.

In other words, we consider that whether all company or private licensees have up to the present reached a satisfactory standard of operation or not, and whether they have met the requirements of their areas promptly by expansion and been zealous in developing the uses of electricity or not, they have to some extent built up load and created electrical mindedness among the people at least in the more urban areas. They have not been allowed to spring up without due regard to conditions of working and with two or three exceptions there will be no insuperable difficulty in linking them up with wider systems of supply, retaining them as agencies for distribution.

We feel therefore that the suggestion that the present system has wrongly and unnecessarily encouraged the growth of parochial and uneconomic stations is not altogether warranted.

17. We must point out also that as regards company and municipal licences the present system does not present such serious obstacles to linking up and interchange as it did in England. The position in England at the time of the Williamson Committee's enquiry is graphically described in paragraph 13 of its report :

“ Owing to the chaos of different systems, and the absence of any attempt to standardize pressures and frequencies, co-operation between neighbouring authorities is difficult and expensive. In London, for example, there are seven railway and tramway systems which generate electricity for the purposes of traction at differing frequencies, one at 50, two at $33\frac{1}{3}$, and four at 25 thus rendering exchange of electricity between them impracticable except at the great expense involved in converting it. Again, there are in the area of Greater London 70 authorities who supply electricity to the public, and own some 70 generating stations, with 50 different types of system, 10 different frequencies and 24 different voltages.”

The position is not the same in this Presidency where the system of supply in all the licensed areas is practically the same, i.e., A.C. 50 cycles, 400/230 volts, except in the case of the Hindupur licence and a limited portion of the areas of the following three earliest licensees: (1) The Madras Electric Supply Corporation, Limited, (2) The Kanadukathan Electric Supply Corporation, Limited, and (3) The Sri Meenakshi Electric Supply Corporation, Limited, Devakottah, where D.C. 230 volts supply prevails.

It is true, however, that the wording of the clause intended to ensure closing down of small uneconomic stations, when bulk supply becomes available, in earlier licences or the absence of such a clause in certain cases has been and is likely to be an obstacle to the smooth development of the bigger power schemes of Government. Negotiations in such cases are necessarily troublesome and we recommend, therefore, that power should be taken to compel licensees, on equitable terms, to close down generating stations, in cases where their licences do not definitely provide for that.

18. We do not at this stage of our report propose to examine in detail the question of the suitability of Government as an agency of supply and bulk distribution of electricity. It has not been suggested that up to the

present the Pykara system has not been efficiently and successfully managed and whatever may be said as regards the future, when there will be a great expansion of Government enterprise if the present policy is continued, we are convinced that Government enterprise in taking up and working the Pykara scheme has greatly helped electrical development and industrial expansion and that, but for the part played by Government, development would have been much slower and more parochial. The general question of the suitability of Government agency for the future we propose to take up later when considering whether a Board should be constituted or not. Meanwhile, before indicating the steps which in our opinion should be taken to ensure an adequate and economical supply of electric power for all classes of consumers in the Presidency, we must refer briefly to industrial possibilities.

Industrial possibilities.

19. We realize the fact, which the Director of Industries has emphasised, that Madras is not rich in minerals and the development of industries in the Presidency is likely therefore to be chiefly in the direction of converting and working up into manufactured or semi-manufactured form the agricultural and forest products of the Province. Thus there is scope for setting up more cotton and weaving mills, developing the oil-crushing industry and rice-hulling and perhaps to a less extent tile-making, soap-making and saw-milling. For industrial purposes such as these the use of electricity has many advantages.

The Chief Engineer of the Madras Electric Supply Corporation has however, pointed out that it should be borne in mind that the incidence of the difference in the cost of power between one source of energy and another (as, for example, electricity purchased in bulk or power generated by modern plant by the consumer) has very little bearing upon the prosperity of a large modern industrial undertaking, such as a new textile factory or paper mill. The availability of cheap electric power would undoubtedly be a factor in choosing a site for such an industrial undertaking but it is probable that the ruling factors would be the availability of raw materials and the cost of freight upon them, the supply of labour, and the cost of freight upon the finished product to the places where markets can be found for it. The Licensees' Association also urges the same point and is of opinion

that large scale industries can produce power for themselves at a rate cheaper than they can buy elsewhere while many of the cottage industries in this country do not require power at all. Where electro-chemical and allied industries are in question it is essential that the price of power should be very low if the manufactured product is to compete with that produced elsewhere.

20. The Director of Industries believes there are possibilities of important new industries being established in certain areas with the advent of electricity, e.g., the manufacture of ammonium sulphate, of vegetable products, of oilcake, of staple fibre, etc., while there is also the possibility of the development of the Salem iron ores if the iron content proves to be high enough to render exploitation feasible commercially, which is doubtful. This, of course, would lead to remarkable developments and severely tax the combined capacity of Pykara and Mettur. We have examples of the encouragement which hydro-electric power can give to new industries in the large cement factory established in Coimbatore district and the steel rolling mill at Negapatam.

There are no doubt limitations to the creation of new large scale industries in a country which is primarily agricultural and Messrs. Octavius Steel & Co., Ltd., of Calcutta have stated in their evidence that though power from coal generating plant in Bengal is available in large quantities at cheaper rates than from hydro-electric sources in Madras that fact has not led to the creation of new industries on any large scale but only to the conversion of existing industries to electric drive. That, however, has not been the case in the neighbourhood of Calcutta and in this connection the Committee appointed by the Government of Bengal to enquire into the charges for electrical energy levied by the Calcutta Electric Supply Corporation, Ltd., has remarked as follows:—

“ At the present stage of industrial development in India the greatest assistance that can be given to industrialists is to place at their disposal a reliable and cheap supply of electrical energy. Considerable industrial development has taken place in the neighbourhood of Calcutta during the past ten years. New industries have come into existence which are giving openings for employment to the people and we have no hesitation in stating that the system of electric supply which

has been built up by the company has been an important factor in this development and has given encouragement to manufacturers to set up factories here”.

21. We have no doubt that the provision of cheap electricity must also help existing established industries to develop. (With the advent of power from Pykara there has been a remarkable development of the textile industry in the Coimbatore district. The ease with which one part of a factory can be shut down and only part of the power system worked, when necessary, with electrical drive is in itself a great advantage and is likely to enable industrial concerns to expand in certain directions.)

It is more difficult to estimate how far the provision of electricity at cheap rates will give any great impetus to the development of industries directly connected with agriculture, though there will naturally be some benefit to the country at large or to particular areas.

22. We do not subscribe to the view of the Licensees' Association that cottage industries do not need power at all as there is plenty of human labour available, but we think that considering the conditions in villages generally the possibilities have been over-rated in some quarters. The Director of Industries has described at some length in his answer to our questionnaire the possibilities in this direction, but the limited extent to which a supply to villages in Coimbatore district has so far become available has not hitherto shown any particular results. Results have been achieved elsewhere in India and the most we can say is that it is reasonable to expect some electrification of cottage industries in South India.

