

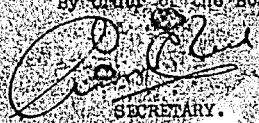
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THE EAST AFRICAN POWER AND LIGHTING COMPANY LIMITED.

CONFIDENTIAL.

Memorandum on the Question of the Future Supply of Electricity to Nairobi and District and the Necessity of an Extension of Licences in this Area submitted for the information of the Committee appointed by the Government of Kenya to advise them on this subject.

By Order of the Board.



SECRETARY.

CONFIDENTIAL.

MEMORANDUM ON THE QUESTION OF THE FUTURE  
SUPPLY OF ELECTRICITY TO NAIROBI AND DISTRICT.

1. A communication, together with relevant appendices, dated the 22nd October, 1935, addressed to the Honourable the Colonial Secretary which sets out in detail the reasons why this Company is at this stage applying for an extension of its Nairobi licences is attached to this memorandum for the information of the Committee. (Appendix I).

This communication in brief deals with the following subjects:-

- (a) The proposed exchange of land for that which will be flooded if the Tana scheme is proceeded with.
- (b) The capital expenditure involved.
- (c) The difficulty of financing this expenditure under existing conditions of the licences.
- (d) The necessity of applying for extension of licences at this stage.
- (e) The urgency of an early decision.

2. This memorandum has been prepared to amplify the above and to justify the contentions of this Company on the following major points :-

- (1) The urgent necessity of providing additional generating plant to meet the growing electricity requirements of the Nairobi area.
- (2) The desirability of the development of the power reach on the Tana River immediately upstream of its confluence with the Maragua River, for the purpose of supplying these requirements.
- (3) The difficulties of financing a scheme of this magnitude under the conditions of the Company's existing licences.
- (4) The effect of adopting an alternative scheme for augmenting the existing generating plant capacity.
- (5) The Company's answer to sundry criticisms.

SUNDRY CRITICISMS.

3. For the sake of clarity it is proposed in the first place to deal with item (5).

Although it is hardly the purpose of this memorandum to reply to the mass of unsubstantiated criticisms that have appeared in the press it is considered desirable to deal with

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major points which have come under discussion, i.e.,

- (a) Tariffs.
- (b) Exclusive Distributing Licence.
- (c) Period of Licences.

4. (a) Tariffs. In Great Britain rates and methods of charge are controlled by Government and it is apparently not generally realised that His Excellency the Governor in Council has similar powers in this Colony under Section 69(2) of the Electric Power Ordinance and that to assist him in his enquiries in these matters a licensee must prepare annual accounts and statistics in a form prescribed by this Ordinance. The two relevant sections of the Ordinance are given in Appendix II.

5. It may be appropriate to state here that at a recent meeting at the Secretariat the Postmaster General, to whom have been delegated the powers of the Governor under the Electric Power Ordinance, stated that "He had no quarrel with the Company's rates."

6. A schedule of the average rate for various classes of supply is given in Appendix III from which it will be noted that the average rate fell from 49.8 cents per unit in 1924 to 19.3 cents per unit in October 1935.

7. A further examination of this Appendix will show that the average rate for lighting, cooking and heating in October 1935 was 37.8 cents or 4.54c per unit and that the average rate for power for the same month was 13.5 cents or 1.62c per unit.

8. For the purpose of comparison the following information has been extracted from the 1932/33 Return of the Electricity Commissioners of Great Britain - the latest return available at this date. Included in a total of 644 Undertakings supplying electricity for lighting, cooking and heating purposes are no less than 256 Undertakings whose average return from consumers of this class was 4c. or over, and 5c. or over in the case of 167. In the case of power supply for 600 Undertakings the average return for 28% was 1.5c. or over and 2c. or over in the case of 193. A copy of the Return referred to is available for perusal by members of the Committee if they should so desire.

9. The following remarks will help to demonstrate the vast difference between conditions in Great Britain and Kenya.

10. The very scattered nature of the demand for electricity in Nairobi and district necessarily results in an abnormally and unavoidable, high cost per unit in respect of maintenance and similar charges. The demand per square mile in Great Britain, including the comparatively sparsely inhabited areas of the Highlands of Scotland, according to the latest figures available, is 57 K.W., which compares with a figure of 2 K.W. in the case of the Nairobi area of supply.

11. The following is an extract from a discussion on "The Design of City Distribution Systems, and the Problem of Standardisation" which took place at the North-Western Centre of the Institute of Electrical Engineers at Manchester, 16th November, 1926 :-



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11. The following is an extract from a discussion on "The Design of City Distribution Systems, and the Problem of Standardisation" which took place at the North-Western Centre of the Institute of Electrical Engineers at Manchester, 15th November, 1926 :-

"The ....

"The reference to load densiting is very interesting, and in this connection some corresponding figures relating to the Manchester electricity supply system may be of interest. In the suburban residential areas (excluding undeveloped land and open spaces) the load density is about 1,800 k.w. per square mile. In the City the average density is about 35,000 k.w. per square mile, with a denser concentration, as high as 75,000 k.w. per square mile, in places."

The load density in the Nairobi Municipal Area is 47 k.w. per square mile.

12. The capital expenditure on the Nairobi distribution system to date amounts to over £240,000 which probably ranks as one of the highest in the world per unit sold but which will not be materially increased as the load develops. The position in regard to the latter improves from year to year and provided a sound policy of development is permitted a further gradual reduction in all rates must inevitably follow.

13. Considerable criticism has been directed to the maximum charge of 85 cents per unit for lighting but in examining this particular tariff consideration must be given to the fact that alternative charges are available to all residential consumers which result in an appreciable reduction of the average rate as consumption increases. For example, the average rate for a normal consumer utilising electricity for cooking purposes in addition to lighting etc. would be 15.5 cents per unit and to a consumer utilising electricity for water heating in addition to the above purposes the rate would fall to 7.2 cents per unit. Further the rate for small users is necessarily high in fairness to other consumers due to the fact that the following items of charges are constant for either small or large consumers :-

Meter reading and transport.

Maintenance of services.

Accountancy.

Collection.

Further, bad debts written off amount to a much higher percentage in the case of small consumers as compared with the larger consumers.

14. Without contravening the Electric Power Ordinance it is not possible for this Company to make a minimum charge as is done by the Municipality in the case of water supply and were this possible an appreciable reduction in the rate per unit could be made. This will be apparent from a perusal of Appendix IV which shows an analysis of the revenue from small consumers on this particular tariff.

15. Comparison has been made with the price per unit charged to small lighting consumers and that to large power consumers. Whilst it is impossible in a memorandum of this sort to deal adequately with the question of electricity supply costs and charges it will be appreciated that the following factors must be taken into consideration when fixing rates for different classes of consumers :-

- (a) Total connected load.
- (b) Maximum load of the class.
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- (b) Maximum load of the class.
- (c) Diversity factor within the class, i.e. the ratio of

- of the individual maximum loads to the class maximum.
- (d) The total "units sold" for the class.
  - (e) The diversity factor among all the classes supplied.
  - (f) The time incidence of the class maximum load in relation to that of the total maximum load.

Further due to the availability of types of drive other than electric it is essential that cost of power supply must be competitive and thus in some cases will not bear a true proportion of overheads, interest charges etc. It may be argued that a policy of developing a power load by virtue of such a course of action is prejudicial to the small consumer but this is not the case. The maximum demand of the primary power load occurs during the day and is approximately equal to the maximum demand of the residential consumers which occurs during the evening. Losses of power consumers which would inevitably follow an increase in rates must therefore react unfavourably in the long run on charges levied from small consumers if revenue interest and depreciation charges are to be met.

16. In 1928 the Chairman, Captain E.F. Ward, enquired of one of the Electricity Commissioners of Great Britain, his opinion as to whether the rates charged by this Company under all the circumstances were reasonable. After obtaining the requisite information for a decision of this variety he replied that in his opinion they were. This opinion was given as a strictly personal one and on the understanding that it would not be made public in view of his official position.

Copy of a letter confirming this opinion is attached to this memorandum, Appendix V.

Reference to Appendix III will show that since that year considerable reduction in rates has been effected.

It is submitted that taking into account all the circumstances the Company's rates in the Nairobi Area of supply are not unreasonable.

17. (b) Exclusive Distributing Licence: Considerable exception appears to have been taken to the fact that this Company holds an exclusive distributing licence in the Nairobi area but any legislation which permitted of more than one licensee operating in the same area would result in chaos and a very definite increase in generation, distribution and management expenses per unit sold and therefore would not be in the interests of anyone. The granting of exclusive licences to electric supply undertakings is a world wide practice to avoid duplication of generating plant, mains and staff.

18. Before issuing exclusive licences Government very rightly protects both the public and the licensee by means of appropriate legislation. The former is protected by virtue of the fact that the licensee is compelled to give supply under tariffs and methods of charge approved by Government and also, with reasonable safeguards, to provide a continuity of supply, failure of which may result in heavy penalties. The licensee enjoys the privilege, objected to by many, of being allowed by legislation to cease giving credit to those members of the public it serves by disconnecting the supply.

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The same so called privilege is of course accorded to every water, gas or electricity undertaking in the civilized world whether operated by private enterprise or under Municipal control.

19. (c) Period of Licences: The communication dated 22nd October, 1935, addressed to the Honourable the Colonial Secretary, which is referred to in the first paragraph of this memorandum, contains considerable independent evidence regarding the modern tendency to increase rather than decrease the period during which electricity undertakings financed by private enterprise are allowed to expand without the threat of compulsory acquisition by the Local Authority.

20. The Final Report of the Water Power Resources Committee, 1921, presided over by Sir John Snell, Chairman of the Electricity Commissioners of Great Britain, contained the following recommendation:-

"We recommend that licences to develop water powers should normally be granted for a period of 100 years. The State should, however, retain the right to terminate a licence at any time after the expiry of 60 years from the commencement of the licence period, provided that adequate notice be given. If the licensee retains possession for the full period of 100 years, we consider that the permanent or comparatively imperishable parts of the undertaking, such for example, as the dam, flumes, tail race, power-house structure, and other civil engineering works, should revert free to the State at the end of that period."

As an instance of the terms of modern Concessions the following are quoted:-

Palestine Electric Corporation Ltd.  
71 years with option to Government to purchase at expiry of 41 years.

Jerusalem Electric & Public Service Corporation Ltd.  
45 years with an option to extend for a further period of 16 years.

Burma Electric Supply Company Ltd.  
50 years from 1928.

Parak River Hydro-Electric Power Company Ltd.

and Bar ea Saloom & District Electric Supply Company Ltd.  
Both 80 years with option to Government to purchase at the expiry of 50 years.

Pangani Concession.

60 years with the option to the Company to extend for a further 15 and the right to Government to purchase the undertaking at the expiry of 50 years.

#### THE QUESTION OF URGENCY.

21. The opinion of technical officers of government qualified to give an opinion on the subject is that, due

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to deforestation, soil erosion and agricultural methods, the dry weather river flows of the Kenya rivers are diminishing. Records kept by this Company confirm this opinion and it is not safe to anticipate a considerable increase in the dry weather capacity of the existing hydro-electric stations even if there is an improvement in rainfall conditions as compared with the last few years. In October last, just prior to the commencement of the "short rains", it became necessary to curtail supply to plant estates during the day with consequent inconvenience and expense to the growers. This is a condition of affairs which must not only persist but become aggravated until such time as additional generating plant is in commercial service. The proposed development will take 3 years to complete so that even if the Company's application is granted immediately the increased generating capacity cannot be available until the latter part of the year 1938. A study of Appendix II which is attached to the communication to the Colonial Secretary referred to in the early part of this memorandum will show that there is a very considerable danger of it becoming necessary to curtail supply to primary power consumers as early as October next.

THE HOSE ECONOMIC SCHEME.

22. As far back as 1927 the London Managers of this Company investigated and reported on the best scheme to provide for the future electricity supply of Nairobi and district. They came to the conclusion that the only possible development, if economy and future requirements were taken into consideration, was that known as the Tarapur-Tana Scheme or the one now under consideration.

