

AN ECONOMIC HISTORY OF  
THE SCOTTISH ELECTRICITY SUPPLY INDUSTRY

1878 - c 1930

VOLUME II

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## SUMMARY

The influence of legislation on the Scottish electricity supply industry was great and by 1931 promoting greater national efficiency. Until the mid-1890's private installations underpinned the development of electricity supply but were being overtaken by the more efficient central generating stations, and after 1900 by the establishment of power companies. Until 1931 the industry was broadly divided between local authorities and private enterprise, the former concentrated in the larger urban cities and towns and the latter in the less industrialised areas; the promotion of power companies complicated this simple analysis. Hostility between these sectors inhibited progress and lack of co-operation necessitated more positive government intervention in 1926.

Superficially electricity supply was vested in numerous autonomous undertakings. However, the private sector was governed by international holding companies. Foreign investment was substantial and aided private development: it was not benevolent and a price was exacted in financial and contractual obligations.

The thesis also examines the industry in the context of the general Scottish economy. The effect of the trade cycle is considered and the application of electricity to established sectors of the economy. Comparisons have been made with the experience of the rest of the United Kingdom economy.

In the period examined demand continually grew as the market - industrial, commercial and domestic - widened; this was evident nationally. Moreover, the industry's ability to meet this expansion also improved as individual units increased in scale: greater efficiency was introduced in generation and transmission; even the adverse effects of the trade cycle could not detract from the overall growth of the industry. In 1931 there were still weaknesses but the industry was firmly established and the 1926 legislation had provided a framework to promote greater national efficiency. Future growth was certain.

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The Clyde Valley Electric Power Company.(1) Formation.

"The Clyde Valley Electric Power Company have embarked upon a scheme which, in magnitude, is more important than any other scheme of the kind in this or any other country ... As you know the 700 square miles in the area of supply represent what may well be described as the workshop of the world. The shipbuilding yards and the engineering yards that are there are not equalled by any other similar area of country in any part of the world."<sup>1</sup>

These comments more than adequately convey the perceived significance of the founding of the Clyde Valley Electric Power Company (after this C.V.E.P. Company) for the industrial environment of West-Central Scotland and, implicit is the view that its foundation would not only enhance this industrial heartland but also stimulate future industrial development. However, despite the optimism and the obvious potential demand, no one person can be singled out as the original thinker behind its conception, although, undoubtedly, industrial interests were foremost in welcoming its birth.

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1. S.R.A. Records of Strain and Robertson, TD 83/6/2, May 1903, Mr. Wilson, Advocate for C.V.E.P. Company.

Sometime in the year 1900 a C.V.E.P. Syndicate was formed to promote the scheme with subscriptions set at a maximum of £500; the actual subscriptions varied between £100 and £500. The members of the Syndicate, all users of power, were representative of the varied industrial interests of the West of Scotland, including shipbuilders, engineers, coalmasters and iron and steel interests. For example, Sir William Pearce and Dr. Elgar represented The Fairfield Shipbuilding and Engineering Company and Frederick Lobnitz represented The Lobnitz Shipbuilding Company of Renfrew. Among the engineers were R.Y. Pickering of R.Y. Pickering, Wagon Builders, Wishaw, Andrew S. Nelson of Hurst, Nelson and Company, Motherwell, P.A. Sumervail, Bridge Builders, Dalmuir and John MacLaren of the Eglinton Foundry, Glasgow. The consulting engineers to the Syndicate - and also members of it - were John Strain and Robert Robertson of 5 Park Circus, Glasgow. Strain and Robertson had previously been consulting engineers for the electric light and power installation of Mexico City and had carried out electrical installations at a number of Scottish collieries. John Strain was a member of the council of the Institute of Civil Engineers and chairman of John Watson Limited, Ironmasters and Coalmasters; this firm owned collieries at Motherwell, Hamilton and Neilsland and, from its Lanarkshire collieries, had an output of 1.2 million tons. He was also chairman of the Lanarkshire Steel Company, Motherwell, one of the largest steelworks in



Scotland with an output capacity of 150,000 tons of finished steel; these works extended to over 100 acres and in 1900 had generators capable of supplying 850 h.p. This, therefore, was the calibre and stature of those who wished to see a proposed scheme for a power company, servicing the industrial needs of western Scotland, becoming a reality.<sup>2</sup>

The Syndicate completed its work by November 1900 and; in April 1901 the C.V.E.P. Bill was investigated by a House of Commons Committee and in July by a Select Committee of the House of Lords under Lord Welby before finally receiving the Royal Assent on 9th August, 1901.<sup>3</sup> There were a number of petitions against the scheme,<sup>4</sup> but the House of Lords was undoubtedly influenced by the strength of feeling in its favour. The area of proposed supply was approximately 730 square miles and contained 1,200 works, 600 of which were in favour of the C.V.E.P. Bill, either as promoters or supporters. Indeed, it was argued on behalf of the C.V.E.P. Company that its case was different from most in so far as all the promoters were people who would take energy later and "who are promoting the Bill not so much with a view to make profit out of the supply of

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- 2. S.R.A. Records of Strain and Robertson, TD 83/6/1.
  - 3. S.R.A. Records of Strain and Robertson, TD 83/1/1, TD 83/6/1 and TD 83/7.
  - 4. See p.p. 366 - 370

electricity, but as enhancing the whole of their works and improving their own enormous trade by getting a very cheap supply of electrical energy."<sup>5</sup>

The promoters can be divided into four main groups viz., shipbuilders, owners of public works, coalmasters and landowners, and the more important of them have been listed under these headings in Appendix 21 (see p.705). Moreover, in addition to those listed in Appendix 21, over 400 industrialists signed a public petition in favour of the scheme which was proposed by the C.V.E.P. Company.<sup>6</sup> Thus, the ultimate decision of the House of Lords in favour of the C.V.E.P. Bill was indubitably influenced by, what can only be described as, a catalogue of "Who's Who" among West of Scotland industrialists and entrepreneurs; the political involvement of certain promoters can also be observed. By the same token the inherent interest of many of the promoters and their companies was also of some significance.

By comparison the numerous petitions against the C.V.E.P. scheme lacked authoritative local influence and substantive support, recognised integrity and unity of purpose in their opposition. For example, the only positive rival to the proposed C.V.E.P. Company was the Caledonian Electric Power Company. This envisaged a

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5. S.R.A. Records of Strain and Robertson, TD 83/7

6. Ibid.

scheme which, if successful, would have covered 1,050 square miles, part of which was moorland and hills, and the establishment of seven small generating stations at Uddingston, Yoker, Port Glasgow, Renton, Kilmarnock and Irvine. However, the promoters of the Caledonian scheme lacked an obvious inherent interest as both users and consumers of electrical power and also the obvious stature of their opponents. Thus, the promoters of the Caledonian scheme were characterised as speculative capitalists "who have only a money profit in view" and were doomed to failure. The promoters of the Caledonian scheme were, in fact, John Charles Cunninghame of Merry and Cunninghame Limited, Ironmasters and Coalmasters, whose works were situated at Ardeer and Glengarnock in Ayrshire but which had only a few collieries in Lanarkshire; David Murray, an accountant of Glasgow; Robert Morton Paterson, a chemical manufacturer from Falkirk, who had no direct interests in the West of Scotland; Archibald R.C. Pitman W.S. of Edinburgh who represented Sir Charles Ross, a landowner with an estate near Hamilton; Paul Rattenger of Leisler, Bock and Company, Merchants of Glasgow who, apparently, were not interested in any public works requiring electricity but whose son was managing director of a small electric machinery company, named Paterson, Cooper and Company Limited, which was registered in 1900 with a capital of £5,000 and had a small factory at Elderslie and, finally, Captain George S. Campbell



Swinton, brother of Archibald Campbell Swinton, an electrical engineer of London and the consultant to the Caledonian scheme.<sup>7</sup>

Excluding the Caledonian petition, there were thirty-eight petitions against the C.V.E.P. scheme, and all of these petitions were either met or circumvented before the C.V.E.P. Bill received the Royal Assent. The strength of such petitions was, perhaps, indicated by the fact that the Select Committee of the House of Lords heard all of them during the month of July 1901 and dealt with them in such a manner as to allow the Royal Assent on the 9th August, 1901.

Among those who petitioned against the C.V.E.P. scheme were the four county councils of Lanark, Renfrew, Dunbarton and Stirling which demanded protection of roads. More important, these county councils wanted the power of purchase at the end of forty-two years at 'break-up' prices; to counter this the C.V.E.P. Company relied heavily on the strong opinions expressed by the Cross Committee. In addition to these county councils, nineteen burghs petitioned for a variety of reasons. These burghs can be divided into two main groups. First of all six, comprising Glasgow, Paisley, Govan, Partick, Hamilton and Motherwell, which held provisional orders from the Board of Trade, authorising them to provide energy, both for

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7. Ibid.

lighting and power, within their own boundaries.

Secondly, there were a further thirteen burghs without provisional orders. Apart from these local authorities, four gas companies at Barrhead, Bothwell and Uddingston, Larkhall and Leven and Renton also objected because they feared both the competition and possible injury to their mains. Five railway companies also objected on the grounds of the possible interference with their lines - the Glasgow and South-Western, the Caledonian, the Lanarkshire and Ayrshire, the Lanarkshire and Dunbartonshire, and, finally, the Glasgow and Renfrew District. The Clyde Navigation Trustees eventually withdrew their petition when adjustments were made to clauses within the Bill which dealt with the laying of cables across the River Clyde. The Airdrie and Coatbridge District Water Trustees also objected. The Hamilton, Motherwell and Wishaw Tramways Company objected on the grounds that the establishment of the C.V.E.P. Company would adversely affect its business. The Scottish House-to-House Electricity Company had a similar objection, since it held the Coatbridge Electric Supply Order 1890 and had agreed to take over the Airdrie Burgh Lighting Order 1898. Penultimately, Archibald A. Spiers of Elderslie objected but withdrew his petition when he reached agreement with the C.V.E.P. Company concerning the purchase of land at Yoker. Finally, the National Telephone Company sought protection against any possible injury caused by the C.V.E.P.



Company's current and protection for any damage caused  
 to its own current.<sup>8</sup>

Despite these petitions the C.V.E.P. Bill received the Royal Assent on 9th August, 1901. The company incorporated was impressive and contained many of the major landowners and industrialists of West-Central Scotland. The company incorporated were The Right Honourable Gavin George, Baron Hamilton of Dalzell; Sir W.G. Pearce, Baronet; Sir Mitchell Thomson, Baronet; Sir C.W. Cazzar; Sir David Richmond; Robert Allison; James Anderson; Robert Anderson; William Box; John Cowan; Francis Elgar; William Ewing; Alexander Findlay; Hugh Gibb; Robert Harvey; James Howden; Richard H. Hunter; James Kennedy; Charles Mackintosh King; Andrew Lamberton; Frederick Lobnitz; Arthur Logan; George F. Loudon; Robert Machill; John McLachlan; John F. Maclaren; Robert McMillan; Walter Menzies; John F. Miller; James Moffat; Charles C. Mowbray; Alexander Pillans; Richard Pillans; James B. Reid; Andrew Rintoul; Anderson Rodger; John Ross; James Rowan; John Shearer; Hugh Steven and James McMeekin Strain. Information on the more important of these men is given in Appendix 21.

The company was domiciled in Glasgow with a capital of £900,000 divided into 90,000 shares of £10 each; in addition, the company had borrowing powers of £300,000. The number of directors was set at not less than six nor

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8. Ibid.

more than twelve, and the financial qualification was a holding of not less than 100 shares. Under the Act the Company was authorised to supply energy in bulk to authorised distributors or to persons requiring energy for power purposes. The company acquired 36 acres of land at Motherwell, 9½ acres at Renfrew and 14½ acres at Paisley for generating stations. Dividends were limited to £8 in respect of every £100 of paid up capital, but if the average price per unit was less than 2½d, the dividend could be increased in the ratio of one-quarter per cent by which the average price charged by the company was below the standard price. Moreover, the following rates per quarter were stipulated by the Act. For any quantity not exceeding the equivalent of four hundred hours of supply, at the maximum power which had been demanded by the consumer, the rate was established at 3d per unit and for any further quantity which exceeded four hundred hours a rate of 2d per unit.<sup>9</sup>

Among these major provisions of the C.V.E.P. Act 1901 it is important to note that the Act limited the company to supply electricity for power purposes and bulk supplies to local authorities and other authorised distributors. However, after 1901 the company was faced with a demand to supply electricity for lighting by a

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9. S.R.A. Records of Strain and Robertson, TD 83/6/1, TD 83/6/2 and TD 83/7.



number of communities and consequently, it sought power to provide this facility. Despite opposition from a number of local authorities and companies, on 22nd July, 1904 a second C.V.E.P. Act was passed which amended the 1901 Act. Under this 1904 Act, electric lighting orders were granted to the company for Barrhead, Bothwell, Eastwood and Cathcart, Johnstone, Kilpatrick, Lanark, Renfrew and Shettleston. It was also stipulated that the company might acquire from any local authority, or other undertaker, its provisional order, and, indeed, it was under this Act that the Clydebank Electric Lighting Order 1901 was transferred to the company at a cost of £400. The 1904 Act also stated that the company could construct a generating station elsewhere than on the sites noted under the 1901 Act and, in addition, hold any quantity of land not exceeding 100 acres.<sup>10</sup> This 1904 Act is important, therefore, since it considerably strengthened the company's position by allowing it to extend its operations.

To facilitate the distribution of electricity further, in May 1905 the directors of the C.V.E.P. Company decided to promote a private company, the Strathclyde Electricity Supply Company Limited, to apply for electric lighting orders for certain populous districts within the former company's area of supply and also to overcome all

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10. S.R.A. Records of Strain and Robertson, TD 83/6/3.

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restrictions imposed by the C.V.E.P. Act 1901.

These restrictions had been partially overcome by the 1904 Act, but the company was only allowed to supply for lighting 20 per cent of what it supplied for power and it was

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not allowed to supply for domestic lighting. The formation of the new company overcame these limitations, and it was also intended that the administration would be simplified by ensuring that contracts for bulk supply would be placed through the new company. Accordingly,

in September 1905 the Strathclyde Electricity Supply Company Limited was registered under the Company Acts 1862-1900 as a private company with a nominal capital of £1000.<sup>13</sup> Thus, by 1905 all legal hindrances to the future development of the C.V.E.P. Company had been removed.

## (2) Directors.

In the initial stages the C.V.E.P. Company, prior to its actual incorporation, emphasised its 'Scottishness.' However, for many years the company was financially dependent upon, largely administered by and under the influence of Anglo-American interests.

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11. S.R.O. Records of the South of Scotland Electricity Board, SSE 5,1/1.
  12. S.R.A. Records of Strain and Robertson, TD 83/6/1.
  13. S.R.O. Records of the South of Scotland Electricity Board, SSE 5,5/1.



The American connection first became evident in 1901 when John Strain visited America and contacted Henry Clay Frick,<sup>14</sup> a partner with Andrew Carnegie in the Carnegie Steel Company of America, with a view, obviously, to financing the C.V.E.P. scheme. In response, Frick suggested that the scheme should be submitted to George Westinghouse, of the Westinghouse Electric and Manufacturing Company of Pittsburgh,<sup>15</sup> who had interests in London. Indeed, on 10th July, 1899 the British Westinghouse Electric and Manufacturing Company Limited was formed for the purpose of establishing works for the production of every type of electrical machinery and appliances. This company became the British subsidiary of Westinghouse Electric and Manufacturing Company of Pittsburgh. The American company transferred to the British company its patents for a period of ten years, future improvements it might make and plans which were necessary to conduct manufacturing operations. The American company also guaranteed that the profits resulting from the business for the first two years would amount to a sum not less than sufficient to pay a six per cent dividend upon amounts

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14. Henry Clay Frick obtained coking coal properties as a steel industry adjunct and became Andrew Carnegie's partner and later an architect of the hard line taken by the steel leaders against trade unions. During the bitter Homestead Strike 1892 at Pittsburgh, Frick brought in 300 Pinkerton detectives to disperse strikers and maintain order. R.M. Robertson, History of the American Economy, (New York, 1964), p.p.402-405.
15. S.R.A. Records of Strain and Robertson, TD 83/3/1.

called up on Preference Shares. Moreover, a site of some 70 acres was acquired at Trafford Park, Manchester for the works. In consideration for such benefits the American company received, as fully paid, 50,000 Ordinary Shares in the British concern. The first directors of the British Westinghouse company, who received as remuneration £500 per annum (the chairman received £1,000) and a percentage of the profits, were J. Annan Bryce, C.W. Benson, Joseph Lawrence, The Honourable R. Clere Parsons M.I.C.E., A.I.E.E., Lemuel Bannister, Joseph H. Lukach, Ph. F. Kobbe and George Westinghouse himself; the technical adviser was Lord Kelvin. At 1901 this company had an authorised capital of £1,750,000 of which £1,000,000 was issued.<sup>16</sup> Westinghouse was also associated with the Traction and Power Securities Company Limited which later became involved in the financial activities of the C.V.E.P. Company. The Traction and Power Securities Company was formed on 27th July, 1901. to acquire and hold shares, stocks, debentures, debenture stocks, bonds, obligations, warrants, certificates of indebtedness and securities issued or guaranteed by any company in the United Kingdom or elsewhere and to carry on the business of financiers and bankers; at 1905 this company had an authorised capital of £2,000,000 of which £854,000 was issued. By 1915/1916 this company was carrying "on the business of a trust

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16. Garcke, op.cit. Vol.V.



company" and by 1920/1921 it had been formally "constituted as a trust company." In 1905 George Westinghouse was chairman of this company and the other directors were W.I. Buchanan, M. Hunsiker and J.H. Lukach.<sup>17</sup>

On 19th June, 1902 Strain and Robertson were still awaiting definite proposals to be made by the two Anglo-American companies. However, on 18th June, 1902 J.H. Lukach had reported to them that the financing of the C.V.E.P. Company's operations had been discussed with George Westinghouse on 17th June, 1902 and that he and Westinghouse were of the opinion that the best way to deal with the matter was for the Anglo-American concerns to make a concerted proposition for the complete installation of the Works in exchange for shares and debentures.<sup>18</sup>

After negotiation on 23rd September, 1902 a contract was signed between Sir David Richmond and James Mackenzie, chairman and secretary respectively of the C.V.E.P. Company, and Joseph Harry Lukach and Raleigh Butler Phillpotts, director and secretary respectively of the British Westinghouse company, for the building of two central generating stations at Yoker and Motherwell. British Westinghouse agreed to construct them, each with a generating capacity of 4,500 KW. In addition, it agreed to construct the distribution system including all sub-stations. The

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17. Ibid., Vols. V, XIX and XXIV.

18. S.R.A. Records of Strain and Robertson, TD 83/3/1.

C.V.E.P. Company was, of course, to provide the sites for both stations. It was also agreed that either of the two stations could be completed first but that one of them would be completed in eighteen months and the second in twenty-four months. The contract price to be paid by the C.V.E.P. Company for the construction of the two generating stations, complete as specified, was £310,000, and the contract price for the entire distribution system £170,000, that is a total cash payment of £480,000. Of the total cash due, £96,000 was to be paid within one month of the signing of the contract. Moreover, fifty per cent of the estimated value of all work done was to be paid by monthly instalments as the work progressed, and twenty per cent was to be paid when each station was ready for operation. The remainder was to be paid six months after the completion of the works to allow for a period of testing and maintenance. However, the contract also specified that British Westinghouse were to apply for 48,000 shares of £10 each in the C.V.E.P. Company which were to be allotted to British Westinghouse or its nominees. The C.V.E.P. Company was then entitled to retain and apply the cash due for the above mentioned first instalment of £96,000 and for all other instalments falling due for work completed as payments to the account of the capital represented by the 48,000 shares until they were fully paid up. In addition, British Westinghouse provided technical aid. Harvey E.



Note of that company, a member of both the American Society of Mechanical Engineers and the American Institute of Electrical Engineers and until that time assistant mechanical engineer of the Manhattan Railway Company in connection with the design and installation of its central station at New York, assisted in the planning of the generating station at Yoker, and presumably at Motherwell.<sup>19</sup> Thus, by the terms of the contract the British Westinghouse company were allotted over fifty per cent of the total 90,000 shares of £10 each of the C.V.E.P. Company and following upon this it quickly exerted executive and administrative control over the Scottish company.

Under the terms of the C.V.E.P. Act 1901 the following persons were appointed to be the first directors of the company viz., Sir C.W. Cazzar; Sir David Richmond; J. Cowan; A Findlay; J Kennedy; C.M. King; G.F. Loudon; R. Machill; A. Rintoul; A. Rodger and J. Shearer.<sup>20</sup> On 7th February, 1902 the first half-yearly meeting of the C.V.E.P. Company was held, and these appointments were confirmed with the exception of G.F. Loudon; no reason is given for his non-appointment. At this date, therefore, there were ten directors, and later on 21st February, 1902 Sir David Richmond became the first formal chairman of the company. However, in July 1902 British Westinghouse

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19. Ibid., TD 83/3/1, TD 83/6/1 and TD 83/6/2.

20. For background information on these men see Appendix 21, p.705.

intimated that as part of the contract, which was not signed until September 1902, it wished the number of directors to be reduced to seven, comprising three of the then present directors and four to be appointed by that company. This was not acceptable to the existing directors. Nevertheless, on 23rd July, 1902 Colonel Willard Hunsiken, 71 King William Street, London and<sup>21</sup> Joseph Harry Lukach were appointed as directors.

Lukach was a director of British Westinghouse and the Traction and Power Securities Company, and possibly<sup>22</sup> Hunsiken was also connected with either concern or both.

Following upon these new appointments and less than one month later on 21st October, 1902 six of the original directors resigned namely, Cazzar, Findlay, Kennedy, Machill, Rodger and Shearer; no reason was given. In their place Dr. Francis Elgar, 18 Cornwall Terrace, Regents Park, London was appointed as director. Elgar, one of the original promoters of the company and part of the company as incorporated, was a director of the<sup>23</sup> Fairfield Shipbuilding and Engineering Company.

Therefore, at 21st October, 1902 the directors of the company were:- Sir David Richmond; John Cowan; Charles Mackintosh King; Andrew Rintoul; Joseph Harry Lukach;

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21. S.R.O. Records of the South of Scotland Electricity Board, SSE 5,1/1. S.R.A. Records of Strain and Robertson, TD 83/6/1 and TD 83/7.
  22. It is noted that a M. Hunsiken was a director of the Traction and Power Securities Company in 1905. Garcke, op.cit. Vol.IX.
  23. S.R.A. Records of Strain and Robertson, TD 83/7.



Willard Hunsiken and Francis Elgar. This reduced the number of directors to seven in accordance with the wishes of British Westinghouse as of 9th July, 1902, although the ratio of London to local directors was not as it wished. However, it is noticeable that after this date the Minutes of the company continually refer to the "London Directors."

On 26th November, 1903 John Cowan, one of the original promoters of the company, resigned. The number of directors was now reduced to six, but no new director was appointed. However, on the resignation of Hunsiken on 4th May, 1905 a new appointment was quickly made in the person of Oscar H. Baldwin, an engineer of 2 Norfolk Street, Strand, London. Baldwin's address was, in fact, the registered office of both the Anglo-American concerns, and clearly Baldwin was their appointee.<sup>24</sup> Therefore, at 22nd May, 1905 the directors were Richmond, who was still chairman, King, Rintoul, Lukach, Elgar and Baldwin. This situation did not remain static for long and on 21st December, 1905 Rintoul resigned and was replaced on 12th July, 1906 by Newcomb Carlton, an engineer of again 2 Norfolk Street, Strand, London.<sup>25</sup> Thus, by July 1906 the Anglo-American concerns controlled fifty

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24. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1. R.C. Dissolved Company Files, B.T. 2/5911. S.R.A. Records of Strain and Robertson, TD 83/8/5.

25. Ibid.

per cent of the directorate which, in many ways, was contrary to the arguments put forward in Parliament in 1901 to obtain parliamentary sanction for the company when it was stated quite forcibly that the strength of the proposed C.V.E.P. Company lay in its local roots and local sponsorship.

The complexion of the Board was further changed at a meeting on 31st January, 1907 when both Baldwin and Elgar resigned. In their place were elected, first of all, the Canadian-Scot Andrew Bonar Law, M.P. (1858-1923), of Kintullo, Helensburgh and of Pembroke Lodge, Edward's Square, London.<sup>26</sup> Bonar Law was, in fact, present at this meeting and took his seat on the Board. In addition to Bonar Law, James Mackenzie, a solicitor, of 3 Queen's Gardens, Glasgow, secretary of the company from its outset, was also appointed director, although he had to acquire the necessary share capital before he could take his seat. Mackenzie resigned as both secretary and treasurer and was replaced by Robert Robertson, the company's consultant engineer.<sup>27</sup>

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26. Andrew Bonar Law became the future Chancellor of the Exchequer under David Lloyd George from December 1916 to January 1919, and later Conservative Prime Minister from October 1922 until his retirement due to ill health in May 1923.
27. S.R.O. Records of the South of Scotland Electricity Board, SSE B, 1/1. R.C. Dissolved Company Files, B.T. 2/5911. S.R.A. Records of Strain and Robertson, TD 83/8/5.



Bonar Law was at this time a director of the Traction  
 28  
 and Power Securities Company, and his importance to the  
 C.V.E.P. Company can be seen from the fact that at only  
 his second meeting, and in the absence of Sir David Richmond,  
 he was appointed temporary chairman. On 26th April, 1907  
 Richmond resigned as chairman because of ill-health and was  
 formally replaced by Bonar Law. Richmond died on 15th  
 January 1908 and was replaced on 26th March, 1908 by  
 Frederick Crombie Gardiner, 5 Dundonald Road, Kelvinside.  
 Gardiner was at this time (or became shortly afterwards) a  
 29  
 director of the Transport and Power Securities Company.  
 Thus, by March 1908 only Charles Mackintosh King remained  
 of the original directors. Moreover, the Anglo-American  
 concerns had achieved overall domination with four of the  
 six directors representing their interests, namely Law  
 (chairman), Lukach, Carlton and Gardiner and only two  
 directors, King and Mackenzie, representing local interests.

On 6th May, 1910 Lukach resigned his position as  
 director and on 21st October, 1910 Carlton also. Lukach

28. Garcke, op.cit. Vol.XIV.

29. At 1926 Gardiner was a director of the following  
 companies:- Traction and Power Securities Company  
 Limited; Public House Trust (Glasgow District)  
 Limited; National Bank of Scotland Limited; 2nd  
 South Western Investment Company Limited; Traction  
 and General Investment Company Limited; 2nd  
 Caledonian Trust Company Limited; 3rd Caledonian  
 Trust Company Limited; C.V.E.P. Company; Clyde  
 Valley Accessories Limited; Kilmacolm Electric  
 Lighting Company Limited; Lanarkshire Hydro-Electric  
 Power Company Limited and Strathclyde Electricity  
 Supply Company Limited. R.C. Dissolved Company  
 Files, B.T. 2/5911.

was replaced, on 2nd December, 1910, by John Kendal Stothert, an engineer, of 40 Queensburgh Gardens, Glasgow, who was also at this time manager of Babcock and Wilcox Company Limited; the possible interest of Babcock and Wilcox in contractual work for the C.V.E.P. Company cannot be ignored. On 13th January, 1911 Carlton was replaced by Philip Augustus Lange. Lange was, in fact, managing director of the Manchester works belonging to British Westinghouse.<sup>30</sup> On 27th December, 1911 Bonar Law, because of the pressure of his Parliamentary duties, was forced to resign as both chairman and director of the company, and James Mackenzie, now apparently Dr. Mackenzie, was appointed chairman with F.C. Gardiner as his deputy. At a meeting held on 17th January, 1912 Charles Ker C.A., 155 St. Vincent Street, Glasgow was appointed as a director to replace Bonar Law.<sup>31,32</sup> Therefore, at 17th January, 1912 the

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30. At the outbreak of war in 1914 Lange, who was stated to be a German, changed his name to Lang, and remained as a director of the C.V.E.P. Company until 1917 - see below.
31. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2. R.C. Dissolved Company Files, B.T. 2/5911. S.R.A. Records of Strain and Robertson, TD 83/8/5.
32. At 1926 Ker, apart from his interest in the C.V.E.P. Company and its subsidiary concerns, held the following directorships:- Dalmellington Iron Company Limited; Lloyds Bank Limited; The London, Midland and Scottish Railway Company; Mirrlees, Bickerton and Day Limited; National Bank of Scotland Limited; North British and Mercantile Insurance Company Limited; Glasgow and South Western Railway Company; Mirrlees Watson Company Limited; Scottish Union and National Insurance Company Limited; Huelva Gas and Electricity Company Limited and the Steel Company of Scotland Limited. R.C. Dissolved Company Files, B.T. 2/5911.



directorship comprised Dr. J. Mackenzie (chairman), C.M. King, J.K. Stothert, P.A. Lange, F.C. Gardiner and C. Ker, and the Anglo-American domination of the company had lessened since it was represented by only two members namely, Gardiner and Lange.

The apparent lessening control of the company by the Anglo-American concerns did not prevent F.C. Gardiner, a Traction and Power Securities Company nominee, becoming chairman on 15th October, 1913 when Mackenzie resigned that position.<sup>33</sup> Moreover, on 24th February, 1915 the company received a letter from H.H. Westinghouse intimating that the Westinghouse Brake Company Limited, the Westinghouse Air Brake Company Limited and the estate of George Westinghouse had recently purchased a considerable number of Ordinary Shares of the C.V.E.P. Company and stating that he would appreciate it if John Wills Cloud was elected as a director of the Scottish Company. Cloud, an engineer, was an American citizen, resident at Windlesham Court, Surrey with a business address at 82 York Road, Kings Cross, London.<sup>34</sup>

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33. Mackenzie retained his position as a director.
34. Cloud had been a director of the British Westinghouse Company in 1905 and at 1920/1921 was a director of the Traction and Power Securities Company. In 1918 he was president of the Westinghouse Brake Company Limited and in 1920/1921, apart from being a director of the C.V.E.P. Company and its subsidiary concerns, he was also president of the Westinghouse Brake and Saxby Signal Company and a director of Compagnie Internationale pour le chauffage des Chemins des Fers Systeme Heintze Limited, Westinghouse Morse Chain Company Limited and Mackenzie, Holland and Westinghouse Power Signal Company. R.C. Dissolved Company Files, B.T. 2/5911. Garcke, op.cit. Vols. IX and XXIV.