23. Many witnesses have, of course, expressed the opinion that with a more extensive and cheaper supply of electricity there would be a great expansion of industry both large and small, but other witnesses have been more cautious and while admitting the possibility and desirability of some expansion, doubt whether it will be phenomenal or if it were so whether that would ultimately be in the best interests of the country, and in particular not a few doubt whether the mere provision of cheap and plentiful electricity will bring about that result. Although there was more than a hint in some of the evidence given to us that saturation point in the textile industry had practically been reached in the Coimbatore district, it cannot be disputed that, having regard to the market for

yarn and piecegoods in the Presidency, there is still scope for further expansion of cotton spinning and weaving and that electricity can help.

24. We conclude that there are distinct possibilities of development both in small and large scale industries through the provision of an abundant and cheap supply of electricity. At the same time it does not appear that the mere availability of such a supply is likely to transform a primarily agricultural province into a predominantly industrial country.

Steps to be taken to secure an adequate and economical supply of electric power generally.

25. In the light of our examination of the existing arrangements and our view of the possibilities of industrial expansion we recommend that the broad lines of future policy should be as follows :—

I. The present policy of steady expansion should be pursued and promising large schemes taken up, especially if they exploit natural resources, as they will provide a cheaper and more flexible and therefore more reliable supply of power than small and uneconomic stations.

II. The generation of electricity and its transmission and supply in bulk should be by State agency throughout the Presidency so far as that is economically possible from a series of large central stations, hydro-electric or thermal. Licences may, however, be granted, as at present, to local bodies or to private companies to generate and transmit electrical energy (a) in areas which are not likely ever to be served by a central station belonging to Government and (b) in areas to which a Government service can only be extended some time in the future, subject to suitable provisions enforcing the adoption of standard type and frequency of current and the acceptance of bulk supply if and when made available.

III. Local bodies should be preferred to private companies as licensees for distribution—and in the cases referred to in II above for generation also—provided Government are satisfied that they are able to finance and fit to manage the concern. We consider it essential in the case of all licensees that adequate power should be taken to ensure proper management and, when necessary, temporary management by Government agency.

IV. In view of the poor progress made by private licensees, with one exception, in serving rural areas and the difficulty local bodies would experience in financing schemes to serve a thin and scattered rural load, we think the only suitable policy at present is for Government to continue to be responsible for retail distribution in rural areas as in the Coimbatore district. We recommend, therefore, that where there is no licensee in a position to do so satisfactorily, Government should take up retail distribution in rural areas, provided the formula adopted for small rural schemes in Coimbatore district, namely a return of $12\frac{1}{2}$ per cent gross on the capital outlay, is satisfied. We consider that, allowing for the cost of generation and transmission of energy to the points where rural feeders take off, such a return is just likely at present to make such extensions satisfy the criterion of productivity and we do not therefore recommend that, except in special cases as is permissible even at present, the formula should be waived on the mere ground that rural extensions in a particular area are yielding more revenue than was expected when they were constructed. The possibility of a more favourable formula might, however, be considered at some future date if the financial results of the power system indicated that that was desirable or if there were particularly good prospects of rural load developing.

26. As already indicated in our third recommendation in the preceding paragraph, we attach great importance to the necessity for closer control over licensees which has been advocated by the Chief Engineer for Electricity. We agree with him that a reasonable amount of control would result in considerable improvement in concerns which at present are not working satisfactorily and would also safeguard the interests of consumers. We have not gone into the question of whether legislation is necessary to give the powers of control we recommend or whether it can be done by executive orders, but we recommend that Government should have power to make regulations covering

- (1) tariff schedules as well as maximum rates,
- (2) distribution of revenue,
- (3) contribution to reserve and interest on loans,
- (4) control of borrowing and control of the return on the investment and amortization,
- (5) expenditure on extensions and new generating equipment,
- (6) standards of technical and commercial supervision.

We have also considered the difficulty which may be experienced if the necessity should arise to revoke a licence under section 4 of the Indian Electricity Act after supply has commenced. We consider that provision should be made by legislation to enable Government in such a case to assume charge of the undertaking and manage it until arrangements can be made for the satisfactory operation of the undertaking.

Desirability of a Statutory Body.

27. We now turn to what is undoubtedly the most difficult and the most controversial part of our task.

The Chief Engineer for Electricity is strongly of opinion that Government (*restricted by rules and regulations as at present*) is not a suitable agency for working a commercial undertaking, though he has indicated that the position would be improved if the existing rules and regulations could be modified to suit commercial undertakings. Other officials consider that Government will prove the best agency for generation and distribution if some of the rules applicable to other Government departments are relaxed in the case of Government enterprises as they can afford to provide an expert engineering service and large capital. Some Collectors are in favour of Government management while others are against it. Some licensees and prominent public men and a majority of the commercial interests are against Government managing electrical concerns.

While several bodies representing commerce, industry and trade have said that Government is not a suitable agency to manage a commercial operation like the generation and supply of power, (the South Indian Chamber of Commerce considers that Government is the proper authority to develop hydro-electric power in all parts of the Presidency and a suitable agency for hydro-electric generation and bulk supply.) To a certain extent this view is shared by the Agent, Madras and Southern Mahratta Railway, who would limit commercial operation by Government to power stations connected with irrigation schemes. The Licensees' Association also considers that Government may develop economically sound hydro-electric stations like Pykara and supply energy in bulk to licensees but it would limit Government's sphere to the utilization of the country's natural resources and to schemes for which private licensees may not be forthcoming.

Many who would admit, as most of our witnesses have admitted, that Government is a suitable agency for control of the industry maintain that Government is not a suitable agency for generation and distribution. The main objection from the licensees' point of view is that Government comes into competition with licensees and they would prefer the selection among applicants for licences not to be made by an authority which has itself power to generate.

There is, however, a more general argument based on commercial considerations. Considerations which have been alluded to in the evidence are that as an agency of commercial operation Government can neither be economical nor effectively controlled; that sufficient responsibility does not devolve on Government officials; that there is loss of time involved in following out definitely laid down procedure and that they are not amenable to suggestions and criticisms.

28. Generally speaking, we agree that a public Corporation run on business lines would have more flexibility in the matter of staff and in the matter of keeping accounts and that there may be difficulty in holding a Minister responsible for the day to day administration of a department like the Electricity Department. Some of us, however, consider that the facts to which we have alluded in paragraph 13 of this report show that Government have been responsive to suggestions and have made it easy for the department to take up all except major schemes without loss of time and in the matter of finance, as indicated in paragraph 12, have anticipated the needs of the industry perhaps even more fully than could have been done by a public Corporation, with an obligation to pay interest on money from the time it was borrowed. Some of us, who have inside knowledge of the working of Government departments, also feel that, while the system of Government control and Government audit may be vexatious and troublesome in the case of a commercial department, it does help to ensure economy of expenditure and there is certainly no ground for the suggestion that Government do not enforce financial responsibility on their officers where slackness is brought home to them.