This conclusion is fully endorsed by the Consulting Engineers to the Crown Agents, Messrs. Preece, Cardew & Co., who in consultation with another well known firm of Consulting Engineers, Messrs. Goode, Wilson, Mitchell and Vaghjilias, made a report to the Crown Agents for the Colonies, dated the 16th March, 1935, the last paragraph of which reads as follows :-

"Briefly put we are of the opinion the scheme proposed on the Tana River by the licencees, so designed as to take advantage of the daily storage, is without doubt the proper and most economical method of meeting the growing demands for electricity in Nairobi and surrounding districts."

The full report of these Consulting Engineers is attached to this memorandum, Appendix VI.

THE QUESTION OF FINANCE.

24. On more than one occasion it has been stated at public meetings and in the press that this Company could quite easily raise the capital for the development under consideration even if the licences for which this development is to serve were liable to expire in 1947. It is

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25. It must be obvious that it would be most difficult to raise capital even at a discount under such circumstances, as to develop the proposed scheme the Company must expend a sum estimated by the Consulting Engineers to the Crown Agents to amount to £300,000. Of this amount £182,000; practically the whole of which would be spent locally, must be provided immediately and the balance before 1947 when the Company's existing licences expire. In the case of a hydro-electric scheme such as that contemplated, it is necessary to spend at the start the larger proportion of the total amount required for the ultimate development. This expenditure includes the cost of the dam, headworks, and canal which would have a life of over 100 years and these works would not be employed to their full capacity for at least another 25 years.

26. The development under consideration would thus deal with the requirements of the area for a considerable period after the end of 1947 but unfortunately the Company cannot increase over the growth of electricity sales up to the end of 1947. It will be sufficient to meet interest and amortisation charges on the new capital required and a considerable short-fall must be anticipated. In the normal course of business this shortfall during the early years would be met by an additional increase in business in subsequent years but it is suggested that the Directors of this or any other Company would be deserving of severe censure if they endeavoured to raise additional capital for a purpose of this sort without regard to making good these interest and amortisation charges.

27. The Company's London financial advisers have stated very definitely that due to the rapidly dwindling period of the Nairobi licences it will become increasingly difficult to raise capital for this development. In order that there could be no possible misunderstanding the opinion of a well known and eminent Consulting Engineer was obtained. A copy of his report, the original of which is in the Home Government, is attached, Appendix VII.

28. He says, inter alia :

"To summarise my views, I am of the definite opinion that the capital expenditure required to meet the growth of load in your area constitutes sufficient grounds for an application to be granted for an extension of your licence and that you should make such application forthwith and for a much longer period than twenty-five years. Failing the granting of your application, in my opinion your Company is not justified in proceeding with the expenditure now contemplated.

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26. The development under consideration would thus deal with the requirements of the area for a considerable period after the end of 1947 but unfortunately the Company cannot foresee that the growth of electricity sales up to the end of that year will be sufficient to meet interest and amortisation charges of the new capital required and a considerable shortfall must be anticipated. In the normal course of business this shortfall during the early years would be met by an additional increase in business in subsequent years but it is suggested that the Directors of this or any other Company would be deserving of severe censure if they endeavoured to raise additional capital for a purpose of this sort without regard to making good these interest and amortisation charges.

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THE ALTERNATIVE.

29. It will be appreciated from the arguments which have been put forward in this memorandum that it would not be possible for this Company to proceed with the Maragua-Tana Scheme without the extension of licences applied for.

30. The alternative is the supplementation of the existing generating plant from time to time by means of fuel units and this method of uneconomic and piecemeal development must continue until such time as a sufficiently long extension of licences is granted to permit of the financing of the scheme recommended by our London Advisers, Messrs. Balfour, Beatty & Co. Ltd., and endorsed by the Consulting Engineers to the Crown Agents.

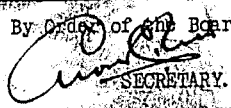
31. If this method of development is adopted it will be impossible to continue with the present programme of rate reductions due to the excessive cost of all types of fuel in Nairobi and district and the necessity of duplicating power station staffs. Further, as the actual cost of generation from this type of plant - apart from other charges - would exceed the average rate per unit which results from some of the lower tariffs it would be necessary to withdraw these during periods of the year when low river flow conditions necessitated running the fuel station.

32. The future effect of this alternative would be that when, at some later date, a sufficiently long term of licence is granted to permit of the financing and construction of the only possible scheme of economy and future requirements are taken into consideration, the then licensee will have on his hands a useless plant the cost of which must then necessarily be written off from revenue account.

CONCLUSION.

33. It is submitted that the foregoing arguments, supported by figures and statements all of which can readily be verified by the Committee, prove conclusively that the way in which the interests of consumers can best be served is the granting of this Company's present application which will enable it to proceed immediately with the construction of the Tana Hydro-Electric Scheme, and that negation on the part of Government entailing a piecemeal type of development must inevitably cause hardship to these consumers not only during the unexpired period of the licences but also for many years after the date of expiry irrespective of who the licensee is at that particular time.

By Order of the Board.

  
SECRETARY.

NAIROBI.

18th February, 1936.

THE ALTERNATIVE.

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By Order of the Board.

  
SECRETARY.

NAIROBI.

18th February, 1936.

THE EAST AFRICAN POWER AND LIGHTING COMPANY LIMITED

Stanley House,  
Hardinge Street,  
NAIROBI.

22nd October, 1935.

The Honourable,  
The Colonial Secretary,  
NAIROBI.

Sir,

MARAGUA-TANA HYDRO-ELECTRIC SCHEME EXTENSION

In conversations which have already taken place with you it has been made clear that the generating capacity of this Company's installations will, at an early date, be insufficient for the needs of the community residing around Nairobi and that an extension on the lines indicated by the consulting engineers to Government must be undertaken in the near future. I have, therefore, the honour to apply for the purpose, for the acquisition of approximately 1400 acres of land in the Kikuyu Native Reserve, the area in question being coloured blue on the attached plan.

The granting of this application is essential for the extension of the hydro-electric development known as the "Maragua-Tana Scheme", the first section of which was completed in 1933 and which utilizes the fall on the Maragua River in the vicinity of its confluence with the Tana.

For the required area in the Native Reserve the Company offers in exchange, subject to the sanction of Government, to such transfer, the following farms :-

L. O. No. 3492  
3493  
1964  
3494  
3495  
3496  
3516  
1986.

These farms, which are either owned or held on lease with the option/

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L. O. No. 3492  
3493  
1964  
3494  
3495  
3496  
3516  
1986

These farms, which are either owned or held on lease with the

option to purchase by this Company, are coloured in red on the plan which accompanies this application.

In the event of Government being prepared to place at this Company's disposal the following farms :-

L. O. No. 1983  
1984  
1985  
3514  
3515  
3517  
3518  
3519

the purchase price of which is in the opinion of Government and of this Company a fair and reasonable one, I am directed on behalf of this Company also to offer these farms. The area in question is shown bounded red on the attached plan, the net result of this land exchange will be the addition of approximately 2400 acres to the area of the Native Reserve since the above mentioned farms have a total area of over 3800 acres.

In addition and as further compensation I am directed to state that this Company would be prepared to construct a light traffic bridge across the Tana River at some suitable point between the westerly boundary of L.O. No. 1983 and the south-easterly boundary of L.O. No. 3519.

At the same time as making this present application I am approaching the Chairman of the Water Board with a view to obtaining the necessary water rights.

I am assuming that the necessary reference of this application to the Central Board and the Local Native Council should be made by you, rather than by the Company.

I am also instructed to bring to the notice of Government that, according to the estimate made by the consulting engineers, recently sent out by the Colonial Office to report on the scheme, it will eventually involve the Company in a total capital expenditure of approximately £300,000. During the last few years we have been repeatedly warned by

our/



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In addition and for further compensation I am directed to state that this Company would be prepared to construct a light traffic bridge across the Tana River at some suitable point between the westerly boundary of Farm No. 1983 and the south-easterly boundary of Farm No. 3519.

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I am assuming that the necessary reference of this application to the Central Board and the Local Native Council should be made by you, rather than by the Company.

I am also instructed to bring to the notice of Government that, according to the estimate made by the consulting engineers, recently sent out by the Colonial Office to report on the scheme, it will eventually involve the Company in a total capital expenditure of approximately £300,000. During the last few years we have been repeatedly warned by

our/

our London financial advisers that due to the rapidly dwindling period of the Nairobi licences, it will become increasingly difficult to secure on favourable terms the additional capital for this and other necessary developments of the undertaking which may arise from time to time. If permission were given immediately for the Company to proceed with the next stage of the development of the Maragua-Tana Scheme this would take approximately 2½ years to complete. Thus as the principal licence under which the Company operates expires in 1947 only 9½ years would be available to the Company to benefit from the increased capacity of the plant. This capital expenditure is being made for the increased output required during the unexpired period of the licence because of the necessity of constructing additional civil engineering works to permit of the ultimate development of the full capacity of the Tana River.

It will be quite obvious that any reasonable provision for the amortisation of the new capital involved would be absolutely impossible in view of the short unexpired period of the existing licences in the Nairobi area and this is particularly the case when it is remembered that substantial sums of this new capital have to be expended in 1936 and again as late as 1946, the present licences, as explained, expiring in 1947.

I have, therefore, the honour to request that you passu with this application for the land you will grant an extension of the various generating and distributing licences in the Nairobi area without which it would not be commercially possible to proceed with the development.

Section 2 of the Amending Ordinance of 1934, Sub-section (4) provides that -

Where the duration of a distributing licence is limited the Licensee may, within a period of not more than five years or such greater period as the Governor in Council

"may in any particular case permit) and not less than three years from the date fixed for the termination of the licence, make application to the Governor in Council for a renewal of such distributing licence. Such application shall be made after public advertisement in manner prescribed by Section 125 of this Ordinance.

It is clear that the raising of fresh capital upon a satisfactory basis is a matter of public importance as the interests of consumers are at stake; and we respectfully submit that it is a good and sufficient reason for the exercise of the powers granted by Ordinance to the Governor in Council to consider an application for renewal of licences at a date earlier than five years before their termination in order that the financial facilities required by the Company can be obtained.

10. The application I have therefore to submit on behalf of the Company (and which I intend to submit formally after publication of the requisite notices) is that the licences referred to be extended so that they expire in 1972 instead of 1947 and 1951 respectively.

11. If this application is approved by Government it will mean that the period of the principal licence - Distributing Licence No. 2 dated 27th March 1922 - will then total in all fifty years.

12. I have the honour to refer Government to modern practice in this respect and to the Distributing Licence which you have issued for the Nakuru, Eldoret and Kakamega Areas as well as to the licence periods of 50 years and 80 years respectively in the adjacent territories of Uganda and Tanganyika. It must also be remembered that this Company suffers serious disadvantages imposed by Section 19 of the Electricity Ordinance 1919 in relation to the right of the local authority to apply to take over any distributing licence at any time during the period of that licence and that Section 3, sub-section 1 of the Amending Ordinance 1934 which was

(signed/

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10. The application I have therefore to submit on behalf of the Company (and which I intend to submit formally after publication of the requisite notices) is that the licences referred to be extended so that they will expire in 1952 instead of 1947 and 1951 respectively.

11. If this application is approved by Government it will mean that the period of the principal licence - Distributing licence No. 2 dated 24th March 1922 - will then total in all fifty years.

12. I have the honour to refer Government practice in this respect and to the Distributing Licences which you have issued for the Nakuru, Eldoret and Kakusiga areas as well as to the licence periods of 50 years and 80 years respectively in the adjacent territories of Uganda and Tanganyika. It must also be remembered that this Company suffers serious disadvantages imposed by Section 19 of the Electricity Ordinance 1919 in relation to the right of the local authority to apply to take over any distributing licence at any time during the period of that licence and that Section 3, sub-section 1 of the Amending Ordinance 1934 which was

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11. If this Application is approved by Government, it will mean that the period of the principal licence - Distributing licence No. 2 dated 24th March 1922 - will then total in all fifty years.

12. I have the honour to refer Government's representative in this respect and to the District Commissioner's letter which you have issued for the Nakuru, Eldoret and Kakumega areas as well as to the licence periods of 50 years and 80 years respectively in the adjacent territories of Uganda and Tanganyika. It must also be remembered that this Company suffers serious disadvantages imposed by Section 19 of the Electricity Ordinance 1915 in relation to the right of the local authority to apply to take over any distributing licence at any time during the period of that licence and that Section 3, sub-section 1 of the Amending Ordinance 1934 which was

designed to relieve these disabilities has, due to provisos attached during its passage through Legislative Council, given this Company no relief whatsoever, although it removes the disability from any new licence which may be subsequently issued.