However, Cloud did not become a director until 9th May, 1917 when P.A. Lange resigned his position. In the meantime, C.M. King resigned as director on 20th December, 1916 and was replaced as from 1st January, 1917 by Robert Robertson, consulting engineer to the company from the outset and its secretary from 1907. Thus, at 9th May, 1917 the composition of the board of directors was F.C. Gardiner (chairman), C. Ker (deputy-chairman), Dr. Mackenzie, J.K. Stothert, R. Robertson and J.W. Cloud.<sup>35</sup>

At 1917 the Anglo-American interest was maintained, therefore, by Gardiner and Cloud and, despite this minority of numbers on the board of directors, this influence was important. However, in that same year American interest in the C.V.E.P. Company was reduced when a British consortium bought the British Westinghouse company, and, presumably, took over the latter's interest in the former company.<sup>36</sup> The Traction and Power Securities Company continued as an independent enterprise, and both Cloud and

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35. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2.
36. In 1917 Vickers Limited and the Metropolitan Carriage, Wagon and Finance Company Limited became jointly interested in the British Westinghouse Company and an agreement was arrived at with the American holders of shares to purchase these shares on or before 1st June, 1917 in order to transfer the control of the company to Britain. Accordingly, on 8th September, 1919 the British Westinghouse company became Metropolitan Vickers Electrical Company Limited. Garcke, op.cit. Vol.XXIV.



Gardiner remained as directors of that company and the C.V.E.P. Company.

On 4th August, 1920 Stothert resigned and Dr. Robert Thomas Moore, a mining engineer, of 13 Claremont Gardens, Glasgow was invited to join the board of directors; his appointment was formally confirmed on 23rd February, 1921. Moore's interests were basically in mining and, therefore, contractual obligations, or at least their possibility, cannot be ignored, although extant records provide no evidence of such contracts.<sup>37</sup> J.W. Cloud resigned on 30th January, 1924 and, thus, for the first time since almost its inception the C.V.E.P. Company was independent of direct personal American involvement in its activities. Sir F.C. Gardiner, however, - he was knighted in 1921 - was still a director of the Traction and Power Securities Company and chairman of the C.V.E.P. Company. Cloud was replaced on 8th October, 1924 by David Cooper of 32 Langside Road, Newlands, Glasgow who, apart from his interest in the C.V.E.P. Company, was also a director of the Dalmellington Iron Company Limited.<sup>38</sup> The only other change

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37. R.T. Moore, apart from his involvement with the C.V.E.P. group of companies, was a director of the following companies:- Dalmellington Iron Company Limited; Edinburgh Collieries Limited; Forth and Clyde Junction Railway Company; James Dunlop and Company Limited; Riddrie and Beakar Coal Company Limited; Robert Addie and Sons (Collieries) Limited; William Dixon Limited; Wilsons and Clyde Coal Company Limited; Bent Colliery Company Limited; Lanner Syndicate Limited and Tresavean Mines Limited. R.C. Dissolved Company Files, B.T. 2/5911.
38. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3.

to occur before 1930 in the structure of the board of directors was in 1929 when it was decided to appoint an additional director; no reason is given for this additional appointment. The new director was Alexander Murray Stephen, 5 Grosvenor Crescent, Glasgow who was also a director of Alexander Stephens and Sons Limited and the Steel Company of Scotland Limited.<sup>39</sup> Therefore, from 21st August, 1929 the directors were Sir F.C. Gardiner (chairman), C. Ker (deputy-chairman), Dr. J. Mackenzie, R. Robertson, Dr. R.T. Moore, D. Cooper and A.M. Stephen.

It has already been noted that the C.V.E.P. Company established a subsidiary concern, the Strathclyde Electricity Supply Company Limited, in September 1905 to obviate any legal difficulties concerning distribution. However, several other concerns, which will be discussed in more detail later, were owned by the C.V.E.P. Company and all of these subsidiaries had identical directorships to that of the parent company. The Scottish Electrical Accessories Limited was formed as a private company on 1st July, 1919 and at its incorporation it was expressly stated that no invitation was to be made to the general public to subscribe for shares. This company was renamed the Clyde Valley Electrical Accessories Limited in

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39. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/5. R.C. Dissolved Company Files, B.T. 2/5911.



December 1926.<sup>40</sup> The activities concerning the promotion and formation of the Lanarkshire Hydro-Electric Power Company have already been discussed fully in Chapter 5. This company was formally acquired by the C.V.E.P. Company in August 1924 and from that time became a wholly owned subsidiary.<sup>41</sup> The Kilmacolm Electric Lighting Company Limited was taken over by the C.V.E.P. Company in December 1925 and from that date shared an identical directorship with the parent company.<sup>42</sup>

### (3) Capital Structure and Shareholding.

By the terms of the C.V.E.P. Act 1901 the authorised capital of the company was £900,000 divided into 60,000 Ordinary Shares of £10 each and 30,000, 6 per cent Cumulative Preference Shares of £10 each. The ordinary shares were issued immediately, and calls made as construction operations progressed. Thus, by the end of 1904 £3.50p. per share had been called, and during 1905 and 1906 further calls of £2.00 and £3.50p. respectively

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40. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 7/1. R.C. Dissolved Company Files, B.T. 2/10496.
41. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2 and SSE 5, 4/1
42. Ibid., SSE 5, 3/3.

were made so that by the end of 1906 £9.00 per share was called. By 7th June, 1907 a final call of £1.00 was made with the result that by that date the shares were fully paid up.<sup>43</sup>

At a half-yearly general meeting of the company held on 16th October, 1912 the issuing of the 30,000, 6 per cent Cumulative Preference Shares of £10 each was sanctioned.<sup>44</sup> However, the extant records of the company do not provide information on the method by which these shares were called, although they were fully paid by 1918 when the company was given powers to increase its authorised capital by £1 million.<sup>45</sup> Therefore, at 1918 the total authorised capital of the company was £1,900,000 of which £900,000 was issued.

On 14th September, 1921 it was decided that, of the additional authorised capital, 50,000, 8 per cent Cumulative Second Preference Shares of £10 each should be issued at par. These shares were, in fact, issued on 6th October, 1921 on the basis of £1.00 on application, £2.00 on allotment, £2.00 to be paid on 16th November, 1921 and a

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43. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1. S.R.A. Records of Strain and Robertson, TD 83/8/5.
44. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2.
45. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2. S.R.A. Records of Strain and Robertson, TD 83/8/5.



further £3.00 on 30th January, 1922, i.e. by that latter date a total of £8.00 per share was paid. There are no details concerning when the final £2.00 was called, although it was paid by 1924. Thus, by 1924 the total paid-up capital of the company amounted to £1,400,000. In 1924 the company received additional powers to increase its authorised capital by £1 million and between 22nd October, 1924 and 12th November, 1924 the company issued 600,000 Ordinary Shares of £1.00 each. There are no details concerning either allotment or calls, although it was specified that the new shares should be offered, in the first place to existing holders of ordinary shares.<sup>46</sup> The following table sets out clearly the capital structure of the company in 1924.

TABLE 22      Capital Structure of the C.V.E.P.  
Company at 1924

<u>Total Authorised Capital</u>			<u>£2,900,000</u>
<u>Total Issued Capital</u>			
60,000 Ordinary Shares of £10.00 each	£600,000		
600,000 Ordinary Shares of £1.00 each	<u>600,000</u>	£1,200,000	
30,000, 6% Cum. Pref. Shares of £10.00 each	300,000		
50,000, 8% Cum. Pref. Shares of £10.00 each	<u>500,000</u>	<u>800,000</u>	<u>£2,000,000</u>
Total Share Capital Unissued.			<u>£ 900,000</u>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5, 1/1, SSE5, 1/2 and SSE5, 1/3.

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46. S.R.O. Records of the South of Scotland Electricity Board, SSE5, 1/3.

In April 1929 the remaining balance of share capital was issued by the creation of 900,000 Ordinary Shares of £1.00 each to rank pari-passu with the existing £1,200,000 Ordinary Shares but to rank for dividend for the year 1929 in respect of the proportion of capital paid therein. The new issue was offered at par to the ordinary shareholders of the company as far as it was possible in the proportion of three new shares for each four ordinary shares held. The new shares were issued and paid by means of four equal instalments of £0.25p each on 22nd May, 1929, 1st July, 1929, 1st August, 1929 and 1st September, 1929.<sup>47</sup> Table 23, therefore, indicates the capital structure of the company at 1st September, 1929.

TABLE 23. Capital Structure of the C.V.E.P. Company at 1st September, 1929

Total Capital, Authorised and Issued.

60,000 Ordinary Shares of £10.00 each.	£ 600,000	
1,500,000 Ordinary Shares of £1.00 each.	<u>1,500,000</u>	£2,100,000
30,000, 6% Cum. Pref. Shares of £10.00 each.	300,000	
50,000, 8% Cum. Pref. Shares of £10.00 Each.	<u>500,000</u>	<u>800,000</u>
		£2,900,000
		<u><u>          </u></u>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE 5,1/1, SSE 5, 1/2 and SSE 5, 1/3.

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47. Ibid.



The C.V.E.P. Company did not rely solely on the issue of shares as a means of raising capital. In Chapter 6 it was noted that the use of overdraft facilities and the employment of loans were widely adopted.<sup>48</sup> For example, overdraft facilities on a, more or less, permanent basis were utilised between 1911 and 1930, 1929 being a peak year with the company's overdraft amounting to £900,000. Moreover, interest was aroused in the fact that on 16th June, 1920, the company decided that, rather than issue debentures for £442,000, an overdraft be taken out for that amount for a period of twelve months at the rate of 7 per cent.<sup>49</sup> The use of loan capital was also noted in Chapter 6. For example, on 23rd August, 1916 the company accepted a loan of £90,000 at the rate of 5½ per cent per annum from the Traction and Power Securities Company; this loan was finally repaid on 31st March, 1925. In addition, in 1919 the Ministry of Munitions granted the company a loan to assist it with the building of a third generating station at Clyde's Mill. By 1921 this loan amounted to £266,499.01p and it was only eventually repaid on 22nd May, 1929. The company may also have received loans from private sources but, since there are no extant cash books of the company, this is more difficult to determine. On 23rd March, 1921 the company decided that J.W. Cloud, one of the company's

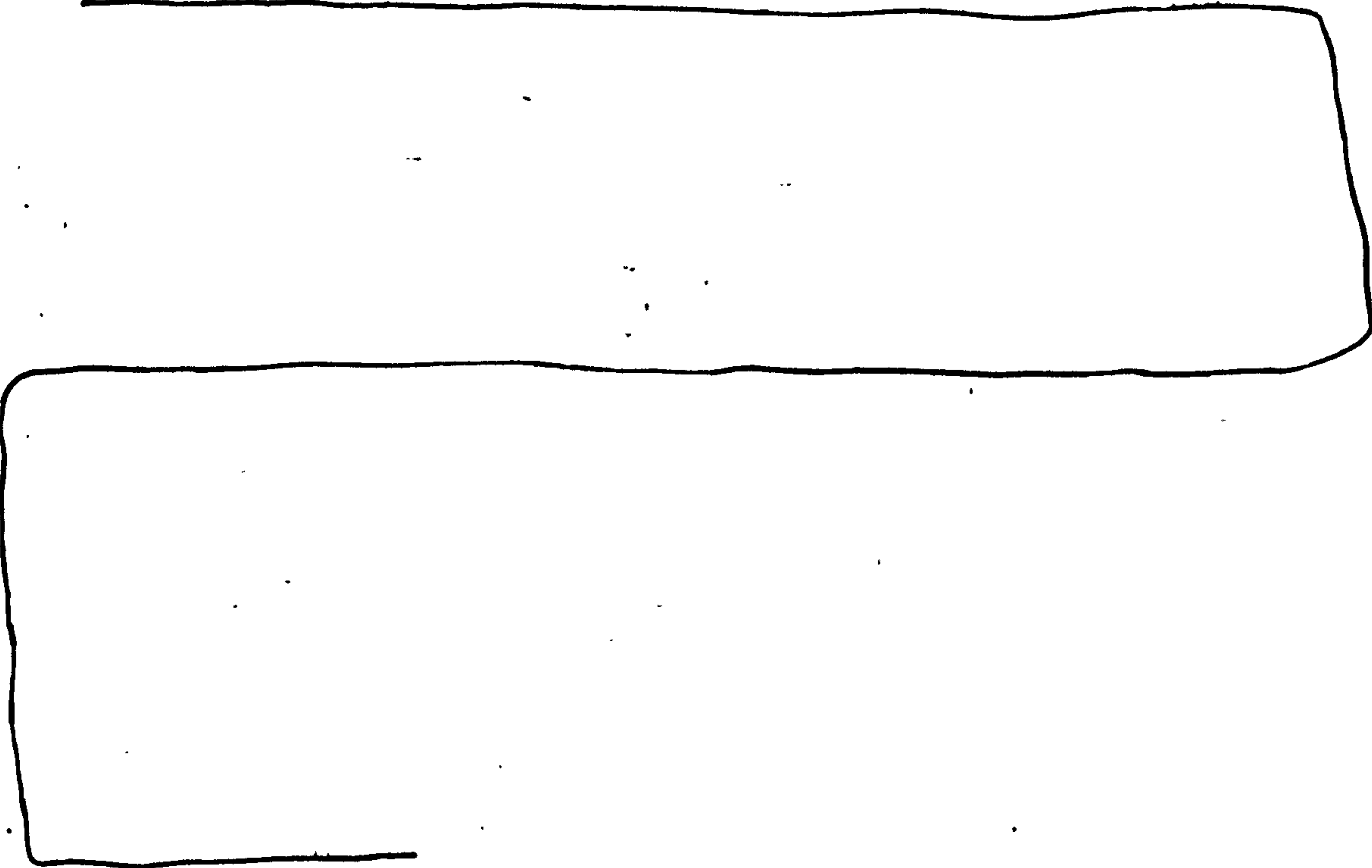
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48. Vide infra, p.p.263 - 267.

49. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2-1/5.



American directors (see above), should discuss the company's financial position with Herman Westinghouse, who was expected to visit London shortly, to see if additional capital loans could be obtained from the company's American shareholders; the outcome of this is not known.<sup>50</sup> The company was clearly under-capitalised and continually in a state of indebtedness. The use of overdraft facilities indicates a lack of liquidity on the part of the company on both a short-term and long-term basis. Moreover, loans were adopted as a means of financing capital projects which emphasises the fact that the company was under-capitalised.



It has already been noted that the authorised capital of

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50. Ibid., SSE 5, 1/2-1/4.

the company under the terms of the C.V.E.P. Act 1901 was £900,000 divided into 60,000 Ordinary Shares of £10 each, and 30,000, 6 per cent Cumulative Preference Shares of £10 each.<sup>51</sup> By 23rd September, 1902, 51,602 Ordinary Shares had been allotted, including 48,000 contract shares to British Westinghouse. On the same date it was agreed that the Traction and Power Securities Company should act as underwriter for the C.V.E.P. Company's shares, and, on 22nd December, 1902, 4,688 Ordinary Shares were allotted to that company. By this time the ordinary share capital of the company was allotted in full; an analysis of ordinary share holdings is given in Table 24 which indicates the small amount of private capital subscribed to the company.

TABLE 24. Analysis of Ordinary Shareholdings in the C.V.E.P. Company at 22nd December, 1902.

	<u>Shares held</u>	<u>Percentage</u>
British Westinghouse Company.	48,000	80.00
Traction and Power Securities Company.	4,688	7.81
Private Shareholdings.	<u>7,312</u>	<u>12.19</u>
Total	<u><u>60,000</u></u>	<u><u>100.00</u></u>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE 5,1/1.

As noted earlier the 30,000, 6 Per cent Cumulative Preference Shares of £10 each were sanctioned for issue in

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51. See p. 388.

1912, but the extant records contain no information of the actual issue and, therefore, it is not known who held those shares. However, by 1912 it is obvious that ordinary shareholdings had altered as indicated in Table 25.

TABLE 25.      Analysis of Ordinary Shareholdings in the C.V.E.P. Company at 17th January, 1912.

	<u>Shares held</u>	<u>Percentage</u>
British Westinghouse Company	19,979	33.30
Traction and Power Securities Company.	34,247	57.08
Private Shareholdings.	<u>5,774</u>	<u>9.62</u>
Total	<u>60,000</u>	<u>100.00</u>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2.

A comparison of Tables 24 and 25 illustrates the continuing dominance of the Anglo-American concerns, although a shift of emphasis is evident with the company's underwriters, Traction and Power Securities Company, becoming by 1912 the major ordinary shareholder with 57.08 per cent of the total ordinary share capital. It is unfortunate that a record of share transfers is lacking, since the beginnings of such financial dominance cannot be dated. Undoubtedly, most of the Traction and Power Securities Company's share acquisitions were derived from its allied company, British Westinghouse, but it is also to be noted that ordinary shares held by private shareholders declined by 1,538 shares.



On 11th June, 1919 a meeting of the ordinary shareholders of the company was held, and the Minutes provide some additional information concerning them. Of the 60,000 Ordinary Shares issued, 30,238 shares, representing 50.40 per cent of the total ordinary share capital, were accounted for at the meeting, and the names of these known shareholders and their shareholdings have been given in Table 26 (see p. 397). The notable omission from Table 26, by comparison with Tables 24 and 25, is the British Westinghouse Company. It has already been noted, of course, that this company was bought over in 1917, although its name was not changed to Metropolitan Vickers until September 1919, and it is assumed that its interest in the C.V.E.P. Company was also taken over, although the extant records of the C.V.E.P. Company contain no evidence of any share transfer. Table 26 does reveal, however, that the Traction and Power Securities Company was still the major ordinary shareholder in the company, holding at that date 25,221 Ordinary Shares, representing 42.04 per cent of the total ordinary share capital. By comparison other individual shareholdings were relatively small and mainly held by institutional investors rather than private individuals.

**TABLE 26. Known Ordinary Shareholders of the C.V.E.P. Company at 11th June, 1919.**

<u>NAME</u>	<u>SHARES HELD</u>	
John R. Cochran	200	
D. Cumming Mitchell	100	
James Mitchell	200	
R. Robertson	250	
Fred Lohnitz	10	
J. Tasker	10	
M.G. Burt	20	
Johnston Webster	10	
Scottish and Dominions Trust Ltd.	145	
C.M. King	450	
Clydesdale Investment Co. Ltd.	400	
Scottish Western Investment Co. Ltd.	1,000	
Caledonian Trust Co. Ltd.	563	
City Property Investment Corp. Ltd.	136	
J. Ross	150	
Traction and Power Securities Co. Ltd.	25,221	
J.T. Sharp	26	
J.D. Nimmo	100	
North American Trust Co. Ltd.	267	
Alexander Findlay	50	
The 1st Scottish American Trust Co. Ltd.	50	
The 2nd Scottish American Trust Co. Ltd.	100	
The 3rd Scottish American Trust Co. Ltd.	100	(1)
	<u>100</u>	29,558
M. Kennedy	50	
T. McArly	500	(2)
A. Macdonald	<u>45</u>	595
C.D. Gairdner	50	(3)
The Mirrlees Watson Co. Ltd.	<u>35</u>	85
	<u>30,238</u>	<u>30,238</u>
TOTAL.		

(1) For purpose of meeting these shares signed over to F.C. Gardinar

(2) For purpose of meeting these shares signed over to Dr. J. Mackenzie

(3) For purpose of meeting these shares signed over to C. Ker  
Source: S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3.

As indicated earlier there are no records of shareholdings or share transfers in the extant records of the C.V.E.P. Company and thus reliance has to be placed on occasional references made to shareholdings in the surviving minute books of the company. The only other reference to ordinary share capital holdings occurred on 26th February, 1924 when a meeting of the ordinary shareholders was held and the minute books record the necessary proxies lodged to have a quorum; it is not stated on this occasion to whom the shares were signed over. Table 27 (see p.399) lists the number of shares held by known ordinary shareholders at 26th February, 1924. Moreover, since this meeting was held before the passing of the C.V.E.P. Act 1924 (see above), Table 27 refers, again, to the 1902 Ordinary Share issue. The 38,405 shares listed represents 64.01 per cent of the 1902 Ordinary Share issue and again it can be noted that the Traction and Power Securities Company was the major ordinary shareholder of the company, holding 23,747 shares which represented 39.58 per cent of the ordinary share capital at that date. It is difficult to make a detailed comparison of Tables 26 and 27, but Table 27 does emphasise the fact, already noted in Table 26, that institutional rather than small private investors were predominant among the ordinary shareholders of the company.



**TABLE 27. Known Ordinary Shareholders of the C.V.E.P. Company at 26th February, 1924.**

<u>NAME</u>	<u>SHARES HELD</u>
Traction and Power Securities Co. Ltd.	23,747
Fred C. Stewart	30
Alex. B.S. Fraser	75
Mrs. Susan Snodgrass	60
John Strain	750
William Gillies	136
Mrs. Sybil G. Norrish	20
Alex. Findlay	15
M.G. Burt	20
Alex. Anderson & Sons Ltd.	100
H. Banfield	50
1st Scottish American Trust Co. Ltd.	550
2nd Scottish American Trust Co. Ltd.	800
3rd Scottish American Trust Co. Ltd.	800
The Northern American Trust Co. Ltd.	1,522
Alex. Martin	20
Alex. W. Bone	25
W.G. Gairdner.	298
Jas. I. Fyfe-Jamieson	60
Miss M. McP.Y. Drylie	10
J.G. Jackson	10
W. Macmillan	30
Scottish Northern Investment Trust Ltd.	200
T.C. Jones	10
Metropolitan Trust Co. Ltd.	1,480
Investment Trust Corp. Ltd.	2,000
H. Taylor	20
J. Yeo	37
Camperdown Trust Co. Ltd.	100
Miss J.E.G. Grant	5
T.R. Taylor	60
W.H. Bane	30
J.J.B. Whitelaw	10
R. Robertson	450
J. Campbell	20
Prudential Assurance Co. Ltd.	4,800
Mrs. J.G.K. Bridge	20
The Mirrlees Watson Co. Ltd.	35
	<u>38,405</u>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3.

The only other known information with regard to shareholdings concerns the issue of the 50,000, 8 per cent

Cumulative Second Preference Shares in 1921 and is general. On 5th October, 1921 applications were received from existing shareholders, customers and staff for 15,601 shares and from the company's underwriters for 18,880 shares, that is a total of 34,481 shares. On 6th October, 1921 a further 6,564 shares were allotted generally with the balance of 8,955 shares allotted to the underwriters. The net position was that the firm's underwriters took 27,835 shares, representing 55.67 per cent of that particular issue and existing shareholders, customers and staff absorbed the remaining 22,165 shares, or 44.33 per cent of the share issue. The company minute books do not positively identify the underwriters by name but on the basis of the evidence given in Tables 26 and 27 it seems reasonable to assume that the underwriters were, in fact, the Traction and Power Securities Company. If this assumption is correct, and if the position remained static until 1924 when the Traction and Power Securities Company held 39.58 per cent of the ordinary share capital, then there seems little doubt that this company was the principal influence.<sup>52</sup>

Apart from its position as a major shareholder in the company, the Traction and Power Securities Company was also a major creditor. On 31st January, 1907 Bonar Law informed

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52. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3.



the other directors that it had agreed to advance any further capital required within the next twelve months, not exceeding £100,000. In addition, on 24th November, 1909 the Traction and Power Securities Company agreed, subject to confirmation by its American shareholders, to advance a further £72,500; this particular agreement was signed on 28th January, 1910.<sup>53</sup> On 13th January, 1911 this loan was increased to £194,517, and on 23rd August, 1916 a new loan of £90,000 at 5½ per cent per annum was obtained. This latter loan was supposed to last until 30th September, 1917 but was not, in fact, repaid until 31st March, 1925.<sup>54</sup>

In return for its overall financial involvement, the Traction and Power Securities Company had, as noted earlier, representation among the directors (see Section 2), but it also directly involved itself in the Scottish company's activities. For example, when it was proposed to link up the Yoker and Motherwell generating stations in 1909, the Traction and Power Securities Company insisted on calling in an independent consulting engineer, C.P. Sparks of London, with the result that the proposal was deferred "meantime"; the scheme was later sanctioned on 20th July, 1909. On 28th May, 1909 the directors agreed

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53. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1. S.R.A. Records of Strain and Robertson, TD 83/8/5.
54. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2 and 1/3. S.R.A. Records of Strain and Robertson, TD 83/8/5.



to inform the Traction and Power Securities Company before they committed themselves to any capital expenditure exceeding £5,000. Again in 1909 when the C.V.E.P. Company wished to install a 5,000 KW turbo generator at Motherwell, Traction and Power insisted on the appointment of an independent engineer to consult with the C.V.E.P. Company's engineer regarding the installation. This contract, valued at £15,887.50p, was eventually placed with British Westinghouse on 17th December, 1909, subject to the approval of Traction and Power.<sup>55</sup> On 26th June, 1912 the C.V.E.P. Company again only after approval had been given by the Traction and Power Securities Company, placed orders with British Westinghouse for two 5,000 KW turbo-alternators, valued at £11,500 each, for its Motherwell and Yoker generating stations. Indeed, this order was placed only after the Scottish Company's financial position was fully discussed with the Traction and Power company and the British Westinghouse company on 15th May, 1912 and 26th June, 1912.<sup>56</sup>

The British Westinghouse company exerted a separate influence over the company. It was, of course, a major shareholder and the main contractor to the company in its formative years and had representation among the directors. After the completion of the initial contract British

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55. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.  
 56. Ibid., SSE 5, 1/2.

Westinghouse continued to obtain further contracts despite protestations by Sir David Richmond in 1906 that the prices charged by British Westinghouse were not more favourable than those charged to outsiders and despite the fact that the C.V.E.P. Company was helping to promote the sale of British Westinghouse's machinery. British Westinghouse was also influential in the appointment of key personnel. For example, David A. Starr, "who was strongly recommended by Mr. Westinghouse," was appointed manager of the C.V.E.P. Company in 1903. The only obvious occasion when the advice of British Westinghouse was not taken concerned the appointment of a superintendent at the Yoker generating station in June 1905. British Westinghouse recommended the appointment of a C.H. Scholes, but other arrangements had already been made.<sup>57</sup>

#### (4) Capital Expenditure and Construction.

In a private and confidential report by Strain and Robertson, to the directors dated 19th June, 1902, it was estimated that the capital costs of constructing the two generating stations at Motherwell and Yoker would be £500,000. The ultimate size of each station would be between 10,000 KW and 20,000 KW. However, the contracts which were put out for tender were for three units, at each

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57. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1. S.R.A. Records of Strain and Robertson, TD 83/8/5.



station, of 1,500 KW each together with ancillary plant and equipment. Four companies tendered for the contract viz., The British Westinghouse Company £447,000; The British Thomson Houston Company £332,401.08p; The Lahmeyer Electrical Company £313,227.42p and The British Schuchert Company £128,000. The British Schuchert Company's quotation did not include the actual buildings and for this reason was disregarded. The Lahmeyer concern's quotation was the lowest, but this firm had quoted for armoured cables laid in the ground without further protection, which was not satisfactory to the directors of the C.V.E.P. Company, and furthermore, this practice did not comply with Board of Trade regulations. In consequence the Lahmeyer quotation was also disregarded. The British Thomson Houston quotation was also ignored. No explanation is given for this, but the consulting engineers estimated that the real cost of this tender was £450,000 and not the £332,401.08p stated. During this time, negotiations were proceeding with the British Westinghouse company and the Traction and Power Securities Company with the result that the contract, valued at £480,000, was awarded to the former company on 23rd September, 1902.<sup>58</sup>

Both stations, which were to have a capacity of 4,500 KW each, were to be built in accordance with the plans of Strain and Robertson. Moreover, although either station

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58. S.R.A. Records of Strain and Robertson, TD 83/3/1.



could be completed first, one had to be completed within eighteen months and the second within twenty-four months of the date of contract. This meant one station opening in March 1903 and the other in September 1903. In the event the Yoker station began operating in August 1905 and the Motherwell station in January 1906, and even then not to the complete satisfaction of the consulting engineers.<sup>59</sup> There were certain natural difficulties encountered during construction operations. For example, at Yoker work was stopped because of the discovery of mud and clay in the foundations.<sup>60</sup> However, there were continual complaints made to the British Westinghouse company both by the consulting engineers and the C.V.E.P. Company's directors concerning the "slow and intermittent progress"<sup>61</sup> and "the great want of activity" at the sites. Moreover, in August 1904 the construction of the chimneys at Motherwell and Yoker was delayed by a lack of bricks. In the same month an environmental complaint was received from the Public Health Department at Paisley because of the severe issue of black smoke at Yoker. This involved the company in having to order and install on its boilers Roney Mechanical Stokers which were "used extensively in

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59. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.  
 60. S.R.A. Records of Strain and Robertson, TD 83/1/5.  
 61. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1. S.R.A. Records of Strain and Robertson, TD 83/3/1.

America, in New York and Other Cities where the Authorities are very exacting." <sup>62</sup> Apart from any concern expressed at the delay in the functioning of both stations, the directors were also anxious about the overall costing. For example, and as noted earlier, in February 1906, which was rather late to do so, Sir David Richmond, the company chairman, expressed anger over the prices being charged to his company by British Westinghouse. <sup>63</sup> However, such complaints did not prevent the latter company from having a sole monopoly for supplying generating units to the C.V.E.P. Company for many future years; the British Westinghouse company was, of course, a major shareholder.

The delay in the opening of the two generating stations was matched by tardiness in the completion of substations. For example, in January 1906 the consulting engineers had received numerous complaints from prospective customers about the delay in the erection of substations and they singled out for mention to British Westinghouse, Napier and Miller's shipyard. <sup>64</sup> Although the extant records of the company are far from clear on the question of sub-stations, by 1908 as many as one

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62. S.R.A. Records of Strain and Robertson, TD 83/1/6.  
 63. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.  
 64. S.R.A. Records of Strain and Robertson, TD 83/3/1.



hundred sub-stations had been erected or were in the process of being erected, and most had been connected to the main supply. It is also not clear how many sub-stations were built by British Westinghouse under the initial agreement of September 1902. However, in such an evolving situation not all of the one hundred or so sub-stations built by 1908 would have been costed under this initial agreement. Therefore, British Westinghouse undoubtedly reaped the financial benefit from the evolving situation as demand for electricity continued to rise.<sup>65</sup>

The multiplier effect of the construction of the two generating stations at Motherwell and Yoker on local industry and, indeed, on local employment is questionable. The major financial benefit of the 1902 contract accrued to the British Westinghouse company as the principal contractor. Nevertheless, minor sub-contractors were required. Unfortunately, there is no full financial analysis of work completed by the minor contractors. However, in July 1903 the consulting engineers wrote to British Westinghouse stating that where possible sub-contracts should be placed with manufacturers in the district since they were potential customers.<sup>66</sup> Despite this exhortation much of the sub-contracting work did go to England, although the financial extent of this is uncertain. Table 28 records, from the

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65. Ibid., TD 83/3/6 and TD 83/3/7.

66. Ibid., TD 83/3/4.



extant records, those items which were supplied by Scottish companies during the initial construction of the generating stations at Yoker and Motherwell; the financial value of these sub-contracts is not known. By comparison with Table 28, Table 29 lists those sub-contracts awarded to English companies and is, perhaps, an indication of the inadequacy of Scottish technology in what, at this time, could still be regarded as a relatively new field. Tables 28 and 29 are, undoubtedly, far from conclusive with regard to the extent of sub-contracting but they do emphasise the fact that the initial economic benefit from the construction of the two generating stations was not entirely local.

TABLE 28.      Items of a sub-contract nature awarded to Scottish companies, 1903-1908.