29. There is also the more general argument that under the present system the scrutiny given by Secretariat departments to the Chief Engineer's schemes is directed rather to matters of detail like pay and staff than to examination of schemes on their merits and that if these schemes were

submitted to an expert Board they would be viewed from a wider angle and judged more from the standpoint of the needs of the country and continuity of policy would also be ensured. There is something to be said for this view ; but it indicates the constitution of a Board of full time experts and while its supporters state that the probable expense of such a Board cannot be considered prohibitive others consider that at the present stage of electrical development in this Presidency there is no justification for incurring it.

30. Another argument in favour of a change to a public Corporation of some sort is that the finances and revenues of the electricity industry should be separated from the general budget. It is felt in some quarters that Government should not depend on profits accruing from their electrical concerns for supplementing their general revenues and that the profits from a public utility service should be devoted to improvements and extensions. As against this it has been argued that if this policy is pursued throughout and Irrigation, Registration, Electricity, Court-fees, etc., are all to contribute nothing to the general revenues, Government will find it difficult to provide money for the Police, for Education, for Medical services and nation-building purposes generally. Faced with this difficulty some are prepared to concede that, even if a public Corporation was formed, Government might have a first call on at least part of the profits. While as a Committee we are not all agreed on the principle that a Statutory Board is the most appropriate agency to generate electricity and distribute it in bulk in this Presidency, we all recognize that a future Government will, in deciding the question, naturally consider the implications of giving away a source of revenue.

31. It has been urged also by some witnesses that impending political changes make the creation of a Board desirable to manage Government's electrical undertakings and develop and plan in the future. No one has, however, suggested that a Board can be created which will not have to turn to Government either for its loans or to guarantee its loans or that there will not be some ultimate ministerial control of policy.

Apart from the apprehension that a future Government might decline to provide funds for further electrical development, there appear to be two main fears, namely, that Government might insist on keeping rates high so as to provide a substantial surplus for the benefit of the general

revenues or that in deference to clamour from consumers they might reduce them so much that the Government systems would hardly pay their way and it would be impossible for the Electricity Department to propose new schemes that could be accepted as remunerative. We consider that none of these apprehensions is very likely to be realised. As regards the first, unless the Board is to go elsewhere than to Government for its loans or raise them without Government guarantee, which will naturally make its borrowing more expensive, the position will not be materially different whether there is or is not a Board. As for the second fear, we would quote from paragraph 10 of Mr. Forbes' report :

“ I do not mean that the power should be sold at actual cost of production, for then the consumer only would benefit, but the power should be sold for what it is worth to the consumer and the profit used for extending the hydro-electric system and in the construction of protective works, or to augment the general revenues of the Government.”

We do not think any Government would be so short-sighted as to keep the rates unduly high.

As regards the third fear, we would add that any Government after investing a considerable amount of money with the expectation of a return of 6 per cent at the tenth year of operation of the various schemes, to cover interest charges and the risk involved as well as the cost of running the Electricity Department, will naturally hesitate to reduce that return too much by an excessive reduction in rates especially as it will have many nation-building schemes to finance and may in some directions have voluntarily restricted its revenue income. We feel therefore that much of the argument based on impending political changes is inconclusive.

32. The Provinces (excluding Indian States) where the electricity supply industry has made some headway are Bombay, the Punjab, the United Provinces and Madras. There are also large hydro-electric stations in operation in these Provinces, the one in Bombay being worked by a private company, the Tata Hydro-electric Company. In none of these Provinces is there any Statutory Electricity Board or Commission to direct, control or carry out schemes of electric supply. In 1926, a Bill was drafted (apparently by the Electricity Department as it was never scrutinized in detail by the Government) for the establishment of an

Electricity Commission in the Punjab. The draft shows that only limited powers were proposed—the powers being more or less those exercised by the Chief Engineer for Electricity in Madras—with the extra power of raising loans in the open market with the approval of the Local Government up to a limit fixed by them. The proposal was, however, dropped, the main reason for dropping it being that the Legislative Council would be reluctant to give up any of its powers to a body such as the proposed Commission. Difficulty was also apprehended in the matter of finding efficient directors, seeing that every one of the limited number of persons who could be considered efficient was interested already as a bulk consumer or as a director of a private enterprise supplying electricity. The question was again considered four years ago towards the close of the construction stage of the Mandi Scheme but it was felt that for various reasons the proposal should not be revived till the Mandi Scheme had been in operation for some years.

Turning now to Indian States, Mysore and Baroda—the only two regarding which we have specific information regarding systems in operation—have their own electrical works. In Mysore the whole business of electric supply industry, i.e., generation, transmission and supply both in bulk and in retail is undertaken by Government direct through a special Government department. There are no private or municipal licensees in that State either for generation or distribution of energy. In Baroda, the Government have recently constituted an Electricity Board, whose function is to advise Government on all matters relating to electrical development in the State, especially for supply of energy for lift irrigation. This is, however, a purely advisory body created by an executive order of Government.

33. The feeling of those who are opposed to handing over Government's electrical concerns to a Board has been put very well in the written evidence of Diwan Bahadur A. Ramaswami Mudaliyar who has said :—

“The Government of India have been a socialistic Government, whether the actual administration was in the hands of a bureaucracy or is going to be in the hands of a democracy. The Government of India have always believed, and the people of the country have come to believe, in State ownership of many things. The land is owned by the State in India ; it is not so in England,

Practically the entire system of railway administration, the second largest in the whole world, is owned by the Government and most of it is managed by the Government. A steady policy has been adopted within the last twelve years whereby in the very near future the whole railway administration will be State owned and State managed. Large irrigation works are similarly State owned and State managed. Many other instances can be given of what I have ventured to call the socialistic policy of the Government of India—a policy which has been accepted by the people and highly approved by them. It is in the light of this traditional policy hallowed by the practice of over a century that the new electrical development in the Madras Presidency should be contemplated.

The policy so far pursued in the development of electricity in the Madras Presidency is in keeping with this traditional policy. Government generate their electricity, undertake to distribute it, supply in bulk electricity to various local bodies, and normally speaking the public of Madras have been led to expect that the development of electricity will be along these lines.”

On the other hand it is urged by those who are in favour of a Board that, unlike England, the bulk of the business not merely of transmission but of generation in the Presidency will be concentrated in State-owned transmission lines and generating stations and the planning, construction and operation of these would justify the constitution of a full time Board.

*Possibility of forming a grid and the case for
a Board in that connexion.*

34. The Chief Engineer for Electricity in his evidence has pointed out that conditions in England before the British Grid was in service were in some respects similar to those existing in the Presidency to-day. A large number of independent and uneconomical central stations existed, which resulted in not only high tariffs, but excessive stand-by generating capacity, and in many cases uneconomical capital expenditure. In Madras electrical development is very much behind what it was in England and the central stations are of smaller capacity and more widely scattered. He considers therefore that the reasons which necessitated the British Grid exist to a great extent in Madras, and if such a reorganization could be carried out in the earlier stages of development, it would be ✓

found much easier and more economical than if an attempt were made at a later date. Further, the benefits of such a reorganization would be felt much earlier.