13. In support of this contention I have the honour to draw your attention to the fact that the Electric Lighting Act 1882, section 27, conferred upon the local authority within whose jurisdiction the area of supply was situate the right to compel the undertakers to sell their undertaking, or so much thereof as was within such jurisdiction, at the expiration of twenty-one years, from the passing of the Act confirming the undertakers' Provision ~~at the expiration of every subsequent period of seven years~~ this period, having regard to the terms of purchase ~~and to be top whort~~ to offer an installment to the investment of capital in electrical supply undertakings, and accordingly by Section 2 of the Electric Lighting Act 1888 the periods were altered, forty-two years being substituted for twenty-one years, and ten years for seven years; though shorter periods may be specified in any provisional or special order. I also enclose copies of two paragraphs taken from the Report of the Committee appointed to "Review the National ~~System~~ of the Supply of Electrical Energy" presided over by the Rt. Hon. Lord Weir of Eastwood in 1927 and commonly known as the Weir Report - Appendix 1. I have also to remind Government that owing to the delay experienced in obtaining permission to exchange farm lands for the 1400 acres of Native Reserve (herein re-applied for) this Company was forced in 1928 to spend about £26,000 upon an oil engined station in Nairobi, a capital expenditure uneconomic and unjustified in itself, which was necessarily forced upon this Company to ensure continuity of supply in any emergency/

-6-

emergency due to a drought.

14. I also beg to lay before you the attached statement of maximum demand and generating capacity - Nairobi area -

1934/1938. Appendix 2.

15. I have the honour to suggest, therefore, that the matter of obtaining permission to develop the Maragua-Tana Scheme is one of extreme urgency both to the consumers in this area and to this Company, negotiations in this respect having been commenced with Government as far back as 1927.

16. In conclusion, my Company trusts that these applications will receive the approval of Government at the earliest possible date in order to avoid penalizing consumers in this area under consideration on account of curtailment of electricity supply to a greater extent than may in any case be necessary, and I am directed also to emphasise the urgency of the position and to point out that if this Company cannot commence construction work on the proposed dam during the dry months of January, February and March 1936 construction must necessarily be postponed until the river falls sufficiently low to permit of work of this nature being carried out which would not be before the following September.

I have the honour to be,

Sir,

your obedient servant,

for THE EAST AFRICAN POWER  
AND LIGHTING COMPANY LIMITED.

J. H. ODAM.

GENERAL MANAGER.

ENCLS.



-6-

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Appendix 1.

Extract from Report of the Committee appointed to review the National Problem of the Supply of Electrical Energy.

Para. 68. DISTRIBUTION COMPANIES. - Turning to Distribution Companies, we find only one point in which we suggest that an alteration should be made. This relates to the purchase of undertakings by Local Authorities. Under the existing law any Local Authority may at the end of 42 years purchase the undertaking in its area on six months' notice, and this right recurs at the expiration of every subsequent period of 10 years. It appears to us that the possibility of purchase at such short notice has the effect of sterilizing the activities of the undertaker during the latter years of his franchise owing to his reluctance to sink capital in an undertaking which may be compulsorily purchased. We recommend that in the interests of electrical development the undertaker should be allowed to purchase in the following manner:-

- (a) The undertaker should have the right at any time within seven years of the end of his franchise to require the Local Authority to declare their intentions;
- (b) If the Local Authority fail to notify their intention within six months, or require unreasonable terms and conditions for the non-exercise of their powers, the Commissioners may by order suspend the right of purchase for such period as they think fit;
- (c) If the Local Authority declare their intention to purchase, they shall advance by way of loan such moneys as the undertakers may reasonably require for expenditure on capital accounts during the remaining seven years, and so assure the continued development of the undertaking.

Para. 77. SUPPLY COMPANIES

Under the existing system there are two types of company differing in certain essential respects. In the first place there are Power Companies endowed by Act of Parliament with powers limited in nature, but monopolistic and perpetual in tenure. In the second place there are Distribution Companies set up by Special Order with power to supply for all purposes, but over a restricted area and subject to purchase after 40 years. Neither type is wholly satisfactory, and in other parts of our Report we recommend various modifications which we believe will improve the position without unduly affecting existing rights and interests. We do not, however, regard the system even with the alterations we have suggested as ideal, and for the future, more especially so far as the new areas are concerned, we recommend as a substitution for both Power and Distribution Companies alike, a new type of Supply Company which will embody the more desirable principles of both. We recommend that Supply Companies should be created by Special Order so as to avoid the greater expense of a Private Bill, and should be authorised to supply for all purposes. The Company should be required to justify the area over which it asks for rights, but it should

Para. 77. (Cont'd).

be the policy of the Commissioners to encourage applications for wider rather than more restricted areas. So far as extent of area is concerned the Supply Companies will thus approximate at one end to existing Distribution Companies, and at the other end to Power Companies. They should be subject to a purchase clause which can be exercised after 50 years, with right of notice seven years before the expiry of their franchise. Where the area is confined to a single local government area, the right should be exercisable by the Local Authority concerned; where it is larger, it should be exercisable either by joint Electricity Authority or an Association of Local Authorities in the area. The purchase clause should be simple in character and based upon the capital properly expended less such depreciation as the Commissioners may allow. If notice of purchase is not given, the Commissioners should have power to extend the franchise for such period as they think fit.

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STATEMENT

MAXIMUM DEMAND AND GENERATING CAPACITY - NAIROBI AREA

1934 / 1938

GENERATING CAPACITY - Drought conditions

Tana Station	700 (measured)
Ndula Station	612 "
Mesco Station	345 (calculated)
Parklands Station	170
	<u>1,827 K.W.</u>

NOTE: By overloading the Parklands Oil Station an output of 200 K.W. can be obtained but the gain is inconsiderable and the practice detrimental to the plant and is not attempted except in the most extreme emergency conditions.

MAXIMUM DEMAND OF GENERATING STATIONS

Maximum demand July, 1933	2,490 K.W.
Maximum demand September, 1934	2,468 K.W.

It will be seen that the total generating capacity under drought conditions falls far below the power demand. The shortfall in 1934 was about 641 K.W. In April, 1934, just prior to the long rains, by arrangement with the sisal estate owners, the bulk of the secondary load had to be transferred from day to night working for a few days until the long rains broke and normal supply conditions could be resumed.

Night working conditions react to the serious detriment of the Sisal Industry and an intolerable situation might have developed had the 1934 long rains failed as they did the preceding year.

The components of the total Maximum Demand in the Generating Stations are as follows:

Primary load	1640 K.W.
Secondary load (displaceable)	828 K.W.
Total demand 1934	<u>2468 K.W.</u>

From the foregoing it will be seen that the total primary load which cannot be displaced, is dangerously near the total drought capacity of our existing plants.

NOTE: Primary load is the demand that must be met continuously and which cannot be displaced in time.

Secondary load is the demand which by arrangement with the particular consumers can at short notice be cut off or displaced in time, to night or other hours as the primary load demands permit.

STATEMENT  
 MAXIMUM DEMAND AND GENERATING CAPACITY - NAIROBI AREA

1934 / 1938

GENERATING CAPACITY - Drought conditions

	K.W.
Tana Station	700 (measured)
Noula Station	61 "
Mesco Station	345 (calculated)
Parklands Station	170
	<u>1,827 K.W.</u>

NOTE: By overloading the Parklands Oil Station an output of 200 K.W. can be obtained but the gain is inconsiderable and the practice detrimental to the plant and is not attempted excepting under extreme emergency conditions.

MAXIMUM DEMAND OF GENERATING STATIONS

Maximum demand July, 1933	1,492 K.W.
Maximum demand September, 1934	1,488 K.W.

It will be seen that the total generating capacity under drought conditions falls far below the power demand. The shortfall in 1934 was about 641 K.W. In April, 1934, just prior to the long rains, by arrangement with the sisal estate owners, the bulk of the secondary load had to be transferred from day to night working for a few days until the long rains broke and normal supply conditions could be resumed.

Night working conditions react to the serious detriment of the Sisal Industry and an intolerable situation might have developed had the 1934 long rains failed as they did in the preceding year.

The components of the total Maximum Demand in the Generating Stations are as follows:

Primary load	1,140 K.W.
Secondary load (displaceable)	828 K.W.
Total demand 1934	<u>2,468 K.W.</u>

From the foregoing it will be seen that the total primary load which cannot be displaced, is dangerously near the total drought capacity of our existing plants.

NOTE: Primary load is the demand that must be met continuously and which cannot be displaced in time.

Secondary load is the demand which by arrangement with the particular consumers can at short notice be cut off or displaced in time, to night or other hours as the primary load demands permit.

ESTIMATE IF DEPRESSION CONTINUES

	1934 (actual)	1935 (estimated)	1936 (estimated)	1937 (estimated)	1938 (estimated)
Primary	1640 KW.	1820 KW.	1920 KW.	2020 KW.	2120 KW.
Secondary	828 "	828 "	820 "	850 "	850 "
	2468 KW.	2648 KW.	2740 KW.	2870 KW.	2970 KW.

Ø Additional load on system peak allowing for diversity.

ESTIMATE IF CONDITIONS MATERIALLY IMPROVE

	1934 (actual)	1935 (estimated)	1936 (estimated)	1937 (estimated)	1938 (estimated)
Primary	1640 KW.	1820 KW.	2020 KW.	2280 KW.	2420 KW.
Secondary	828 "	828 "	820 "	850 "	850 "
	2468 KW.	2648 KW.	2840 KW.	3130 KW.	3270 KW.

HAEROBI.

February, 1935

ELECTRIC POWER ORDINANCE.APPENDIXSECTION 42. ACCOUNTS TO BE IN PRESCRIBED FORM

Every licensee shall on or before the thirtieth day of June in every year fill up annual statements of accounts of the undertaking made up to the thirty-first day of March then next preceding, in the forms and containing the particulars prescribed in the schedule to this Ordinance and statements shall be published, in such manner, as may from time to time be prescribed in that behalf by the Governor in Council. The licensee shall deliver to the Governor copies of such annual statements of accounts and shall, if the Governor in Council so directs, keep copies of such annual statements of accounts at his office in the area of supply and sell the same to any applicant at a price not exceeding two shillings for the copies of such statements for any one year. In case the licensee makes default in complying with the provisions of this section he shall be liable to a penalty not exceeding three pounds for each day during which such default continues.

Provided that if any licensee shows to the Governor in Council that some other dates are, owing to special circumstances, more convenient in his case than the thirtieth day of June and the thirty-first day of March, the Governor in Council may substitute such other dates for the said thirtieth day of June and the thirty-first day of March, and this section shall as respects such licensee be construed with the substituted date.

SECTION 69. MAXIMUM PRICE

(1) The prices to be charged by the licensee for electrical energy supplied by him shall not exceed those stated in that behalf in the licence, or in the case of a method of charge approved by the Governor in Council, such prices as the Governor in Council may determine on approving the method.

(2) Provided that if, in a case where a public or local authority is not the licensee, either of such authorities, or the licensee, or such authorised distributors (in the case of a bulk supply area) or ordinary consumers (in the case of a distributing area) as the Governor in Council may consider sufficient having regard to the circumstances, at any time after the expiration of five years after the commencement of the licence, make a representation to the Governor in Council that the prices or methods of charge stated in the licence or approved by the Governor in Council ought to be altered, the Governor in Council after such inquiry as he may think fit, may make an order varying the prices or methods of charge stated in the licence or so approved as aforesaid, or substituting other prices or methods or charge in lieu thereof, and the prices or methods of charge so varied or substituted shall have effect on and after such day as may be mentioned in the order, as if they had been stated in the licence. Provided also, that the prices and method of charge for the time being in force may be altered in like manner at any time after the expiration of any or every period of five years after they were last altered.