<u>ITEM</u>	<u>GENERATING STATION</u>	<u>SUB-CONTRACT AWARDED TO:-</u>
Steel Work	Motherwell and Yoker	The Brandon Bridge Building Company, Motherwell.
Boilers and Stokers	Motherwell and Yoker	Babcock & Wilcox, Renfrew.
Condensers	Yoker	The Mirrlees Watson Company, Glasgow.
Joinery	Yoker	James S. Knox & Company, Renfrew.
Weighbridges	Motherwell and Yoker	W.T. Avery Limited, Manufactured at Partick Works, Glasgow
Water Storage Tank	Yoker	Barrowfield Iron Company, Glasgow.
Fencing	Motherwell	A. & J. Main & Company, Clydesdale Iron Works, Glasgow.
Feed Water Filter	Motherwell	The Harris Patent Feed Water Filter Limited, Greenock.
Boiler & Pipe Covering	Motherwell and Yoker.	Peter Ferguson, Glasgow.

Source: S.R.A. Records of Strain and Robertson, TD83/3/1, TD83/3/2, TD83/3/3, TD83/3/4 and TD83/3/8.





prevent a full analysis of all sub-contracts being detailed. Nevertheless, Table 30 illustrates the greater participation of Scottish companies in extensions at both Yoker and Motherwell and also in the construction and later extensions of the Clyde's Mill generating station; sub-contracts of less than £1,000 have been ignored. The rather patchy nature of the extant records has been emphasised, but from Table 30 it is possible to say that main sub-contracts to the value of £80,338.10p were awarded locally. However, by contrast, it is also possible to say that these identical references reveal that, during the same period, the British Westinghouse company were awarded contracts for main switchgear and generating units to the value of £300,126.93p.<sup>67</sup> Table 30 does, of course, indicate that these major sub-contracts were awarded to a narrow group of companies which undoubtedly emphasises the specialised nature of these concerns and their operations.

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67. Ibid., TD 83/3/11 - TD 83/3/38.



TABLE 30

Sub-contracts awarded to Scottish companies, 1910-1923

Date	Item	Value £	Generating Station	Sub-Contract Awarded to:-
June, 1910	Boiler Extension	£ 4,291.87	Motherwell	Babcock and Wilcox, Renfrew.
July, 1910	Steel Pipes	2,655.92	Motherwell	Meechin and Sons, Scotstoun.
Nov., 1911	Condensing Plant	2,856.37	Yoker	G. & J. Weir, Cathcart.
Nov., 1912	Condensing Plant	5,825.00	Motherwell	G. & J. Weir, Cathcart.
Nov., 1915	Condensing Plant	3,580.00	Clyde's Mill	G. & J. Weir, Cathcart.
Jan., 1916	Coal Handling Plant	3,639.00	Clyde's Mill	Babcock and Wilcox, Renfrew.
Jan., 1916	Steel Work at Boiler/Generating Houses	6,751.93	Clyde's Mill	Steel Construction Company, Glasgow.
Jan., 1916	Boiler Plant	8,520.50	Clyde's Mill	Babcock and Wilcox, Renfrew.
Feb., 1917	Boiler Plant	23,937.00	Clyde's Mill	Babcock and Wilcox, Renfrew.
Feb., 1917	Condensing Plant	4,260.00	Clyde's Mill	G. & J. Weir, Cathcart.
Feb., 1923	Boiler Plant Extension	14,021.00	Clyde's Mill	Babcock and Wilcox, Renfrew.

Source: S.R.A. Records of Strain and Robertson, TD83/3/11 - TD83/3/38.

In a similar manner and after the completion of the two generating stations at Motherwell and Yoker in 1905/1906, their contribution in direct employment terms to their respective localities was not great. During the actual period of construction operations there is no knowledge of the extent of the labour force employed or in what measure it was recruited locally. However, prior to the opening of Yoker, British Westinghouse recommended that certain staff should be employed there, and, since the Motherwell station was of a similar size and scale, it is fair to assume that the workforce at Motherwell followed a similar pattern. In May 1905 British Westinghouse recommended that the following staff should be employed at Yoker viz.,

One station superintendent to be in charge of the entire plant.

Engine Room Staff.

One steam engineer on each staff to rank next to the superintendent.

One auxiliary engineer on each staff.

One oiler, on one shift, in charge of oiling and lubrication.

One electrical operator on each shift.

One junior electrical operator on each of two shifts.

One cleaner on one shift only.

Boiler Room Staff.

One boiler plant operator on each shift.

One helper on each of two shifts to assist the boiler plant operator.

Two helpers, on one shift only, for handling coal and general labour.

General Staff.

One fitter, on one shift only, to make all repairs.  
One stores and time-keeper to act as clerk and messenger.

In addition, British Westinghouse emphasised the fact that the operators of its turbines had to be experienced men and that it would put forward the names of suitable personnel.<sup>68</sup>

Moreover, as already noted, the general manager of the company, D.G. Starr, was a British Westinghouse appointee.<sup>69</sup>

The multiplier effect of such a labour force on the local economy was limited since the generating stations, apart from their actual construction, were by no means labour intensive. Moreover, the skilled personnel were apparently, externally recruited, at least initially, although this situation may have altered with the evolution of time as juniors, presumably recruited locally, received training and became experienced. However, part of the workforce comprised general labour which had little skill, required no training and was presumably paid accordingly and thus had a virtual negative effect on the local economy. In fairness, as time progressed, the company did expand its activities and operations, and additional personnel were required for technical, clerical and administrative functions. Consequently, with the passage of time, the company did have an increasingly major effect, both with

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68. Ibid., TD 83/1/6.

69. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.



regard to actual numbers employed and wage payments received, on the local economy.

As noted earlier, the generating plant capacity of each station was to be 4,500 KW, although it was believed that the ultimate size of each station would be between 10,000 KW and 20,000 KW. However, with the ever increasing demand for power within the area and the active sales policy pursued by the company these expectations were soon realised and then surpassed. The recorded detail of individual plant extensions at both Motherwell and Yoker is imprecise and lacking in detail,<sup>70</sup> but it is known that, as early as March 1906, to accommodate extensions at Motherwell, a further ten acres of land was acquired from Lord Hamilton.<sup>71,72</sup> Subsequently, in February 1906, as a result of growing demand at Motherwell, it was decided to install a 4,000 KW turbo-generator instead of a 2,000 KW set. This decision was quickly superseded in March of the same year when it was decided that, in addition to the 4,000 KW set, a 3,000 KW set should also be installed; the agreed total cost of this contract, which was awarded to British Westinghouse, was £25,900.

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70. S.R.A. Records of Strain and Robertson, TD 83/3/9-TD 83/3/16.
71. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.
72. This extant record simply states Lord Hamilton and this is assumed to refer to Alfred Douglas, 13th Duke of Hamilton and 10th Duke of Brandon who succeeded to his title in 1896 and who died on 16th March, 1940. P. Townend (Ed), Burke's Genealogical and Heraldic History of the Peerage, Baronage and Knightage, 103rd Edition, (1963), p.112. Who Was Who 1929-1940, (1947), p.582.

In the following month of April it was agreed to accept a 4,000 KW unit instead of the 3,000 KW unit. In May 1909 the decision was taken to install additional generating plant of 5,000 KW, although at which station is not known. In December 1909 the tender for the new 5,000' KW set was placed with British Westinghouse at a reduced price of £15,887.50p, despite the fact that a first tender for £13,156 and an amended tender for £12,140 had been received from the firm of C.A. Parsons.<sup>73</sup> In the years 1910, 1911 and 1912 additional plant was installed at both Motherwell and Yoker by British Westinghouse.<sup>74</sup> Indeed by 1913 the total plant installed at Motherwell and Yoker amounted to 37,500 KW and that position remained static until 1915.<sup>75</sup>

For several years consideration was given to the building of a new generating station but it was only in December 1915 that this third station was referred to by name. The name given to this station was Clyde's Mill and it was conveniently situated at Cambuslang, roughly midway between the Motherwell and Yoker stations.<sup>76</sup>

This plant began generating power

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73. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.  
 74. Ibid., SSE 5, 1/2.  
 75. S.R.A. Records of Strain and Robertson, TD 83/6/8.  
 76. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2.



in 1916.<sup>77</sup> By September 1916 expenditure at Clyde's Mill amounted to £74,215.22p, but the total overall costs of construction and installation of plant is not known. British Westinghouse again appear to have been the main contractors. In the ensuing years additional plant was ordered from British Westinghouse, but unfortunately the extant records do not always specify where this plant was installed. However, the position of British Westinghouse was secure. In March 1918 the question of competitive tenders was discussed by the directors concerning the proposed installation of a 15,000 KW set at Clyde's Mill, and it was decided to negotiate only with British Westinghouse.<sup>78</sup>

Throughout this period the total plant capacity of the company continued to increase and was obviously stimulated by the completion of the third generating station. At 1915 the total plant capacity of the company was 37,500 KW, by 1919 it was 49,500 KW and by 1923 it had reached 87,500 KW.<sup>79</sup> Indeed at 31st December, 1923, by which time the company had 230 sub-stations and 360 miles of distributory mains, Motherwell had a plant capacity of 20,500 KW, Yoker 35,750 KW and Clyde's Mill 31,250 KW. At that date the total expenditure on the three generating stations and

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77. S.R.A. Records of Strain and Robertson, TD 83/6/6A.  
 78. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/2 and SSE 5, 1/3.  
 79. S.R.A. Records of Strain and Robertson, TD 83/6/8.



on the distribution system was approximately £2.5 million.<sup>80</sup>  
 Table 31 provides further analysis of the plant capacity  
 at each of the three stations in 1923.

TABLE 31.      Analysis of the Plant Capacity of the  
                                  C.V.E.P. Company in 1923.

<u>STATION</u>	<u>NO. OF</u> <u>GENERATORS</u> <u>INSTALLED</u>	<u>KW. SIZE</u>	<u>KW OUT-</u> <u>PUT</u>	<u>TOTAL</u> <u>PLANT</u> <u>CAPACITY</u> (KW)	<u>COMPANY</u> <u>CAPACITY</u> (KW)
Yoker	1	18,750	18,750	35,750	
	2	6,000	12,000		
	2	2,500	5,000		
Motherwell	3	6,000	18,000	20,500	
	1	2,500	2,500		
Clyde's Mill	1	18,750	18,750	31,250	87,500
	2	6,000	12,000		
	1	500	500		

Source: S.R.A. Records of Strain and Robertson, TD 83/6/8.

The optimal exploitation of the capacity of the three  
 stations was aided by their interconnection. As early as  
 July 1909 it was agreed to proceed with the inter-connection  
 of the Motherwell and Yoker stations.<sup>81</sup> In March 1920 the  
 general manager was authorised to obtain tenders for the  
 laying of the interconnector cables between Clyde's Mill and  
 Yoker and in February 1923 he was asked to obtain tenders  
 to link Clyde's Mill with Motherwell.<sup>82</sup> By June 1921  
 Yoker had been interconnected with Clyde's Mill and by May  
 1924 the three stations were linked by a main transmission

80. Ibid., TD 83/6/6A.

81. S.R.O. Records of the South of Scotland Electricity  
 Board, SSE 5, 1/1.

82. Ibid., SSE 5, 1/3.

line to ensure security of supply.<sup>83</sup> In May 1925 a duplicate interconnecting cable was laid down between Clyde's Mill and Motherwell at a cost of £22,018.33p.<sup>84</sup> Later in June 1926 it was agreed at a cost of £44,653.53p to link up the Motherwell station with the Stonebyres and Bonnington stations which belonged to the Lanarkshire Hydro-Electric Power Company and had an aggregate capacity of 13,000 KW.<sup>85</sup>

During the period between 1923 and 1930 evidence is less than adequate relating to the expansion of generating capacity at any of the company's three stations. In the West of Scotland Scheme for The Improvement of the Organisation for the Supply of Electricity 1923, organised by the Electricity Commission under the Electricity (Supply) Act 1919, it was estimated that in view of anticipated demand the Yoker station would have to be extended by the addition of one 20,000 KW set so that the generating capacity of the station would be 55,750 KW by 1927/1928. For similar reasons the Clyde's Mill station would require to be extended by the addition of one 20,000 KW set by 1927/1928 and by a second 20,000 KW set by 1932/1933. This would mean that the generating capacity of Clyde's Mill would be 51,250 KW by 1927/1928 and 71,250 KW by 1932/1933.

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83. S.R.A. Records of Strain and Robertson, TD 83/6/5 and TD 83/6/6B.
84. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3.
85. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3. S.R.A. Records of Strain and Robertson, TD 83/6/6A.



No extension was recommended for the Motherwell station so that its generating capacity would remain at 20,500 KW<sup>86</sup> throughout the period.

In anticipation, perhaps, of rising demand the physical size of both Clyde's Mill and Yoker was increased. As early as December 1920 the company accepted an offer by the Hamilton Estates Trustees to feu an additional ten acres at Clyde's Mill ostensibly for the purpose of depositing ashes, while in January 1925 an additional two and one half acres was feued at Yoker at an annual feu duty of £50<sup>87</sup> per acre.

In June 1927 Clyde's Mill was rated for the purposes of generating capacity at 50,000 KW, but the boilers could only steam 36,000 KW. In consequence, and after much discussion, Babcock and Wilcox began to install four<sup>88</sup> boilers in 1927 at a cost of £90,000. Presumably, therefore, when this had been completed, the Clyde's Mill station had a generating capacity of 51,250 KW. In May 1928 a tender was received and accepted from Metropolitan Vickers Electrical Company Limited for the installation of a new 50 cycle turbo alternator and accessories at Yoker at a cost of £39,780. The General Electric Company was to supply the main switchboard at a cost of £29,234, while

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86. S.R.A. Records of Strain and Robertson, TD 83/6/5.  
 87. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/3.  
 88. Ibid., SSE 5, 1/4.



coal handling plant was to be provided by Babcock and Wilcox at a cost of £5,925. Despite the apparent firmness of this decision, the position at Yoker is unclear. In October 1929 it was decided that the new 20,000 KW set would take the place of the existing Number Five set which would then be rewound to 50 cycles. It was also agreed to enter negotiations with Metropolitan Vickers for the new set at a cost not exceeding £42,000, plus the old set. In November 1929 the price agreed for the new set at Yoker was £46,710, less £5,000 for the old set. Moreover, in October 1929 a tender of £59,000 for the installation of new boilers at Yoker from Babcock and Wilcox was accepted.<sup>89</sup>

Therefore, by about 1930 the generating capacity at Yoker was 55,750 KW, that of Clyde's Mill 51,250 KW and that of Motherwell 20,500 KW. Moreover, since the Lanarkshire Hydro-Electric Power Company had a generating capacity of 13,000 KW, the company had an overall generating capacity at this time of 140,500 KW whereas by the terms of the initial contract the company had in 1906 a generating capacity of only 9,000 KW. Thus, in a period of some twenty-four years the company had increased its plant capacity by 1461.11 per cent.

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89. Ibid.

(5) Marketing and Sub-stations.

The thoroughness in analysing potential demand is revealed in an "Inventory of Works" made by the company during its formative years.<sup>90</sup> This provides a detailed analysis, reflecting potential demand at, or near, the initial generating stations of Motherwell and Yoker; a summary is given in Table 32.

TABLE 32. Analysis of Works within the proximity of the Motherwell and Yoker Generating Stations, about 1902.

<u>Number of Works</u>	<u>Motherwell Generating Station</u>	<u>Yoker Generating Station</u>
Within radius of 2 miles	77	39
Within zone 2-4 miles	138	219
Within zone 4-6 miles	206	146
Within zone 6-8 miles	93	93
Within zone 8-10 miles	116	62
Within zone 10-12 miles	45	62
Within zone 12-14 miles	5	7
Total.	680	628

Source: Appendix 22

A detailed examination of Appendix 22 (p. 709) reveals the catholicity of industrialisation in the West of Scotland, reflects the potential demand inherent in this region and goes far to explain the rapid installation of generating plant.

Exploitation of this potential demand was quickly under-way. From at least 1902 detailed weekly reports were made

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90. See Appendix 22, p. 709.

of the probable demand of individual works within the areas peripheral to both generating stations.<sup>91</sup> In addition, on 7th August, 1903 David A. Starr, a Westinghouse appointee, became manager of the company at a salary of £800 per annum. Starr replaced Norman A. Thompson who had been appointed manager on 21st February, 1902 at a salary of £400 per annum; Thompson now became assistant manager and assistant secretary and also retained his position as resident engineer at both Motherwell and Yoker. Starr formally took up his appointment in October 1903 and very quickly demonstrated his decisiveness. In November 1903 he asked the directors to appoint a practical assistant engineer to deal with the owners of works and to advise them on their power requirements. On the apparent recommendation of Starr, Thompson was given six months notice since, allegedly, he did not have practical experience.<sup>92</sup> As the date for the completion of the two initial generating stations grew nearer, the desire to exploit the potential market heightened. In May 1905 A.A. Cunningham was appointed as a canvasser at a salary of £175 per annum, in July of the same year I.D. Allen as a canvasser in the Motherwell district at a salary of £300 per annum and T.O. Thompson as a canvasser in the Clydebank

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91. S.R.A. Records of Strain and Robertson, TD 83/8/3.  
 92. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1. S.R.A. Records of Strain and Robertson, TD 83/8/5.



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and Dalmuir district at a salary of £140 per annum. There are no reasons given for the differences in salary of those appointed, but it may be accounted for by experience and/or qualifications. These are the only canvassers mentioned in the extant records but there seems no reason to believe, in view of the area covered by the company, that they were the only ones employed.

The company's market research and active sales policy was accompanied and complemented by a vigorous policy of constructing sub-stations to accommodate its consumers. Initially, there were three basic types of sub-station to meet the requirements of a particular site and/or the requirements of a particular customer. Type A contained four 200 KW transformers of which three were in service and one on standby. The inside dimensions of this type were 20 X 26 feet. Type B was similar to Type A but arranged in such a way as to be located on a very narrow site. The inside dimensions of this type were 11 X 35 feet. Type C was intended to connect a single consumer or small group of consumers to a main feeder and could be erected in the corner of an existing building.

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The rapidity in the construction of sub-stations is revealed by the fact that by December 1906 at least twenty-one sub-stations had either been installed or allocated.

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93. S.R.O. Records of the South of Scotland Electricity Board, SSE 5, 1/1.  
 94. S.R.A. Records of Strain and Robertson, TD 83/3/6.

These sub-stations supplied power for shipyards, iron and steel works, collieries and other miscellaneous purposes. Among the shipyards supplied were Napier and Miller, Old Kilpatrick; Yarrows and Company, Scotstoun; Lobnitz and Company, Renfrew and Scott's Shipbuilding Yard at Bowling. The ironworks included the Scotstoun Iron Works; the Etna Iron and Steel Works, Wishaw; Glasgow Iron and Steel Works; the Excelsior Iron and Steel Works; the Steel Company of Scotland and the Bull's Metal Company of Wishaw. Unfortunately, because of the inadequate nature of the extant records, the total of twenty-one sub-stations mentioned may underestimate, even at this stage, the number of sub-stations constructed by the company.<sup>95</sup>

During the period from 1908 until 1910 this vigorous policy of sub-station construction continued unabated. It is again difficult to determine the actual number of sub-stations constructed and the user of the power is not always identified. However, during this period sub-stations were erected at Viewpark; Kenmuirhill; Glenboig; Gartcosh; Pather; Tannochside; Rutherglen; Coatbridge and Craigneuk. Among the users identified were engineering concerns such as Stewart and Lloyds, Rutherglen; G. and J. Weir, Cathcart and the Waverly Iron and Steel Company. Mining was represented by the Haughhead Colliery, and the Dechmont Colliery, and shipbuilding by John Brown and

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95. Ibid.



Company of Clydebank, while miscellaneous users were as diverse as the Dalbeth Convent, Tollcross and the Garnkirk Distillery. There is no financial information available concerning the placing of contracts for these sub-stations, but it is important to note that all the equipment was ordered from British Westinghouse. Only minor accessories were ordered from local firms. For example, the fencing for the Wishaw, Rutherglen and Shettleston sub-stations was ordered from G.B. Smith and Company, Craighall Iron Works, Glasgow, while the ventilating arrangements at the Etna and Wishaw sub-stations was sub-contracted to Robert Boyle and Son of Glasgow.<sup>96</sup> The distribution network of high and low tension cables and also armoured cables for river crossings was supplied by The British Insulated and Helsby Cables Limited of Prescott, Lancashire and W.T. Henleys<sup>97</sup> Telegraph Works Company Limited, Blomfield Street, London.

There is no further evidence of the development of sub-stations until 1923 when very much a 'part' directory of sub-stations was inserted, for reasons not evident, into the company records.<sup>98</sup> However, by 25th May, 1923 over 220 sub-stations had been constructed and 318 miles of high tension cable erected and/or laid underground.<sup>99</sup> In addition, by 31st May, 1924 the total capital expenditure of the company was £2,579,551 of which £1,049,170 was expended on

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96. Ibid., TD 83/3/7.

97. Ibid., TD 83/3/8.

98. Ibid.

99. Ibid., TD 83/6/9.



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distribution and £1,530,381 on generating. .

The essential nature of such capital expenditure on distribution and the vigorous policy of sub-station construction was obvious. During the period between 1906 and 1930 the company contracted to supply to electricity users within its district 247,932 KW of power.<sup>101</sup> Unfortunately, the extant records do not reveal in detail the particulars of contracts entered but merely the overall figures. A summation of these figures on a quinquennial basis, indicating the percentage increase achieved is provided in Table 33. This Table reveals the remarkably steady progress of the company throughout the twenty-five year period examined. In total between the first period 1906-1910 and the latter period 1926-1930 the company achieved a 151.14 per cent increase in demand. The trend in the pattern of demand was more than adequately reflected in revenue. An examination of the identical quinquennial periods reveals that the revenue of the company increased by 3666.49 per cent, that is from £151,106.28p in the period 1906-1910 to £5,691,396.20p for the period 1926-1930.<sup>102</sup> Both aspects in turn allow an understanding of how the company between 1913 and 1930 could pay out total dividends of £1,635,250.<sup>103</sup>

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100. Ibid., TD 83/6/4.

101. See Appendix 23, p.731.

102. See Appendix 24, p.732.

103. See Section 10, Table 52, p. 509.

**TABLE 33.** Total Contracts Entered by C.V.E.P. Company on a Quinquennial Basis. 1906-1930

<u>Years</u>	<u>Total Contracts Entered in Quinquennial Period</u>	<u>Percentage Increase in Quinquennial Period</u>
1906-1910	31,381 KW	-
1911-1915	35,609 KW	13.47
1916-1920	44,760 KW	25.70
1921-1925	57,373 KW	28.18
1926-1930	78,809 KW	37.36

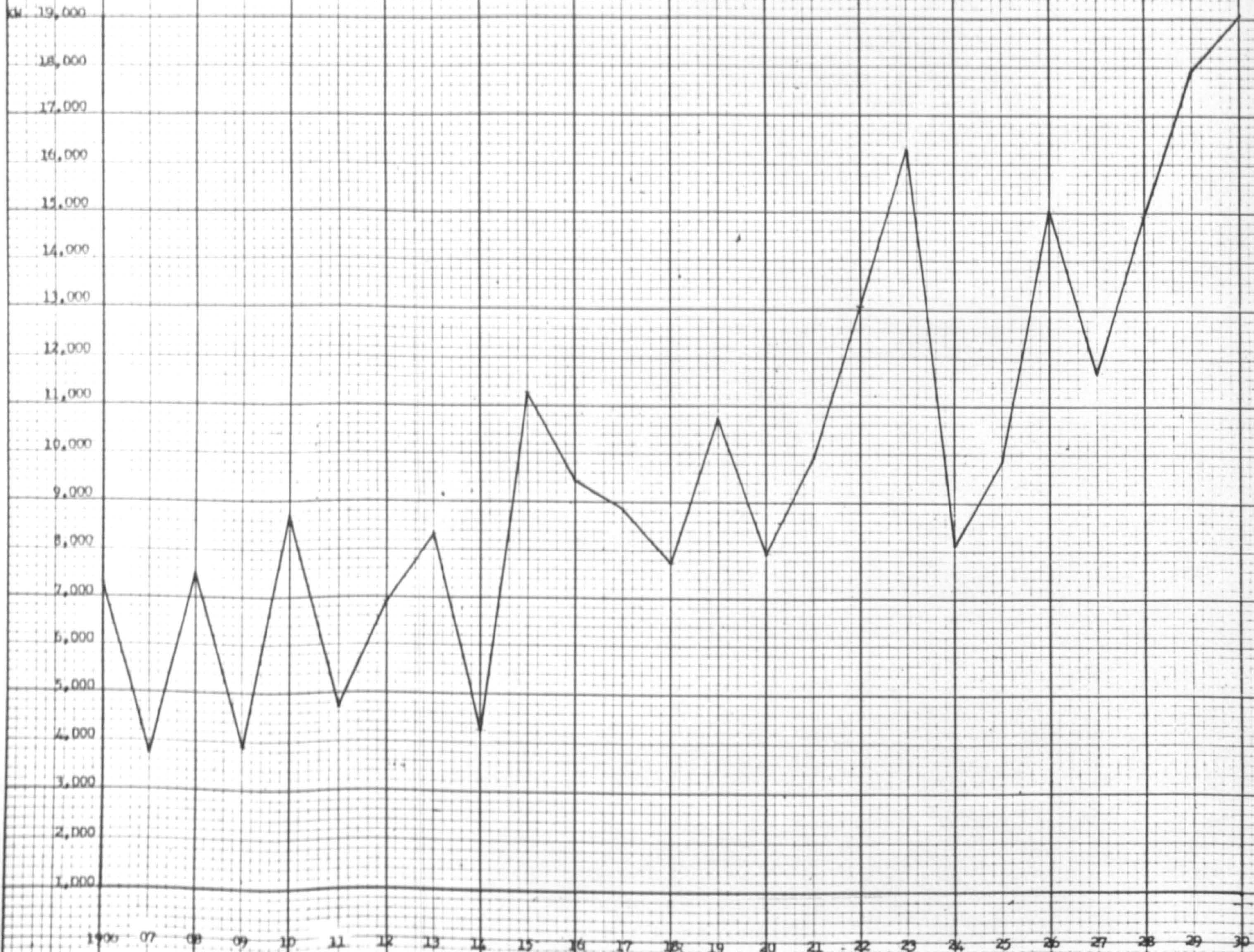
Source: Appendix 23.

However, such a global assessment disguises the fact that throughout the period from 1906 to 1930 the company experienced very definite peaks and troughs in respect of contracts entered. This pattern is revealed in Graph 5 which analyses the contract situation on a year to year basis. An examination of this graph reveals that the company experienced peak periods of activity in the years 1906, 1908, 1910, 1913, 1915, 1919, 1923, 1926 and 1930, and suffered a decline in activity in the years 1907, 1909, 1911, 1914, 1918, 1920, 1924 and 1927. In general terms the graph reveals that the company made steady, if rather uneven, progress between 1906 and 1914. Between 1914 and 1915 there was a dramatic rise in the number of contracts entered, which was possibly due to the expected opening of the Clyde's Mill generating station, and then between 1915 and 1918 there was a gradual decline. The period between 1918 and 1920 experienced a short-lived boom and then between 1920 and 1923 a second dramatic rise in demand was



GRAPH 5

Total Contracts Entered by C.V.E.P. Company, 1906 - 1930





: TABLE 33. Total Contracts Entered by C.V.E.P. Company  
on a Quinquennial Basis. 1906-1930

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Source: Appendix 23.

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experienced. This in turn was followed by an almost equally dramatic decline in 1923/1924. After that with the exception of a relatively minor decline in 1926/1927 the company experienced continuing growth conditions.

The continuing expansion of the company, noted above on the basis of contracts entered into, is also reflected in an equally dramatic rise in unit sales and in revenue. However, the deficiencies in the extant records prevent a complete analysis of unit sales from the inception of the company until 1930. Table 34 indicates the growth of the company, with respect to unit sales and revenue, from 1911 until 1924. It should be noted that the revenue figures quoted in Table 34 do not agree with those abstracted from the Minute Books of the company held in the Scottish Records Office and given in Appendix 24. There is no obvious explanation for this discrepancy, although different accounting periods may have been used to collate these figures for reasons which are not evident and not stated. It should also be noted that, although revenue and average rate per unit are quoted in this table and will be referred to, the pricing policy of the company will be discussed in detail later. <sup>104</sup> The figures given under average rate are quoted in pence, that is, in pre-decimalisation currency.

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104. See Section 6.



From Table 34 it is apparent that between 1911 and 1924 unit sales increased by 109,001,720 units, representing a percentage increase of 320.47 per cent. These global figures, of course, disguise the fact that there were certain peaks and troughs. From 1911 until 1918 the company sales were in continuous upswing and experienced a 280.59 per cent increase. The year 1919 witnessed a 16.56 per cent decline in sales whereas the fairly sharp boom in 1920 ensured a recovery rate of 17.44 per cent. The recovery of 1920 was followed by a sharp recession when sales fell by 19.60 per cent. From 1921 until 1924 there was gradual recovery and during this period sales increased by 40.21 per cent, but it is noteworthy that the peak year of 1918 was not surpassed until 1924.

TABLE 34.      Unit Sales and Revenue of the C.V.E.P.  
Company 1911-1924.

<u>Year</u>	<u>Units Sold</u>	<u>Revenue (£)</u>	<u>Average Rate (d)</u>
1911	34,013,031	98,499	0.695
1912	41,401,388	111,091	0.644
1913	46,680,017	132,001	0.678
1914	51,126,947	148,446	0.696
1915	71,267,273	199,505	0.671
1916	92,180,026	264,303	0.688
1917	114,156,593	342,778	0.720
1918	129,450,604	440,201	0.816
1919	108,012,563	451,528	1.003
1920	126,854,946	660,962	1.250
1921	101,996,937	584,928	1.376
1922	103,592,620	440,144	1.019
1923	127,919,764	539,955	1.013
1924	143,014,751	589,667	0.990

Source: S.R.A. Records of Strain and Robertson, TD 83/6/4, TD 83/6/5 and TD 83/6/6C.