While we do not wish to be taken as implying, at this stage, that without a grid system for the Presidency or a series of grids there would be no real scope for an Electricity Board, we feel that many of those who have advocated a Board are under the impression that control of generation by a Board, as in England, would limit generation more nearly to actual load requirements from time to time over wide areas and save stand-by plant and directly contribute to a lower cost per unit. We have in our survey of existing arrangements indicated that the present system itself provides for the gradual elimination of small and uneconomic stations.

On the evidence before us there is no idea of a Presidency-wide grid. Mr. Burkinshaw, Chief Engineer of the Madras Electric Supply Corporation, while admitting the disadvantages of small uneconomic stations and the benefit which the grid system in England has given to smaller undertakings has advised that the grid should be a gradual growth in this country, because of the very long transmission lines wanted to connect up the various large load centres which are very scattered and because of the complex problems raised by such lines which are not yet satisfactorily solved even in England and the more advanced Western countries. The Licensees' Association has remarked that conditions in Great Britain or South Africa do not exist in India, e.g., density of population, large bulk consumers such as mining companies, railways, etc., and that even a "grid" system is not likely to prove economical. Many witnesses however have advocated the division of the Presidency into convenient units or areas each with an independent main generating centre and transmission system and not a few think some of these may eventually be linked up in a grid, power being transmitted over as large an area as may be economically possible. We have already indicated that in our opinion that is the policy which should be kept in view.

35. The Chief Engineer for Electricity has himself, for purposes of planning, divided the Presidency into some nine power areas including the Madras area, Pykara and Mettur and other possible hydro-electric systems and large thermal schemes. It is intended that Mettur and Pykara shall be interconnected so as to supplement each other.

As regards Madras also, the Chief Engineer seems to envisage a situation in which the existing Supply Corporation would continue to generate power from its power station which would be declared a selected station, and the Board would purchase power from the Corporation to supplement its own power stations or direct other authorized undertakers to buy power from the Corporation. He has stated in his report on the Mettur Hydro-Electric Scheme that these three power areas (Pykara, Mettur and Madras) "will operate together and there will be a constant interchange of power to conform to the load and water conditions of each power system so that each generating plant may be operated to the best advantage. Furthermore, in an emergency, any plant may supplement the generation of the others."

If a grid is regarded as a system of transmission lines which link up selected generating stations for operation with each other and with the distribution systems of other electrical undertakings, which appears to be the meaning attached to it in England in connexion with the Electricity Board there, Mettur and Pykara or Mettur, Pykara and Madras would serve as a grid for a great part of South India. For the rest, however, there is no immediate prospect of anything more than a few large stations, each with a fairly extensive network of transmission lines, which some witnesses would call grids but which would not, at least for a long time to come, have the advantage of interlinking.

36. It is no doubt true that England with a large number of selected stations and a number of super stations where energy was generated by different agencies, required, if these were to be connected up and their output controlled, pooled and transmitted to the best advantage not only of the generating stations but also of the distributing licensees, a Board not only to act as a clearing house but to provide the interconnecting lines and manage the whole business. Circumstances are different in this Presidency where the existing system already, to a great extent, enables small uneconomic stations to be closed down and bulk supply to be given to distributing licensees from larger stations, and we have recommended that Government's hands should be strengthened for that purpose. Unless private enterprise is forthcoming to start really large generating stations, of which there appears to be no great prospect, it seems that the present trend of development is towards several large Government stations, hydro-electric and thermal, Madras being the only large private station

not likely to be absorbed by a bigger one giving bulk supply. With all the large stations but one operated by the same agency the case for an Electricity Board for the purpose purely of interlinking these stations and controlling and operating a grid or grids is, in this Presidency, less strong than it was in England. If, as is claimed, one of the main advantages of the Electricity Board in England was the linking up of power stations, then that advantage cannot be expected in this Presidency.

Expectation of lower rates with management by a Board.

37. Many witnesses have urged before us that rates are too high. Mr. Seshasayee for example has urged that he could generate power as cheaply at Trichinopoly as Government could supply him with hydro-electric power there. Other witnesses have urged that Government ought to be able to supply energy for well pumps at 5 of an anna per unit as in Mysore instead of at one anna. And there is a general feeling all round that lower rates would encourage consumption. It might in this connexion be pointed out that if Government could distribute all their hydro-electric power within a comparatively compact area their rates would naturally be lower but the factor of long transmission lines from district to district cannot be ignored. Since Pykara started operation in 1933, high tension rates have been reduced four times and low tension rates also four times and the question of further reduction is under consideration. The rates are already much lower than those contemplated in the Project Report, a result that has only been achieved because load expectations have been greatly exceeded.

There is an impression that Government have already made considerable profits from their electrical enterprises which have gone to the general exchequer to the advantage of the tax-payer and the prejudice of the consumer. It is true that the *gross* revenue from the Pykara system has been very satisfactory, the actuals in 1934-35 being just over Rs. 10 lakhs while in 1936-37 they are expected to be just over Rs. 20 lakhs but it must be remembered that no interest is yet being paid on the capital sum at charge as interest, in accordance with the usual procedure, will be capitalized and added to the capital sum at charge at the tenth year. If interest was paid annually, as in the case of a private licensee, it would considerably reduce the gross revenue. Again, in accordance with the practice of most hydro-electric organizations developing new territory.

depreciation on plant and machinery is not provided in the first five years of operation but only from the sixth year onward. To compensate for this the expected life of the plant and machinery is shortened by five years for the purpose of calculating depreciation. If depreciation were allowed from the beginning, as in the case of private licensee, again the gross revenue would be considerably reduced. If due weight is given to these considerations it is obvious that the Pykara Hydro-electric System, though definitely successful, is not yet a source of substantial profit.

The forecast prepared by the Accountant-General in connexion with the Appropriation Accounts for 1934-35, from the information furnished by the Electricity Department, and printed as appendix III to this report indicates that if arrears of simple interest were paid the return expected at the end of 1936-37 is just over 8 per cent. If depreciation also was allowed starting from the fourth year only at the appropriate rate obtained by shortening the life of the plant by three years, the return would not be much over 6 per cent. In this connexion also it must be remembered that the gross revenue estimate up to 1936-37 includes the revenue from Salem, Trichinopoly and Tanjore districts. From about the middle of 1937 this revenue will be transferred to the Mettur system. Though load in Madura, Dharapuram, Dindigul, etc., on the Madura line will come in, it remains to be seen whether it will immediately compensate for all the load transferred. It is obvious therefore that at present the position would not justify drastic reduction of rates and the facts do not support the suggestion that Government by retaining generation and bulk distribution in their own hands are preventing a great expansion of the electrical industry with low tariffs.