MIAMI CITY

AVERAGE RATES FOR UTILITIES SOLD

TARIFF	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	October 1935
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Public Lighting	45	45	45	24.5	22.2	22.4	27.5	24.6	22.6	21.9	18.5	18.1
Lighting Heating & Cooking	83.5	82.5	75.2	73.7	66.4	66.7	60.8	53.1	48.4	45.6	44.7	41.4
Power Supplies	21	21.8	20	16.8	16.1	19.8	19.6	19.6	15.7	16.4	13.2	13.4
C. I.	49.8	50.2	39	50.5	51.6	32.3	30.8	30.3	25.2	22.4	20.1	19.6



APPENDIX

STATEMENT OF REVENUE FROM THE SALE OF ELECTRICITY TO  
CONSUMERS AT THE RATE OF FIVE CENTS A UNITING TARIFF

OCTOBER, 1935

Under Shs. 1/- per month	Total under Shs. 1/- per month	Consumers
Shs. 1/- and under Shs. 2/- per month	332	233
" 2/- "	185	365
" 3/- "	135	480
" 4/- "	127	615
" 5/- "	166	742
" 6/- "	82	908
" 7/- "	71	979
" 8/- "	54	1050
" 9/- "	54	1104
10/- and over	610	1158

8th August, 1928.

Dear Sir,

With reference to your call with Mr. Valentine of Messrs. Holfour Beatty and Company on Friday of last week, you expressed a wish that I should give my opinion of the position of the East African Power and Lighting Company on two points -

- (a) charges for supply of electrical energy and
- (b) capital expenditure in connection with the undertaking.

(A) Charges for Supply of Electrical Energy

The charges for electrical energy vary very much in this country, but are chiefly controlled by the density of population. From the figures you have supplied to me it is clear that the population in Nairobi is very sparse indeed. I do not think that I can do better than quote you two paragraphs from a Report of Proceedings of Conferences on Electrical Supply in Rural Areas which was issued by the Commissioners last month :-

"(b) In the case of the more remote and more sparsely populated rural areas of supply where a degree of development beyond a consumption of the order of 30 units per head of population could not be reasonably expected, the alternative rates of charge should not exceed -

- (i) from 9d to 10d per unit for lighting,
- (ii) from 3d to 4d for other purposes.

It is pointed out that the ~~above-mentioned~~ prices for other purposes will not be conducive to ~~inclusion~~ ~~ment~~, and that the prospect of ~~insuring~~ any general use of electricity in such areas will be dependent on the offer of a suitable two-part tariff.

(c) In the case of the most remote rural areas where a restricted electrical service only may be possible for such consumers as are prepared to pay a price which will ensure remunerative working, the limits of price may extend to 1s. per unit for lighting and 4d or more for power and other purposes.

Your charges appear to be on the average 9d per unit for domestic services and 3d per unit for power and no one can say that these are high taking into consideration the nature of the area of supply. The reason for the relative high price in the sparsely populated areas such as yours is clearly brought out from the figures you have submitted. Your capital cost per kilowatt of demand is £116 for transmission and distribution, whereas the capital expenditure per kilowatt in dense areas is in the neighbourhood of £20 per kilowatt of demand.

The total length of main transmission line as compared with a local generating station will of course account for a considerable part of the difference in these two figures.

(B) Capital Cost of Generating Station.

The capital cost in kilowatts of plant and the cost per kilowatt are shown in the following table :-

Station.	Kilowatt installed.	Capital Cost.	Cost per Kilowatt.
			£. s. d.
Thika	2,000	£751,000	37 10 0
Ruiru	360	£7,000	19 8 10
Parklands	360	£25,000	69 8 0
TOTAL	2,720	£107,000	35 6 7

The capital expenditure involved in these Electric Stations varies very much and depends upon whether storage of water is provided or if only the natural flow of the river is used. In 1918 a Committee was set up by the Board of Trade to investigate the water power resources in the United Kingdom and their final report was published in 1921. The Committee was known as the Water Power Resources Committee.

One of the findings of the Committee was the economic cost of capital expenditure per effective kilowatt on hydroelectric takings and on a medium sized installation, between 2,000 and 10,000 kilowatts, with coal at 20/- per ton was £120 per kilowatt. I think this was comparable with the scheme (at a cost) between £14 and £15 per kilowatt installed. Owing to the very greatly improved thermal efficiency of the modern steam generating stations I should think that this figure of £120 might be halved. Various hydro electric schemes have been considered in this country on a small scale at a capital cost of between £50 and £60 per kilowatt installed. £60 per kilowatt is certainly justified with coal at £1 per ton and for every increase of 1/- in cost of coal the capital cost of hydro stations could be increased by £1.

From the above you will realise that I am of opinion that your cost per kilowatt is most reasonable.

Yours faithfully,

Major Ward,  
Chairman of the East African  
Power and Lighting Co.,  
Sedwood, Cambridge, Isle of Wight.

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COPY.

PREECE, CARDEW AND RIDER

8 and 10, Queen Anne's Gate,  
WESTMINSTER. S. W. 1

16th March, 1935.

The Crown Agents for the Colonies,  
4, Millbank, Westminster, S.W.1.

Gentlemen,

O/UGANDA 53

We have the honour to submit our report for the information of the Government of Kenya upon certain projected hydro-electric developments in the neighbourhood of Nairobi and referred to in your letter to us of the 20th September, 1934.

2. The East African Power and Lighting Company, the present Licensees, have already developed a hydro-electric power scheme of 4,000 kilowatt capacity near the Junction of the Maragua and Tana Rivers about 45 miles north-east of Nairobi, and they are desirous to extend this development. The Company's proposal, however, involves the construction of a dam in the Tana River and the construction of 2,500 acres of Active Reserve Land. The area of land to be flooded.

It has been suggested to the Kenya Government some years ago that the proposed development by the East African Company was unnecessary, as there were other possible schemes with greater developments of power, involving the disturbance of natives, further down the Tana River in a westerly direction at the Seven Forks some 35 miles from the junction of the Maragua-Tana Rivers. It was claimed that, though the distance over which transmission lines would have to be provided would be nearly doubled, the capital cost of the necessary civil engineering works would be lower, and there were possibilities of producing up to 20,000 kilowatts. The Kenya Government were consequently anxious to ascertain what were the commercial possibilities of any scheme in the neighbourhood of this area, known as the Seven Forks area.

As arrangements had recently been made with us by the Government of Uganda, through you, to send out three Engineers to Uganda to investigate possible hydro-electric developments in that Protectorate, the Kenya Government obtained the approval of the Colonial Office to utilise the services of these Engineers to investigate the suitability of the Tana River both in the Seven Forks area and also in the area proposed by the East African Company at Maragua-Tana, and we have now reviewed the results of their investigations.

3. The three Engineers, Mr. Hughes, Electrical Engineer, Mr. Naylor and Mr. Thomson, Civil Engineers, arrived at Nairobi on November 20th. Very complete arrangements had been made by the Director of Public Works and the management of the East African Company to facilitate the inspections. They were also handed by the Colonial Secretary detailed instructions regarding the points which the Government desired them to consider. We attach to this report a copy of these instructions dated 22nd November, 1934, (Appendix 1).

5. The Engineers by means, first, of an aerial survey, and subsequently by visits extending to some eight days in the case of the Seven Forks area and six days in the case of the Maragua area, were able to send us full reports to which we refer later.

As/

As a result of their investigations, the Engineers were in a position to place before the Colonial Secretary in Nairobi their preliminary conclusions, and we attach to this report a copy of their letter signed by Mr. Hughes and Mr. Naylor, dated the 24th December, 1934, (Appendix 11). It will be noticed that in this letter the opinion expressed was in favour of the Company's proposal for the development of the Maragua-Tana Scheme, and they did not think any useful purpose would be served by a more detailed survey of the Seven Forks area.

6. The merits of any alternative hydro-electric schemes must depend upon their suitability for meeting the present and the probable future demands for power and upon the capital cost. It is obvious that it would be uneconomical to develop a hydro-electric scheme capable of producing some 20,000 kilowatts at a capital cost of say, £750,000 if there was little prospect of a demand reaching 20,000 kilowatts for some 25 years or more. The difficulty with many hydro-electric schemes is that the civil engineering work, such as dams, river diversions and canals generally require to be constructed to suit the ultimate developments of the scheme. The mechanical and electrical equipment can, of course, be provided in sections as the actual demand grows. The civil engineering work required for a large scheme may hence be a heavy burden upon the undertaking.

It is consequently necessary to keep in view the probable immediate future demands for electricity in Nairobi and the surrounding areas, and also the fact that as a commercial company it is essential for the Licensees to avoid unnecessary capital expenditure which might cause high prices and thereby stifle growth in demand.

7. With regard to the development of electricity supply in Nairobi and district, Mr. Hughes made a general survey of the present and the probable future demands. The normal industrial load is required mainly from 8.0 a.m. to 4.0 p.m. and the lighting load comes on at 6.0 p.m. There is also an industrial load from certain factories, owing to special cheap rates, during the night after the lighting demand has ceased. The present maximum demand in the whole area of supply is about 2,500 kilowatts of which the sisal plantations take about 800 kilowatts.

Mr. Hughes estimates that, with the present rate of growth, which is about 12% per annum, the probable future demand will be 4,000 k.w. by 1940 and about 8,000 k.w. by 1947.

The existing plants at Maragua, Ndula and Meso (all hydro-electric) and at Nairobi (oil engines) are capable of supplying a maximum load of about 3,000 kilowatts, providing the flow of water in the Maragua is normal. If, however, the flow there is reduced, as it was in April, 1934 by drought, the existing plant at Maragua can only produce about 700 kilowatts. As the other stations, including the oil engine plants could only produce 1,125 kilowatts between 1934 and 1935, the Company were only able to maintain its supply in April, 1934 by cutting off temporarily the supply to the sisal plantations.

8. With regard to the flow of water in the Tana River, our Engineers were informed by letter (dated December 18th, 1934 - Appendix 111) a copy of which is attached from the Director of Public Works that at the junction of the Maragua-Tana the reservations in the Tana River for irrigation purposes would be 38 cusecs, and that in the case of the Seven Forks Schemes the reservation would be 130 cusecs of the flow of the Thika, which is the whole of the minimum dry weather flow of that river, and 70 cusecs of the flow of the Tana, making a total reservation for irrigation of 200 cusecs out of the estimated minimum flow of 830 cusecs at the Seven Forks complex.

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9. As a result of the various reports received by us from our Engineers, we have to make the following remarks :-

Seven Forks and Neighbouring Schemes

The district known as the Seven Forks area of the Tana River is situated about 75 miles in a direct line from Nairobi where the Tana River, reinforced by the Thika and the Thiba, flows down a series of rapids which have a total fall of about 1,000 feet in the course of 23 miles starting from a point just above the Elephant Falls. As the result of the aerial survey the Engineers reported:

"We flew right down the Tana at about 150 feet up and were able to see that there is no concentration of head anywhere at the Elephant Falls and at Seven Forks.

Various further flights up and down the River decided the Engineers to confine their detail attention to the Elephant Falls and to the Seven Forks complex.

We should explain that at Seven Forks some few years ago Mr. Stanley, a local engineer, on behalf of the East African Company, inspected the Tana River and prepared a tentative scheme for a possible development up to 15,000 kilowatts at a certain point, and in the following reports it has been referred to as "Stanley's Scheme".

10. Mr. Naylor, the Civil Engineer, in his sixth report has made the following remarks :-

"Seven Forks Area.

"Stanley's Scheme, the scheme surveyed by Stanley and called for convenience "Stanley's Scheme" is the most economical single scheme in the Seven Forks area. The dam is sited on a bar of sound gravel. The aqueduct is largely in exposed rock and there is a suitable line for pipe line and site for power station.

"The available power is only 7,000 kilowatts at minimum flow, owing to the revised minimum flow of 830 cusecs and the reservation of 200 cusecs for irrigation purposes. Our total cost works out at £381,000. Capital cost per kilowatt is £55.

"Lower Seven Forks Scheme. There is, however, a further fall of at least 170 feet according to aneroid levels in the Seven Forks complex. . . . . As the length of canal, pipe line and head available are about the same the cost would be about the same as for Stanley's Scheme.

"Elephant Falls Dam. The presence of valleys and the flat gradient preclude a scheme depending upon an intake canal and pipe line in the Elephant Falls area. There are, however, three possible sites for a high dam.

Mr. Naylor then discusses two other sites which appear to contain difficulties for a dam and then refers to the

"Lowest Elephant Dam Site. A narrow deep gorge at the foot of the rapids is an ideal site for an arch dam, but the enormous flood flow and the absence of a site for a power station make this impossible. A design was got out showing a dam of gravity section. . . . . The maximum flood level would be about 20 feet over the crest. . . . . A feature of this scheme is that the reservoir formed permits of sufficient storage to cope with the fluctuation of the daily load, thus allowing of a peak load of 8,500 kilowatts with a head of only 100 feet.