The revenue figures indicate a similar pattern in the sense that there are peaks and troughs, but closer scrutiny highlights distinct differences in the two sets of figures. A comparison of the 1911 and 1924 figures reveals that by 1924 annual revenue had increased by £491,168, or in percentage terms by 498.65 per cent. In contrast, and as noted above, annual unit sales had only increased by 1924 by 320.47 per cent reflecting the importance of the average rate per unit received. The annual revenue of the company increased markedly between 1911 and 1920 and, in fact, the figure given at 1920 represents a 571.03 per cent increase over the 1911 figure. In 1921 and 1922 the revenue of the company declined, and the 1922 figure indicates a 33.41 per cent decrease on the peak year of 1920. However, the years 1923 and 1924 were years of recovery. Further comparison of both sets of figures reveals that, although unit sales reached an initial peak in 1918, slumped in 1919 and had almost but not quite recovered the 1918 level by 1920, the company's revenue did not reach its initial peak until 1920. This is obviously related to the company's pricing policy; the end result of this is indicated in column three of the table. From the table it is evident that average rate per unit rose after 1918 to reach a peak in 1921 which was a depressed year for sales. After 1921 the average rate declined, but in 1924 it was still greater than at any time prior to 1919. The



increase in the average rate per unit after 1918 is symptomatic of the immediate post-war inflation and probably reflects the need to counterbalance rising unit costs created by rising raw material prices, for example coal, and/or the reduction in the general hours of labour.<sup>105</sup>

There are serious difficulties in attempting to provide a comprehensive analysis of the distribution of unit sales. Under Section 43 of the C.V.E.P. Act 1901 the company was allowed to supply energy in bulk to authorised distributors or for providing power to any person. As a power company it was only allowed to supply for lighting up to 20 per cent of what it supplied for power but it was not allowed to supply for domestic lighting. In 1923 it was supplying power for domestic lighting and there is no evidence to indicate how long this practice had been going on.<sup>106</sup> This issue is further complicated by the fact that in May 1905 the directors promoted the Strathclyde Electricity Supply Company to apply for electric lighting orders within the C.V.E.P. Company's area of supply to enable a supply for lighting to be given and also to overcome the restrictions imposed by the 1901 Act. Contracts for bulk supply had to be

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105. For a more detailed discussion of the nature of the inflation which followed World War I, see J.A. Dowie, 1919-20 is in Need of Attention, Economic History Review, 2nd Series, Vol. 28, 1975, p.p. 429-450.
106. S.R.A. Records of Strain and Robertson, TD83/6/1, TD83/6/4 and TD83/6/6C.

made through the new company.<sup>107</sup> By 1923 the Strathclyde Electricity Supply Company, which will be discussed in detail later,<sup>108</sup> held nine electric lighting orders, had expended £178,616 on distribution, owned 110 miles of underground distribution mains and had 6,141 consumers.<sup>109</sup>

The only figures available providing an analysis of the units sold by the C.V.E.P. Company occurs in 1923 and 1924 and these figures are given in Tables 35 and 36 (see p.p. 434 and 435 respectively). Despite the increase in sales in 1924 the percentage taken by individual users remained very similar. If Tables 35 and 36 are typical of the pattern of demand on the company over the period of time examined, then they exemplify the advantages which the C.V.E.P. Company had as a large company with central power stations supplying a variety of needs. The tables may also reflect the acumen of the directors and the market policy pursued by the company since those industries taking the greatest proportion of power had a high load factor. Collieries took the greatest percentage of power, 22.11 per cent and 20.10 per cent respectively, of all users identified. Demand from collieries was fairly

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107. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1.  
 108. See Section 9.  
 109 S.R.A. Records of Strain and Robertson, TD83/6/6A.



constant and almost continuous night and day for, among other uses, pumping work. Therefore, collieries gave an extremely high load factor. Iron and steel works, which absorbed 19.52 per cent and 19.11 per cent respectively, provided a similar advantage. It is unfortunate that general power users, who took 18.81 per cent and 18.48 per cent respectively of the supply, cannot be identified in an attempt to provide some indication of the load factor involved.

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TABLE 35

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Analysis of Units Sold by the C.V.E.P. Company in 1923

Purpose of Supply	Units Sold	Units Sold as a Percentage of Total for Light	Units Sold as a Percentage of Total for Power	Units Sold as a Percentage of Total Units Sold
<u>A. LIGHTING ETC.</u>				
1. Shops	500,430	30.30		0.39
2. Domestic	370,380	22.43		0.29
3. Special Lighting	30,566	1.85		0.02
4. Small Power	<u>750,048</u>	<u>45.42</u>		<u>0.59</u>
	<u>1,651,424</u>	<u>100.00</u>		<u>1.29</u>
<u>B. POWER</u>				
5. General Power Users	24,062,006		19.06	18.81
6. Collieries	27,000,212		21.38	21.11
7. Textiles	4,521,149		3.58	3.53
8. Bulk	21,846,269		17.30	17.08
9. Traction	1,663,466		1.32	1.30
10. Engineering and Repair Shops	12,710,232		10.07	9.94
11. Shipyards	9,498,533		7.52	7.42
12. Iron & Steel Works	<u>24,966,473</u>		<u>19.77</u>	<u>19.52</u>
	<u>126,268,340</u>		<u>100.00</u>	<u>98.71</u>
<u>C. SUMMARY</u>				
Lighting	1,651,424			1.29
Power	<u>126,268,340</u>			<u>98.71</u>
	<u>127,919,764</u>			<u>100.00</u>

Source: S.R.A. Records of Strain and Robertson TD83/6/6C.



TABLE 36

## Analysis of Units Sold by the C.V.E.P. Company in 1924

Purpose of Supply	Units Sold	Units Sold as a Percentage of Total for Light	Units Sold as a Percentage of Total for Power	Units Sold as a Percentage of Total Units Sold
<b>A. LIGHTING ETC.</b>				
1. Shops	544,480	29.73		0.38
2. Domestic	414,129	22.62		0.29
3. Special Lighting	34,157	1.87		0.02
4. Small Power	838,414	45.78		0.59
	<u>1,831,180</u>	<u>100.00</u>		<u>1.28</u>
<b>B. POWER</b>				
5. General Power Users	26,427,901		18.72	18.48
6. Collieries	28,746,829		20.36	20.10
7. Textiles	4,505,848		3.19	3.15
8. Bulk	23,648,752		16.75	16.54
9. Traction	1,835,718		1.30	1.28
10. Engineering & Repair Shops	15,383,479		10.90	10.76
11. Shipyards	13,304,114		9.42	9.30
12. Iron & Steel Works	27,330,930		19.36	19.11
	<u>141,183,571</u>		<u>100.00</u>	<u>98.72</u>
<b>C. SUMMARY</b>				
Lighting	1,831,180			1.28
Power	141,183,571			98.72
	<u>143,014,751</u>			<u>100.00</u>

Source: S.R.A. Records of Strain and Robertson, TD83/6/4.

Bulk supply, which represented 17.08 per cent and 16.54 per cent respectively of the total, may, in fact, be somewhat misleading since it is known that, in 1923, 4.16m units were absorbed by the Strathclyde Electricity Supply Company which was itself involved in providing energy for lighting purposes; further analysis of the figures for bulk supply in 1923 will be given later. Next in ascending order of merit came engineering and repair shops, shipyards and textiles and again these areas may have provided equally high load factors but, since individual firms cannot be identified, assumptions, only, can be made. It is significant that traction and lighting were apparently low in the marketing priorities of the company. The requirements of an electric tramway, averaging about eight hours per day, would mean a load factor of 30-33 per cent, while lighting would represent only 8-9 per cent. These figures may, in fact, reflect the importance which the company attached to these particular areas. Despite the optimism expressed with regard to load factor, in May 1924, by which time the total units sold during the year was 143,014,751 and the total number of consumers was 2,630, the yearly load factor was 34 per cent. However, by the same token, Glasgow Corporation, with total unit sales for the same period of 162,337,809 and consumers numbering 58,390, indicating consumers of relatively small amounts of power, had a load factor of a mere 22 per cent.<sup>110</sup>

The only additional analysis of Tables 35 and 36 in

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110. Ibid., TD 83/6/4.



the extant records is that concerning bulk supply for 1923 and this is given in Table 37. Table 37 reveals that there were six consumers taking a bulk supply from the company. Of the six, three were local authorities viz., the burghs of Motherwell, Wishaw and Hamilton. The burghs of Motherwell and Hamilton had their own undertakings, and the figures against them in Table 37 represent only partial bulk supplies.<sup>111</sup> However, with the exception of the Strathclyde company, there is not a great deal of information concerning the other five users and the use which they made of these supplies.

TABLE 37

Consumers taking a bulk supply from  
the C.V.E.P. Company in 1923

<u>Consumer</u>	<u>Units Taken</u>	<u>Percentage of Total</u>
Coatbridge & Airdrie Electric Supply Co. Ltd.	9,809,321	44.90
The Electric Supply Corporation Ltd.	5,569,658	25.49
Strathclyde Electrici- ty Supply Co. Ltd.	4,162,855	19.06
Burgh of Wishaw	1,194,955	5.47
Burgh of Motherwell	226,780	1.04
Burgh of Hamilton	882,700	4.04
Total	<u>21,846,269</u>	<u>100.00</u>

Source: S.R.A. Records of Strain and Robertson,  
TD83/6/6C.

The initial agreement for a supply of electricity in

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111. The Hamilton Burgh Electric Lighting Order 1898 was operated by Edmundsons' Electricity Corporation Limited. S.R.A. Records of Strain and Robertson TD83/6/5.

bulk to the Burgh of Wishaw was signed on 17th December, 1903, and further agreements with this burgh were reached in July 1905 and in 1910.<sup>112</sup> After 1910, although it must be assumed that a bulk supply continued, the first mention of a bulk supply to the town occurs in 1924 when negotiations were proceeding for a bulk supply to Motherwell and Wishaw at an estimated capital expenditure of £11,467.50 with an estimated annual return of £600.<sup>113,114</sup> The supply to Motherwell itself apparently began in February 1920. A further agreement for a bulk supply to Motherwell and Wishaw was signed in June 1927.<sup>115</sup> The agreement to supply the Electric Supply Corporation, which operated in Dumbarton, was signed in March 1914,<sup>116</sup> with the supply itself beginning in December 1914.<sup>117</sup> The Coatbridge and Airdrie Electric Supply Company had initially its own generating station which it closed in order to take power from the C.V.E.P. Company.<sup>118</sup> In May 1918 the directors of the C.V.E.P. Company approved of a new contract for ten years with this company.<sup>119</sup> However, a supply had commenced much earlier, since sub-stations belonging to

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112. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1 and SSE5,1/2.  
 113. Ibid., SSE5,1/3.  
 114. Motherwell and Wishaw became a united burgh by the Motherwell and Wishaw Amalgamation Act 1920. S.R.A. Records of Strain and Robertson, TD83/6/5.  
 115. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/4.  
 116. Ibid., SSE5,1/2.  
 117. S.R.A. Records of Strain and Robertson, TD83/6/6C.  
 118. Ibid., TD83/6/6B.  
 119. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/2.



this company at Waverley, Coatbridge and Airdrie had been connected to the C.V.E.P. Company in March 1907, November 1908 and March 1917 respectively.<sup>120</sup> Further bulk supply agreements were made with the town councils of Paisley and Helensburgh in May 1925 and with Lanarkshire County Council for a supply at Cambuslang in April 1926.<sup>121</sup> Moreover, in June 1928 the C.V.E.P. Company, itself, reached an agreement with the Shotts Iron Company whereby the former took a bulk supply from the latter for five years for distribution in the town of Shotts.<sup>122</sup>

There is a minimum of information concerning traction. In March 1909 an agreement was concluded to supply the Lanarkshire Tramways Company for its Hamilton to Uddingston boundary route and for its Wishaw to Newmains route,<sup>123</sup> and in June 1910 another to supply Paisley and District Tramways Company.<sup>124</sup> In October 1922 the directors of the company decided, subject to the scrutiny of figures, to provide a bulk supply to Paisley and Glasgow Tramways at Paisley and in October 1923 a further agreement to provide a bulk supply to the Lanarkshire Tramways was signed.<sup>125</sup>

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120. S.R.A. Records of Strain and Robertson, TD83/6/6C.  
 121. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/3. S.R.A. Records of Strain and Robertson, TD83/6/6C.  
 122. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/4.  
 123. Ibid., SSE5,1/1.  
 124. Ibid., SSE5,1/2.  
 125. Ibid., SSE5,1/3.

As noted in Tables 35 and 36, the C.V.E.P. Company also supplied power for lighting purposes. However, the amount supplied was a small percentage of the total power supplied, 1.29 per cent in 1923 and 1.28 per cent in 1924. From the tables it can be observed that even these figures may overestimate the situation since part of the overall figure for lighting includes that provided for small power. Despite the promotion of the Strathclyde company to deal with lighting orders, the C.V.E.P. Company, by 1923, was operating a number of lighting orders for Lanarkshire County Council viz.,

Bellshill Electric Lighting Order 1906, taken over by the company in 1909; Blantyre Electric Lighting Order 1906, taken over by the company in 1914; Bothwell Electric Lighting Order 1906, taken over by the company in 1909; Uddingston Electric Lighting Order 1906, taken over by the company in 1909 and the Shettleston and Tollcross Electric Lighting Order 1906 which was also taken over in 1909.<sup>126</sup>

No reason is given for the retention of these particular orders by the C.V.E.P. Company. For example, the Clydebank Electric Lighting Order 1901 was taken over by the C.V.E.P. Company in 1904 but in 1908 was transferred to the Strathclyde company.<sup>127</sup> Apart from the overall

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126. S.R.A. Records of Strain and Robertson, TD83/6/6A and TD83/6/8

127. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1.



figures for lighting given in Tables 35 and 36 no further analysis is available of the amounts taken under these five electric lighting orders.

The orders operated by the C.V.E.P. Company indirectly, and by means of its subsidiary the Strathclyde company, in 1923 were:-

Clydebank Electric Lighting Order 1901;  
 Kilpatrick and Milngavie and District Electricity Orders 1906 and 1922; Rutherglen Electricity Supply Orders 1905 and 1908; Eastwood, Cathcart and District Electricity Orders 1906 and 1923;  
 Barrhead Electric Lighting Order 1908; Johnstone Electricity Special Order 1922; Renfrew and District Electricity Special Order 1922;  
 Kirkintilloch and District Special Order 1922 and Busby, Mearns and District Electricity Special Order 1923.<sup>128</sup>

#### (6) Pricing Policy.

The extant records contain no clear statement concerning the pricing policy of the company, although certain inferences may be made. Under the terms of the 1901 Act the company was confined to the supply of electricity for two purposes. First of all it could supply energy in

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128. S.R.A. Records of Strain and Robertson, TD83/6/6A.

bulk to authorised distributors and secondly it could supply energy for power purposes to industrial concerns.<sup>129</sup> This naturally meant that a very simplistic approach could be adopted with regard to the rates charged. For example, in 1901 it was proposed that a quarterly rate of 3d. per unit should be charged for any quantity not exceeding the equivalent of 400 hours of supply at the maximum power which the consumer had demanded and for any further quantity exceeding the equivalent of 400 hours of supply at maximum power the rate should be 2d. per unit.<sup>130</sup>

This simplistic approach to pricing became more complicated, however, when the company became involved in the acquisition of electric lighting orders under the terms of the Clyde Valley Electric Power Act 1904 and after it established the Strathclyde Electricity Supply Company in 1905. Many industrial units which were taking a power supply from the company had their own generating stations but substituted the company's power supply for their own because of its cheapness.<sup>131</sup> Moreover, the Coatbridge and Airdrie Electricity Supply Company Limited closed its generating station to take power from the C.V.E.P. Company. In 1924 the rates charged by the Strathclyde company were said to be cheaper than that of any concern

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129. Ibid., TD83/6/3.

130. Ibid., TD83/6/1.

131. Ibid., TD83/6/6B.



of comparable size in Britain. However, this must remain open to question and, furthermore, since the Strathclyde concern was a wholly owned subsidiary, the parent company may well have introduced an element of subsidy at the expense of other users.

Table 38 provides some useful information for the period between 1911 and 1924 concerning both the C.V.E.P. Company and the Strathclyde company. The units sold, the revenue gained and the average rate received by both companies as well as the combined income and average rate are given. In an attempt to simplify the mass of figures given in this table a graphic presentation has also been made to illustrate an 'at a glance' analysis of the figures for both companies. The graphic analysis can be noted in Graphs 6, 7, 8, 9 and 10. It should also be noted that in the graph examining the average rate (Graph 10) and in Table 30 the use of the pre-decimalisation penny unit (d.) has been retained.

TABLE 38

Statement of Unit Sales, Income and Average Rate Received by the C.V.E.P. Company and the Strathclyde Electricity Supply Company, 1911-1924.

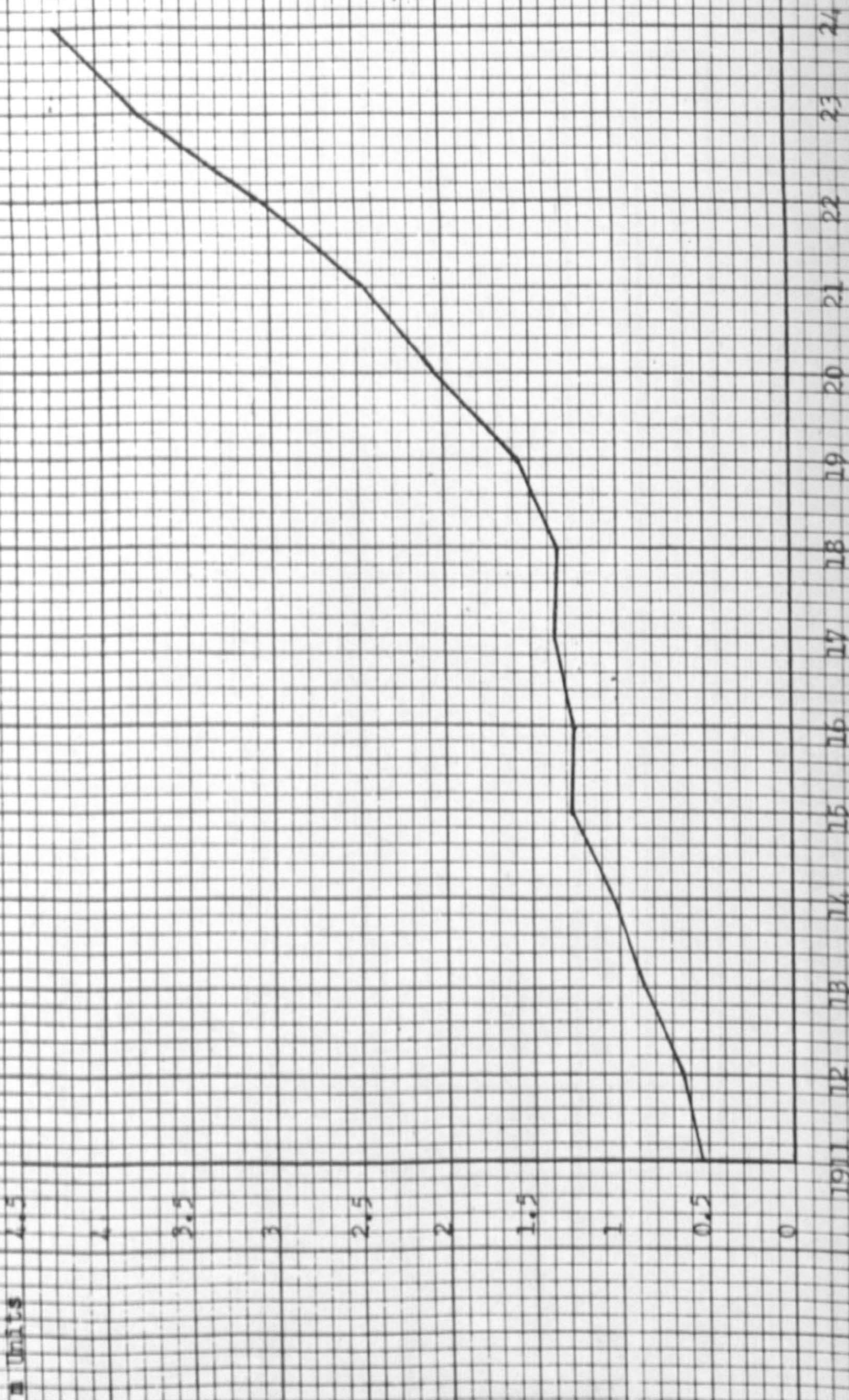
	C.V.E.P. Company		Strathclyde Company			Combined		
	Units Sold	Income (£)	Average Rate (d.)	Units Sold	Income (£)	Average Rate (d.)	Income (£)	Average Rate (d.)
1911	34,013,031	98,499	0.695	507,642	3,922	1.854	102,421	0.723
1912	41,401,388	111,091	0.644	642,980	5,300	1.978	116,391	0.675
1913	46,680,017	132,001	0.678	860,475	6,745	1.881	138,746	0.713
1914	51,126,947	148,446	0.696	1,016,175	8,357	1.973	156,803	0.736
1915	71,267,273	199,505	0.671	1,299,421	9,784	1.807	209,289	0.705
1916	92,180,026	264,303	0.688	1,274,484	11,158	2.101	275,461	0.717
1917	114,156,593	342,778	0.720	1,376,008	11,474	2.001	354,252	0.745
1918	129,450,604	440,201	0.816	1,370,154	13,026	2.282	453,227	0.840
1919	108,012,563	451,528	1.003	1,587,333	13,869	2.097	465,397	1.034
1920	126,854,946	660,962	1.250	2,088,428	20,530	2.359	681,492	1.289
1921	101,996,937	584,928	1.376	2,477,886	33,233	3.285	618,161	1.455
1922	103,592,620	440,144	1.019	3,053,081	37,642	2.958	477,786	1.107
1923	127,919,764	539,955	1.013	3,784,413	45,542	2.888	585,497	1.098
1924	143,014,751	589,667	0.990	4,238,208	51,475	2.915	641,142	1.045

Source: S.R.A. Records of Strain and Robertson, TD83/6/4 and TD83/6/6C.



GRAPH 6

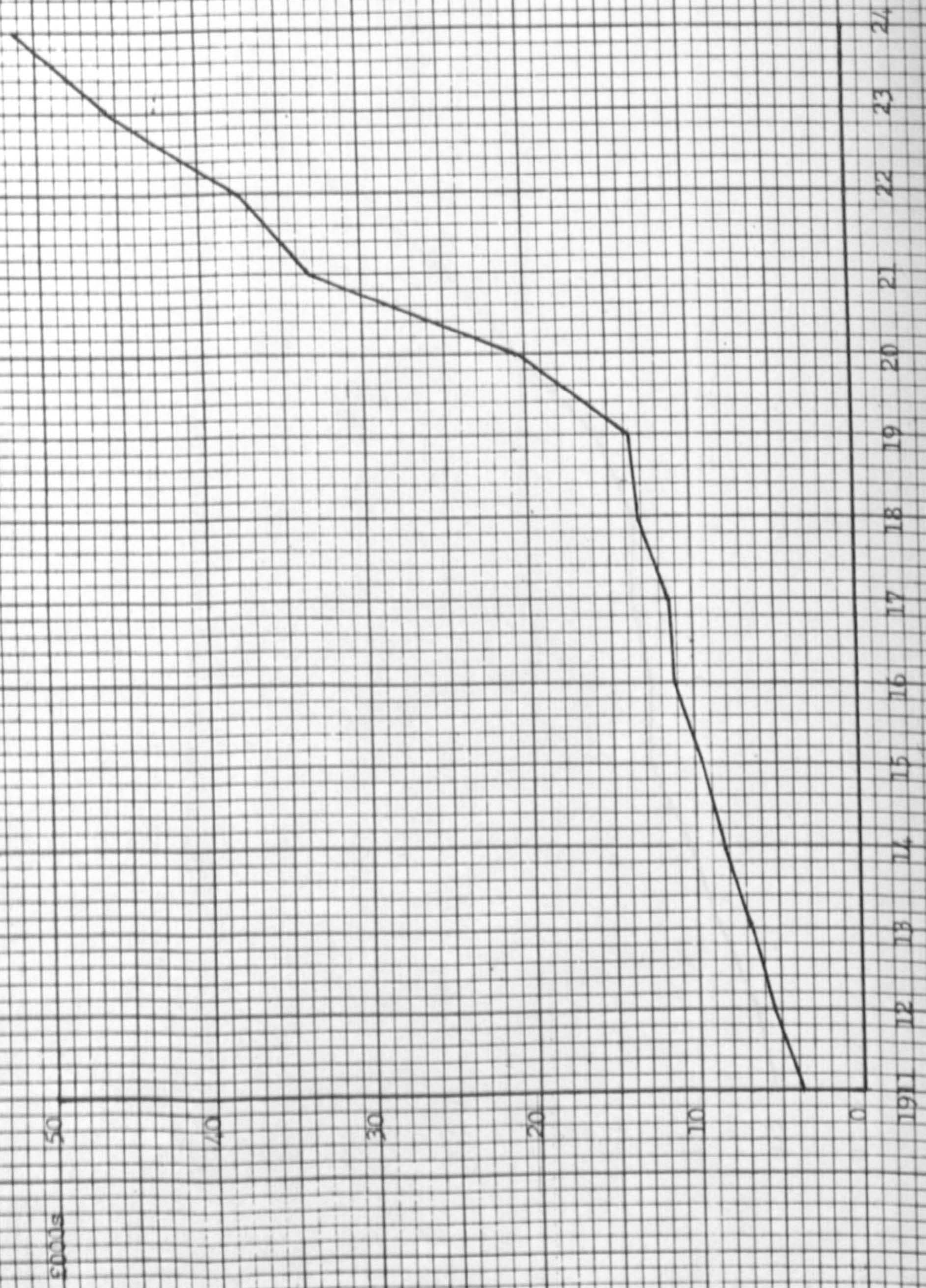
Unit Sales of Strathclyde Electricity Supply Company 1911 - 1924.





GRAPH 7

Revenue of Strathclyde Electricity Supply Company 1911 - 1924.



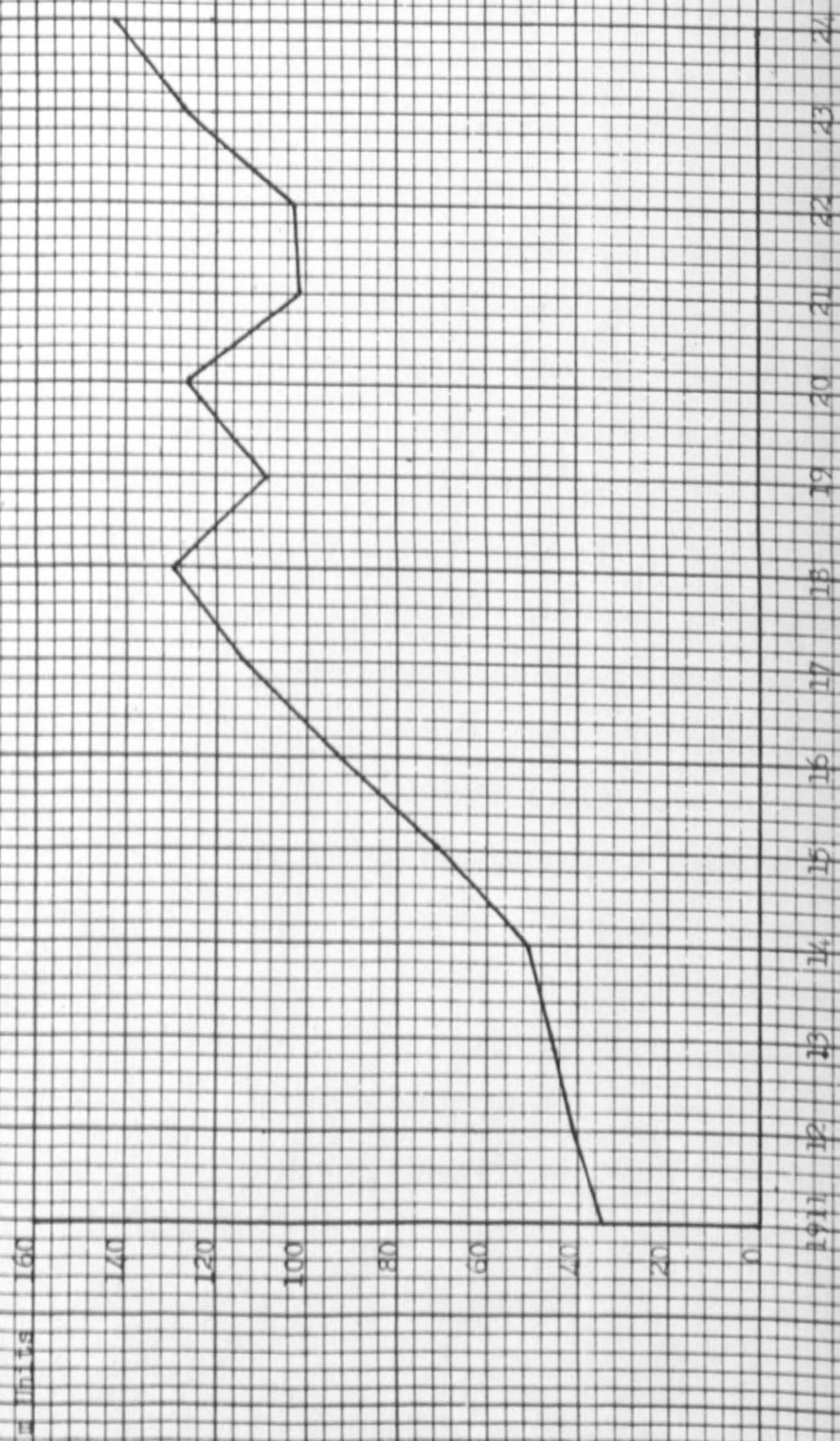


An examination of the figures and graphs pertaining to the Strathclyde company reveals a number of salient points. At no time during this fourteen year period did the Strathclyde company suffer a decline in its income while only in two years, viz., 1916 and 1918, did it experience a marginal decrease in the expansion of its unit sales. Furthermore, any reduction in the average rate received was matched by an expansion of sales and consequently an increase in revenue. Moreover, in the two years when there was a marginal decrease in unit sales, that is in 1916 and 1918 when the decrease was 1.92 per cent and 0.43 per cent respectively, there was an apparent tendency to over-compensate by increasing the average rate. The increase in the average rate in 1916 was 16.27 per cent and in 1918, 14.04 per cent. During the eight year period from 1911 until 1919 when income steadily expanded and when unit sales, with the exception of the two years already mentioned, also expanded, the average rate rose and fell in consecutive years and there does not appear to be any apparent explanation for the regularity of this cyclical movement. From 1919 until the year 1921, which was the peak year for average rate, the average rate rose by 56.65 per cent while unit sales rose by 56.10 per cent and this is reflected in the revenue figures which indicate a massive 139.62 per cent increase over the same period. The general downward trend in the average rate after 1921 was matched by an expansion of unit sales and this is reflected in revenue; the market responded to falling unit



GRAPH 8

Unit Sales of C.V.E.P. Company 1911 - 1924





GRAPH 2

Revenue of C.V.E.P. Company 1911 - 1924

8000

700

600

500

400

300

200

100

0

1911

12

13

14

15

16

17

18

19

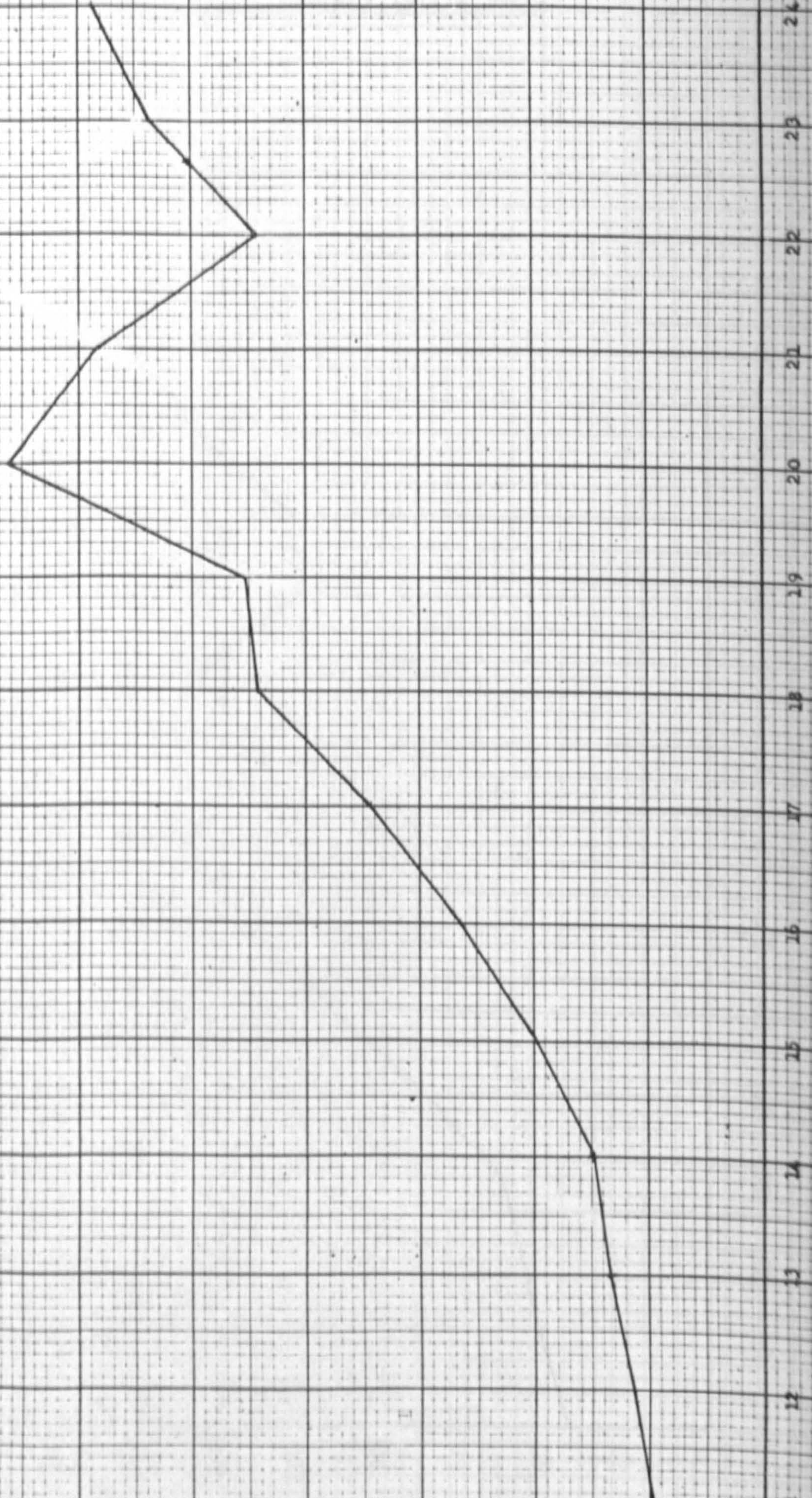
20

21

22

23

24





prices.