38. Opinions naturally differ on the question whether the transfer of the existing Government generating stations and transmission systems or those likely to be completed before a Board could be established would make generation cheaper and enable tariffs to be reduced. Those who think it would, consider that new systems could also be constructed and operated more cheaply by a Board. Those who doubt this feel that the usual type of business requiring close knowledge of markets of supply and demand, judgment of when to buy and when to sell, a constant adjustment of prices and immediate decisions on all these matters is different from the business of supplying electricity.

Statutory Board not recommended at present.

39. On the main question of principle whether a Statutory Board is desirable or not in the present circumstances of this Presidency or in the near future we are divided in opinion, although with a view to eliminate some causes of difference of opinion we agreed to leave the type of Board vague and to predicate simply extensive powers of management.

Those of us who think a Board is unnecessary consider that we are justified in looking to the circumstances in Great Britain before the time of the Williamson report and which eventually dictated the necessity first for Electricity Commissioners, and eventually for an Electricity Board. We find that the main features there were—

- (a) parochial and uneconomic stations ;
- (b) difficulty in linking up and interchange owing to varying pressures and frequencies ;
- (c) absence of authority to ensure the best system being adopted by local authorities, more regard being paid to financial stability than to efficiency and suitability ;
- (d) vital importance of cheap electricity for the industrial needs of an industrial country.

In view of various facts and opinions referred to in this report we do not consider that the limited extent to which these circumstances can be said to exist in this Presidency would justify us at the present time in recommending a relatively expensive form of administration and one for which we think it would be very difficult for some years to come to find a suitably qualified personnel. We consider that the main conditions governing a cheap supply of electricity enumerated by the Williamson Committee in England, namely,—

- (1) combined generation within suitable areas ;
- (2) well-situated stations having regard to condensing water, fuel, and distance from consumers ;
- (3) modern and large units of generating plant ;
- (4) uniform standards of system, frequency and pressure, so far as now practicable ;
- (5) greater freedom for overhead wires and wayleaves ;
- (6) good technical and business management ;
- (7) adequate and cheap capital,

are already in process of being achieved in this Presidency and that the association of business experience with

Government management can for the present at least be secured less expensively by means of an Advisory Board. Further, while admitting that arrangements could be made for part of the profits of a Statutory Electricity Board to be diverted to general revenues, we consider that that is hardly in keeping with the fundamental principle of such a Board and that we would not be justified in recommending to a future Government a course of action which should logically deprive it of an expanding source of revenue. This would not of course preclude a future Government from initiating such a measure itself.

Those of us who think a Board is desirable are impressed by the fact that many progressive countries have formed Boards or Commissions to manage such a public utility service and by the general arguments in favour of management of a commercial concern on business lines and in varying degrees by the political arguments. We feel that the objections to such a proposal raised in certain quarters are uninformed and based on unfounded suspicions. We also consider that, though the conditions of the electricity industry in England which necessitated the constitution of the Central Electricity Board do not all exist now in this Presidency, they do not exhaust the grounds in support of the formation of such a Board and that the circumstances which exist to-day in this Province, the developments that are in prospect and the great assistance to the expansion of industries and to the improvements of social amenities, which electrification is bound to give are sufficient proof of the need for a Board composed of technical, business and administrative experts for efficient planning, construction and operation.

We are, however, as a Committee in full agreement that a Statutory Board may be desirable at some future date and we recommend that Government should not lose sight of that possibility. We consider it unnecessary, however, in the circumstances to express any opinion on the constitution and powers of such a body, regarding which we find there is great diversity of opinion.

Advisory Board recommended.

40. While we do not, for the reasons we have explained, advocate the formation of a Statutory Electricity Board at present, we recommend that the powers of the Local Government under section 35 of the Indian Electricity Act, 1910 (as amended) should now be exercised and that an Advisory Board should be formed which could

make recommendations to Government on various matters connected with the work of the Electricity Department. Apart from suggesting that business knowledge and experience should be represented on the Advisory Board, we refrain from suggesting what its constitution should be, particularly as we understand that it is possibly because sub-section (3) of the Indian Electricity Act [before it was omitted by the Indian Electricity (Amendment) Act, 1922], laid down in some detail the constitution of such Advisory Boards, that no such Board has ever been formed. We also refrain from suggesting in any detail the matters on which the Advisory Board should be competent to advise but we consider the field should in any case be much wider than the matters referred to in sections 36 (3) and 38 (3) and clause XI of the Schedule of the Act. We consider that the recommendations of a suitable Board would carry great weight and would be of great assistance to Government in matters of policy, rates and conditions of service of staff, and it might also be in a position to advise as to the lines on which a self-contained and simplified Account Code for the Electricity Department might be drafted. It might also make recommendations in such matters as the installation of small motors for trade purposes in towns and panchayat areas, where the Chief Engineer complains that the policy and rules of the Local Self-Government and Public Health Departments result in harmful restriction of electrical development.

Other recommendations.

41. There is another matter on which a recommendation might with advantage be made. The Electrical Inspector to Government was a separate officer working directly under Government until his department and the Hydro-electric department were merged into the Electricity department. The Electrical Inspector now works under the Chief Engineer who as Electrical Inspector to Government has a considerable amount of work devolving on him, much of it now of a post office character, which distracts his attention from more important work which has to receive his personal attention. We feel that there is something to be said for a proposal made by the Chief Engineer that the Electrical Inspector might again be separated from the Chief Engineer and made a Commissioner with the rank of Superintending Engineer.

His main duties would be to administer the Indian Electricity Act and the Municipal Service of Electrical

Engineers. He would have nothing to do with the execution work of the department particularly in regard to schemes for electrical development, technical details, etc., but should co-operate with it in questions affecting tariffs and of general interest in the electrical industry. His activities would in general be confined to the regulation of profits and tariffs and the general control of private licences, inspection of industrial installations, possibly standardization and calibration of meters, and arbitration in disputes. He could, however, advise the Minister in charge on general electrical engineering subjects, if required.

42. We do not feel that we are in a position to make further recommendations except in the matter of certain difficulties to which the Chief Engineer for Electricity has referred in connexion with the present system of Government management. As has been already indicated he seems to be prepared to change his view that a Board is necessary, or is at least prepared to admit that Government commercial undertakings can be managed and administered with greater efficiency than at present, if some of the administrative restrictions with which all Heads of Departments have to contend are removed and if the rules for the recruitment of officers and establishment are simplified. In view of what has been pointed out in paragraphs 11, 12 and 13 above we do not think there has been any real impediment to development or to the carrying out of schemes as a result of the financial procedure which is necessarily applicable to a Government department. Money has been freely forthcoming in good time for every sound scheme put up and considerable sums have in fact been surrendered in past years because schemes were not ready or were dropped on further examination or because work did not proceed as fast as was expected due to contractors' delays or other reasons. We have no recommendation to make in this connexion.