However/



" However, the cost of this scheme is greater than Stanley's Scheme, our estimate being 2509,000. This works out at 260 per kilowatt in capital cost.

" Other Schemes in the Seven Forks Area. In the 23 miles of river comprised under the above heading, there is no possibility of a development equal in magnitude to the above schemes. Should the demand ever arise for more power than can be produced by the Tana Scheme the development of Stanley's Scheme the Lower Seven Forks Scheme and the Elephant Dam schemes would be an economical proposition and would produce between them a further 22,500 kilowatts.

11. It should be mentioned that the existing power station of the Licensees at Maragua is already accessible by suitable roads. In the case of any scheme, however, at Seven Forks, it is necessary to construct new roads over rather a difficult country. The district around Seven Forks also requires cleaning and it is at present unhealthy and uninhabited. The present road between Seven Forks and Ndula, through which country mission line routes must be constructed, necessitate a somewhat larger than the usual type to avoid any risks of infection, for example, by full grown giraffes.

Mr. Hughes reports that, owing to certain difficulties of the ground to be covered and the expense of maintenance of access roads if the shortest route is taken, the main transmission lines should preferably be taken close to the existing and new roads. This makes the total length of the main transmission lines from Nairobi to the Stanley site via the existing station and transforming plant at Ndula (which is 37-1/2 miles from Nairobi) about 90 miles of which 62 miles will be close to the existing roads.

Provision for the transmission lines and construction of the roads has been made in the estimates. The length of the existing transmission line from Nairobi to the Maragua-Tana Power Station is about 50 miles.

MARAGUA-TANA SCHEME

12. The small power station at Maragua-Tana recently constructed by the Licensees consists of two 2,000 H.P. hydro-electric plants working at a head of 240 feet. The available output varies from 700 kilowatts to 2,200 kilowatts according to the flow of water in the Maragua.

Complete new surveys have been made by the Licensees of the country in the area of the Tana River up to Mathoma River, and it has been ascertained that there is a minimum flow in the Tana River of 380 cusecs, of which 38 cusecs is reserved for irrigation and by the construction of a dam and a 2-1/2 mile canal a fall of 225 feet can be secured which would be capable of producing with daily storage on a load factor of 50% about 11,000 kilowatts. This scheme involves only a short dam about 70 feet high above the foundation level. The building of this dam, however, will cause the flooding of native reserves having an area of about 1,500 acres now partly cultivated. The proposed canal would be designed and constructed to carry the full supply of water, i.e. 680 cusecs, but the existing generating station would only be extended as and when required.

13. We instructed the Engineers, when considering the proposals of the Licensees, to look specially into the question of any possible variations from the Licensees' proposals which might remove the necessity for the flooding of the 1,500 acres of reserving land.

Mr./

" However, the cost of this scheme is greater than Stanley's Scheme, our estimate being £509,000. This works out at £60 per kilowatt in capital cost.

" Other Schemes in the Seven Forks Area. In the 23 miles of river comprised under the above heading, there is no possibility of a development equal in magnitude to the above schemes. Should the demand ever arise for more power than can be produced by the Tana Scheme the development of Stanley's Scheme the Lower Seven Forks Scheme and the Elephant Dam schemes would be an economical proposition and would produce between them a further 22,500 kilowatts.

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Mr./

Mr. Naylor's report contains the following remarks :-

"The Company's scheme for the Tana at Maragua is the most economical possible scheme. The survey has been checked by us and found to be substantially correct. The siting of the dam at the constriction in the valley at the top of the rapids is the obvious one. The gradient of the aqueduct is fixed by the level of the edge of the gorge and a very suitable site for a head pond some 15 feet below the present Maragua head pond. The canal so fixed is for the most part above the edge of the gorge, but it would have to be formed in the side of the gorge for a short distance.

"In order to remove the chief objection to the Tana project, viz: the flooding of 1,500 acres of native reserve, a low dam and low level aqueduct was considered. By reducing the crest level from plus 240 at Company's datum to plus 200 the flooding would be confined to the gorge and the cultivable land submerged would be nil. The aqueduct would now lie entirely along the steep sides of the gorge . . . . . Such a canal would be very expensive and I estimate that the saving on the dam would be just about counterbalanced by the increased cost of the aqueduct and head pond. There would no longer be daily storage so that the peak load would be reduced to one half. It is further reduced on account of the lower head so that the available peak load becomes only 4,000 k.W.

14. A further scheme was also considered for building dams across the Tana and Withioya above the proposed flooded area. The Engineers report, however, that a canal would be necessary in deep cutting or in tunnel to correct the two rivers and the gradient of the main aqueduct would be very flat. The cost of the construction of such a canal would be prohibitive. There is, however, a suitable site for a dam found on Withioya a short distance below the junction of the river. The cost of the canal works out to be prohibitive, the cost being £388,600. Moreover, with this scheme about 500 acres remain flooded and the area is the most fertile and most densely cultivated.

15. The plants to be provided for the proposed schemes either at Maragua-Tana or at Seven Forks will be identical. At the present time there are the two units of 2,000 kilowatts each at Maragua. As soon as the civil engineering work is completed on the Tana the 4,000 kilowatt unit will always be available. Frequently, provision has been made for a continuous output of 4,000 kilowatts from Maragua-Tana. In the event of the failure of one of the 2,000 kilowatt units coinciding with a period of low water, the Company could still maintain an output of over 3,125 kilowatts by bringing into service the old plants at Mula, Mesco and Nairobi. Hence the provision of the civil engineering work and one additional pipe line only would suffice for the anticipated demands in Nairobi and districts up to about 1939. Probably in 1938 it would be advisable for the Licensees to add one 4,000 kilowatt unit. In 1946 or so it may be necessary to add a second 4,000 kilowatt unit which would bring the maximum output up to about 11,000 kilowatts.

16. The Seven Forks scheme would have to be carried out on a different basis as the supply system would remain dependent upon the fluctuating output from Maragua and a possible drop there to an output of 700 kilowatts in times of drought. Consequently new plant of 4,000 kilowatt capacity must be provided at the outset. It should preferably consist of two units each of 2,000 kilowatts to allow for the failure of a plant. The future output with the assistance/

assistance of the four existing plants may be estimated at 4,000 kilowatts during droughts. The growth in the demand in Nairobi and district will necessitate the addition of a 4,000 kilowatt unit by 1940 or thereabouts. The final provision of a second 4,000 kilowatt unit will be required about 1946, and it would bring the maximum output up to about 9,000 kilowatts except at times of minimum flow at Seven Forks. It is clear that, if the flow at Seven Forks is at a minimum, the output from that station will be reduced to 7,000 kilowatts and as the flow at Maragua and Nauli will also be at its lowest, only 700 kilowatts may be available at the former and 600 kilowatts at the latter station. We are of the opinion, however, that even with the reservation for irrigation which may be modified slightly in occasional times of extreme drought, it is reasonable to calculate on an output of 9,000 kilowatts at all times with the Stanley plant and the help of existing plants.

The adoption of a scheme at Maragua-Tana would enable the Licensees to get the full benefit throughout the year from the expenditure already incurred at Maragua. It would also meet the immediate future demands by an expenditure upon only civil engineering work of about £190,000 plus the cost of resettling the native cultivators whose land would be flooded when the dam is built, whereas the Seven Forks scheme would involve an immediate capital cost of not less than about £300,000. We have not attempted to estimate the cost of resettling the natives who are at present in beneficial occupation of the site of the proposed reservoir, as this question must necessarily be dealt with by the Government Department concerned.

17. Mr. Hughes and Mr. Taylor came to the conclusion that the Licensees' proposed dam on the Tana, designed to take advantage of the daily storage, is the only rational one from a commercial point of view. The cost of the civil engineering works in connection with Maragua-Tana scheme is estimated as being about £170,000 excluding contingencies. The Licensees themselves had mentioned that the cost might be in the neighbourhood of £100,000 so that in this respect the Company appear to have underestimated the cost of the civil engineering work.

18. It has been suggested that the construction of a reservoir of about 1,500 Acres on the Tana would increase the danger of malaria in the surrounding country. We suggest that any risk of this nature could be guarded against by including a clause in the License or Concession making it obligatory for the Licensees to maintain such anti-malarial measures in and around the proposed new reservoir and canal as the Medical and Health Department of the Kenya Government may consider necessary.

19. In conclusion it may be a convenience to summarise the results of the investigations as follows: The most suitable scheme in the Seven Forks area is that known as the "Stanley Scheme". In this case there would be an output of about 7,000 kilowatts with the minimum flow of water. On the other hand, the Maragua-Tana Scheme would always have an output of about 11,000 kilowatts. The estimated costs, as given by the Engineers are attached (Appendices IV and V). They have been checked by us so far as we have been able to do so, and for the reasons given in paragraph 16 we have omitted the provision for compensation for flooding, but we have considered it desirable to add a further 10% for contingencies. Consequently, the estimated capital expenditure with Stanley's scheme is £419,100 and with the Maragua-Tana Scheme £299,860 plus the cost of settling native cultivators. The Maragua-Tana Scheme would thus entail a saving of about £100,000 and with the plant allowed for in the estimate be able to supply some 2,000 kilowatts

more

more to Nairobi and district at periods of the minimum flow of water.

20. It is evident that the construction of the hydro-electric scheme at Maragua-Tana instead of in the Seven Forks area will be of considerable advantage to the Licensees, not only in the capital expenditure, but also with respect to the staffs required and to a reduction in transmission line losses over some 50 miles in place of nearly 90 miles. It is therefore, not unreasonable to expect that, if the Licensees are permitted to make use of the Tana River above the confluence of the Maragua River, it should result in appreciably less prices for electricity than would be the case if developments had to take place in the Seven Forks area.

Briefly put we are of the opinion the scheme proposed on the Tana River by the Licensees, so designed as to take advantage of the daily storage, is without doubt the proper and most economical method of meeting the growing demands for electricity in Nairobi and surrounding districts.

W. A. A., etc.

(sgd) [illegible] and Rider

(sgd) [illegible], Wilson, Mitchell and [illegible]

more to Nairobi and district at periods of the minimum flow of water.

20. It is evident that the construction of the hydro-electric scheme at Maragua-Tana instead of in the Seven Forks area will be of considerable advantage to the Licensees not only in the capital expenditure, but also with respect to the staffs required and to a reduction in transmission line losses over some 50 miles in place of nearly 90 miles. It is therefore not unreasonable to expect that, if the Licensees are permitted to make use of the Tana River above the confluence of the Maragua River, it should result in appreciably less prices for electricity than would be the case if developments had to take place in the Seven Forks area.

Briefly put we are of the opinion the scheme proposed on the Tana River by the Licensees, so designed as to take advantage of the daily storage, is without doubt the proper and most economical method of meeting the growing demands for electricity in Nairobi and surrounding districts.

We are, etc.

(sgd) [Signature] and Rider

(sgd) Goode, Wilson, Mitchell and  
Vigness-Lee.

APPENDIX 1

The Secretariat,  
NAIROBI.

22nd November, 1934.

Gentlemen,

With reference to your conversation of yesterday's date with the Colonial Secretary, I am directed to indicate to you the lines on which this Government desires your investigations to proceed, as follows:-

- i. To examine the potentialities of the Tana River in the vicinity of the Seven Forks taking into consideration.
  - (a) Maximum power capable of development in that power reach of the river;
  - (b) the power likely to be required for consumption within the distributing area of the East African Power and Lighting Company, within a reasonable period of years.
- ii. To compare the relative merits from an economic point of view of the Matagua-Tana Scheme and the most suitable project in connection with the Seven Forks power reach.

It is also possible of designing works to utilize the power of the Tana River above the Matagua Confluence to generate power without involving the flooding of a large area of land.

You are requested to advise Government generally on any other matters which may assist Government in arriving at a decision as to the comparative merits of the two schemes referred to in (i).

It is also requested that you be able to undertake these investigations on a full flow basis. It is noted that the East African Power and Lighting Company have indicated that they are unable to do so.

Yours faithfully,  
for COLONIAL SECRETARY.

Messrs. A. E. Hughes  
A. H. Naylor.