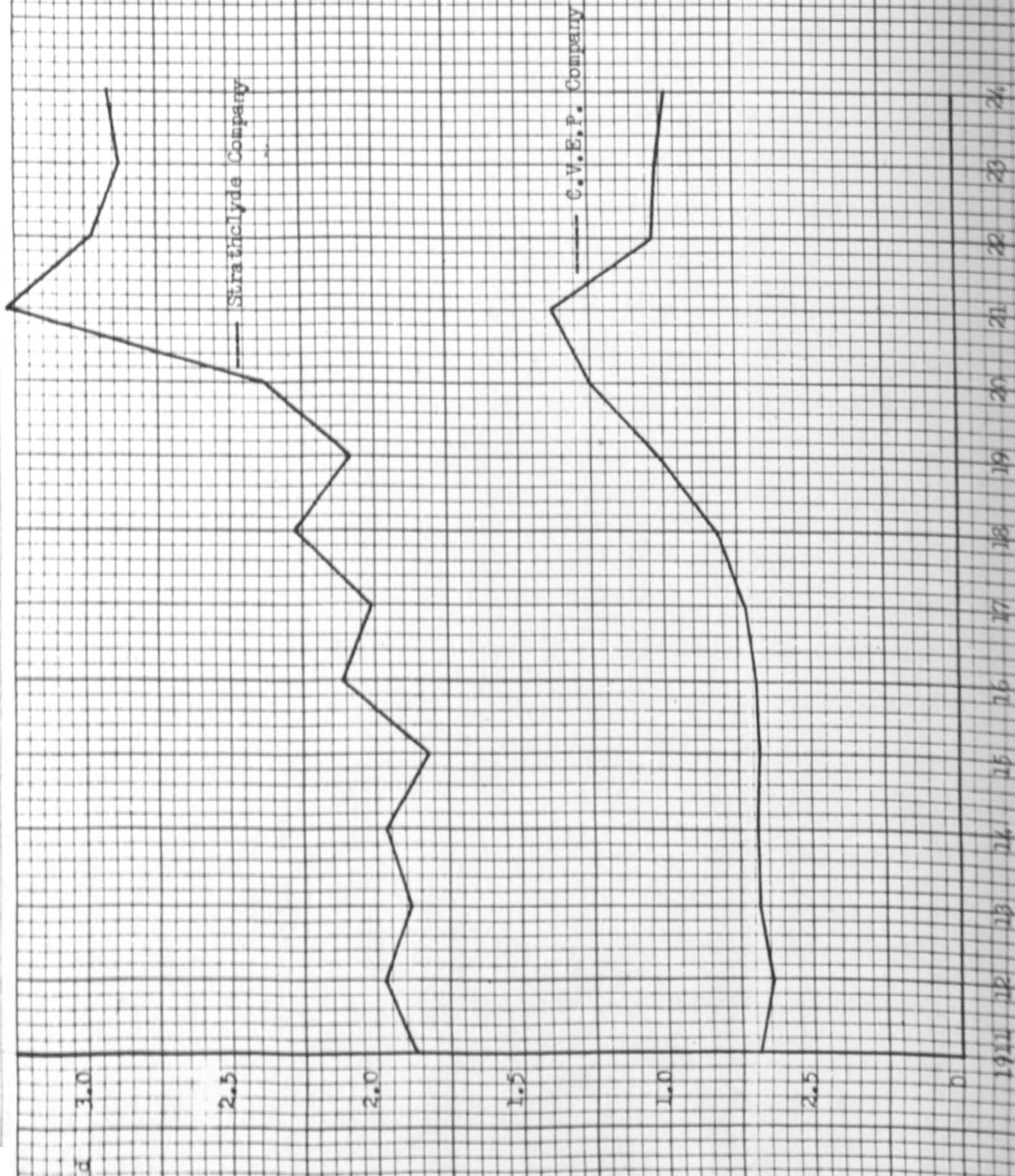
From Table 38 and the accompanying graphs it can be observed that the position of the C.V.E.P. Company was somewhat different. The C.V.E.P. Company did experience a fall in revenue and, indeed, between 1920 and 1922 revenue fell by 33.41 per cent. In a similar manner to the Strathclyde company, the C.V.E.P. Company experienced only two years of declining sales, 1919 and 1921, but with the parent the decline was much more severe being 16.56 per cent and 19.60 per cent respectively. However, in 1919 an increase in the average rate compensated for the decline in sales and income continued to expand. On the other hand in 1921, despite an increase in the average rate, income declined; 1921 was, in fact, the peak year for average rate and may reflect increased unit costs incurred in the inflationary period between 1918 and 1920, that is, the pricing policy may simply reflect what it was thought the market would stand in terms of transmitting increases in costs. In the case of the parent company it can also be noted that when the average rate declined it was normally the case that unit sales increased to compensate for this fall and that this ensured an increase in income. This was true of 1912, 1915, 1923 and 1924. However, in 1922 when unit sales increased the company's income did not. Nevertheless, in 1923 and 1924, when the average rate declined, an increase in unit sales ensured that revenue continued to expand.

A comparison, therefore, of the parent company and its



GRAPH 10

Average Rate Received by Strathclyde Electricity Supply Company and C.V.E.P. Company 1911 - 1924





subsidiary reveals several essential yet in many ways obvious differences. Throughout the period examined the revenue of the Strathclyde company continued to increase, whereas that of the C.V.E.P. Company fluctuated declining, for example, between 1920 and 1922 before resuming its upward movement. By the same token the unit sales of the Strathclyde company indicated only marginal decreases in 1916 and 1918 to thwart the overall trend of expansion, whereas the C.V.E.P. Company, although continuing its general expansion of unit sales until 1920, suffered a rather severe decline in unit sales in 1921 and 1922 and, although recovery took place after 1922, the 1920 figure was not surpassed until 1924. Again the average rate received offers further comparison. Until 1920 the Strathclyde company underwent an almost biennial cyclical movement thereafter experiencing a sharp rise in 1921, followed by a general downward trend until 1923 with a relatively minor increase in 1924. On the other hand the C.V. E.P. Company from 1912 until 1921, a peak year for both companies, displayed a general upward tendency. After 1921 the C.V.E.P. Company displayed a general downward trend but without experiencing any increase in 1924. The difference in trends between the two companies is explained by the fact that the Strathclyde company was basically supplying energy for lighting whereas the C.V.E.P. Company was supplying a minority of its energy for lighting but the majority for power purposes. Bearing this in mind, therefore, the C.V.E.P. Company was more susceptible



to changes in the pattern of demand from the overall economy and also to changes in the pattern of demand from particular industrial sectors. This is particularly evident in 1921/1922. The increase in the average rate of the parent company in 1921 coincided with the depression of that year which badly affected industrial power consumers and, thus, the continuing decline in its revenue in 1922 was undoubtedly influenced by that depression. On the other hand, the Strathclyde company was meeting ever increasing consumption consequent upon ever increasing consumer demand and environmental advance and was less likely to be affected by depression.

Unfortunately the figures given in Table 38 and illustrated in its associated graphs only allow a global interpretation of the overall situation affecting these companies between the years 1911 and 1924. Thus a detailed analysis of the distributive pattern of demand and individual rates charged to consumers cannot be attempted. However, fortunately, certain figures are available for the years 1923 and 1924 which allow such an analysis to be undertaken and reveal, to a limited extent, an interpretation of the company's pricing policy. The analysis of the distributive pattern of demand for the years 1923 and 1924 has already been made in reference to Tables 35 and 36 (see p.p. 434 and 435) and, thus the following section attempts to relate this demand pattern to the rates charged by the company to individual sectors.

Table 39 (p. 451) tabulates the rates charged by the

C.V.E.P. Company for lighting and heating for the years 1923 and 1924. The section devoted to lighting reveals the fact that domestic consumers were charged at a lower rate than business consumers. Although this could, possibly, be expected there may, in fact, be an element of subsidy to the domestic consumer to boost sales in this particular sector which from the analysis given in Tables 35 and 36 formed a very small part of the company's overall business. The section of Table 39 devoted to heating is more complex. No additional information is contained in the extant records concerning 'Special Lighting' and 'Small Power' and, therefore, to make generalised and unsubstantiated assumptions would not appear to be constructive at this stage. It is interesting to note, as explained in the footnotes to Table 39, that, with regard to heating, dwelling houses could be charged at two different rates. Although adequate background information is lacking, it would appear questionable that there should be a 100 per cent difference in the tariff because of the use of a separate meter. However, the company policy concerning the allocation of the 730 hours, stated in footnote three, would appear to be reasonable and logical. The hours were allocated on a quarterly basis in the following manner:- January/March Quarter - 300 hours; April/June Quarter - 65 hours; July/September Quarter - 65 hours and the October/December Quarter - 300 hours. Moreover, although it



is not revealed in Table 39 and there is only one reference in the extant records, it was possible, for domestic consumers only, to obtain alternative terms for lighting and heating. This was a domestic rental system with a fixed charge based on the size of the house and with, in 1923, a running charge of 0.75d. for all current consumed.<sup>132</sup> From Table 39 it can also be seen that the heating charge for business premises fell midway between the two different rates charged to domestic consumers. Finally, from this table it would appear that it was deliberate company policy to charge for lighting at a much higher rate than for heating.

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132. Ibid., TD83/6/4.

**TABLE 39**

**C.V.E.P. Company, Rates charged for Light and Heat in the years 1923 & 1924**

	1923				1924			
	Units	% of Total	Rate <sup>2</sup>	Revenue	Units	% of Total	Rate <sup>2</sup>	Revenue
<b>LIGHTING:-</b>								
a) Business Premises, Halls, Places of Entertainment	393,240	23.82	d.	8,192	439,609	24.00	d.	9,159
b) Domestic Consumers	226,673	13.73	5.0	4,250	253,500	13.84	5.0	4,753
			4.5				4.5	
<b>HEATING:-</b>								
c) In Premises other than Dwelling Houses <sup>3</sup>	107,190	6.49	1.5	670	104,871	5.73	1.5	655
d) Dwelling Houses <sup>3</sup>	91,177	5.52	1.0	380	101,916	5.57	1.0	425
e) Dwelling Houses <sup>4</sup>	52,530	3.18	2.0	438	58,713	3.21	2.0	489
f) Special Lighting	30,566	1.85	2.5	318	34,157	1.87	2.5	356
g) Small Power	750,048	45.42	2.25	7,032	838,414	45.78	2.25	7,860
<b>TOTAL</b>	<b>1,651,424</b>	<b>100.00</b>	<b>3.093</b>	<b>21,280</b>	<b>1,831,180</b>	<b>100.00</b>	<b>3.1058</b>	<b>23,697</b>

1. Expressed as a percentage of the total units sold as per this table.

2. Monetary value stated in terms of pre-decimalisation currency

3. Combined domestic tariff for current used for cooking, heating or other domestic purposes, in excess of 730 hours use of the maximum demand for lighting and metered through the same meter.

4. Domestic heating, cooking etc. through separate meter.

Source: S.R.A. Records of Strain and Robertson, TD83/6/3 and TD83/6/4.



Table 40 provides an analysis of the users of power in the years 1923 and 1924. This table provides much useful information concerning sales, revenue and average rates but it does not provide a complete interpretation of the pricing policy of the company. In many ways the figures given, although useful, tend to be global. For example, it is not known if different rates were charged to different consumers within the same sub-strata. From Table 41 (p. 455) it is known that the rate given against bulk supply of 0.616d. was an average rate and that individual consumers taking a bulk supply were charged at different levels and this may well be the case with the other power consumers given in Table 40. However, it would appear that the rate stated was not entirely related to unit sales. For example, the collieries, the largest consumers of power in both years, appear to have been charged at a higher rate than iron and steel works or bulk consumers who individually absorbed less power, and the same is true of a comparison made of engineering and repair shops and textiles. Thus, although Table 40 does provide useful information, neither it nor the extant records provide sufficient detail to allow an interpretation of overall company policy regarding pricing.

TABLE 40

C.V.E.P. Company, Rates charged for Power in the years 1923 & 1924

	1923				1924			
	Units	% of Total	Rate <sup>2</sup> d.	Revenue £	Units	% of Total	Rate <sup>2</sup> d.	Revenue £
<b>POWER:-</b>								
Collieries	27,000,212	21.38	0.943	106,109	28,746,829	20.36	0.936	112,067
Iron & Steel Works	24,966,473	19.77	0.837	87,120	27,330,930	19.36	0.806	91,788
General Power Users	24,062,006	19.06	1.114	111,675	26,427,901	18.72	1.068	117,579
Bulk	21,846,269	17.30	0.616	56,095	23,648,752	16.75	0.625	61,571
Engineering & Repair Shops	12,710,232	10.07	1.410	74,694	15,383,479	10.90	1.316	84,322
Shipyards	9,498,533	7.52	1.241	49,119	13,304,114	9.42	1.157	64,153
Textiles	4,521,149	3.58	1.192	22,454	4,505,848	3.19	1.212	22,755
Traction	1,663,466	1.32	1.646	11,409	1,835,718	1.30	1.534	11,735
<b>TOTAL</b>	<b>126,268,340</b>	<b>100.00</b>	<b>0.986</b>	<b>518,675</b>	<b>141,183,571</b>	<b>100.00</b>	<b>0.962</b>	<b>565,970</b>

1. Expressed as a percentage of the Total Units sold as per this table.
2. Monetary value stated in terms of pre-decimalisation currency.

Source: S.R.A. Records of Strain and Robertson, TD83/6/4 and TD83/6/6C.



Table 41 which provides an analysis of bulk supply is perhaps easier to understand, although there still appears to be a lack of logic in the rates quoted against the first two companies in the table. The Strathclyde company, the wholly owned subsidiary of the C.V.E.P. Company, appears to have been subsidised thus providing it with an inherent advantage over any rivals. In some senses the figure quoted against the Burgh of Wishaw is self-explanatory since this includes interest on plant, although the actual amount for interest is not known. Finally, the figures quoted against the Burghs of Motherwell and Hamilton appear to indicate that the company did not operate a common pricing policy for all consumers, and this aspect is emphasised by the rate set against the Electric Supply Corporation Limited.

TABLE 41

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C.V.E.P. Company, Rates charged for Consumers taking a Bulk Supply in 1923

Consumer	Units	% of Total	Gross Amount <sup>1</sup> Received £	Gross <sup>1</sup> Rate (d.)
Coatbridge and Airdrie Electric Supply Company Limited	9,809,321	44.90	24,345.15.11.	0.596
Electric Supply Corporation Ltd.	5,569,658	25.49	13,692. 9. 4.	0.590
Strathelyde Electricity Supply Co. Ltd.	4,162,855	19.06	9,901. 9. 8.	0.571
Burgh of Wishaw <sup>2</sup>	1,194,955	5.47	4,513. 0.10.	0.906
Burgh of Hamilton <sup>3</sup>	882,700	4.04	3,031.15. 3.	0.824
Burgh of Motherwell <sup>3</sup>	226,780	1.04	610.11. 4.	0.646
TOTAL	21,846,269	100.00	56,095. 2. 4.	0.616

1. Monetary value stated in terms of pre-decimalisation currency.
2. Includes interest on plant, supplied by the C.V.E.P. Company, for converting current to D.C.
3. Partial bulk supply only.

Source: S.R.A. Records of Strain and Robertson, TD83/6/6C.



From an examination of Tables 39, 40 and 41 and from what has been said above concerning them, it is difficult to interpret the pricing policy of the company. Decisions concerning pricing must have been taken by the Board. It would be surprising if a company, such as the C.V.E.P. Company, which was so positive in so many other ways, did not have a definite policy on pricing. It appears that, with the exception of lighting and heating where a differential in rates was employed and with the obvious exception of the Strathclyde company, the pricing policy of the company was to charge what the market would stand. Within the major industrial sectors, as designated in Table 40 (p.453), individual industrial units were charged different rates in accordance with their bargaining power and their relationship with the C.V.E.P. Company.

After the period dealt with in Tables 39-41 the extant records contain several references to pricing but do not provide much information concerning pricing policy. In September 1926 the directors decided that from 1st October, 1926, because of the high cost of coal, lighting charges would be increased by 10 per cent for all consumers other than those on the domestic rental system. The increase was withdrawn on 1st October, 1927.<sup>133</sup> In 1926 also the alacrity with which the company dealt with

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133. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/4.

defaulters is shown. On 15th December, 1926 the directors decided that if William Beardmore and Company Limited did not pay its account for the September quarter within one week then the company would discontinue supply. The Beardmore concern paid within the week.<sup>134,135</sup> In October 1928 the company decided to revise the tariffs for both domestic and non-domestic consumers and to introduce a novel two-rate tariff. However, after discussion and apparent hostility from the general public the two-rate tariff was withdrawn, and a new rental tariff decided upon for housing schemes and other small houses. From December 1928 the rental tariff for a three apartment and kitchenette was to be £2.50p per annum, for a four apartment and kitchenette £3.25p per annum and for a five apartment and kitchenette £4.00p per annum.<sup>136</sup> The growth of housebuilding during this period, both in the public and private sector, must have stimulated the company's activities. For example, in August 1922 Glasgow Corporation requested a supply to its Sandyhills Housing Scheme at Tollcross and in October 1923 it also requested a supply to its 1,190 houses at its Knightswood Housing Scheme.<sup>137</sup> Moreover, the importance attached

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134. S.R.O. Records of the South of Scotland Electricity Board, SSE, 5, 1/4.

135. For a complete history of the Beardmore company, including the difficulties confronting it at this time, see John R. Hume and Michael S. Moss, Beardmore. The History of a Scottish Industrial Giant, (1979).

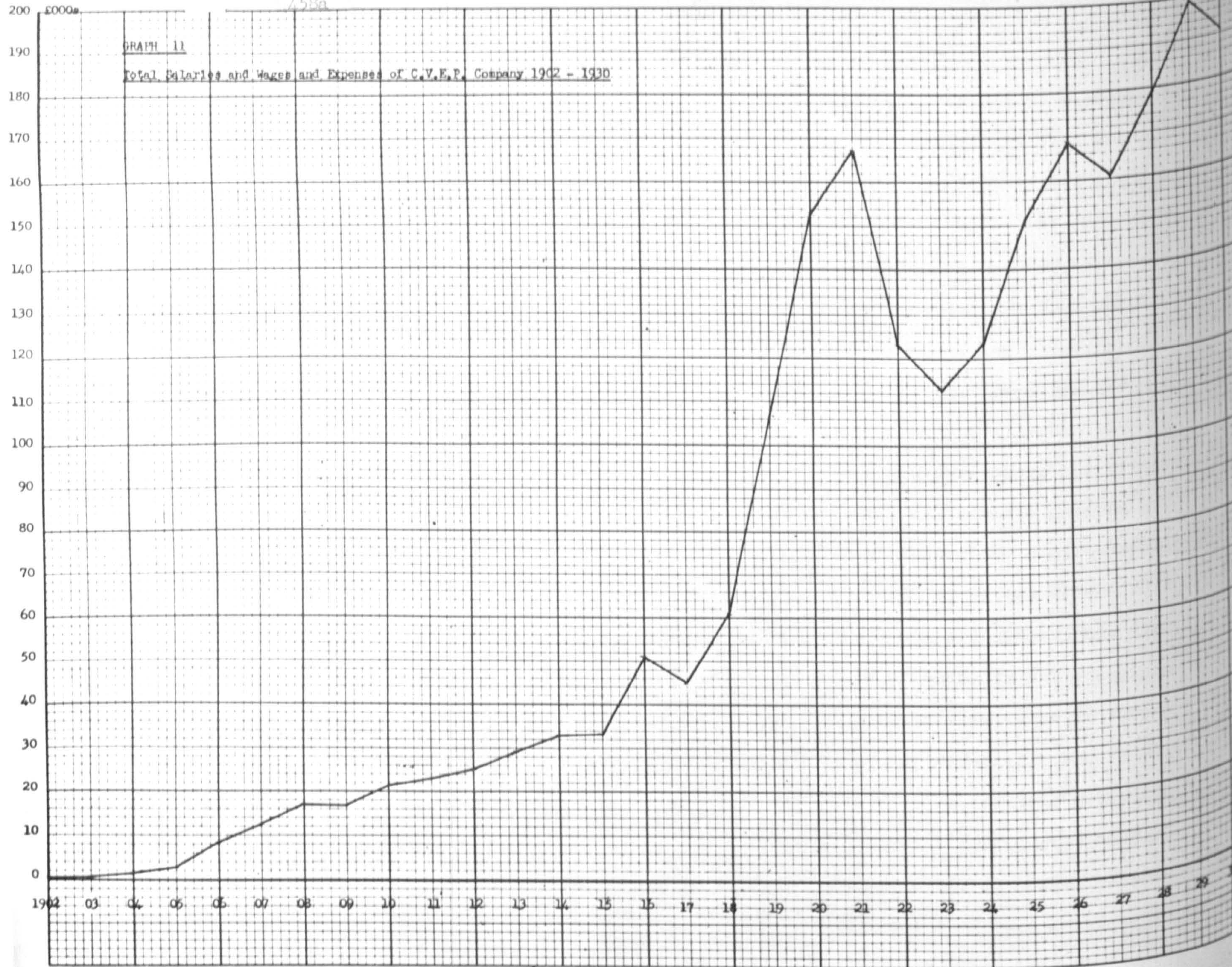
136. S.R.O. Records of the South of Scotland Electricity Board, SSE, 5, 1/4.

137. Ibid., SSE, 5, 1/3.



GRAPH 11

Total Salaries and Wages and Expenses of C.V.E.P. Company 1902 - 1930





to domestic supply is indicated by the fact that in May 1929 the company decided to take a stand, at a cost of £1,000, at a Housing and Health Exhibition which was held in September of that year.<sup>138</sup> Overall, therefore, the pricing policy of the company was rather arbitrary and largely determined by what the market would accept.

(7) Management Structure, Staffing and Wages.

The extant records of the C.V.E.P. Company provide a degree of information concerning salaries, wages and expenses and directors fees from 1902 until 1930. These figures have been presented in Appendix 25 and graphically in Graph 11. Unfortunately these figures are global. Particularised information is available concerning salaries, and this will be referred to later, but similar information is not available concerning wages and expenses.

Graph 11 examines the grand total for both salaries and wages and expenses on an annual basis. Total expenditure for these items expanded fairly steadily down to 1908. This expansion obviously reflects the gradual build-up of the labour force during, and following upon, the opening of the Yorker generating station in August 1905, the Motherwell generating station in January 1906 and the construction and maintenance of some 100 sub-stations by 1908. The year 1909 witnessed a marginal decrease in

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138. Ibid., SSE5,1/4.



expenditure on salaries and wages perhaps due to an optimum capacity with regard to generating output being reached by that time.

The period between 1909 and 1915 witnessed a further steady expansion of expenditure on these items. This can, perhaps, be explained by the further extensions in capacity at both Yoker and Motherwell, as indicated in Table 30 (p. 4II) and the need for the recruitment of additional personnel of all types. Furthermore, the Yoker and Motherwell stations were interconnected which would doubtless involve further expenditure on wages.

The marked rise of this expenditure from 1915 to 1916 can possibly be explained by the fact that the Clyde's Mill generating station was being constructed at this time which, yet again, involved the recruitment of all types of labour. On the other hand the relatively sharp decline of wages and salaries from 1916 to 1917 can be explained by the fact that Clyde's Mill was almost certainly nearing completion. Between 1917 and 1921 there was a major rise in expenditure on wages and salaries. It is noticeable that this complements an equally significant rise in the generating capacity of the company (see Section 4, p. 4I6) as further extensions were carried out at the company's generating stations. Throughout this period there was a continuing process of sub-station construction which would involve maintenance labour while at the same time Clyde's

Mill and Yoker were interconnected. Moreover, the effects of the immediate post-war inflation on labour costs should not be discounted. The completion of such construction and the static nature of plant capacity may help to explain the decline of such expenditure in the period 1921/1923. The further major rise in expenditure on wages and salaries in the period from 1923 to 1926 can be associated with the continuing expansion at Yoker and Clyde's Mill, the laying of, and the duplicate laying of, an interconnection between Clyde's Mill and Motherwell and may well be associated with the beginnings of construction of the Lanarkshire Hydro-Electric Scheme. The marginal decline of wages and salaries expenditure during 1927 may well, although there is no positive evidence to support this, represent a 'cooling off' period following the aftermath of the General Strike of 1926 or, perhaps, represent a transitional period following upon the major legislation of that year affecting the electricity supply industry.

The period from 1927 to 1929 is signified by a marked increase in such expenditure and, yet again, can be possibly equated with the continued expansion of Clyde's Mill in 1927 and Yoker in 1928. The final year noted, that is 1930, witnessed a marginal decline of such expenditure but, nevertheless, it was greater than for any other year with the exception of 1929. This analysis, therefore, takes cognisance of an increase in the size of the labour force



but it does not take account of an increase in either salary or wage rates; this latter aspect will be referred to later. Moreover, the overall increase in both salaries and wages may have partially resulted from trade union pressure, but there is no information to substantiate the effects of any such activity.

A comparative assessment of the graphs representing salaries and wages, contracts entered, revenue and unit sales indicates that although some relative sympathy between them may be indicated, no positive direct correlation may be found. As already stated, the figures presented in Appendix 25 are global, and from the extant records it is impossible to particularise on the actual numbers employed by the company at any one time. What is not in doubt, however, is that the overall level of wages paid must have had, with the passage of years, an increasingly significant multiplier income effect on the local economy in the West of Scotland. It is also obvious from Appendix 25 that directors' fees bore no relationship to the burden of responsibility as indicated by the level of wages payment or by the increase in unit sales or by the increase in the revenue of the company.

(8) Subsidiary Concerns.

As noted earlier the C.V.E.P. Company formed or acquired several subsidiary companies, and the first of these was the Strathclyde Electricity Supply Company which was registered as a private company in September 1905 to apply for electric lighting orders within the parent company's area of supply. Table 42 (p. 464) provides a Statement of Capital of the Strathclyde company from 1905 until 1929 and reveals that throughout this period the great majority of shares were held by the parent company with a nominal £1 share being held by other shareholders, mainly directors; directors required to be shareholders to act. At the initial allotment of shares in 1905 David A. Starr, the general manager of the C.V.E.P. Company, James Mackenzie, its secretary, and Robert Robertson, its consulting engineer, were also allotted shares. No reason is given for this but, of course, Mackenzie and Robertson were to become directors in 1907 and 1917 respectively.

The initial capital of the company was £1,000 and this situation remained until August 1911 when the capital was increased to £50,000 by the creation of 49,000 new shares of £1 each. In July 1919 the capital was increased to £100,000 by the creation of an additional 50,000 £1 shares. No specific reasons are given for these increases of capital but it is obviously associated with the expansion



of business or its anticipated expansion. Moreover, the extant records do not state why such a relatively small amount of capital remained unissued between 1905 and 1911 when it would have appeared more logical for the parent company to have taken up these shares. It is also obvious from Table 42 that when the nominal capital was raised the total amount of the increase was not issued immediately but it was issued in partial lots as and when required. For example, the 49,000 shares created in August 1911 and 87 unissued shares from the initial issue were allotted to the C.V.E.P. Company as follows:-

November 1911	-	32,345 shares
October, 1912	-	2,636 shares
August 1913	-	4,151 shares
October 1914	-	3,652 shares
<u>October 1915</u>	-	<u>6,303 shares</u>
<u>Total</u>	-	<u>49,087 shares</u>

Similarly, the additional 50,000 shares created in July 1919 were allotted to the parent company in three stages viz.,

November 1920	-	17,965 shares
December 1921	-	21,755 shares
<u>October 1923</u>	-	<u>10,280 shares</u>
<u>Total</u>	-	<u>50,000 shares</u>

Thus, taking into account the 900 shares allotted to the C.V.E.P. Company in 1905 and the adjustments in the nominal £1 shares held by directors as a result of deaths and retirements, at 1929 the parent company held 99,993 shares, or 99.993 per cent of the total capital.

TABLE 42.

STRATHCLIDE ELECTRICITY SUPPLY COMPANY LIMITED  
Statement of Capital 1905-1929.