43. In the matter of accounting and audit procedure we understand that the necessity of maintaining the accounts of the Electricity Department in accordance with the Public Works Department system, as the Auditor-General refused permission to maintain the accounts in a purely commercial form, has in the past been irksome.

The chief feature of that system is that the Divisional Officer (Executive Engineer) is in direct charge of all accounts, both receipts and expenditure. He is assisted by a Divisional Accountant posted by the Accountant-General from his staff, the Accountant being paid by the

provincial Government. He is responsible to the Accountant-General for pre-auditing the bills and for the submission of various forms prescribed by the Public Works Department Code to the Accountant-General regularly, subject to the supervision and control of the Divisional Officer. The Chief Engineer felt, however, that the Divisional Officers and Subdivisional Officers of the Electricity Department should be relieved of accounting work and enabled to devote their time solely to the technical and commercial work of the department.

After two conferences in 1933 and 1934 it was finally decided that the Divisional Officers of the Electricity Department should be relieved of much of their accounting work, that a Chief Accountant of gazetted rank should be appointed for entire charge of accounts, and that the Accountant-General might post his Divisional Accountant for preparing the several forms of accounts and submitting them to the Accountant-General periodically. At the same time the Accountant-General undertook to simplify as far as possible the returns and periodicals to be submitted to him. Orders were accordingly issued in December 1934 in which the duties of the Chief Accountant and the Accountant-General's Divisional Accountant were definitely fixed.

The result is that the accounts of the Pykara and thermal systems are now maintained in commercial form, in addition to being maintained separately according to the Public Works Department system in some respects. The Chief Engineer has admitted in his Administration Report for 1934-35 that a complete set of commercial accounts is being maintained and that though it has not been possible to do away with the compilation of special accounts to suit the complicated Government audit system, and the large number of references from the Audit department, the Accountant-General has done everything possible to simplify the system. We doubt if in the circumstances anything more can be done except perhaps by way of compilation of a self-contained and simplified Account Code for the Electricity Department, a matter which we have suggested the Advisory Board might consider.

44. It seems possible, however, that the present system might be improved in the matter of recruitment of staff. Two of the official witnesses, Messrs. Green and Hood, have suggested that changes in the method of recruitment might be considered. To some extent the delay in recruiting

candidates for technical posts through the Services Commission to which the Chief Engineer has referred has been due to the difficulty of fixing qualifications for posts requiring various kinds of practical experience. The response to advertisements has in some cases necessitated a reduction in the standard of theoretical qualification in favour of practical experience. Regulations have recently been issued under the Madras Services Commission Act, 1936, which make consultation with the Services Commission no longer necessary for appointments to the Madras Electrical Subordinate Service, for promotion in the service or transfer from one Subordinate Service to another or for making any appointment, the terms of which are to be governed by contract. We think it may be assumed that there should be less difficulty and delay in future. The importance in a department like the Electricity department, of getting men with good qualifications and not merely the minimum academic qualification is obvious and possibly a service examination for admission to the Subordinate Service might provide a better type of candidate.

It might as an alternative be desirable to give the Chief Engineer power to engage men on contract on a temporary basis for periods up to say 18 months for construction work.

We are also of opinion that the probation and seniority rules are not altogether suitable for the Electricity department. The senior probationer in the Provincial Service or the seniormost in the Electrical Subordinate Service from which promotions are made, may not have experience in the special branch of work for which an Assistant Engineer is required. It would be better perhaps to make special and simpler rules and eliminate some of the reporting to and consultation with the Commission leaving the head of the department more authority.

Summary of recommendations.

45. Our chief recommendations briefly summarized are—

(1) That, although we do not advocate the creation of a Statutory Board at present, we are, as a committee, in full agreement that a Statutory Board may be desirable at some future date and we recommend that Government should not lose sight of the possibility of such a Board being formed (paragraph 39).

(2) That an Advisory Board should be set up as soon as possible with as wide a scope as possible (paragraph 40).

(3) That a policy of steady expansion should be pursued by Government and promising large schemes taken up, especially if they exploit natural resources (paragraph 25).

(4) That generation and bulk supply should be, as far as possible, by a series of large central Government stations (paragraph 25).

(5) That, subject to certain provisos, local bodies should be preferred to private companies as licensees for distribution and in certain cases for generation also (paragraph 25).

(6) That where there is no licensee in a position to do it satisfactorily, Government should undertake schemes for rural distribution provided a certain prescribed standard of gross return is satisfied (paragraph 25).

(7) That powers should be taken to enforce closer control over licensees in certain matters (paragraph 26).

(8) That power should be taken by Government to enforce the closing down of small uneconomic stations when bulk supply becomes available (paragraph 17).

(9) That the Electrical Inspector should again be separated from the Chief Engineer for Electricity and made a Commissioner with appropriate rank and wider responsibility (paragraph 41).

(10) That the question of drafting a simplified and self-contained Account Code for the Electricity Department should be taken up (paragraph 43).

(11) That methods of recruitment and promotion of technical staff should be examined with a view to modification where necessary (paragraph 44).

K. V. REDDI (*Chairman*).

W. O. WRIGHT.

N. GOPALASWAMI.

G. G. ARMSTRONG.

C. E. JONES.

S. K. KRISHNA YACHENDRA.

C. S. RATNASABAPATHI MUDALIYAR.

T. M. MOIDOO.

W. SCOTT BROWN (*Secretary*).

We desire to express to our colleague and Secretary to the Committee, Mr. Scott Brown, our great indebtedness for the valuable assistance that we have received from him. But for the able and speedy manner in which he helped us in preliminary arrangements, in analysing the evidence, in marshalling the facts and in preparing the draft report we would not have been able to consider and sign this report in such a short time.

K. V. REDDI (*Chairman*).

W. O. WRIGHT.

N. GOPALASWAMI.

G. G. ARMSTRONG.

C. E. JONES.

S. K. KRISHNA YACHENDRA.

C. S. RATNASABAPATHI MUDALIAR.

T. M. MOIDOO.

STONEHOUSE HILL, THE NILGIRIS,
6th June 1936.

APPENDIX I.

(Referred to in paragraph 3 under Thermal Stations.)

Statement showing the electric licences granted in the Presidency.