APPENDIX 11

Nairobi,

24th December, 1934

Sir,

As agreed at our meeting this morning with yourself and the Postmaster General, we have the honour to attach hereto a copy of the sheet setting out the comparative costs of the various Hydro-Electric Schemes we have investigated, together with the sheets giving details of the progressive stages at Maragua-Tana and Seven Forks.

2. As we told you this morning, it is understood that the figures now submitted are to be treated as preliminary only since they are subject to confirmation by our respective firms in London.

3. The result of our investigation shows that the most advantageous scheme is that originally proposed by the East African Power and Light Company on the Tana just above the Maragua confluence. In addition, you will see from a comparison of the figures detailed in the enclosed sheets that this scheme offers a considerable advantage during the intermediate stages of development.

4. In view of this result, we do not consider that it would be useful at this stage to investigate the possibility of the Seven Forks area any more closely.

We have, etc.

(Sgd.) Aubrey T. Hughes

(Sgd.) A. H. ...

The Hon. Colonial Secretary,  
NAIROBI.



APPENDIX 11

Nairobi,

24th December, 1934

Sir,

As agreed at our meeting this morning with yourself and the Postmaster General, we have the honour to attach hereto a copy of the sheet setting out the comparative costs of the various Hydro-Electric Schemes we have investigated, together with the sheets giving details of the progressive stages at Karagua-Tana and Seven Forks.

2. As we told you this morning, it is understood that the figures now submitted are to be treated as preliminary only since they are subject to confirmation by our respective firms in London.

3. The result of our investigation shows that the most economical scheme is that originally proposed by the East African Power and Lighting Company on the Tana just above the Karagua Falls. In addition, you will see from a comparison of the figures detailed in the enclosed sheets that this scheme is a better advantage during the intermediate stages of development.

4. In view of this result, we do not consider that it would be useful at this stage to investigate the possibilities of the Seven Forks area any more closely.

We have, etc.

(Sgd.) Aubrey T. Hughes

(Sgd.) A. H. Taylor

The Hon. Colonial Secretary,  
NAIROBI.

Ref.No.  
D.1689/117/3/1/18

PUBLIC WORKS DEPARTMENT  
Head Office,  
NAIROBI.

18th December, 1934.

A. H. Taylor Esq.,  
c/o New Stanley Hotel,  
NAIROBI.

Sir,

Referring to our conversation last week, I have the honour to inform you that, in any authorising document issued to the East African Power and Lighting Company for the utilisation of the water of the Tana River for the development of power, Government would reserve the right to grant authority for diversions of water from the Tana River and its tributaries above the point of draw off, of such a nature and extent that they might, in the aggregate, have the effect of reducing the available flow of the amounts stated in the authorising document. In other words, the flow available for the development of power at the selected site would be liable to reduction below what it is at present to the extent of the reservation.

It is, of course, impossible to say at what time or times in the future that reservation would be acted on to any extent, and would materially affect the flow which would otherwise be available at the selected site. It is, however, the case that certain projects for the employment of water for irrigation have been under consideration during recent years, and in the event of these or other projects being brought into effect, the encroachment on the reservation would be material.

3. In the case of power development just above the Maragua-Tana confluence, it is likely that the reservation of the flow of the Tana River would be 23 cusecs.

4. In the case of power development at the Seven Forks site, it is likely that the reservation would be:-

- (1) 130 cusecs of the flow of the Thika River
- (2) 70 cusecs of the flow of the Tana River

excluding the above contribution from the Thika River.

In respect of the Tana River these reservations are based on 10% of the estimated minima of the flow of the river at the sites mentioned.

I have, etc.

(Sgd) H.L.Sikes

DIRECTOR OF PUBLIC WORKS

APPENDIX 111

Ref. No.  
D. 1689/117/3/1/18

PUBLIC WORKS DEPARTMENT  
Head Office,  
NAIROBI.

18th December, 1934.

A. H. Taylor Esq.,  
c/o New Stanley Hotel,  
NAIROBI.

Sir,

Referring to our conversation last week, I have the honour to inform you that, in any authorising document issued to the East African Power and Lighting Company for the utilisation of the water of the Tana River for the development of power, Government would reserve the right to grant authority for diversions of water from the Tana River and its tributaries above the point of draw off, of such a nature and extent that they might, in the aggregate, have the effect of reducing the available flow to the amounts stated in the authorising document. In other words, the flow available for the development of power at the selected site would be liable to reduction below what it is at present to the extent of the reservation.

It is, of course, impossible to say at what time or times in the future that reservation would be acted on to any extent which would materially affect the flow which would otherwise be available at the selected site. It is, however, the case that certain projects for the employment of water for irrigation have been under consideration in recent years, and in the event of these or other projects being put into effect, the encroachment on the reserved flow would be substantial.

3. In the case of power development just above the Maragua-Tana confluence, it is likely that the reservation of the flow of the Tana River would be 3 cusecs.

4. In the case of power development at the Seven Forks site, it is likely that the reservation would be :-

- (1) 130 cusecs of the flow of the Thika River
- (2) 70 cusecs of the flow of the Tana River

excluding the above contribution from the Thika River.

In respect of the Tana River these reservations are based on 10% of the estimated minima of the flow of the river at the sites mentioned.

I have, etc.

(Sgd) H. L. Sikes

DIRECTOR OF PUBLIC WORKS

APPENDIX IV

ESTIMATES FOR THE STANLEY and MARAGUA-TANA SCHEMES

Stanley's Scheme

New plant installed	4,000	8,000	12,000
	£	£	£
Civil Engineering works, including house and quarters	125,000	125,000	132,000
Pipe lines .. .. .	14,000	28,000	42,000
Mechanical and electrical equipment .. .. .	35,000	44,250	68,000
Transmission lines and substations .. .. .	95,000	99,500	100,000
Road Transport .. .. .	4,000	6,250	10,000
	273,000	303,000	381,000
Contingencies .. .. .	27,300	30,300	38,100
	300,300	333,300	419,100

Maragua Tana Scheme

Plant installed	Nil	4,000	
	£	£	
Arrangements made for engineering works, including house and quarters	166,000	174,000	183,000
Pipe lines .. .. .	7,000	7,000	14,000
Mechanical and electrical equipment .. .. .	-	24,300	33,500
Transmission lines and substations .. .. .	-	3,700	42,100
	173,000	209,000	272,600
Contingencies .. .. .	17,300	19,900	27,260
	190,300	228,900	299,860

SUMMARISED ESTIMATES FOR THE COMPLETE STANLEY

and

MARAGUA-TANA SCHEMES

Stanley's Scheme

12,000 Kilowatts of new plant installed

Civil Engineering works including power house and quarters	£132,000
Pipe Lines	42,000
Mechanical and electrical equipment	68,000
Transmission lines and sub-stations	129,000
Road Transport	10,000
	<u>381,000</u>
Contingencies	38,100
	<u>£419,100</u>

Maragua-Tana Scheme

8,000 Kilowatts of new plant installed

Civil Engineering works including power house and quarters	£183,000
Pipe lines	14,000
Mechanical and electrical equipment	33,500
Transmission lines and sub-stations	42,100
	<u>272,600</u>
Contingencies	27,260
	<u>£299,860</u>

SUMMARISED ESTIMATES FOR THE COMPLETE STANLEY

and

MARAGUA-TANA SCHEMESStanley's Scheme12,000 Kilowatts of new plant installed

Civil Engineering works including power house and quarters	£132,000
Pipe Lines	42,000
Mechanical and electrical equipment	68,000
Transmission lines and sub-stations	129,000
Road Transport	10,000
	<u>381,000</u>
Contingencies	38,100
	<u>£419,100</u>

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Civil Engineering works including power house and quarters	£183,000
Pipe lines	14,000
Mechanical and electrical equipment	33,500
Transmission lines and sub-stations	42,100
	<u>272,600</u>
Contingencies	27,260
	<u>£299,860</u>

(COPY)

HIGHFIELD and ROGER SMITH,  
Consulting Engineers.

36, Victoria Street,  
LONDON. S. W. 1.

8th November, 1935.

The Chairman of the Local Board,  
The East African Power & Lighting Co. Ltd.,  
66, Queen Street, E. C. 4.

Dear Sir,

With reference to our conversation regarding the proposed extension of your Company's Hydro-Electric Station in Kenya Colony to deal with the growing load, I have, as requested, carefully studied the position in relation to the about unexpired term of your licence which I understand expires in 1947.

I understand that the proposed extension referred to involves the construction of works consisting principally of a new hydro-electric plant having a capacity of some 8,000 kilowatts the cost of which has been estimated at £300,000.

Our experience is that capital spent for electric supply under similar conditions will not reach its full interest-earning capacity in less than five years after the plant has been put to use. Taking into account a construction period of say two years, the unexpired term of your licence is then somewhat less than ten years. In my opinion, therefore, your Company is not justified in undertaking this extension of your system unless your period of tenure is considerably increased. I observe although normally you cannot apply for a renewal of your licence until 1942 that under Section 2, Sub-section 4 of the Electricity Ordinance, 1934, the Governor in Council has discretionary power to extend or renew a licence before the appointed date on which such application is normally made.

The position in which your Company finds itself, therefore, makes it, in my opinion, imperative for you to apply immediately for the exercise by the Governor in Council of the powers granted to him by the section quoted above with the view of obtaining an extension of your licence.

I understand that an application is about to be made for the term of your licence to be extended for a period of twenty-five years, that is to the 23rd March, 1972. Having regard to the large amount of capital expenditure involved, I consider that even this period is inadequate. In support of this opinion, I would refer to the precedent of the Electric Lighting legislation in the United Kingdom. The first Electric Lighting Act was passed in 1862 and granted a right of supply for a period of not more than twenty-one years. Certain progress had been made in the public supply of electricity before the passing of the 1862 Act, but the effect of the quite inadequate period granted under the Act was practically to put an end to that progress. The result was that an amending Act was passed in 1888 extending the supply period to 42 years and numerous companies were formed to generate and distribute electricity in the principal towns and densely populated areas.

In the year 1900 further legislation resulted under

which/

(COPY)

HIGHFIELD and ROGER SMITH.  
Consulting Engineers.36, Victoria Street,  
LONDON. S. W. 1.

8th November, 1935.

The Chairman of the Local Board,  
The East African Power & Lighting Co. Ltd.,  
66, Queen's Street, N. C. 4.

Dear Sir,

With reference to our conversation regarding the proposed extension of your Company's Hydro-Electric Station in Kenya Colony to deal with the growing load, I have, as requested, carefully studied the position in relation to the short unexpired term of your licence which I understand expires in 1947.

I understand that the proposed extension referred to involves the construction of works consisting principally of a new hydro-electric plant having a capacity of some 8,000 kilowatts the cost of which has been estimated at £300,000.

Our experience is that capital spent on electric supply under similar conditions will not reach its full interest-earning capacity in less than five years after the plant has been put to work. Taking into account a construction period of say two years, the unexpired term of your licence is then somewhat less than ten years. In my opinion, therefore, your Company is not justified in indenting this extension of your system unless your period of tenure is considerably increased. I observe although normally you cannot apply for a renewal of your licence until 1942, that under Section 3, Sub-section 4 of the Electricity Ordinance, 1934, the Governor-in-Council has discretionary power to extend or renew a licence before the appointed date on which such application is normally made.

The position in which your Company finds itself, therefore, makes it, in my opinion, imperative for you to apply immediately for the exercise by the Governor in Council of the powers granted to him by the section quoted above with the view of obtaining an extension of your licence.

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In the year 1900 further legislation resulted under

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which "Electric Power Companies" were authorized and empowered to supply electricity over much wider areas bounded rather by county boundaries than by city boundaries. It was realized that the developments in these areas would be less rapid than in urban areas, and to enable the companies to be financed, they were given power of supply in perpetuity.

I should point out that in all this legislation it was contemplated that practically the whole of the generating works would be steam driven, using mainly coal fuel. The capital cost of water power plant is often twice or may be even three times as great as steam plant. It follows that the necessity of a long term concession is more important for a water power plant than for a steam plant.

I would also draw your attention to the precedents of concessions granted abroad, where the practice has been for periods of forty years up to eighty years. I would refer you to the concessions and licences granted in Palestine, Federated Malay States, Tanganyika, etc.