Shareholder	1905	1906	1907	1908	July 1911	Oct. 1911	1912	1913	1914	1915	1917	1920	1921	1923	1924	1927	1929
C.V.E.P. Co.	900	900	900	900	900	33,245	35,881	40,032	43,684	49,987	49,987	67,952	89,707	99,990	99,990	99,994	99,993
Sir D. Richmond	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
C.M. King	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
A. Rintoul	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
J.H. Lukach	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Dr. F. Elgar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
O.H. Baldwin	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
J. Mackenzie	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
R. Robertson	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D.A. Starr	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N. Carlton	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F.C. Gardner				1	1	1	1	1	1	1	1	1	1	1	1	1	1
A.B. Lav			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
J.K. Stothert			1		1	1	1	1	1	1	1	1	1	1	1	1	1
F.A. Langé					1	1	1	1	1	1	1	1	1	1	1	1	1
C. Ker					1	1	1	1	1	1	1	1	1	1	1	1	1
J.W. Cloud										1	1	1	1	1	1	1	1
R.T. Moore											1	1	1	1	1	1	1
D. Cooper												1	1	1	1	1	1
A.M. Stephen												1	1	1	1	1	1
Capital Issued & Taken up	909	910	911	912	913	33,258	35,894	40,045	43,677	50,000	50,000	67,965	89,720	100,000	100,000	100,000	100,000
Capital Un-issued	91	90	89	88	87	16,742	14,106	9,955	6,303	-	-	32,035	10,280	-	-	-	-
Total Capital	1,000	1,000	1,000	1,000	1,000	50,000	50,000	50,000	50,000	50,000	50,000	100,000	100,000	100,000	100,000	100,000	100,000

Source: R.C. Dissolved Company Files, BT2/5911/1 - BT2/5911/70.



The pattern of appointments, resignations and retirements of directors followed exactly that of the parent company and this has already been examined. However, Table 42 is to a certain extent misleading since several shareholders, or their executors, continued to hold shares long after all association with the company had severed, whereas others had their shares transferred immediately upon severance. For example, Rintoul resigned in 1905, Richmond and Elgar in 1907 and Starr died in 1919 and yet they or their executors held these shares until 1927 when they were transferred to the C.V.E.P. Company. In a similar manner Baldwin, Law and King resigned in 1907, 1911 and 1916 respectively and yet their shares were only transferred to the C.V.E.P. Company in 1923. On the other hand Carlton's share was transferred to Langé immediately upon the former's retirement and a similar pattern is revealed in the cases of Lukach and Ker, Langé and Cloud, Stothert and Moore and, Cloud and Cooper. The situation between Carlton and Langé and, in turn, Langé and Cloud is understandable since they were representatives of British Westinghouse but the same argument is not valid concerning the other cases, given the background of those involved. Thus, there does not appear to be a uniform pattern of shareholding but it is, of course, true that the shares

139,140

involved represented only a nominal holding.

Despite the fact that the Strathclyde company was successful in obtaining and operating a number of electric lighting orders (see below), its value to the parent company seems to have been in doubt from 1906 to 1913. Throughout that period there were on-going discussions concerning its possible sale to what is described as a "Syndicate"<sup>141</sup>. The possible reasons for these discussions was the fact that it was not financially independent of the parent company. For example, in 1914 a temporary loan of £20,000, at an interest rate of 3.75 per cent per annum, was made to the Strathclyde company by the C.V.E.P. Company.<sup>142</sup> Moreover, the administration of the Strathclyde company was the responsibility of the parent company. For example, in November 1924 the C.V.E.P. Company increased its annual administrative charge on the Strathclyde company from £1,000 to £3,000.<sup>143</sup>

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139. R.C. Dissolved Company Files, B.T.2/5911/1 - B.T. 2/5911/70.
140. The extant records of the Strathclyde company contain only information concerning the structure of the board of directors, shareholdings and capital size; no other general or financial information is provided. Thus, other information concerning this company has to be obtained from casual and infrequent reference made to it in the extant records of the parent company.
141. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1 and SSE5,1/2.
142. Ibid., SSE5,1/2.
143. Ibid., SSE5,1/3.



By 1923 the Strathclyde concern operated nine electricity orders and had expended on distribution £178,616, owned 110 miles of underground distribution mains and had 6,141 consumers.<sup>144</sup> The growth of this company has already been discussed with respect to unit sales and revenue between 1911 and 1924 (see Table 38 p.444 and its associated graphs). The figures for unit sales and revenue in Table 38 indicate that the company was undergoing steady expansion and was, apparently, a viable concern. However, since no financial returns were made by this company, it is impossible to judge its profitability. Moreover, Robert Robertson's statement in 1924 that the rates charged by the Strathclyde company were cheaper than those of any other comparable size concern in Britain,<sup>145</sup> and thus, by inference, that it was a most efficient and highly productive organisation overlooks the fact that it was a wholly owned subsidiary which was undoubtedly subsidised by the C.V.E.P. Company. For example, it had received at least one temporary loan from the parent company in 1914 and up to 1924 its administration was the responsibility of the parent concern, though at an annual charge of £1,000. Moreover, as already noted in Table 37 (p.437) the Strathclyde company was only one of six concerns taking a bulk supply from the

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144. S.R.A. Records of Strain and Robertson, TD83/6/6A.  
 145. Ibid., TD83/6/6B.

C.V.E.P. Company in 1923 and, of the six, it received the best terms.

TABLE 43. Number of Consumers Supplied by the Strathclyde Electricity Supply Co., 1913 - 1923.

1913	-	1,069	1919	-	2,278
1914	-	1,312	1920	-	3,172
1915	-	1,530	1921	-	3,605
1916	-	1,674	1922	-	5,211
1917	-	1,704	1923	-	6,141
1918	-	1,748			

Source: S.R.A. Records of Strain and Robertson, TD83/6/8 and TD83/6/6C.

Table 43, which indicates the actual number of consumers supplied by the Strathclyde company between 1913 and 1923, also reflects upon the growth of the company. During the years stated the number of consumers rose by 5,072 or 474.46 per cent, but the surprising aspect of this table is the small number of consumers involved. This is all the more notable since the company was operating in some of the most densely populated areas in the West of Scotland. However, the table indicates a marked expansion after 1918 which may reflect upon the beginnings of the inter-war expansion of housebuilding which was discussed earlier. Individual consumers cannot be identified, but a broad analysis of the pattern of consumption has been made for the year 1923 and 1924 in Table 44; these are the only years for which figures are available.



TABLE 44.

Strathclyde Electricity Supply Company Limited  
Analysis of Supply for Years 1923 and 1924.

	1923		1924		Unit Sales	%	Revenue £	%	Rate	Revenue £	%
	Unit Sales	%	Rate	%							
Lighting:- Shops	635,506	16.79	5.0	27.94	818,365	19.31	13,239.71	27.94	5.0	17,049.00	33.12
	302,753	8.00	1.5	3.99	442,393	10.45	1,892.21	3.99	1.5	2,768.00	5.38
	938,259	24.79		31.93	1,261,258	29.76	15,131.92	31.93		19,817.00	38.50
Lighting:- Domestic	1,122,120	29.65	4.5	44.41	951,021	22.44	21,039.75	44.41	4.5	17,832.00	34.64
	756,883	20.00	1.0	6.66	636,579	15.02	3,153.68	6.66	1.0	2,652.00	5.15
	189,221	5.00	2.0	3.33	144,947	3.42	1,576.84	3.33	2.0	1,208.00	2.35
	78,281	2.07	0.75 <sup>6</sup>	1.03	3	-	486.00	1.03	-	3	-
	2,146,505	56.72		55.43	1,732,547	40.88	26,256.27	55.43		21,692.00	42.14
Special Lighting & Small Power	699,649	18.49	4	12.64	1,244,403	29.36	5,990.36	12.64	1.92	9,966.00	19.36
	699,649	18.49		12.64	1,244,403	29.36	5,990.36	12.64		9,966.00	19.36
TOTALS	3,784,413	100.00	3.005 <sup>5</sup>	100.00	4,238,208	100.00	47,378.55	100.00	2.949	51,475.00	100.00

1. Rate figures given in pre-decimalisation currency.
2. No figures for pence given in records.
3. No figures given in records.
4. Records state units sold at standard power.
5. Average rate as stated in records and expressed in pre-decimalisation currency.
6. Does not include unspecified charges.

Source: S.R.A. Records of Strain and Robertson, TD83/6/4 and TD83/6/6C.

Table 44 indicates that there were three categories of consumer viz., shopkeepers, householders and those taking special lighting and small power. It is unfortunate, of course, that the extant records only reveal evidence for these two years since any comparison between them may well distort overall trends among these three types of consumer. Nevertheless, the table does reveal that, with regard to lighting for shops, both unit sales and revenue displayed a very positive increase during the year 1924 and that, by comparison with 1923 and as part of the overall business of the company, this particular category of consumer had gained in importance. For example, both unit sales and revenue expressed as a percentage of their respective overall totals had increased from 24.79 per cent and 31.93 per cent in 1923 to 29.76 per cent and 38.50 per cent in 1924. On the other hand, the category indicated as domestic lighting had declined in overall importance within the sphere of the company's activities. As indicated in the table every individual area within this category had declined in 1924. In 1924 the percentage of the company's business occupied in this category was 40.88 per cent and 42.14 per cent for unit sales and revenue respectively whereas in 1923 the corresponding figures had been 56.72 per cent and 55.43 per cent. Moreover, even in absolute terms the individual figures within this category indicate a decline both for unit sales



and revenue and even taking into account that one particular area has been omitted from the 1924 figures (see note 3) the overall position is still one of decline. However, the third category, special lighting and small power, does indicate a marked increase both for unit sales and revenue in 1924. Thus, in 1924 the unit sales and revenue of domestic lighting had declined but this had been more than compensated by the increase in both unit sales and revenue of the other two categories. No explanation is given in the extant records for the decline in the expansion of domestic supply and, as already indicated above, it is dangerous to draw conclusions based upon the evidence of only two years. Nevertheless, this does indicate a significant decline which would appear to be contrary to expected trends.

Although the extant records provide no details of the Strathclyde company's pricing policy, Table 44 makes it obvious that there was a discrimination in the charges levied on consumers. A differential tariff was charged both with regard to shops and domestic premises, but for special lighting and small power a single tariff was employed. Table 44 was abstracted verbatim from the extant records and, although there is no written evidence to substantiate this interpretation, it may well follow the pattern indicated in Table 39 (p.451) which concerns the parent company. Therefore, if this was the situation,

then the 5.0d per unit for shop lighting in Table 44 would stand but the 1.5d per unit would, in actual fact, be for heating. In a similar manner the 4.5d per unit for domestic lighting would also stand but the 1.0d, 2.0d and 0.75d would represent the differential tariff charged for domestic heating. Thus, it would appear that an identical pricing policy was adopted by the subsidiary concern or imposed upon it by the parent company.<sup>146</sup>

The capital formation of this company and the allotment of share capital has already been discussed and it would appear that the allotment of additional share capital took place haphazardly as additional capital was required.<sup>147</sup> In August 1911 the share capital of the company was increased from £1,000 to £50,000 and in November 1911, 32,345 shares of £1 each were allotted, followed by a further 2,636 shares of £1 each in October 1912. The November 1911 allotment is not fully reflected in the 1912 sales figures but is, perhaps, reflected in the unit sales figures for 1913 which indicate a 69.50 per cent increase over 1911. In a similar manner the allotment of 49,087 shares between August 1913 and October 1915 was reflected

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146. The pricing policy of the C.V.E.P. Company has already been discussed in Section 6 and, therefore, it is not intended to pursue the matter further.
147. The following percentage figures relating to the growth of unit sales have been abstracted from Table 38 (p.444), and the share allotment statistics taken from the second paragraph of this particular section.



in the 1917 sales figures which indicated an increase of 59.91 per cent over 1913. In July 1919 the share capital of the company was raised to £100,000 and the additional 50,000 £1 shares were allotted between November 1920 and October 1923. On this occasion the additional capital was undoubtedly required for not only the legal expenses but also the construction and distribution expenses concerned with the Kilpatrick and Milngavie and District Electricity Order 1922, the Johnston Electricity Special Order 1922, the Renfrew and District Electricity Special Order 1922 and the Kirkintilloch and District Electricity Special Order 1922. In 1923 there was a similar situation with the passing of the Eastwood, Cathcart and District Electricity Order and the Busby, Mearns and District Electricity Special Order. The operation of these new orders by the company is reflected in the unit sales figure of 1924 which indicates a remarkable 102.94 per cent increase over the 1920 figure.<sup>148</sup>

Thus, from its rather weak beginning in 1905 and after undergoing a period when it appeared that the parent company was losing confidence in its subsidiary, the Strathclyde company was by 1924 an apparently strong, viable concern.<sup>149</sup>

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148. For a complete list of electricity orders operated by the Strathclyde company see p. 441.
149. It is, therefore, to be regretted that after 1924 the extant records contain no further information concerning this company.

The Scottish Electrical Accessories Limited was formed on 1st July, 1919 as a private company and was a wholly owned subsidiary of the C.V.E.P. Company; the name of the company was changed to Clyde Valley Electrical Accessories Limited in December 1926. The functions of the new company were miscellaneous and covered most aspects of the electrical industry. In the event the company remained relatively anonymous and the extant records contain only one reference to any function carried out by this company and that was in November 1921 when it was revealed that it had bought and re-sold coal to the parent company. The directorship of the new company, from 1919 until 1930, was identical to that of the parent concern which has already been examined in detail. The initial capital of the company was £5,000 divided into 5,000 shares of £1 each and this remained static throughout this period. In August 1919 1,504 shares were taken up by the C.V.E.P. Company with a further 6 shares allotted to the directors and in October 1929 the remaining 3,490 shares were allotted to the C.V.E.P. Company. Thus, by 1930 the seven directors, as nominal shareholders, held one share each and the parent company held the remaining 4,993 shares.

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150. R.C. Dissolved Company Files, BT2/10496.  
 151. S.R.O. Records of the South of Scotland Electricity Board, SSE5,7/1.  
 152. S.R.O. Records of the South of Scotland Electricity Board, SSE5,7/1. R.C. Dissolved Company Files, BT2/10496.



The only other evidence of real value contained in the extant records is the annual record of dividend payments and the net profit carried forward by the company at the end of each financial year. This information is given in Table 45 which indicates that, whatever the prime function of the company, it was indeed profitable and provided an excellent return on the investment made. Until the year ending 30th June, 1929 the paid up capital of the company was £1,510. During that period the company declared dividends of £9.50 per share (1921), £3.00 per share (1928,1929), £1.20 per share (1924), £1.00 per share (1920, 1926) and £0.90 per share (1925). In 1923 and 1927 the relatively small rate of return of 33 and one-third per cent and 15 per cent respectively was still attractive. No dividend was paid in 1922, since the company was under investigation by the Inland Revenue concerning its liability to excess profits duty and the entire balance of profit, £2952.42p, was carried forward pending settlement. In October 1929 the paid-up capital reached its maximum of £5,000 but dividends still proved attractive. For example, in 1930 and 1931 the declared dividend was 0.875 per cent and 0.30 per cent respectively per £1 share invested. Therefore, on even the nominal capital created in 1919 of £5,000, the overall dividend payment by 1931 of £36,200.83p represented a 624.02 per cent return, whereas, on actual paid-up capital up to 1929 the total dividend amounted to

£30,325.83p representing a return on the initial investment of £1,510 made in 1919 of 1908.33 per cent. From Table 45 it can be seen that the overall net profit amounted to £5471.32p. However, ignoring the figure for 1922, for the reasons stated above, then the total figure for net profit amounted to £2,511.90p which indicates an average net profit of £228.35p for the eleven years concerned. Generally, it can be noted that the Clyde Valley Accessories Limited was a profitable venture for the parent company and thus, it is to be regretted that the extant records do not reveal additional evidence on the activities of this concern.

TABLE 45. Clyde Valley Accessories Limited  
Statement of Dividend Payments and Net Profit 30th June,  
1920 - 30th June, 1931

<u>Year</u>	<u>Dividend £</u>	<u>Net Profit £</u>
1920	£1,510.00	£ 361.15
1921	14,345.00	48.13
1922	-	2,959.42
1923	503.33	91.37
1924	1,812.00	230.56
1925	1,359.00	163.11
1926	1,510.00	110.21
1927	226.50	138.97
1928	4,530.00	214.08
1929	4,530.00	323.93
1930	4,375.00	307.56
1931	1,500.00	522.83
<b>Totals</b>	<b>£36,200.83</b>	<b>£5,471.32</b>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5,7/1.

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153. Ibid.



The development of the Falls of Clyde hydro-electric scheme had a long and tangled history (see Chapter 5) but after much wrangling the scheme received the Royal Assent on 7th August, 1924 and at this date the Lanarkshire Hydro-Electric Power Company came into existence.<sup>154</sup> The first meeting of the directors, and promoters, of the new company was held on 20th August, 1924 and present were P.J. Pybus, who was appointed interim chairman, Sir George May and Sir Hugh Reid.<sup>155</sup> H.E. Ferguson, who had been secretary of the C.V.E.P. Company since June 1911, was appointed interim secretary.<sup>156</sup> The only business conducted at this meeting was the allotment of shares, in their entirety, to the directors of the C.V.E.P. Company and to the C.V.E.P. Company itself (see Table 46). The first Annual General Meeting of the new company was held in Glasgow on 3rd September, 1924 and by that time the company had been formally transferred from the original promoters and directors to the C.V.E.P. Company and the agreement of May 1924 completed (see Chapter 5).<sup>157</sup>

The extant records of the new company provide limited information about its activities. As was to be expected, its directorship was identical to that of the parent

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154. S.R.A. Records of Strain and Robertson, TD83/6/6C.  
 155. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/4.  
 156. Ibid., SSE5,1/2.  
 157. Ibid., SSE5,1/4.

company. An analysis of the share capital of the hydro-electric company is given in Table 46. At the incorporation of the company it was stated that its nominal capital was to be £250,000 and this sum could be increased to £400,000, with powers to borrow in addition one half of these sums, and each director had to subscribe <sup>158</sup> £250. From Table 46 it is obvious that, prior to 1930, not all of this capital was issued despite the fact that at the time of incorporation, the estimated construction costs were £250,000. This is explained by the fact that in December 1925 the directors decided that the future financing of the company should be obtained from the C.V.E.P. Company in the form of temporary loans, and this <sup>159</sup> policy was apparently adhered to until 1930. The directors, as indicated, did provide £250 each towards the capital of the company, but these sums were not personally subscribed but paid for from the funds of the C.V.E.P. <sup>160</sup> Company. Moreover, when A.M. Stephen became a director in September 1929, 250 shares of £1 each were transferred to him from the C.V.E.P. Company. The only other point of information required is that Rintoul and Strathie were the auditors of the company and that in May 1926 a £1 share was allotted to that firm to allow it to qualify for that position.

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158. S.R.A. Records of Strain and Robertson, TD83/6/6A.  
 159. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/4.  
 160. Ibid., SSE5,1/3.



**TABLE 16.** Lanarkshire Hydro-Electric Power Company.  
Analysis of Share Capital 1924 - 1930.

<u>Shareholder</u>	<u>26th Aug.,</u> <u>1924.</u>	<u>3rd Dec.,</u> <u>1924.</u>	<u>26th May,</u> <u>1926.</u>	<u>4th Sept.</u> <u>1929.</u>
C.V.E.P. Co.	98,750	98,750	98,750	98,500
Sir F.C. Gardiner	250	250	250	250
C. Ker	250	250	250	250
Dr. J. Mackenzie	250	250	250	250
R. Robertson	250	250	250	250
Dr. R.T. Moore	250	250	250	250
D. Cooper	-	250	250	250
Rintoul & Strathie	-	-	1	1
A.M. Stephen	-	-	-	250
<b>Total.</b>	<b>100,000</b>	<b>100,250</b>	<b>100,251</b>	<b>100,251</b>

Source: Records of the South of Scotland Electricity Board, SSE5,4/1.

Table 47 provides a record of the share calls made by the company on its shareholders but, as stated above, it would appear that the amounts stated in the table were paid in their entirety by the C.V.E.P. Company. On two occasions shares were allotted to that Company but not called up. In December 1924 the C.V.E.P. Company was allotted 248,500 shares of £1 each and in December 1926 a further 149,748 shares were allotted to the same company but in neither case were these shares apparently called up. It is noted that if these shares had been called up then the total issued would have been in excess of the maximum stated at the time of incorporation.

TABLE 47.

Inarkshire Hydro-Electric Power Company.  
Record of Share Calls.

Date	Amount £p	Called (£sd)	Total Paid £	Total called to date £p	(£sd)	Total paid-up Capital £
20/8/24 <sup>2</sup>						
24/3/25	0.23	(4/6)	22,556.24	0.23	(4/6)	22,556.24
25/3/25	0.06	(1/3)	6,265.63	0.29	(5/9)	28,821.87
28/5/25	0.15	(3/-)	15,037.50	0.44	(8/9)	43,859.37
14/7/25	0.06	(1/3)	6,265.63	0.50	(10/-)	50,125.00
2/9/25	0.10	(2/-)	10,025.00	0.60	(12/-)	60,150.00
9/9/25	0.07	(1/6)	7,518.75	0.67	(13/6)	67,668.75
21/10/25	0.11	(2/3)	11,278.13	0.78	(15/9)	78,946.88
4/11/25	0.09	(1/9)	8,771.87	0.87	(17/6)	87,718.75
11/11/25	0.07	(1/6)	7,518.75	0.94	(19/-)	95,237.50
16/12/25	0.05	(1/-)	5,012.50	1.00	(20/-)	100,250.00
Margin of error on conversion 0.01						
TOTALS	£1.00	(20/-)	100,250.00			

- Table 47 records the calls made both in £p and in £.s.d. On conversion it was found that, using Decimal Currency Board conversion tables, there was a margin of error of one new pence and this has been included in the Table to give an accurate statement. The Table also ignores the £1 share held by Rintoul and Strathie.
- The extant records provide no information on calls made before 25th March, 1925, although it is evident that such calls were made. Thus, twenty-three pence has been recorded as the total calls made between August 1924 and March 1925.

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5, 4/1.



The overall impression of Table 47 is that capital was called up in small units and in an arbitrary manner. On only two occasions can a call be fully explained. On 28th May, 1925 the directors agreed that £15,553.85p should be paid to C.J.E. Cranstoun for the acquisition of his lands, and a cheque was signed for that amount. To fulfill the agreement it was decided that a call of 15 pence (3/-) be made amounting to, in total, £15,037.50p. In September 1925 it was estimated that the cost of acquiring land belonging to Sir Charles Ross would be £15,500 and partly to meet this expense a call of ten pence (2/-) per share was made amounting, in total, to £10,025. Apart from these two examples it is not possible to account for individual calls. <sup>161</sup> However, there seems little doubt that calls were generally associated with construction costs and the acquisition of land. For example, in November 1924 the directors accepted an offer of 8½ acres of land, from the trustees of the Lee Estate, at the Stonebyres Falls, for the erection of a power house at a cost of £30 per acre. In addition, in January 1925 an access road at Stonebyres, together with a bridge across the River Clyde cost another £7,000. Furthermore, the company had to meet the demands of scenic protection interests. In April 1925 the Secretary for Scotland's Scenic Protection

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161. In April 1926 Ross's land claim was settled for the relatively small sum of £1,000.

Committee recommended that the company should acquire a further 3½ acres at the Bonnington Power House to provide a screen of trees to conceal the pipeline and also that the power house buildings should be simplified; this was apparently accepted. It was also reported in April 1925 that a comparison of the costs of the power stations as originally designed with the then present design indicated an increase of £18,000 in the case of the Stonobyres station and £19,500 in respect of the Bonnington station. This was accepted by the directors with the exception of certain architectural items amounting to £2,740 upon which the directors requested further information.<sup>162</sup> This additional expenditure, which was to an extent unforeseen, may account for the rather arbitrary manner in which shares were called up during 1924 and 1925.

In accordance with the agreement made in 1924 the contracts were awarded to Sir William Arrol and Company and the English Electric Company. For example, in September 1925 tenders for the switchgear at the stations were received from both the English Electric Company and Metropolitan Vickers. The ~~\_\_\_\_\_~~

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162. S.R.O. Records of the South of Scotland Electricity Board, SSE5, 4/I.



tender from the former company was accepted despite the fact that the latter company had been associated with the parent company from its inception. In the case of Sir William Arrol and Company the extant records do not reveal whether its tender was submitted in the face of competition.<sup>163</sup>

In the completion of construction operations, neither contract was free from conflict. In July 1927 the company secretary was requested to write to the Electricity Commissioners to allow an extension of one year in the completion of the works; a twelve month extension was granted from 7th August, 1927. The contractual obligations of the English Electric Company, generally speaking, appear to have been fulfilled. However, in July 1928 the company would not take over the plant until several points had been adjusted.

The contract with Sir William Arrol and Company created greater difficulty. As early as April 1926 the question of arbitration with Sir William Arrol and Company over the construction of the Bonnington station and its associated tunnel was discussed by the directors of the hydro-electric company. The point at issue was the cost of the Bonnington tunnel and in May 1926 the company instructed its law agents to arrange a meeting with Sir William Arrol and Company provided that the Power and Traction Finance Company and the English Electric Company were also represented at

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163. Ibid.

the meeting. The outcome of the meeting is not known. However, in July 1926 the company was still expressing its concern at the quality of work carried out by Sir William Arrol and Company and decided to make inquiries in London on the possibility of employing an expert in tunnel construction.

In November 1926 a Mr. Curry, who was recommended by a Mr. Basil Mott, was appointed as resident engineer on the civil engineering contract at an inclusive cost for the job of £600. His value to the company must have been immediately realised since, within one week of his appointment, his salary was raised to £800 and, in addition, he was given £200 to cover the cost of his expenses of removal from London to Lanark and back. His positive assistance to the company is seen by the fact that, after nine months protracted negotiations, Sir William Arrol and Company agreed, in December 1926, to carry out the recommendations contained in Basil Mott's report which was presumably based on information from Curry whom Mott had recommended as resident engineer. Furthermore, in January 1927 it was agreed to appoint three inspectors experienced in tunnel work. Finally, in March 1928 Sir William Arrol and Company explained that it had been involved in extraordinary costs in the construction of the Bonnington Tunnel because of the soft and difficult ground encountered instead of the rock anticipated. Consequently, it wished to arrive at a



friendly and satisfactory solution which would avoid the time and costs of arbitration. After lengthy considerations the hydro-electric company decided, in April 1928, to make a payment to Sir William Arrol and Company of £15,000 in addition to the agreed contract price of £203,500; a final contract payment was made to that company in August 1929.<sup>164</sup>

The extant records of the Lanarkshire Hydro-Electric Company, or indeed of the parent company, do not provide a great deal of other information on its activities. However, tenders were received, in June 1926, for the laying of interconnectors between Bonnington and Stonebyres and between Stonebyres and the Motherwell station; the contract, valued at £44,653.53p, was awarded to R.N. Russell. Moreover, on the recommendation of the consulting engineers, the company took over the plant on 1st June, 1928 and, therefore, presumably began generating power at that date.<sup>165</sup>

No details of the company accounts are available until the year ending 31st December, 1929 when it is merely stated that the balance of profit amounting to £59,939.46p was to be carried forward. A similar situation exists for 1930 when the balance of profit was £88,051.27p.<sup>166</sup> Thus, the company would appear to have been extremely profitable but

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164. Ibid.  
 165. Ibid.  
 166. Ibid.

there is no way of knowing whether the sums stated represented gross profit or net profit or whether a dividend had been paid.

(9) The Kilmacolm Electric Lighting Company Limited.

The Kilmacolm Electric Lighting Company Limited was formally taken over by the C.V.E.P. Company on 23rd December, 1925.<sup>167</sup> However, this company had a relatively long history. The first meeting of directors took place on 16th June, 1902. The company's provisional order was sanctioned in March 1903, construction operations began in May 1903 and a public supply began in December 1903.<sup>168</sup> The company, however, despite the speed with which it began operations, had a chequered career and never really attained major success. Nevertheless, this company, which was clearly based on domestic consumers, illustrates the difficulties and weaknesses of the small concern and for this reason its history, prior to acquisition by the C.V.E.P. Company, is examined in some detail.

The directorship of this company was composed of local investors who were, perhaps, inspired to promote the undertaking by the thought of a quick return on original investment. The first directors of the company were W.B. Stirrat, R. Barr, W.F. Salmon, W.A. Sloan, Dr. Parker, A.C. Wallace

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167. Ibid., SSE5,3/3.

168. Ibid., SSE5,3/1.



and W.R. Farquar. In July 1902 they were joined by a Colonel Fullarton which brought the total to eight. In February 1903, T.H. Barr was appointed as a director but in May 1903 W.R. Farquar resigned. R. Barr was appointed chairman in October 1903 and Colonel Fullarton appointed his deputy. In March 1909 both Sloan and Salmon resigned, and this reduced the number of directors to six.<sup>169</sup> In March 1911 Wallace resigned, and, although Sloan was re-elected in November 1911, Fullarton decided to resign in June 1913 which reduced the directorship to five, and this number remained until September 1916 when W.C. Warden took up his appointment.<sup>170</sup> In October 1921 James White, the manager of the company from 1909, and J.C. Weir were appointed directors. In January 1922 Dr. Parker died and was replaced by J.S. Kincaid. In April 1925 Sloan also died. Thus, when the C.V.E.P. Company took over the concern in December 1925 there were seven directors viz., R. Barr, T.S. Barr, W.B. Stirrat, W.C. Warden, J. White, J.C. Weir and J.S. Kincaid.<sup>171</sup>

Table 48 analyses the share capital of the company between 1902 and 1923. The total share capital of the company after 1902 was £15,000 but at no time was this

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169. Ibid.  
 170. Ibid., SSE5,3/2.  
 171. Ibid., SSE5,3/3.

capital fully subscribed. The table indicates that the nominal capital of the company was relatively small and there was a slow build up of subscribed capital; the table ignores the fact that contractors took shares in lieu of cash (see below). Preference share capital was more attractive than ordinary share capital, but this again disguises the fact that contractors took preference shares rather than ordinary shares. For example, in May 1905 contracting and commercial firms held 1,945 preference shares, and even as late as September 1911 a minimum of 1,525 shares were held by contractors.

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172. Ibid., SSE5,3/1.

173. Ibid., SSE5,3/2.



TABLE 1

Kilnacoln Electric Lighting Co. Ltd.  
Analysis of Share Capital 1902/1923.