A. Companies.

Serial number and name of licence.	Year of grant of licence.	Year of commencement of supply.	System of supply.
1 The Madras Electric Licence.	1905	1908	D.C. 450/225 volts for a small portion of the city which was electrified prior to 1915 and the rest A.C. 400/230 volts. 3-phase 50 cycles.
2 Cochin Electric Licence ..	1921	1925	A.C. 400/230 volts 3-phase 50 cycles.
3 Devakottai Electric Licence.	1924	1924	D.C. 460/230 volts.
4 Trichinopoly-Srirangam Electric Licence.	1925	1927	A.C. 400/230 volts 3-phase 50 cycles.
5 Rajahmundry Electric Licence.	1925	1929	Do.
6 Kanadukathan Electric Licence.	1926	1928	A.C. 400/230 volts 3-phase 50 cycles, but a small portion of area is served by D.C. 400/230 volts.
7 Nattarasankottai Electric Licence.	1927	1932	A.C. 400/230 volts 3-phase 50 cycles.
8 Calicut Electric Licence ..	1927	1929	Do.
9 Karaikudi do. ..	1928	1930	Do.
10 Vellore do. ..	1929	1931	Do.
11 Kumbakonam do. ..	1930	1932	Do.
12 Mangalore do. ..	1930	1933	Do.
13 Guntur do. ..	1930	1932	Do.
14 Nellore do. ..	1930	1934	Do.
15 Tinnevely-Turicorin Electric Licence.	1930	1933	Do.
16 Proddatur do. ..	1930	1936	Do.
17 Okkur Electric Licence ..	1930	1935	Do.
18 Salem-Erode do. ..	1931	1933	Do.
19 Palghat do. ..	1932	1933	Do.
20 Tirumalai-Tirupati Electric Licence.	1932	1932	Do.
21 Chittoor Electric Licence ..	1932	1935	Do.
22 South Arcot do. ..	1933	1934	Do.
23 Negapatam do. ..	1933	1935	Do.
24 Vizagapatam do. ..	1933	1934	Do.
25 Mayavaram-Mannargudi-Tiruvavur Electric Licence.	1933	1935	Do.
26 Ellore Electric Licence * ..	1935	..	Do.
27 Adoni do. * ..	1935	..	Do.
28 Ambur-Vaniyambadi Electric Licence.*	1935	..	Do.
29 Gudiyattam Electric Licence.*	1935	..	Do.
30 Bobbili do.*	1935	..	Do.
31 Chingleput do.*	1935	..	Do.
32 Gudivada do.*	1936	..	Do.
33 Ongole do.*	1936	..	Do.
34 Narasaraopet do.*	1936	..	Do.

* Not yet commenced construction.

Statement showing the electric licences granted in the Presidency—cont.

Serial number and name of licence.		Year of grant of licence.	Year of commencement of supply.	System of supply.
B. Municipal Councils and Panchayat Boards.				
1	Bellary Electric Licence ..	1921	1924	A.C. 400/230 volts 3 phase 50 cycles.
2	Ootacamund do. ..	1921	1924	Do.
3	Madura do. ..	1923	1928	Do.
4	Bezwada do. ..	1927	1930	Do.
5	Cocanada do. ..	1927	1929	Do.
6	Kurnool do. ..	1928	1930	Do.
7	Masulipatam do. ..	1929	1932	Do.
8	Hindupur do. ..	1929	1930	D.C. 460/250 volts.
9	Coonoor do. ..	1929	1929	A.C. 400/230 volts 3 phase 50 cycles.
10	Tanjore do. ..	1929	1929	Do.
11	Conjeeveram do. ..	1931	1931	Do.
12	Sembiam do. ..	1930	1930	Do.
13	Tiruppur do. ..	1932	1933	Do.
14	Pollachi do. ..	1932	1933	Do.
15	Coimbatore do. ..	1933	1933 *	Do.
16	Virudunagar do. ..	1933	1934	Do.
17	Dindigul do. ..	1933	1934	Do.
18	Hospet do. ..	1933	1935	Do.
19	Tiruvottiyur do. ..	1933	1934	Do.
20	Palni do. ..	1934	1934	Do.
21	Karur do. ..	1934	1935	Do.
22	Alandur do. ..	1934	1935	Do.
23	Periyakulam do. ..	1935	1935	Do.
24	Bodinayakkanur do. ..	1935	1935	Do.
25	Udamalpet do. ..	1935	1935	Do.
26	Villivakkam do. † ..	1935	..	Do.
27	Tiruvallur do. † ..	1935	..	Do.

* Supply actually commenced in October 1932, but licence was given only in 1933.

† Under construction.

APPENDIX II.

(Referred to in paragraph 11.)

ELECTRIC SUPPLY UNDERTAKINGS.

Statement showing capital, area of supply, plant installed and units produced.

A. Companies.					
Name of the undertaking.	Area of supply.	Capital invested.	Loan.	Installed capacity.	Units generated.
(1)	(2)	(3)	(4)	K.W. (5)	(6)
1 The Madras Electric Licence.	Madras City and about 30 miles around.	Rs. 1,86,89,594	Rs. Nil.	37,500	38,889,661
2 The Cochin Electric Licence.	British Cochin ..	1,68,497	2,15,178	72	116,946
3 The Devakotah Electric Licence.	Devakotah and 5 miles round it.	2,17,936	Nil.	158	175,558
4 The Trichinopoly-Srirangam Electric Licence.	Trichinopoly and Ialgudi taluks.	11,86,895	3,50,000	1,212	3,107,000
5 The Rajahmundry Electric Licence.	Rajahmundry and Dowlaishwaram.	3,37,831	1,10,000	436	337,831
6 The Kanadukathan Electric Licence.	North, Pudukkottai boundary; east, Tanjore district; south, 10-5 latitude; west, 70-5 longitude.	4,45,160	57,000	273	181,882
7 The Nattarasankottai Electric Licence.	Nattarasankottai and Sivaganga.	2,03,628	1,05,400	120	112,826
8 The Calicut Electric Licence.	Calicut and a few miles around it.	4,00,000	Nil.	680	438,000

Statement showing capital, area of supply, plant installed and units produced—cont.