To summarise my views, I am of ~~my~~ definite opinion that the capital expenditure required to meet the growth of load in your area constitutes sufficient grounds for an application to be granted for an extension of your licence and that you should make such application forthwith and for a much longer period than twenty-five years. Failing the ~~the~~ <sup>granting</sup> of your application, in my opinion, your company is not justified in proceeding with the expenditure now contemplated.

Yours faithfully,

(Sgd) J. S. Lightfield.

Past President, Institution of Electrical Engineers.  
Member Institution of Civil Engineers.  
Member Royal Society of Great Britain.  
Hon. Member, Assoc. of Electric Power Companies.

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Yours faithfully,

(Sgd) J. S. Highfield.

Past President, Institution of Electrical Engineers.  
Member Institution of Civil Engineers.  
Member Royal Commission of Great Britain.  
Hon. Member, Association of Electric Power Companies.

C O P Y.

NAIROBI DISTRICT COUNCIL.

Offices, 2, Victoria House,  
P.O. Box 320,  
Nairobi.  
18th November, 1935.

No. CLG/LIS/316.

ELECTRIC POWER ORDINANCE.

To Clerk to His Excellency the Governor in Council 1,  
The Secretariat,  
Nairobi.

Sir,

EAST AFRICAN POWER & LIGHTING CO., LTD.

At a Special Meeting of the Council held on the 15th instant, a letter from Messrs Hamilton, Harrison & Lethbrow, Nairobi, was read, in which application was made by the East African Power & Lighting Co. Ltd. for the renewal of the existing Electric Power Licenses.

I have the honour to inform you that the following resolution was carried unanimously:-

"That this Council is not in favour of the proposed extension of the period of license granted to the East African Power & Lighting Co. Ltd. beyond the year 1947, and that a letter recording this resolution be sent to His Excellency the Governor in Council in accordance with General Notice No. 1309 of the Official Gazette, dated 5th November, 1935."

I have the honour to be,

Sir,

Your obedient servant,

(sgd) J. W. W. W.  
DEPUTY CLERK.

To His Excellency the Governor in Council  
for the Colony of Kenya.

ELECTRIC POWER ORDINANCE

(Cap.165 of the Revised edition of the Laws of Kenya)

In the matter of an

APPLICATION of the East African Power and Lighting Company Limited (hereinafter called the Company) for a renewal of their existing Licences as set out in the Notice of their intention to make the application from the respective dates of determination thereof until the 20th. day of May, 1972.

OBJECTION to the Company's application by the Municipal Council of Nairobi (hereinafter called the Council).

May it please Your Excellency:

The Council object to the Company's application on the following grounds:-

1. That the Application is premature.

None of the existing licences will expire until 1947. Normally the application for a renewal of the existing licences would be made within a period of from three to five years from the date of the expiration of such licences that is to say, not earlier than 1942, nor later than 1944.

No sufficient reason is disclosed for making application for the renewal of these licences more than eleven years before the expiration thereof.

"The object and reason of the application" the Company state in their Notice, "is that additional capital is required immediately for the further development of the Company's undertaking, but such additional capital will be available on reasonable terms, only upon the Company's position under the existing licences being secured for a longer period than at present".

That additional capital is immediately required is disputed - indeed it is obvious in order to provide additional Generating Plant - but that additional capital will only be available if the period of the existing licences is extended, is emphatically denied.

On the last occasion the Company required additional capital, at a time when money commanded a higher rate of interest than it does to-day, the Company experienced no difficulty in obtaining the necessary capital; that is conclusively established by the fact that the shares were issued at a premium.

The preference shares of the Company carry interest at the rate of 7% per annum. No difficulty whatsoever will be experienced in raising all the additional capital the Company require on more favourable terms than 7% per annum. On first-class securities money is available for investment at 4% per annum. The Council have received offers of loans up to £250,000 at the latter rate of interest.

The Company also state in the Memorandum which has been prepared in support of their application,

"It will be seen that with only twelve years to go, 2½ of which are required for construction, there is no chance of this Company being able to secure any reasonable return on the new capital involved let alone make suitable provision for amortisation during the balance of 9½ years....."

That statement is based on erroneous premises.

The capital employed, according to the last published Accounts of the Company at 31st December, 1954, in connection with the Nairobi area is \$466,605. The profit for the year ended 31st December, 1954, is £44,216, equal to 6.4% on the capital employed at the close of the year.

Even with the expenditure of the additional capital required for the purpose of providing additional Generating Plant the Company will secure an adequate return on the capital employed.

The increased demand for electrical energy, according to the statement put forward by the Company, is calculated at 12% per annum, which will afford an ample return on the capital.

Appendix I attached to the Company's Memorandum clearly indicates the imperative necessity for additional Generating Plant in the immediate future. "The Company have been granted a monopoly and, in carrying with it obligations as well as privileges, and a most important obligation is that they provide sufficient Generating Plant to meet the demands of their consumers. Failure to provide sufficient Generating Plant is calculated to penalise the consumer to a much greater extent than the provision of the additional capital required to supplement the existing Generating Plant which is inadequate."

If the Company's application were granted the result would be to increase the market value of the present shares, and to enable the Company to issue shares at a premium.

That, it is suggested, is the principal reason for making the application for a renewal of the Company's existing licences eleven years before the dates of expiry of such licences, but it is submitted that that is not a sufficient reason to justify the present application.

2. That the position of the Council as the local authority for the Municipality of Nairobi will be prejudiced by the Company's application.

As is usual in Enactments relating to the generation and distribution of electrical energy the Electric Power Ordinance contains provisions expressly inserted for the benefit and protection of the interests of local authorities.

If the Company's application were granted it would probably deprive the Council as the local authority for Nairobi of those benefits to which they are now entitled,

and if the Company succeed in their endeavour to obtain the repeal of the proviso to Section 5 (1) of the Electric Power (Amendment) Ordinance of 1934 it would unquestionably deprive the Council of those benefits.

Section 5 (1) of the last mentioned Ordinance reads as follows:-

"5. (1) Paragraph (a) of Section 19 of the Principal Ordinance is, subject to the proviso contained in this sub-section, hereby repealed and the following is substituted therefor:-

"(a) Within six months after the expiration of a period of forty-two years from the date of the distributing licence, or such shorter period as is specified in that behalf in the distributing licence, or within six months after the expiration of every subsequent period of seven years, or such other period as is specified in that behalf in the distributing licence, such local authority shall make an application to the Governor in Council for the revocation of the existing distributing licence as to the whole or part of the area of supply, and for the issue to them of a distributing licence for such area or part thereof. In addition to any notices required to be given by the Council, the applicant shall serve copies of applications upon the authorized distributor together with such further particulars as the Governor in Council may direct."

"Provided that the provisions of this sub-section shall not apply to any distributing licence granted before the commencement of this Ordinance but the provisions of paragraph (a) of section 19 of the Principal Ordinance as they appear in the Ordinance before the coming into operation of this Ordinance shall continue to apply to any such distributing licence."

The Company have made representations to the Secretary of State for the Colonies regarding the repeal of the proviso to the said Section which representations are now under consideration: if these representations succeed then the position of the Council will be prejudiced by the present application, inasmuch as they could not apply for the revocation of any of the existing Licences and the transfer to them of a Distributing Licence for Nairobi until 1964 at the earliest, and possibly not until 1972.

The Council have had under consideration for some time past a proposal to apply for a Distributing Licence in respect of this area, and they object to any of their rights and privileges under the Ordinance being abrogated.

3. That the Maximum prices authorised by the Company's Distributing Licence No. 2 dated the 24th March, 1932, are too high and should be reduced.

The maximum prices which may be charged for the supply of electrical energy for the first five years from the date the Licence came into force are

For power	.....	56 cents per B.T.U.
For lighting	.....	100 cents per B.T.U.

The Licence contains a provision to the effect that such maximum prices shall be subject to revision after the first five years, but no revision of such maximum prices has taken place.

The prices at present charged by the Company for the supply of electric energy are less than the authorised maximum prices.

Attention is directed to the provisions of Section 69 of the Electric Power Ordinance on the subject of prices.

The Section 69 reads as follows:-

"69. (1) The prices to be charged by the licensee for electrical energy supplied by him shall not exceed those stated in that behalf in the licence, or in the case of a method of charge approved by the Governor in Council, such price as the Governor in Council may determine on approving the method.

"(2) Provided that if, in a case where a public or local authority is not the licensee, either of such authorities, or the licensee, or such authorised distributors (in the case of a bulk supply area) or ordinary consumers (in the case of a distributing area) as the Governor in Council may consider sufficient, having regard to the circumstances, at any time after the expiration of five years after the commencement of the licence, make a representation to the Governor in Council that the prices or method of charge stated in the licence or approved by the Governor in Council ought to be altered, the Governor in Council after such inquiry as he may think fit, may make an order varying the prices or methods of charge stated in the licence or so approved as aforesaid, or substituting other prices or methods of charge in lieu thereof, and the prices or methods of charge so varied or substituted shall have effect on and after such day as may be mentioned in the order, as if they had been stated in the licence. Provided also, that the prices and methods of charge for the time being in force may be altered in like manner at any time after the expiration of any or every period of five years after they were last altered."

4. That provision for depreciation is not being made by the Company in accordance with the requirements of section 45 of the Electric Power Ordinance.

The said Section requires that "there shall appear in the accounts of the undertaking from year to year an allowance for depreciation of such works or part thereof which shall be of such amount as is usual for works of the same nature and class, or as may be stated in the licence."

A perusal of the Company's accounts will reveal that there is no fixed rate or standard of depreciation as "is usual" in undertakings of this character.

The amounts set aside by way of depreciation vary enormously and there does not appear to be any recognised basis upon which provision for depreciation is calculated.

For example, in 1929 the amount shown in the Company's Accounts as depreciation on stores was no less a sum than Shs.80,000/- (in respect of Nairobi and Mombasa Undertaking); in 1930 the corresponding amounts are Nairobi Shs.19,876/-, Mombasa Shs.4,501/-; for 1931 Nairobi Shs.10,538/-, Mombasa nil; 1932, Nairobi Shs.7,048/-, Mombasa Shs.5,000/-, for 1933, Nairobi Shs.609/-, Mombasa Shs.5,000/-.

Again with respect to Buildings (Generating Stations) in 1929 there was no provision made for depreciation. In 1930 a sum of Shs.22,500/- is shown in the Accounts for depreciation. In 1931 the corresponding item is Shs.16,180/-, whereas in 1932 the figure had risen to Shs.92,540/-.

(These figures relate to the Nairobi Undertaking).

In the last published Accounts of the Company the depreciation on Stores is shown as follows:

<u>Nairobi</u>	<u>Mombasa</u>	<u>Nakuru</u>	<u>Eldoret</u>
Shs.2,848/67	Shs.5,000/-	Nil.	Shs.628/65
= 1%	= 5%		= 1%

A Statement showing the depreciation in respect of the Nairobi Undertaking is appended.

These figures clearly show the necessity for a standardised rate of depreciation; otherwise it is possible for the Company by making greater or less provision for depreciation in any particular year to decrease or increase the amount of net profit remaining for distribution to its shareholders by way of dividend.

That the maximum dividends payable by the Company should be limited to ten per centum per annum.

Where the Licensee is not a public or local authority Section 45 (a) of the Electric Power Ordinance provides as follows:-

"Provided that when the net profits from the Undertaking paid as dividend on the paid-up share capital shall at any time have amounted to a sum equal to 10% per annum on such paid-up share capital from the date of its being so paid up the dividend payable on such paid-up share capital from any net revenue or profits from the Undertaking in excess of 10% per annum may be increased by 1% per annum for every 1% by which the average price charged to consumers for the supply of electrical energy is reduced below the maximum price stated in the licence....."

It is suggested that the provision in the Ordinance which permits of an increase of profit over 10% whenever there is a reduction in the average price of 1% below the maximum prices stated in the Licence, should be repealed; 10% per annum is an exceedingly good return on invested capital, and in no circumstances should the Licensee be allowed to increase this figure.



6. That the system of overhead lines in built-up areas is unsatisfactory, unsightly and dangerous and should be replaced by underground cables in built-up areas.

Whilst there is no objection to overhead lines to carry high tension cables over agricultural land in rural areas, overhead lines in densely populated areas constitute a source of danger, and underground cables in closely built-up areas such as exist in Nairobi are necessary.