	<u>1902</u>	<u>1903</u>	<u>1904</u>	<u>1905</u>	<u>1912</u>	<u>1921</u>	<u>1922</u>	<u>1923</u>
<u>Nominal Share Capital</u>								
10,000 Ord. Shares of £1 each	£10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
5,000, 5% Cum. Pref. Shares of £1 each <sup>1</sup> .	£ -	5,000	5,000	5,000	5,000	5,000	5,000	5,000
<u>Total Nominal Share Capital</u>	<u>£10,000</u>	<u>15,000</u>	<u>15,000</u>	<u>15,000</u>	<u>15,000</u>	<u>15,000</u>	<u>15,000</u>	<u>15,000</u>
<u>Allotted Share Capital</u>								
Ord. Share Capital	£ 2,750	3,490	4,190	4,595	4,620	5,870	6,070	6,255
Pref. Share Capital	£ -	1,625	2,410	3,570	3,570	3,820	3,820	3,820
<u>Total Allotted Share Capital</u>	<u>£ 2,750</u>	<u>5,115</u>	<u>6,600</u>	<u>8,165</u>	<u>8,190</u>	<u>9,690</u>	<u>9,890</u>	<u>10,075</u>
<u>Unissued Share Capital</u>								
Ord. Share Capital	£ 7,250	6,510	5,810	5,405	5,380	4,130	3,930	3,745
Pref. Share Capital	£ -	3,375	2,590	1,430	1,430	1,180	1,180	1,180
<u>Total Unissued Share Capital</u>	<u>£ 7,250</u>	<u>9,885</u>	<u>8,400</u>	<u>6,835</u>	<u>6,810</u>	<u>5,310</u>	<u>5,110</u>	<u>4,925</u>
<u>Ordinary Share Capital</u>								
Percentage Issued	27.5	34.90	41.90	45.95	46.20	58.70	60.70	62.55
Percentage not Issued	72.5	65.10	58.10	54.05	53.80	41.30	39.30	37.45
<u>Preference Share Capital</u>								
Percentage Issued	-	32.50	48.20	71.40	71.40	76.40	76.40	76.40
Percentage not Issued	-	67.50	51.80	28.60	28.60	23.60	23.60	23.60
<u>Total Ord. &amp; Pref. Share Capital</u>	<u>27.50</u>	<u>34.10</u>	<u>44.00</u>	<u>54.43</u>	<u>54.60</u>	<u>64.60</u>	<u>65.93</u>	<u>67.17</u>
Percentage Issued	72.50	65.90	56.00	45.57	45.40	35.40	34.07	32.83
Percentage not Issued								

1. From 13th September, 1911 these shares were converted into 5000 £1 Non-Cumulative Preference Shares.  
Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5, 3/1, 3/2 and 3/3.

The table is self-explanatory but what is surprising is that a company which was locally organised and administered should have such a slow rate of subscription so that even at 1923 only 67.17 per cent of the total capital was subscribed. This probably reflects on local knowledge of the company, its known profitability, its marketing techniques, the rates charged and so on. However, it must ultimately reflect on the entrepreneurial ability of its directors.

Despite the novelty of electricity supply during this period and its relative cost, the marketing technique of the company was over-conservative and not designed to enhance the subscription of share capital. In October 1904, J. Bell enquired on what terms the company would supply his house with current. He was informed that the company would supply current on four conditions. First of all that he took ordinary shares to the value of the actual cost of the cable, estimated at about £500. Secondly, that he agreed to pay £25 per annum for depreciation for ten years. Thirdly, that he paid a minimum of £20 per annum for current and, fourthly, that he laid the service cable not only at his own expense but also maintained it. Not surprisingly in December 1904 Bell decided not to take a supply. In March 1905 H.B. Collins inquired about terms and was told that the company would supply current providing that he took ordinary shares to the value of the main cable



and paid the whole cost of the service cable. Thus, as time progressed the terms became less severe but still inhibited the taking of a supply and the increase in capital subscription.<sup>174</sup> In 1915 supply by share subscription was modified. In April 1915 G.A. Macdonald was informed that he would be given a supply provided that he took shares to the value of the capital outlay on cable or, failing that, if he could induce the neighbouring houses en route to take a supply then the company would lay the cable at its own expense.<sup>175</sup> Even as late as 1923 the practice of supply by share subscription continued although its severity had diminished. In February 1923 it was intimated that a Miss Ferguson and a Mr. Campbell, both of Kilmacolm, had each applied and had been allotted twenty-five shares of £1 each and that a cable had been laid to their houses. This rather negative sales policy perhaps explains why by 1917 the company had only managed to recruit 234 consumers and by 1919, 248 consumers.<sup>176</sup>

A simplified, and perhaps over-exaggerated, example of the indecision of the directors is indicated by the continuing saga over the question of installing a water closet at the works. This issue was discussed by the directors in December 1903 and in February and May 1904 but any decision was deferred. In September 1907 the District Sanitary

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174. Ibid., SSE5,3/1.  
 175. Ibid., SSE5,3/2.  
 176. Ibid., SSE5,3/3.

Inspector stated that such a convenience should be built. However, it was not until May 1908, approximately five years after the initial discussion, that a decision was taken to accept the estimate of a Mr. McIlwraith. Protracted discussions also took place on the question of installing a telephone at the works. This issue was first discussed in February 1906 but it was not until May 1909 that a final decision was reached to install a telephone.<sup>177</sup>

The efficiency of the company, and the attitude of its directors, is also revealed in the charges made by it after the initial installation had taken place. In February 1902 it was stated that the charge for motive power and heating was to be 4d per unit but that it was hoped to reduce this to 3d when the company was fully developed;<sup>178</sup> no information on the charge for lighting is available at this time. However, in 1917 the charge for lighting was 7d per unit and in October 1917 it was decided to increase this to 9d per unit retrospectively from 1st July, 1917. In March 1918 it was resolved that the 9d per unit charge should remain until the end of September 1918 when it was to be increased to 11d per unit until further notice. Furthermore, users of pre-payment meters were charged 10d per unit and users of power 6d per unit from 1st April, 1914 and presumably by 1918 these figures had

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177. ibid.

178. ibid., SSE5,3/1.



also risen. Taking into account the size and scale of the two companies, these charges can be considered excessive by comparison with the charges made by the C.V.E.P. Company. Equally important was the complacent attitude of directors. In February 1923 W.A. Sloan stated that there were "whispers" that the company charge of 1ld per unit was high. In reply T.H. Barr, perhaps the major influence on the company, expressed his satisfaction with the company's pricing policy by stating that, nationally, there were 169 companies charging between 1ld per unit and 1/2d per unit.<sup>179</sup>

The profitability of the company was of obvious importance since it not only determined the attitude of shareholders, either current or prospective, but also had a bearing on the long-term growth of the company. In May 1904 it was stated that working costs were exceeding revenue. Moreover, in August 1904 the company had to obtain overdraft facilities of up to £1,000 from the company's bank on the personal guarantee of the directors. In addition; in May 1909, since no dividend on shares had as yet been declared, discussions began on the possibility of converting the accumulative preference shares to non-accumulative preference shares.<sup>180</sup> In July 1909 James Callender of Callenders Cables Ltd., the major preference

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179. Ibid., SSE5,3/3.

180. Ibid., SSE5,3/1.

shareholder with 1,160 preference shares, agreed to forego all arrears of dividend provided that the other preference shareholders did likewise. . The final outcome of such discussions occurred on 13th September, 1911 when the following resolution was accepted by both the preference and ordinary shareholders viz.,<sup>181</sup>

"That existing 5% Cumulative Preference Shares issued and unissued shall be cancelled as from 1st January, 1911 and in lieu thereof there shall be created 5,000, £1 non-cumulative preference shares. These shares shall be entitled to a fixed dividend of 6% p.a. payable out of each year's profits available for dividend as from said date."

Thus, this resolution is, perhaps, a natural conclusion to a company which, from its inception, was not financially stable and one which throughout this period was unable to attract sufficient capital.

Table 49 recording the profitability of the company has been extracted from the extant records. Despite its incompleteness the table reveals the inherent weakness of the company namely that at no time, prior to its being taken over by the C.V.E.P. Company, did it realise an adequate profit either to make a return to shareholders and thus attract additional capital or to finance future expansion.

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181. Ibid., SSE5,3/2.



**TABLE 49. Kilmacolm Electric Lighting Company Ltd.****Record of Profitability, 1904 - 1930**

<u>Year ending.</u>	<u>Gross Profit</u> <u>£</u>	<u>Net Profit</u> <u>£</u>	<u>Dividend Pay-</u> <u>ment £</u>
31st December, 1904.	- 1	33.35	N11
1905.	186.95	14.97	N11
1906.	414.99	15.40	N11
1907.	419.20	14.81	N11
1908.	543.19	129.63	N11
1909.	285.70	25.17	N11
1910.	496.63	52.50	184.75
1911	449.37	50.57	110.85
1912.	244.29	34.10	110.85
1913.	452.29	44.64	110.85
1914.	395.50	45.31	N11
1915.	577.71	63.95	N11
1916.	200.00	- 1	- 1
1917.	300.00	- 1	- 1
1918.	- 1	16.72	- 1
1919.	366.17	73.85	N11
1920 & 1921.	- 1	- 1	- 1
1922.	300.00	- 1	- 1
1923.	- 1	919.15	114.60
1924. <sup>2</sup>	- 1	1,759.18	- 1
1925.	- 1	3,395.58	- 1
1926,1927,1928	- 1	- 1	- 1
1929.	1,709.60	67.53	392.70
1930.	2,254.56	396.36	858.70
<b>Total</b>	<b>£9,596.15</b>	<b>7,152.77</b>	<b>1,882.67</b>

1. No figures available for these years.

2. From 31st December, 1925 this company became a subsidiary of C.V.E.P. Company.

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5,3/1,3/2 and3/3.

The poor financial record of the company meant that any future expansion depended upon the loyalty of the directors. In February 1913, when an extension of plant was discussed, it was resolved that the necessary investment should be provided by the directors since they recognised that it would be impossible to raise the share capital otherwise. In April 1913, however, when it was realised that the extension would cost £1,500, it was decided to approach Callenders Cables Limited to obtain a loan and when this was refused, the directors were forced to rely on their own devices. In January 1914, to finance the extension, Dr. Parker made a personal loan of £400 and T.H. Barr a personal loan of £1,600, both at 4 per cent per annum interest.<sup>182</sup> Parker was eventually repaid in February 1922 (he had died in January) and Barr in February 1923.<sup>183</sup> Therefore, throughout this period from 1902 until 1925 a major weakness of the company was its lack of adequate capital resources resulting from its unattractiveness to potential investors and customers.

The extant records reveal virtually nothing about the technical background to the company's operations nor do they reveal full contract details. It is known that in July 1903 the following estimates were accepted:-

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182. Ibid.

183. Ibid., SSE5,3/3.



Boilers from Babcock and Wilcox	£ 587.00
Engines and dynamos from G.E. Bellis and A. Norcom	561.00
Switchboard from Kelvin and White	380.00
Accumulators from Tudor Accumulator Company	720.00
Street Mains from Callender's Cables Limited	1,500.00
House Mains from Callender's Cables Limited	200.00
Building complete from A. and J. Main	<u>342.00</u>
	<u>£4,290.00</u>

In return these companies agreed to take, as part payment of the contract price, preference shares as follows:-

Kelvin and White	125
G.E. Bellis and A. Norcom	100
Tudor Accumulator Company	240
Babcock and Wilcox	220
Callender's Cables Limited.	<u>1,160</u> 1,945 shares

The construction of the works began in May 1903 and was completed in December 1903 since the company began supplying current for lighting purposes during the last few days of December 1903.<sup>184</sup> Thus, the scale of the undertaking was relatively small.

The labour force was equally small. However, the information contained in the extant records does provide an interesting insight into the character of a small under-

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184. Ibid., SSE5,3/1.

taking. In July 1902 A.W. Stewart was appointed electrical engineer but his appointment was terminated fairly quickly since in August 1903 a James Brown, 3 Rosemount Terrace, Ibrox, who had been resident engineer with the Govan Electricity Department, was appointed resident engineer at a salary of £120 for the first year and £130 for the second year. In July 1905 it was decided to employ Brown for a further two years at a salary of £140 and £150 for the respective years. In August 1905 Brown was allowed to take on a premium apprentice named White; the premium of £30 was divided equally between Brown and the company. In August 1907 when White's apprenticeship expired, Brown was allowed to employ him for a further six months at a wage of £1 per week. White obviously proved a satisfactory worker since in September 1908 he was retained at a wage of £1.25p per week while another assistant named MacCrae was engaged at a wage of £1.40p per week. In September 1909 White's steady progress was marked by his weekly wage being raised from £1.25p to £1.40p per week; MacCrae did not receive an increase.<sup>185</sup>

From early March 1909 it became increasingly obvious that there had been a break-down in communications between Brown, the manager, and the directors. On 10th March, 1909 it was reported that despite repeated requests by the secretary of the company, Brown's books "were not yet to

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185. Ibid., SSE5,3/1 and 3/2



hand". However, the books were handed over in May 1909, and the directors stated that not only were they not satisfied with the state of the books but also that Brown was fifteen months behind with his monthly statements. Accordingly, Brown was placed on three months trial.<sup>186</sup>

The conflict between Brown and the directors came to a head later in 1909 when the manager gave a report which analysed the units generated by the company for the months of August and September and also for the nine months ending September 1909. The report highlighted the operating inefficiency of the company and was unacceptable to the directors who expressed surprise that this information had not been available "years ago" since, if it had, they could have taken steps to avoid the loss. Consequently, in November 1909 the directors felt that "there should be a change of management at the works," and it was decided to ask Brown to resign; if he refused to resign he was to be instantly dismissed.<sup>187</sup>

The new manager of the company was James White, 1 Hamilton Drive, Pollokshields, Glasgow, who received an annual salary of £150 and remained with the company until it was taken over by the C.V.E.P. Company; he was appointed a director in October 1921. White, despite the continued unsatisfactory record of profitability of the company, was obviously a valued servant and benefited from regular

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186. Ibid., SSE5,3/1

187. Ibid.

increases in salary. In July 1916 his salary was increased to £200 per annum back-dated to January of that year. In April 1919, June 1920 and October 1923 his annual salary was increased to £300, £380 and £500 respectively and in each case the increase took effect from the first of January of the year concerned. In addition to these increases, he received, for whatever reason, an annual bonus. Despite the incomplete nature of the extant records it is known that he received the following bonuses viz., 1910 (£25), 1911 (£25), 1912 (£40), 1913 (£75), 1914 (£50), 1915 (£50), 1916 (£40) and 1922 (£100). Moreover, in 1921 he became, as stated above, a director of the company when, in order to obtain the necessary qualifications, the company presented him with 100 ordinary shares which he was to retain as long as he remained in the employment of the company. As if to emphasise his valued service to the company, when negotiations were being conducted with the C.V.E.P. Company in 1924 it was emphasised that White should also be taken over by that company without any change in his status as manager.<sup>188</sup>

As early as April 1913 the directors had discussed the "expediency" of coming to an agreement with the C.V.E.P. Company but had decided that the expense of bringing that company to Kilmacolm was too great.<sup>189</sup> The more immediate background to the take-over of the Kilmacolm company by the

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188. Ibid., SSE5,3/1 and 3/2

189. Ibid., SSE5,3/2.



C.V.E.P. Company is far from clear. Negotiations between the two companies continued throughout 1922 and 1923 but it was only on 7th March, 1924 that it was reported that the C.V.E.P. Company had made a tentative proposal to acquire the Kilmacolm company as from 31st March, 1924 at a price which would yield the shareholders twenty shillings in the £ on issued capital. This decision was accepted by the shareholders on 24th March, 1924, but administrative problems concerning the transfer of shares and the irascibility of the Kilmacolm company's secretary over arrears of salary delayed the formal take-over until 23rd December, 1925.<sup>190</sup>

#### (10) Profitability

The extant records of the C.V.E.P. Company contain neither cash nor account books, and in the Minute Books statements of account are noted in a perfunctory manner. However, figures are available which indicate the amount carried forward at the end of each year after provision had been made for all expenses and allowances such as depreciation, dividend, reserve accounts and so on. Thus, these figures, given in Table 50, could be interpreted as net profit.

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190. Ibid., SSE5,3/3.

TABLE 50. Net Profit of the C.V.E.P. Company 1911 - 1930

<u>Year</u>	<u>Amount £</u>	<u>Comments</u>
1911	6,332.32	For 6 months to 30th June, 1911.
1912	-	No figures available
1913	-	No figures available
1914	-	No figures available
1915	12,612.86	For 6 months to 31st December, 1915.
1916	41,253.34	
1917	21,146.07	
1918	23,334.64	
1919	58,301.57	
1920	69,693.22	
1921	51,547.20	
1922.	33,342.83	
1923	29,107.68	
1924	63,878.18	
1925	67,423.93	
1926	50,124.17	
1927	84,289.75	
1928	84,691.31	
1929	88,288.15	
1930	88,429.91	

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1 - SSE5,1/5.

Table 50 immediately raises the question of what happened to this surplus and it is unfortunate that the extant records provide no additional information other than the fact that such sums were carried forward to the following year when, presumably, they were included in that year's accounts. However, these figures were obviously affected by policy



decisions made by the company's directors. For example, the determination of dividends and amounts set aside as reserves as well as decisions on the repayment of loans could affect them. Furthermore, the profitability of the company was undoubtedly affected by other factors to an extent outwith its immediate control, but without access to complete financial records a specific analytical interpretation cannot be made. For example, the decline in profitability evident in 1917 and 1918 may be partly accounted for by rising costs, such as coal and wages, experienced in these years. Moreover, it is noted that the figures for the 1920's conform closely to the trade cycle of that decade with the year 1922 being particularly significant and 1926 adversely affected by the General Strike. More generally, the gains in the 1920's may be associated with falling coal costs,<sup>191</sup> and the upward level of demand, already observed, for an electricity supply.<sup>192</sup>

On the 8th May, 1924 R. Robertson, a director of the company, stated that no ordinary share dividend had been paid during the first eleven years of the company's history.<sup>193</sup> However, during this period interest was paid out

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191. S. Pollard, The Development of the British Economy, 2nd edn. (1969), p.p.110-114 and 274-277. C.L. Mowat, Britain between the Wars, (1956), p.p. 120, 123-124, 290-293, 301-302 and 334.
192. See Section 5.
193. S.R.A. Records of Strain and Robertson, TD83/6/5.

of capital. In a letter dated 17th June, 1902 to J.H. Lukach, who became a director of the company on 23rd July, 1902, it was stated that the company intended to raise £600,000 in ordinary shares so as to be able to pay interest out of capital during construction. At this date the cost of construction was estimated at £500,000. This intention of paying interest out of capital was further reiterated in a private and confidential report by Strain and Robertson to the directors on 19th June, 1902.<sup>194</sup> Moreover, the extant records contain three references to this practice. On 28th September, 1905 it was stated that a fifth payment of interest out of capital should be made to the shareholders for the half-year to 30th June, 1905; no actual amount or percentage figure is given.<sup>195</sup> In November 1909 the company secretary was instructed to pay the shareholders the "usual" interest out of capital for the six months ending 31st December, 1909; again no amount or percentage figure is given.<sup>196</sup> The third reference to this practice occurred on 22nd January, 1914 when £15,155.34p paid to shareholders during construction was written off and an amount, not stated, which represented the balance was carried forward.<sup>197</sup> This payment of interest out of capital

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194. Ibid., TD83/3/1.

195. Ibid., TD83/8/5.

196. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1.

197. Ibid., SSE5,1/12.



was, in fact, made to ordinary shareholders since the initial preference share issue was only made in 1912, and thus Robertson's statement of 1924 is misleading.<sup>198</sup>

The first recorded payment of ordinary share dividend was on 23rd August, 1916 for the accounting period ending the six months to 30th June, 1916. This was, in fact, some fifteen years after the company had been founded, though only nine years since the shares had been fully paid. Table 5I. (p.506) records all the known payments of ordinary share dividend paid by the C.V.E.P. Company between 1916 and 1930. It is fairly straightforward, listing the amount paid each year in both monetary and percentage terms on ordinary share holdings and the manner in which this dividend was paid. Between 1916 and 1924 the ordinary share capital stood at £600,000 but in the latter year a further 600,000 £1 Ordinary Shares were issued. It is not known when these additional shares were fully paid but it is obvious that the date of final payment was taken into account by the company in declaring a dividend of 1.875 per cent on these shares. Similarly, in 1929 a further 900,000 £1 Ordinary Shares were issued and again the dates at which calls were made were taken into account in deciding the proportion of total dividend due on this new issue.<sup>199</sup>

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198. It is also interesting to note that on 28th September, 1905 a sum of £18,579.81p was paid to the original syndicate of the company for their services. S.R.A. Records of Strain and Robertson, TD83/8/5.
199. The capital structure of the company was fully discussed in Section 3

TABLE 5I      Known Payments of Ordinary Share Dividend  
by the C.V.E.P. Company

<u>Year</u> <u>Ending</u>	<u>Amount £</u>	<u>%</u>	<u>Comments</u>
31.12.1916	15,000.00	2.5	Paid, free of tax, two equal instalments.
31.12.1917	15,000.00	2.5	Paid, free of tax, two equal instalments.
31.12.1918	30,000.00	5.0	Paid, less tax, 2% & 3% each half year.
31.12.1919	30,000.00	5.0	Paid, less tax, 2% & 3% each half year.
31.12.1920	45,000.00	7.5	Paid, less tax, 2.5% & 5% each half year.
31.12.1921	45,000.00	7.5	Paid, less tax, 2.5% & 5% each half year.
31.12.1922	48,000.00	8.0	Paid, less tax, 2.5% & 5.5% each half year.
31.12.1923	48,000.00	8.0	Paid, less tax, 3% & 5% each half year.
31.12.1924	48,000.00	8.0	Paid, less tax, 3% & 5% each half year.
31.12.1925	48,000.00	8.0	Paid, less tax, 2% & 6% each half year.
)	11,250.00	1.875	on 1924 issue of 600,000 £1 Ord. Shares.
31.12.1926	96,000.00	8.0	Paid, less tax, 3% & 5% each half year.
31.12.1927	96,000.00	8.0	Paid, less tax, 3% & 5% each half year.
31.12.1928	96,000.00	8.0	Paid, less tax, 3% & 5% each half year.
)	96,000.00	8.0	Paid, less tax, 3% & 5% each half year.
31.12.1929	24,000.00	8.0	Div. for 4 months on 900,000 £1 Ord. Shares issued 1929.
)			
31.12.1930	168,000.00	8.0	Paid, less tax, 3% & 5% each half year.

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Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1 - SSE5,1/5.



Table 5I is interesting since these payments of ordinary share dividend obviously reflect on the profitability of the company. Ignoring the fact that dividends were paid to these shareholders prior to 1916, it can be seen that such payments rose fairly markedly between 1916 and 1921 until an almost uniform rate of 8 per cent was achieved after that latter date. Indeed, the figure of 8 per cent is 2 per cent higher than that paid on the 1912 Cumulative Preference Share issue, and this would appear to have been taken into consideration when in 1921 an 8 per cent Cumulative Second Preference Share issue took place.

The issue of 30,000, 6 per cent Cumulative Preference Shares was sanctioned on 16th October, 1912 but, as indicated earlier, it is not known when these shares were actually issued. However, the first recorded payment on these shares was noted on 9th September, 1914 when it was stated that the dividend for the six months to 31st October, 1914 was to be paid on 11th November, 1914.<sup>200</sup> It may be logical to assume, therefore, that these shares were actually issued on 31st October, 1912, with the first six monthly payment of interest being made for the six months ending 30th April, 1913; it was normal practice to pay interest in two annual instalments. Thus, the first full year when dividend was paid is assumed to have been 1913. Moreover,

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200. S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/2.

these were cumulative preference shares, and the company was obliged to make annual payment or be responsible for arrears. Consequently, between 1913 and 1930, inclusive, £18,000 was paid annually to these shareholders.

On 6th October, 1921, 50,000, 8 per cent Cumulative Second Preference Shares of £10 each were issued, and by 31st January, 1922 a total of £8.00 per share had been paid, that is four-fifths of the total.<sup>201</sup> There is no record of dividend payments on these shares in the minute books of the company. However, it has been assumed that for the year 1922 four-fifths of the dividend was paid, and that after that year the dividend was paid in full. Thus, for the year 1922 it is assumed that £32,000 was paid in dividend on these shares and thereafter until 1930 an annual payment of £40,000.

All information concerning dividend payments has been collated in Table 52 (p.509). The overall sum paid in dividends to the several categories of shares amounted to £1,635,250. It is difficult to analyse, fully, this sum because of the complexity of the company's capital structure. Nevertheless, the £324,000 paid on the 6 per cent Cumulative Preference Shares represented 19.81 per cent of total dividends, and at 1930 these shares represented 10.35 per cent of the total issued capital. In a similar manner,

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201. Ibid., SSE5,1/3.



but over a much shorter period, the 8 per cent Cumulative Preference Shares received £352,000, or 21.53 per cent, of total dividend payment, although at 1930 such shares represented 17.24 per cent of the total issued capital. Finally, Ordinary Share Capital, which represented 72.41 per cent of the total issued capital at 1930, had by that year received £959,250, or 58.66 per cent, of the total dividends paid by the company.

TABLE 52.      Total Dividend Payments on both Ordinary and Preference Share Capital

<u>Year</u>	<u>6% Cum. Pref. Shares</u>	<u>8% Cum. Pref. Shares</u>	<u>Ord. Shares</u>	<u>Total</u>
1913	£18,000.00			£18,000.00
1914	18,000.00			18,000.00
1915	18,000.00			18,000.00
1916	18,000.00		£15,000.00	33,000.00
1917	18,000.00		15,000.00	33,000.00
1918	18,000.00		30,000.00	48,000.00
1919	18,000.00		30,000.00	48,000.00
1920	18,000.00		45,000.00	63,000.00
1921	18,000.00		45,000.00	63,000.00
1922	18,000.00	£32,000.00	48,000.00	98,000.00
1923	18,000.00	40,000.00	48,000.00	106,000.00
1924	18,000.00	40,000.00	48,000.00	106,000.00
1925	18,000.00	40,000.00	59,250.00	117,250.00
1926	18,000.00	40,000.00	96,000.00	154,000.00
1927	18,000.00	40,000.00	96,000.00	154,000.00
1928	18,000.00	40,000.00	96,000.00	154,000.00
1929	18,000.00	40,000.00	120,000.00	178,000.00
1930	18,000.00	40,000.00	168,000.00	226,000.00
	<u>£ 324,000.00</u>	<u>352,000.00</u>	<u>959,250.00</u>	<u>1,635,250.00</u>

Source: S.R.O. Records of the South of Scotland Electricity Board, SSE5,1/1 - SSE5,1/5.

## (II) Conclusion

The C. V. E. P. Company was not simply chosen because of its size and scale of operations; its history raises some of the main economic issues arising from the growth of the electricity supply industry in Scotland. Moreover, as the analysis of its pricing policy and sales indicates, it was in a position to influence greatly the economy of the West-Central Region.

As a company it claimed to be Scottish and local but very rapidly it was controlled by Anglo-American concerns; more than fifty per cent of its directorate came from these by the first decade of the twentieth century. Although it was in a position to make substantial demands on the rest of the economy during the creation of its power network, there is very little evidence that many sub-contracts went to Scottish companies. The immediate effects of the physical construction of the company in terms of employment generated and the investment multiplier were limited.

In terms of supplying electricity its main contribution was bulk supplies to industry, although traction, domestic and public lighting were provided. The major industrial users hoped to save on costs, although it is possible that the application of a new form of energy made possible greater output. Generally, the regional economy provided the company with opportunities for relatively stable profits. The West-Central Region did not diversify sufficiently to allow profits to expand substantially.



## Chapter 9

### State Intervention and Local Authority Development 1915/1916 - 1931

#### (1) State Intervention

During the First World

War the electricity supply industry began to play an increasingly vital role in the economic life of the nation;<sup>1</sup> it was recognised that this importance would not dwindle with the ending of the war, and some people believed that in the post-war period the viability of the economy would be largely dependent on the efficiency of the electricity supply industry. Moreover, the government's interest in the electricity supply industry was shown by the setting up of a number of committees to investigate the industry with a view to increasing its national efficiency. Such investigations eventually culminated in the Electricity Supply Act 1919 and more importantly in the Electricity (Supply) Act 1926. However, in the period prior to 1930 this legislation had only a limited effect on individual Scottish undertakings which continued, generally, to function normally throughout most of the period under scrutiny.<sup>2</sup>

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1. See Chapter 6, p.p. 223 - 226.
  2. Private sector developments in the period before 1930 have already been examined in Chapters 6, 7 and 8, and local authority progress will be analysed in some detail in Section 2 of this chapter.

The proliferation of committees between 1916 and 1925 to inquire into the electricity supply industry indicated a growing realisation by governments of the crucial function of that industry in the post-war world and of the need to enhance its efficiency.<sup>3</sup> In 1916, under the auspices of the Ministry of Reconstruction, an Electricity Sub-Committee was set up under Viscount Haldane to investigate the supply industry and in April 1917 this committee presented an interim report on electrical power supply.<sup>4</sup> The principal recommendation of the Haldane Committee was that generation and mains transmission should be re-organised on a regional basis under a Board of Electricity Commissioners rather than on an almost parochial basis under a multiplicity of autonomous local undertakings. In 1916 also, the Board of Trade appointed, under the chairmanship of Sir Charles Parsons, an Electrical Trades Committee to consider the position of the industry in the post-war period, and this committee issued its report in 1918.<sup>5</sup> This committee emphasised the need for cheap electricity and stressed the

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3. A detailed analysis of the workings of such committees, their influence on legislation and a detailed examination of the legislation itself has already been conducted by a number of historians. Thus, this section only attempts to note the main recommendations of the committees and the principal features of the legislation of 1919 and 1926. For a more detailed coverage see Ballin, op.cit. Chs. 5,6 and 8; Hannah, op.cit. Chs. 2,3 and 4.
  4. Ministry of Reconstruction, Coal Conservation Sub-Committee, Interim Report on Electric Power Supply in Great Britain, Cmd.8880,1917.
  5. Report of the Departmental Committee appointed by the Board of Trade to consider the Position of the Electrical Trades after the War, Cmd.9072,1918.



importance of the industry for both military and industrial purposes. It felt that the industry should be treated nationally rather than locally and that small, uneconomic stations should be subordinated or even eliminated in favour of larger plant. The Parsons Committee also advocated the establishment of a Board of Electricity Commissioners which should be independent of any political control and not bound by previous practices. Finally, it recommended at an early stage the establishment of a quite separate committee to examine the organisation and administration of the supply industry. Consequently, in 1917 the Board of Trade set up yet another committee under Sir Archibald Williamson<sup>6</sup> (later Lord Forres) which reported back in April 1918.