Name of the undertaking.	Area of supply.	Capital invested.	Loan.	Installed capacity. K.W.	Units generated.
(1)	(2)	(3)	(4)	(5)	(6)
A. Companies—cont.					
9 The Karaikudi Electric Licence.	North, 10-5 ; south, 10 ; west, 78-40 ; east 78-50.	Rs. 2,71,301	Rs. Nil.	200	257,007
10 The Vellore Electric Licence.	Vellore and six miles radius from the Power House.	3,37,695	80,000	500	327,114
11 The Kumbakonam Electric Licence.	Kumbakonam and Papanasam taluks and a portion of Tanjore taluk.	3,87,226	Nil.*	490	443,897
12 The Mangalore Electric Licence.	Mangalore and 5 miles around.	6,65,485	Nil.	750	452,083
13 The Guntur Electric Licence.	Guntur, Tenali, Bapatla and Repalle taluks.	4,76,543	2,00,000	350	383,290
14 The Nellore Electric Licence.	Nellore and 3 miles around.	1,70,664	1,00,000	248	80,671
15 The Tinnevely-Tuticorin Electric Licence.	Tinnevely-Palamcottah and Tuticorin and 5 miles on either side of their line from Tuticorin and Palamcottah.	11,49,314	Nil.	1,100	460,440
16 The Proddatur Electric Licence.	Proddatur and a few miles around.	50,000	Nil.	96	[Supply commenced in January 1936.
17 The Okkur Electric Licence.	Okkur and six other villages in Ramnad district.	1,69,113	50,000	90	Supply commenced in December. 750,000
18 The Salem-Erode Electric Licence.	Salem town and 6 miles round it and a small portion of Salem taluk and Erode town.	5,42,905	Nil.	1,075 K.V.A.	123,846
19 The Palghat Electric Licence.	Palghat town ..	1,31,657	26,238	150 K.V.A.	201,519
20 The Tirumalai-Tirupati Electric Licence.	Tirupati town, Tirumalai Hills and a small area around Tirupati.	6,11,728	Nil.	384	100,000
21 The Chittoor Electric Licence.	Chittoor and 5 miles around.	1,00,000	20,336	96	300,000
22 The South Arcot Electric Licence.	Villupuram, Chidambaram and Cuddalore taluks.	4,00,000	1,00,000	400	..
23 The Negapatam Electric Licence.	Negapatam town and water-works.	1,13,997	Nil.	1,075	150,000
24 The Vizagapatam Electric Licence.	Vizagapatam and 6 miles around.	1,56,073	Nil.	240	100,000
25 The Mayavaram-Mannargudi-Tiruvavur Electric Licence.	Mayavaram, Mannargudi and Tiruvavur taluks.	4,43,000	Nil.	800 K.V.A.	2,78,26,242
				<u>46,495</u>	<u>47,579,641</u>
26 The Ellore Electric Licence.†	Ellore and 5 miles around.	2,60,000	Nil.	500	Roughly 10 lakhs for all the items under construction—viz., items 26 to 34.
27 The Adoni Electric Licence.†	Adoni and 5 miles around.	2,00,000	Nil.	200	
28 The Ambur-Vaniyambadi Electric Licence.†	Portion of Tirupattur and Gudiyattam taluks.	4,00,000	Nil.	200	
29 The Gudiyattam Electric Licence.†	Portion of Gudiyattam and Vellore taluks.	3,00,000	Nil.	200	
30 The Bobbili Electric Licence.†	..	2,00,000	Nil.	150	
31 The Chingleput Electric Licence.†	Chingleput and 5 miles around.	1,50,000	Nil.	150	
32 The Gudivada Electric Licence.†	Gudivada and 2 miles around.	1,00,000	Nil.	100	
33 The Ongole Electric Licence.†	Ongole and a few miles around.	1,00,000	Nil.	100	
34 The Narasaraopet Electric Licence.†	Narasaraopet and a few miles around.	1,00,000	Nil.	100	

* The company has obtained permission to raise debenture.

† Not yet commenced construction. The figures indicate rough estimates.

Statement showing capital, area of supply, plant installed and units produced—cont.

Name of the undertaking.	Area of supply.	Capital invested.	Capital borrowed.	Installed capacity K.W.	Units generated.
(1)	(2)	(3)	(4)	(5)	(6)
B. Municipal Councils and Panchayat Boards.					
		RS.	RS.		
1 The Bellary Electric Licence.	Municipal and Cantonment limits.	3,72,282	1,84,000	273	377,194
2 The Ootacamund Electric Licence.	Ootacamund, Coonoor and St. George's Homes, Ketti.	6,42,042	4,75,000	1,200K.V.A.	541,818
3 The Madura Electric Licence.	Municipal limit	8,72,642	10,00,000	1,125	1,478,539
4 The Bezwada Electric Licence.	Do. ..	4,59,432	5,62,985	163	603,517
5 The Cocanada Electric Licence.	Do. ..	4,10,866	4,05,000	450	405,759
6 The Kurnool Electric Licence.	Do. ..	2,79,819	4,00,000	235	315,784
7 The Masulipatam Electric Licence.	Do. ..	2,92,377	3,25,000 *	160	194,619
8 The Hindupur Electric Licence.	Do. ..	1,40,670	1,33,000	60	61,263
9 The Coonoor Electric Licence.	Do. ..	1,77,741	1,72,000	350K.V.A.	164,100
10 The Tanjore Electric Licence.	Do. ..	3,65,370	2,90,000	250	527,466
11 The Conjeeveram Electric Licence.	Do. ..	2,50,000	2,50,000	350	290,473
12 The Sembiam Electric Licence.	Do. ..	1,12,830	22,000	80	173,245
13 The Tiruppur Electric Licence.	Do. ..	1,47,591	1,93,000	500K.V.A.	761,590
14 The Pollachi Electric Licence.	Do. ..	1,68,671	1,55,700	460	454,342
15 The Coimbatore Electric Licence.	Do. ..	4,75,072	5,00,000	700	1,048,711
16 The Virudunagar Electric Licence.	Do. ..	1,48,523	1,41,600	380	183,634
17 The Dindigul Electric Licence.	Do. ..	1,09,705	1,00,000	380	163,680
18 The Hospet Electric Licence.	Do. ..	1,00,000	1,10,000 †	985	..
19 The Tiruvottiyur Electric Licence.	Do. ..	16,014	20,000	150	50,840
20 The Palni Electric Licence.	Do. ..	50,000	38,000	135K.V.A.	50,180
21 The Karur Electric Licence.	Do. ..	96,000	96,000	..	Not known.
22 The Alandoor Electric Licence.	Do. ..	50,000	55,000	200K.V.A.	100,000
23 The Periyakulam Electric Licence.	Do. ..	77,500	77,500	95	100,000
24 The Bodinayakanur Electric Licence.	Do. ..	60,500	60,500	70	75,000
25 Udamalpet ..	Do. ..	63,000	63,000	..	..
26 The Villivakkam † Electric Licence.	Do. ..	25,000	25,000	100K.V.A.	..
27 Tiruvallur Electric † Licence.	Do. ..	75,000	50,000	..	..
		58,75,647	57,25,285	9,241	8,196,724

* Rs. 75,000 from Government and Rs. 250,000 from the Kistna District Board.

† From the Kurnool District Board.

Under construction.

Government of Madras

PUBLIC WORKS DEPARTMENT

(Electricity)

G.O. No. 1353, 9th June 1936

Electricity—Committee appointed to investigate and advise on questions relating to electricity—Report published.

READ—the following papers :—

I

G.O. No. 2436 W., dated 12th November 1935.

II

From the Secretary, Madras Electricity Board Committee,
dated 6th June 1936.

Order—No. 1353, P.W.D. (Electricity), dated 9th June 1936.

The Committee appointed in G.O. No. 2436 W., dated 12th November 1935, to enquire into and advise on questions connected with the electric supply industry in the Presidency has submitted its report. The report is published for information. The Government will examine the recommendations of the Committee and orders thereon will issue in due course, any matters requiring consideration being left to the Government under the Reformed Constitution.

2. The Government desire to place on record their appreciation of the care and thoroughness with which the Committee has conducted its investigation.

(By order of the Governor in Council)

W. SCOTT BROWN,
Secretary to Government.

To the Members of the Committee.
,, Chief Engineer for Electricity.
,, Director of Industries.
,, Finance Department.
,, Development Department.
,, Revenue Department.
,, Public Department.
,, Accountant-General, Madras.
,, Legislative Council Library.

Press.