7. That the practice of the Company in undertaking Contract work at a loss is unfair and inequitable both to consumers and Electrical Contractors and should be prohibited.

Section 138 (1) (a) of the Electric Power Ordinance provides that

"138. (1) (a) A licensee shall not directly or indirectly have any interest in any other business of an electrical nature within his area of supply, excepting that he may undertake the supply by sale or hire of electrical motors, cooking, heating or domestic and industrial appliances of such a nature as to require for their operation or use (a supply) of electrical energy originating from the works or system of a licensee."

Sub-section (2) of the same Section enacts

"138. (2) Provided that the provisions of clause (a) of the preceding subsection (1) shall not come into operation and have effect until after the expiration of twelve months from the enactment of this Ordinance, and that the Governor in Council may suspend the provisions of clause (a) of the preceding subsection (1) in any area or areas and for such times as he thinks expedient; and provided that in any case where the provisions of clause (a) of the preceding subsection (1) have been so suspended, they shall not be operative in any such area or areas until after the expiration of twelve months from the date of a notice in the Gazette of the suspension of the Governor in Council to make operative and to enforce such provisions."

The provisions of sub-section (2) were no doubt necessary in view of the availability at the time of licence was granted, there could not be found in Kenya contractors capable of carrying out works of this description but that is no longer the position in Nairobi, there are several firms of electrical contractors capable of carrying out works of this description and this necessity to permit the Company to continue to execute works of this kind no longer exists and the provisions of Section 138 (1) of the Ordinance should become operative.

8. That the charges for meter rents are excessive.

The provisions of the Electric Power Ordinance of 1920 relating to meters were considerably amended by the Electric Power (Amendment) Ordinance, 1954, the position now being that the Company supply the meters, whereas formerly Consumers were entitled to provide their own meters.

The published Accounts of the Company do not shew the revenue derived by them from meter rents (the amount is included in the item "Rental of Meters and other apparatus "on Consumers' premises") but the annual revenue from this source in the Nairobi area is probably not less than £5,800.

The Capital Account of the Company as at 31st. December, 1934, relating to the Nairobi area, shews a sum of Shs. 77,348/- = £5,867/8/-, as the written down value of meters; a revenue of £5,800 per annum will produce a return of approximately 100% on the capital employed, or, after making a generous allowance for depreciation a profit of 75%.

9. That the application of the Company for an area in the Native Reserve to complete what is known as the "MARAGUA-TANA SCHEME" is a separate matter and should be dealt with quite independently from the application of the Company for a renewal of their existing Licences.

The Council offer no objection to the Company's application for an additional area in the Native Reserve, to complete the Maragua Tana Scheme, but they submit that this should be the subject of a separate application.

10. That the position which the Company allege in their Memorandum is "Fraught with grave danger" is due to the failure of the Company to adopt measures to prevent such a position arising.

The Company have known for the last two and a half years that the Generating Plant is insufficient to meet the demand during periods of drought and that the primary load has been perilously near the total generating plant capacity in drought conditions, for some time past.

11. That paragraph 5 of the Company's Memorandum on their application for a renewal of their licences is not supported by fact.

The recommendations contained in the "Weir" Report (which is referred to in the said Memorandum) have not been adopted by Parliament.

For the reasons hereinbefore stated the Council request that the application of the Company for a renewal of their existing Licences be not granted.

PASSED under the Common Seal of the Municipal Council of Nairobi pursuant to a resolution to that effect this 14th day of February 1936.

THE COMMON SEAL of the Municipal Council of Nairobi was hereunto affixed in the presence of

(Sd.) G. DELAMERE  
DEPUTY MAYOR

(Sd.) F. S. ECKERSLEY  
TOWN CLERK

S T A T E M E N T

showing the Depreciation provided in respect of the  
East African Power and Lighting Company Limited's  
Machoni Undertaking for the period of five years  
from 1930 to 1934 inclusive.

	Generating Stations				Distributing & Transmitting						Total
	Lands	Buildings	Hydraulic Works	Machinery	Lands	Buildings	Machinery & Lines	Meters and other Apparatus	Tools, furniture, fittings etc.	Stores	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.
1930	-	22,300	12,100	69,340	-	2,620	65,220	19,283	19,922	13,873	230,661
1931	-	16,180	54,060	51,700	-	-	97,680	15,115	16,547	10,538	220,620
1932	-	92,520	8,980	120,160	-	-	66,140	15,401	20,518	7,048	350,787
1933	-	64,745	6,285	84,070	-	-	46,275	18,284	26,823	609	247,089
1934	-	24,960	27,580	69,140	-	-	131,700	56,385	15,502	2,626	307,115
	-	220,725	89,005	374,410	-	2,620	407,015	108,466	99,112	40,918	1,337,570

(Copy).

OFFICE OF THE POSTMASTER GENERAL  
P.O. Box 311,  
NAIROBI.

5th January, 1936.

Sir,

With reference to your Company's application for an extension of their licences in the Nairobi area, I shall be glad of information on the following matters:

(1) It had been stated on behalf of the Company that the 195,000 Ordinary Shares, which were issued early in 1933, at a premium of Shs. 650 per share, were for the purpose of the Pangani Concession in Tanganyika.

Is it the Company's case that they were able to issue these shares at the premium mentioned solely and entirely on the merits of the Pangani Concession and without any relation to the Company's general financial standing towards which the revenue from the Nairobi undertaking has contributed so substantially?

(2) It is understood that the first stage, already completed, of the Maragua-Tana scheme has cost approximately £75,000. It is stated in the Company's application that a further sum of approximately £300,000 will be required to complete the scheme. This makes a total cost of £375,000. In evidence given on behalf of the Company before the Special Tribunal appointed in 1935 to consider the Maragua-Tana scheme, the estimate for the whole scheme was placed at £200,000 or £211,000 if transmission line costs are included.

I shall be glad to learn how the large discrepancy between the two estimates is accounted for.

Note I would here observe that the Company's estimate in regard to development at Seven Forks placed before the Tribunal closely approximates to the estimate furnished by the experts who recently investigated the possibility of development at that point.

(3) It would be a convenience if the Company would furnish a self-contained statement, suitable for placing before a Committee of Enquiry regarding the difference between the depreciation figures in respect of the Nairobi undertaking of £10,068 included in the 1935 accounts and the figure of £21,862 submitted for current valuation by Messrs. [redacted], a figure of £14,000, actually, was stated to be [redacted].

It is stated that 1,000,000 ordinary shares issued early in 1933, at a premium of Shs. 650 per share, were for the purpose of the Pangani Concession and that the shares had to be taken up by the Beaver Trust Ltd. under the agreement entered into with that trust.

It has been stated by the Company that the issue in question yielded approximately £251,855, or some £5,520 less than the full yield at the 25% per share. The commission due to be paid to the Beaver Trust in respect of all expenses in connection with the allotment amounts to £4,875.

I shall be glad if the difference between the latter amount and the £5,520 above referred to can be explained.

What amount is estimated to have been paid to the Beaver Trust in/

THE GENERAL MANAGER,  
THE EAST AFRICAN POWER & LIGHTING CO. LTD.,  
NAIROBI.

(Copy).

OFFICE OF THE POSTMASTER GENERAL  
P.O. Box 311,  
NAIROBI.

5th January, 1936.

Sir,

With reference to your Company's application for an extension of their licence in the Nairobi area, I shall be glad of information on the following matters:

(1) It has been stated on behalf of the Company that the 195,000 ordinary 5s. 20/- shares which were issued early in 1935 at a premium of 5s. 6/6 per share, were for the purpose of the Pangani Concession in Tanganyika.

Is it the Company's case that they were able to issue these shares at the premium mentioned solely and entirely on the merits of the Pangani Concession and without any relation to the Company's general financial standing towards which the revenue from the Nairobi undertaking has contributed so substantially?

(2) It is understood that the first stage, already completed, of the Maraga-Tana scheme has cost approximately £78,000. It is stated in the Company's application that a further sum of approximately £200,000 will be required to complete the scheme. This makes a total cost of £278,000. In evidence given on behalf of the Company before the Special Tribunal appointed in 1928 to consider the Maraga-Tana scheme, the estimate for the whole scheme was placed at £200,000 or £210,700 if transmission line costs are included.

I shall be glad to learn how the large discrepancy between the two estimates is accounted for.

Note: I would here observe that the Company's estimate in regard to development at Seven Forks placed before the Tribunal closely approximates to the estimate furnished by the experts who recently investigated the possibility of development at that place.

(3) It would be a convenience if the Company would furnish a self-contained statement, suitable for placing before a Committee of Enquiry, regarding the difference between the depreciation figures in respect of the Nairobi undertaking of £10,000 included in the 1935 accounts and the figure of £21,462 submitted for certain depreciation purposes. A figure of £10,000, incidentally, was stated to be included in the 1935 accounts.

It is stated that 195,000 ordinary shares issued early in 1935, at a premium of 5s. 6/6 per share, if any, of these shares had to be taken up by the Beaver Trust Ltd. under the agreement entered into with that Trust.

It has been stated by the Company that the issue in question yielded approximately £251,856, or some £5,520 less than the full yield of 5s. 26/60 per share. The commission due to be paid to the Beaver Trust in respect of all expenses in connection with the allotment amounts to £4,875.

I shall be glad if the difference between the latter amount and the £5,520 above referred to can be explained.

What amount is estimated to have been paid to the Beaver Trust in/

THE GENERAL MANAGER,  
THE EAST AFRICAN POWER & LIGHTING CO. LTD.,  
NAIROBI.

in respect only of guaranteeing the subscription of the whole of the 195,000 ordinary shares referred to?

(5) What is the usual arrangement adopted by the Company in regard to the construction of major development works? Are, for instance, tenders invited from Contractors competent to undertake such kind of work, or is the contract given to some firm in association with the Company without any steps being taken to obtain competitive prices?

Further, what is the exact nature of the contract entered into, i.e., is the contract for a fixed amount based on specific action, or is it in the nature, so far as profits are concerned, of a percentage of the cost of carrying out the work? If the latter, what is that percentage?

Is it proposed to carry out the Company's usual arrangement in connection with any new development works on the Maragua-Tana?

(6) That additional capital would it be necessary to raise in order to complete:

- (a) the next stage of the Maragua-Tana scheme.
- (b) the scheme as a whole.

If it is necessary to raise additional capital to the full extent of the £300,000 now estimated to be required to complete the whole scheme, how is this position reconciled with the following statement made by the present Chairman of the Company in evidence before the Special Tribunal in 1929:-

"Therefore, although the Company would probably be unable to carry out both stages of development with its present capital resources, at the outside it would only require either temporary accommodation or a relatively small increase of its capital resources in order to complete the full Maragua-Tana development."

(7) In the 1934 accounts, the following items, in round figures, appear in the Balance Sheet of the Nairobi Branch:-

Reserve Fund Account	£21,500	
Depreciation Fund Account	50,000	
Investment Reserve	58,400	
	Total	<u>£139,900</u>

Particulars of the present disposition of the foregoing reserves can, perhaps be stated:-

(8) In the event of arrangements being made for the full development of the Maragua-Tana scheme:

- (a) What exactly is the nature and extent of the next stage of development?
- (b) What is the estimated capital cost of this stage?
- (c) What would be the total installed capacity of generating plant available to serve the Nairobi area upon completion of this stage?
- (d) What is the estimated peak load which could then be handled under dry season conditions?
- (e) Up to what date is it estimated that the additional plant resulting from the development of this stage will meet requirements of consumers in the area, keeping in view the fact that during 1935 the maximum demand has fallen below that of 1933 and 1934?

(9) If the Company's application is refused, to what extent is it estimated that the raising of capital for further development will/

will be affected?

(10) If the present application for renewal of the Company's licence is refused, is it the Company's intention to adopt the recommendation made by Mr. J.S. Highfield in the final paragraph of his letter of the 8th November which accompanies the application?

(11) If the answer to (10) be in the affirmative, what is the alternative method proposed by the Company by which the necessary additional generating plant is to be provided to meet demands for power to the end of the licence period? What are the estimated capital costs of such an alternative scheme and what will be the effect on prices of electricity to consumers?

I shall be grateful for a reply to this letter as early as convenient.

I have the honour to be,  
Sir,  
Your obedient servant,

(Sd.) S. Fitzgibbon

POSTMASTER GENERAL.