As early as May 1917 the Williamson Committee concluded that in the post-war period, when British industry was subjected to international competition, its success would depend on the adoption of the most efficient methods and machinery to reduce manufacturing costs. It also noted that an important element in costs would be the general extension of the use of electrical power supplied at the lowest possible price. The system whereby electricity was supplied in a large number of small areas by separate authorities was incompatible with what was, at that time, now possible and practicable. The interconnecting of

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6. Report of the Committee appointed by the Board of Trade to consider the question of Electric Power Supply, Cmd.9062, 1918.

existing undertakings, recommended by the Board of Trade in 1916, could not in itself remedy the then weaknesses of the industry. In November 1917 the committee heard submissions from Scottish interests viz., Alexander Stevenson, a City of Edinburgh councillor and ex-convener of the city's Electric Lighting Committee who represented the Convention of Royal Burghs of Scotland; D.A. Starr, general-manager of the C.V.E.P. Company who represented the Association of County Councils of Scotland; W.W. Lackie, engineer and manager of the Electricity Department of the City of Glasgow, who represented nine municipalities in the West of Scotland, and W.H. Hannay who was a City of Glasgow councillor.<sup>7</sup>

Despite claims, counter-claims and advice from such diverse vested interests the Williamson Committee generally followed conventional thought in its recommendations. It was of the opinion that a new body called the Electricity Commissioners should be set up, to which the existing powers of the Board of Trade, Local Government Board and the Scottish Office relating to the supply of electricity should be transferred as well as additional powers to encourage and regulate the generation and distribution of electricity. The Committee also recommended that the Electricity Commissioners should have general control over the generation and distribution of electricity in the United Kingdom; the

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7. S.R.O. Records of the Scottish Development Department, D.D.11/4.



existing system by which electricity was separately generated for small areas should be abolished. The Electricity Commissioners, after local inquiries had been held, should divide the United Kingdom into districts suitable for the generation and distribution of electricity, and within each Electrical District, District Electricity Boards should be set up to purchase all generating stations of authorised distributors. The District Electricity Boards should then be responsible for the generation of electricity in their districts and also for the establishment of new generating stations. Existing undertakers, if they so wished, could retain their powers of distribution but they should bulk purchase electricity from their District Electricity Boards. Finally, the Committee recommended that the District Electricity Boards should make no divisible profits and that they should be financed with funds raised with government assistance.<sup>8</sup>

In 1918 yet another committee consisting of the chairmen of the various sections of the advisory council at the Ministry of Reconstruction and headed by Sir Henry Birchenough was set up to consider the Williamson Report. The Birchenough Report went much further than that of Williamson and concluded that only a national system of electricity generation under State regulation but run on commercial rather than civil service lines could lead to the thorough development of

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8. Ibid.

an electricity supply; essential for the future well-being  
of British industry.<sup>9</sup>

The scheme envisaged by the Birchenough Committee was far too radical for the contemporary political climate and thus the Electricity (Supply) Bill, introduced into the House of Commons in May 1919, was based largely on the Williamson Report. The original intention of the Bill was to set up Electricity Commissioners with powers to direct electricity policy and to create District Electricity Boards with compulsory powers to re-organise and concentrate generation in selected stations from which the Electricity Commissioners could then sell electricity at a standard price to existing undertakers who would retain control of distribution. The Bill as presented to Parliament faced strong opposition.<sup>10</sup> Many Conservative members feared the spectre of nationalisation while vested interests, well represented in Parliament, found state intervention repulsive, especially intervention which provided District Boards with powers of compulsory purchase of generating stations. Consequently, by the time the Bill received the Royal Assent on 23rd December, 1919 it had little in common with the expressed

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9. Ministry of Reconstruction, Advisory Council, Report of the Committee of Chairmen on Electric Power Supply, Cmd.93, 1919.
10. Vide infra. Hansard's Parliamentary Debates, 5th Series, 115, Cols.1625-1690 (14th May, 1919)



intentions of Williamson. The District Electricity Boards with compulsory powers were replaced by Joint Electricity Authorities which lacked the purchase powers of the boards and were voluntary in nature. The Electricity Commissioners were set up, responsible to Parliament through the Board of Trade and subsequently through the Ministry of Transport, and they were given powers for sanctioning local authority loans but their lack of compulsory powers and their reliance on voluntary co-operation among disparate interests made the task of re-organising electricity generation difficult.

Under the terms of the 1919 legislation the Electricity Commissioners divided the country into seventeen areas, two of which were in Scotland.<sup>11</sup> The two districts provisionally determined by the Electricity Commissioners in Scotland were the West of Scotland Electricity District and the East of Scotland Electricity District which was later renamed as the Edinburgh and Lothians Electricity District.<sup>12</sup> The latter scheme was fairly quickly established but the former proved much more difficult and was not finally determined until 1927.<sup>13</sup>

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11. It is interesting to note that, excluding the chairman of the Electricity Commission, two of the four commissioners were Scots namely Archibald Page, who had been assistant engineer for Glasgow Corporation and at the time of his appointment to the Commission chief engineer and manager of the C.V.E.P. Company, and W.W. Lackie who was chief engineer of Glasgow Corporation.
12. Electricity Commissioners, Third Annual Report 1922/23, Fourth Annual Report 1923/24.
13. See p. 563,

Previous to the initial proposal for an East of Scotland Electricity District, comprising the Counties of the City of Edinburgh, Midlothian, East Lothian and parts of the Counties of Linlithgow and Peebles, boundary legislation of 1920 had extended Edinburgh's boundaries to include Leith and Musselburgh. However, official notification of the proposed district was given on 24th February, 1922 which also stated that the latest date for the submission of schemes was 31st July, 1922. A scheme was submitted by Edinburgh Corporation, and a local inquiry began in the city on 12th December, 1922.<sup>14</sup> By the 14th March, 1923 the Commissioners had considered the evidence given at that inquiry by the Corporation of Edinburgh for the improvement of supply in the proposed district and had also heard representations made by various interested bodies. Consequently, in March 1923 the Commissioners concluded that the area as provisionally determined was confirmed, subject to minor parochial boundary adjustments, as the Edinburgh and Lothians Electricity District. Under the technical scheme submitted to the Commissioners it was proposed that the new generating station of the Corporation of Edinburgh at Portobello should be utilised not only for the requirements of the statutory area of the Corporation, but for providing the bulk supplies required for the development of

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14. Garcke, op.cit. Vol.XXIV.



the other parts of the District under an agreement between the Corporation and the National Electric Construction Company Limited. For this purpose the Corporation proposed to proceed immediately with the laying of transmission lines in the first instance to Musselburgh and Tranent, and to Lasswade and Fordel. The technical scheme also proposed that distribution in the District outside Edinburgh should be undertaken by the National Electric Construction Company Limited under agreements with the County Councils of Midlothian and East Lothian. This technical scheme was generally approved by the Commissioners. Moreover, the Scheme originally submitted to the Commissioners provided for the establishment of a Joint Electricity Authority for the District. This proposal was, however, withdrawn during the course of the Inquiry in December 1922 because of the agreements reached with the National Electric Construction Company Limited. It also appeared to the Commissioners that the position in this District was exceptional: the duties with regard to generation would be centralised in the hands of an existing public authority viz., the Corporation of Edinburgh; two other public bodies viz., the County Councils of East Lothian and Midlothian, were prepared to charge themselves with the supervision of the development of distribution outside Edinburgh and showed their readiness to do so by entering into agreement with the National Electric Construction Company. Thus, the commissioners concluded that the setting up of any other body,

even of an advisory character, was unnecessary.

Following upon this statement of conclusions, an approved scheme was published by the Commissioners in February 1924 which defined the areas to be constituted the Edinburgh and Lothians Electricity District; this placed the Corporation of Edinburgh and the Lothians Electric Power Company (the local subsidiary of the National Electric Construction Company<sup>16</sup>) under obligation to provide or secure the provision of a cheap and abundant supply of electricity within the District. The Corporation was also obliged to supply electricity in bulk to the Lothians Electric Power Company. A local inquiry into the approved scheme was held at Edinburgh on 10th March, 1924 when some minor amendments were made, and on 8th July, 1924 the Commissioners made the Edinburgh and Lothians Electricity Order 1924 and submitted it on the same day to the Minister of Transport for confirmation.<sup>17</sup> The Order was confirmed by the Minister on 28th November, 1924 and presented to both Houses of Parliament on 9th December, 1924. Affirmatory Resolutions were passed by both Houses on 16th December, 1924, and the Order accordingly came into operation on that date under the title the Edinburgh and Lothians Electricity District Order,<sup>18</sup> 1924.

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15. Electricity Commissioners, Third Annual Report 1922/23, p.p.99-100.
16. See Chapter 7, Section 4, p.p. 355 - 358.
17. Electricity Commissioners, Fourth Annual Report 1923/24, p.p.31-32.
18. Ibid., Fifth Annual Report 1924/25, p.14.



Official notification for the establishment of a proposed West of Scotland Electricity District was given by the Commissioners on 23rd December, 1921, and the proposed area comprised, generally, the Counties of the City of Glasgow, Renfrew, and parts of the Counties of Ayr, Dunbarton, Lanark and Stirling.<sup>19</sup> The latest date for the submission of a proposed scheme was originally fixed for 30th December, 1922 but was later extended to the 30th June, 1923 and again to 31st December, 1923.<sup>20</sup> As early as 27th February, 1922 a conference of authorised undertakers was held in the Glasgow City Chambers comprising councillors and engineers from major local authority undertakers viz., Glasgow, Greenock, Paisley, Ayr, Kilmarnock, Dunbarton, Hamilton, Motherwell and Wishaw and Lanark County Council as well as representatives from various private concerns viz., the C.V.E.P. Company, the Strathclyde Electricity Supply Company, Coatbridge and Airdrie Supply Company, Kilmacollm Electric Lighting Company and the Skelmorlie Electric Supply Company.<sup>21</sup>

From such diverse vested interests it was soon obvious that any overall agreement on a proposed scheme would be difficult. Various meetings of the interested parties in the proposed Electricity District were held throughout 1922

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19. S.R.A. Records of Strain and Robertson, TD83/6/5; Garcke, op.cit. Vols. XXIV and XXIX.  
 20. Garcke, op.cit. Vols. XXIV and XXIX.  
 21. S.R.A. Records of Strain and Robertson, TD83/6/5.

and 1923. On 26th February, 1923 marginal boundary changes were made whereby a number of parishes, not originally included in the designated area, in the Counties of Lanark and Ayr were now included. Friction among such vested interests was to be expected and was indeed evident. On 26th June, 1923 the conference of authorised undertakers decided, by a show of hands, not to extend the Pinkston Power Station of the Corporation of Glasgow. The net result of this can be noted on 7th December, 1923 when the Corporation of Glasgow retired from the promotion of the proposed scheme because they wished greater freedom of action. The Lanarkshire Tramways Company, which had not been a member of the original conference in February 1922, also retired for reasons unknown.<sup>22</sup> However, despite such retirals, on 28th December, 1923 a scheme for the improvement of the organisation for the supply of electricity in the West of Scotland and providing for the establishment of an Electricity Advisory Board was submitted by a Conference of Local Authorities, Authorised Undertakers and others within the district, and a local inquiry was held in Glasgow on 23rd

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22. Ibid.



23,24

April, 1924, and following days, by the Commissioners.

When the West of Scotland Electricity District Inquiry was held before the Electricity Commissioners in April 1924 the list of those supporting the proposed scheme was impressive viz., the County of Dunbarton, the Royal Burgh of Dumbarton, the Burgh of Kirkintilloch, the County of Lanark, the Royal Burgh of Lanark, the Burgh of Hamilton, the Burgh of Motherwell and Wishaw, the Burgh of Biggar, the County of Stirling and also, the major power company, the C.V.E.P. Company. However, those disinclined to support the scheme, although smaller in number, were equally imposing including, and in particular, the City of Glasgow and also the Corpor-

23. Electricity Commissioners, Fourth Annual Report 1923/24, p.p.35-36.
24. The ideal, of course, of the 1919 Act was for the formation of electricity districts and the setting up in each district of a body to be called the Joint Electricity Authority, i.e. there should be in each district one central authority owning the generating stations and the main transmission lines, which should supply electricity in bulk to other authorised undertakers in the district who in turn would distribute the electricity to individual consumers. This ideal was difficult to obtain in Britain because since the 1882 Act large vested interests had appeared with the result that the formation of Joint Electricity Authorities was difficult to achieve. This was recognised by Parliament and Section 19 of the Amending Act 1922 gave the Commissioners power to establish either Joint Electricity Authorities or "some other body." The Commissioners did, in fact, set up Advisory Boards in South East Lancashire and in mid-Lancashire. Thus, the West of Scotland Scheme was drafted along the lines of the South East Lancashire Scheme with an Electricity Advisory Board.-  
S.R.A. Records of Strain and Robertson, TD83/6/5.

ation of Greenock and the Kilmacolm Electric Lighting Company Limited. The importance and influence of the City of Glasgow in the West of Scotland was emphasised by the fact at the 1921 Census the City had a population of 1,034,171 whereas the population of the remainder of the proposed district was 1,260,679 i.e. the concentrated area within the City of Glasgow contained 45.06 per cent of the total population of the proposed district.<sup>25</sup>

The Corporation of the City of Glasgow objected to the proposed scheme for a number of reasons and there is little doubt that such objections, bearing in mind the voluntary nature of the 1919 legislation, were a major influence on the eventual outcome of the inquiry. Glasgow totally rejected as unnecessary the establishment of an Electricity Advisory Board or, indeed, "any other body" to improve the existing organisation for the supply of electricity in the proposed district. The Corporation of Glasgow believed that they were the largest undertakers in the proposed district with the greatest capital expenditure and the largest number of units generated. However, their area of supply was surrounded on all sides by the authorised areas of the C.V.E.P. Company, the Strathclyde Electricity Supply Company and the Lanarkshire County Council. In such circumstances they believed that they

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25. S.R.A. Records of Strain and Robertson, TD83/6/5.



were precluded from supplying electricity beyond the City. Moreover, because of "the magnitude and efficiency of their undertaking," they stated that they would not require any assistance from any other authorised undertakers outside the City. On the purely financial side the Corporation believed that the estimated savings in coal and capital expenditure arising from the proposed scheme were insignificant and would not realistically affect them. On the other hand, if an Electricity Advisory Board was established, and since they were the largest undertakers in the proposed district and if the expense of administration was allocated on the basis of units sold, then the Corporation would have to bear the largest share of these expenses without receiving any corresponding advantage. Thus, the Corporation objected to being burdened with the administrative expenses of a Board whose functions would not benefit them.

The Corporation also argued for exclusion from the proposed scheme on the basis of paragraph 55 of the Williamson Report which stated that,

"Subject to our general recommendation that there should be one comprehensive system for the generation and main transmission in each district, it may be advisable in an exceptional district, the outstanding feature of which is an undertaking, whether municipal or company, already supplying power on a large scale and over a large area, and

able and willing to develop that supply at its own risk, that the municipal authority or the company, as the case may be, should continue, subject to conditions laid down by the Commissioners."

The Corporation of Glasgow believed that this statement was peculiarly applicable to the position of Glasgow and justified it in claiming to be treated as a separate and independent district under the 1919 legislation. The Corporation also alleged that the exclusion of Glasgow from the proposed scheme would not be prejudicial to its success and, perhaps in a gesture of conciliation, suggested that such exclusion would not prevent the Corporation from providing a cheap and abundant supply of electricity for the proposed district by mutual arrangement with authorities in the district.

The difficulties of the Commissioners in formulating the West of Scotland Electricity District were compounded by Glasgow's insistence on certain conditions. In the event of the Commissioners deciding that it was essential that Glasgow should be included in the proposed district to improve the supply and also be represented on the Advisory Board, Glasgow insisted that the constitution of the Advisory Board and the technical scheme be amended. The principal technical amendments required by Glasgow were that the proposal to commence, within five years, an additional main



generating station to the west of the City should be embodied in the technical scheme, primarily to meet the requirements of the City, although power could be made available for other authorised undertakers. In addition Glasgow wanted any decision with regard to its Pinkston Station and matters which it regarded as 'domestic' to it deleted from the scheme and left entirely to the decision of the Corporation and not to the proposed Advisory Board. Moreover, the possible interconnection of the Corporation's generating station at Dalmarnock with the C.V.E.P. Company's generating stations at Clyde's Mill and Yoker was faced with hostility, since the Corporation did not believe that they would receive any benefit from this proposed interconnection.

Penultimately, and as indicated above, the Corporation objected to both the Advisory Board and its composition. The Corporation took exception to any powers being conferred upon the Board other than those of advice and recommendation and they wished their representation on the proposed Board to be increased from the recommended three members, out of a total of twenty-one, to a number not stated but one which would be "commensurate with their position and interests." Finally, 'since the Corporation believed that it could derive no benefit from the proposed scheme, they submitted that they should not be called upon to pay any part of the administration expenses of the proposed Advisory Board.

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26. Ibid.

The objections by the Kilmacolm Electric Lighting Company to the setting up of the West of Scotland Electricity District are not known, but Greenock Corporation's principal objection was that they did not want an Advisory Board but a Joint Electricity Authority established.<sup>27</sup> Furthermore, the complexity of the situation in the West of Scotland was additionally compounded by an application for a special order in 1923 by the Corporation of Ayr jointly with Ayr County Council and the Corporation of Kilmarnock to constitute a Joint Board i.e. the Ayrshire Electricity Board. This Board, representative of the three bodies in question, was to act as an undertaker for an area of supply consisting of the County of Ayr including the burghs of Ayr and Kilmarnock but excluding fourteen other burghs and also the area of supply of the Skelmorlie Electric Supply Company. The order itself was granted in 1924 and provided that the Joint Board was deemed to have taken over, as at 15th May, 1923, the existing electricity undertakings of the corporations of Kilmarnock and Ayr. The corporations of Kilmarnock and Ayr were authorised to supply electricity in eleven of the burghs not included in the supply area established by the 1924 order. However, after the transfer of the undertakings of the two corporations, the powers of supply in the eleven burghs in question were controlled by the Joint Board. Subsequently, and by 1925/

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27. Ibid.



1926, a supply was available in Kilmarnock, Ayr, Prestwick, Troon, Irvine, Saltcoats, Ardrossan, Stewarton, Galston, Newmilns, Darvel, Kilwinning and a number of other lighting districts.<sup>28</sup>

The position facing the Commissioners in the West of Scotland, in view of their limited powers, was difficult but not insurmountable if they had the co-operation of all the interested parties. Unfortunately, this was not the case. The hostility of, in particular, the City of Glasgow made the proposals of the seventeen promoters for this particular scheme untenable. Glasgow, which was the major industrial and commercial city and the most populous area at the heart of the proposed district, objected to the very foundation of the scheme and based its objections on financial, technical and administrative grounds. Moreover, the nature of such objections indicated its wish to retain an independence of action while even its submitted amendments, if it were to be included in the district, indicated its unwillingness to co-operate with other interests and a desire to dominate the proposed area of supply. The antipathy of the Corporation of Glasgow undoubtedly influenced the Commissioners who, after considering the evidence put forward at the inquiry, deferred any pronouncement upon the submitted scheme and notified the parties concerned accordingly. It is additionally alleged that the Commissioners .

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28. Garcke, op.cit. Vols. XXVII, XXVIII, XXIX.

procrastinated in making a decision because of the possible alteration in government policy due to the coming to power of the Labour Government.<sup>29</sup> For example, on 30th July, 1924 the Government informed the House of Commons that it proposed to restore the clauses giving compulsory powers to the Commissioners which had been abandoned during the passage of the 1919 legislation.<sup>30</sup> If this policy was carried out, of course, it would ensure greater co-ordination of effort and, in the case of the West of Scotland, subordinate the interests of Glasgow in favour of the national interest.

The situation in the West of Scotland highlighted the facts that the problem of sectionalism remained, that the 1919 Act was inadequate, and that compulsory powers were essential. This was recognised in 1924 by the First Labour Government and emphasised by the Lloyd George committee of experts, formed to investigate the coal and electricity industries, which in July 1924 in their report (Coal and Power) indicated the need for greater compulsory powers for the Commissioners and state financial aid for the industry. However, before anything concrete could be achieved, the short-lived Labour Government were swept from office in the General Election of October 1924.

The fundamental problems, and weaknesses, were now so

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29. Electricity Commissioners, Fifth Annual Report 1924/25, p.23.  
 30. Hannah, op.cit. p.89.



evident that no government could afford to ignore them. Accordingly, Stanley Baldwin, the Conservative leader, set up in 1925 a further committee under Lord Weir<sup>31</sup> to review the problems of the electricity supply industry, and it was the report of this committee which formed the basis of the Electricity (Supply) Act 1926. The Weir Committee recommended that a Central Electricity Board should be set up. This would be responsible for selecting the most efficient generating stations. A National grid should also be established for the purpose of interconnecting these principal generating stations on a national basis; the Central Electricity Board was to be responsible for the erection of the grid and was to direct the operations of the selected stations.

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31. William Douglas Weir (1877-1959) was born in Glasgow and educated at Allen Glen's School and Glasgow High School. He was apprenticed into the family engineering business of G. and J. Weir Limited at Cathcart, Glasgow which at that time was mainly producing auxiliary machinery for ships and pumps for the oil industry. He became managing director in 1902 and was chairman from 1910 until 1953. During the First World War he held several government appointments and was knighted in 1917 for his achievements as Controller of Aeronautical Supplies. In April 1918 he became Secretary of State for Air and soon afterwards was raised to the peerage as Lord Weir of Eastwood. In the inter-war period he was called in by governments as an adviser in civil and military matters, particularly with regard to aircraft production. At the outbreak of the Second World War he became Director-General of Explosives and Propellants and later in 1942 he was Chairman of the Tank Board. He was also a member of the Cooper Committee of 1941/1942 set up to inquire into the development of hydro-electricity in the Highlands. W.J. Reader, Architect of Air Power: The Life of the first Viscount Weir of Eastwood 1877-1959, (1968); Who-Was-Who Volume V 1951-1960, 3rd edn. (1967).

The owners of selected stations were to be placed under an obligation to sell to the Central Electricity Board all electricity generated at cost price, but retail distribution was to be left in the hands of existing undertakings i.e. the Central Electricity Board was to purchase in bulk at cost price and sell to authorised distributors again at cost price after allowing for the cost of constructing and operating the national grid. The Board itself was not allowed, except under exceptional circumstances, to operate stations. The Board was to arrange with authorised undertakers for the erection of new stations in accordance with national requirements while the Electricity Commissioners were to be given power to close down inefficient generating stations as soon as an equivalent supply of electricity became available from the national grid at lower cost. The Board was also to be charged with the responsibility of ensuring that the frequency of alternating current systems was standardised.<sup>32</sup> Such proposals were not universally welcomed.<sup>33</sup> A number of groups were hostile to the proposed Bill including the Electrical Contractors Association of Scotland and also the Glasgow Chamber of Commerce which felt that the Bill would divorce capital from management and "if passed into law in its present form will be an instrument

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32. Report of the Weir Committee appointed to review the National Problem of the Supply of Electrical Energy, 1926.

33. Hannah, op.cit. p.p.95-100.



ready made in the hands of the future nationalizer."<sup>34</sup> However, since generating stations remained under the ownership and operation of undertakings themselves, although overall executive control was exercised by the Central Electricity Board, they were generally embodied in the Electricity (Supply) Bill 1926 which eventually received the Royal Assent on 15th December, 1926.

It is interesting to note that when the Ministry of Transport appointed the members of the Central Electricity Board in 1927 Scots played a prominent part. The first

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34. S.R.O. Records of the Scottish Development Department, DD.11/7.

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chairman of the Board was Sir Andrew Duncan appointed on 21st January, 1927; Duncan's position as chairman was full-time and he received a salary of £7,000 per annum.

The seven members of the Board, who were all part-time and received an annual salary of £750, included two other Scots

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35. Sir Andrew Rae Duncan (1884-1952) came from a relatively humble background in Irvine and Glasgow. He began his career as a pupil teacher at Ayr Academy and proceeded to take an M.A. and L.L.B. at Glasgow University; in later years he was awarded an honorary degree by Dalhousie (Canada) and by Glasgow University. After graduating he joined a firm of industrial lawyers closely associated with ship-owners and shipbuilders. He became Coal Controller in 1919/1920 when he succeeded in reconciling the hostile parties in the coal dispute of 1920 for which he was awarded a knighthood in 1921. Sir Andrew also later held a number of both public and private appointments. For example, his public appointments included those of Chairman of Advisory Committee of Coal Mines Department 1920/1929; Chairman of Sea-Fish Commission for the United Kingdom 1933/1939; Chairman of the Central Electricity Board 1927/1935 (Member 1936/1940); M.P. (Nat.) City of London 1940/1950; President of Board of Trade 1940 and 1941; Minister of Supply 1940/1941 and 1942/1945; High Sheriff, County of London 1939/1940; one of H.M. Lieutenants for City of London. In a more private capacity Sir Andrew was Chairman of the Executive Committee of the British Iron and Steel Federation 1935/1940 and Vice-President of the Shipbuilding Employers' Federation 1920/1927. He was also a director of I.C.I. Limited, Royal Exchange Assurance, North British Locomotive Company Limited, Dunlop Rubber Company Limited and a director of the Bank of England between 1929 and 1940. Who Was Who Volume V 1951-1960, 3rd edn. (1967); Hannah, op.cit. p.102; R.H. Campbell, The Rise and Fall of Scottish Industry 1707-1939, (Edinburgh 1980) passim, P.170-179.
36. Hannah, op.cit. p.p.102-103.



viz., Sir James Lithgow and Sir Duncan Watson.

The method by which policy was implemented under the 1926 Act was for the Electricity Commissioners to prepare and transmit to the Board schemes relating to large areas

37. Sir James Lithgow (1883-1952), First baronet of Ormsary 1925; G.B.E. 1945; C.B. 1947; M.C., T.D., D.L., J.P., Hon. L.L.D. (Glasgow). Vice-Lieutenant of Renfrewshire from 1943. Educated at Glasgow Academy and Paris. Chairman of Lithgows and other companies; commissioned Renfrew and Dunbarton R.G.A. 1902; served European War 1914/1919 (despatches, wounded) France. Seconded to Admiralty as Director of Shipbuilding Production 1917; Member of Board of Admiralty 1940/1946 as Controller of Merchant Shipbuilding and Repairs. President of Clyde Shipbuilders Association 1908; Shipbuilding Employers' Federation 1922; British Employers' Confederation 1924; F.B.I. 1930/1931/1932; Institution of Engineers and Shipbuilders in Scotland 1929/1931; British Iron and Steel Federation 1943/1945; The Iron and Steel Research Association. Chairman of Scottish Development Council 1931/1939 and a member of Central Electricity Board 1927/1930.  
Who Was Who Volume V 1951-1960, 3rd ed. (1967); R.H. Campbell, The Rise and Fall of Scottish Industry 1707-1939, (Edinburgh, 1980), passim, p.p.170-179.
38. Sir Duncan Watson (1873-1959) Knighted 1927. Educated at Hutcheson's Grammar School, Glasgow, Glasgow and West of Scotland Technical College and King's College, London. Mayor of St. Marylebone 1919/1920 and J.P. County of London. Founder of Duncan Watson Electrical Engineers Limited; Director of Perak River Hydro-Electric Power Company; Chairman of Harley-Davidson Motor Company Limited; Vice-President of International Association for Promotion and Protection of Trade. Member of Central Electricity Board from inception until transferred to British Electricity Board 1948 and of North of Scotland Hydro-Electric Board until April 1948. Sir Duncan was also Governor of the Regent Street Polytechnic from 1931 until 1953, and on retirement founded scholarships for electrical engineers.  
Who Was Who Volume V 1951-1960, 3rd edn. (1967).

which together would ultimately cover the whole country. Each scheme determined which generating station should be selected to generate electricity for the Board and provided for the interconnection of these stations with one another and with the systems of authorised undertakers by means of main transmission lines to be constructed or acquired by the Board. Each scheme also provided for standardisation of frequency and enabled temporary arrangements to be made by which the Board could obtain supplies of electricity during the carrying out of works connected with the scheme. Selected stations were chosen on a number of criteria viz., the cost of coal delivered to the station; the abundance of water for condensing purposes; the technical characteristics of the station, such as the type and size of the plant units, and steam pressures; proximity to load and the possibilities of the site for future expansion.<sup>39</sup>

The first scheme to be transmitted to the Board by the Commissioners was the Central Scotland Scheme which was received on 12th April, 1927 and adopted by the Board on 29th June, 1927. The scheme covered an area of about 4,980 square miles, including roughly the whole

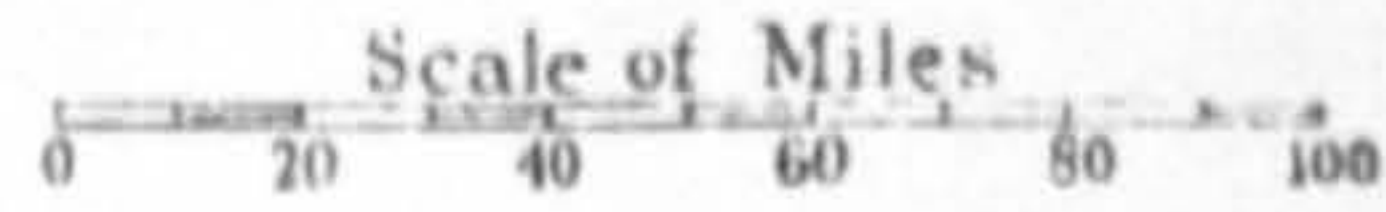
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39. Central Electricity Board, First Annual Report 1927/28, p.p.2-4.




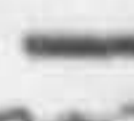
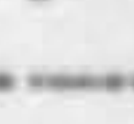




# MAP showing the MAIN GRID

SO FAR AS PROJECTED.



REFERENCE :-

- Primary Stations 
- Secondary Stations 
- 132 Kitovolt Transformer Stations 
- Hydro-electric Stations 
- Principal Main Transmission Lines 
- Boundaries of Areas 
- Transmission Lines not owned by CEB 



Source: 4th Annual Report of The Central Electricity Board 1931, (1932).



of the industrial, shipbuilding and coalfield areas of Scotland and extended from Montrose and Brochin in the County of Forfar to a southern boundary of the County of Ayr. The area had a population at the 1921 Census of 3,761,200. In 1927 there were forty-two authorised undertakers in the area, owning between them thirty-six generating stations, but under the proposals of the scheme ten existing stations were to be selected and operated for the Board.<sup>40,41</sup> From Map 3 which indicates the main grid at 1932 it can be noted that eight primary stations were selected viz., Kilmarnock, Yoker, Dalmarnock, Clyde's Mill, Bonnybridge, Dunfermline, Portobello and Dundee, and two secondary stations viz., Greenock and Port Dundas. The scheme provided that the frequency employed in the extensive systems of Glasgow Corporation and the C.V.E.P. Company, and also in the systems of certain other authorised undertakers in the area, should be changed to the standard frequency of 50 cycles per second. The Commissioners estimated that the approximate net cost of this work, if commenced in January 1928, would amount to £2,921,250. After holding conferences with representatives of most of the

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40. Central Electricity Board, First Annual Report 1927/28, p.p.5-6; Garcke, op.cit. Vol.XXX p.20.
41. For a detailed Parochial analysis by County for the entire area covered by this scheme, see S.R.O Records of the Scottish Development Department, DD11/8.



undertakers involved, the Board adopted the scheme with only slight modifications.<sup>42</sup>

The only important question which appears to have been raised at this stage was that by the Grampian Electricity Supply Company which felt the scheme would adversely affect its development, since the company depended upon the possibility of supplying energy to the industrial areas in the eastern districts of Central Scotland. However, the Board recognised the national importance of water power resources, which were mainly concentrated in the Scottish Highlands, to the economy and gave assurances to the company that it would take a supply of current from it up to a maximum demand of 12,000 KW as from a date not later than 31st December, 1930.<sup>43</sup> Having resolved this situation, the Board invited tenders for the main transmission lines in September 1927, for transformers in November 1927 and for switchgear in January 1928. By the 31st December, 1928 the following contracts, for the amounts stated had been awarded:-

Primary Transmission Lines	£439,239
Primary Transforming Stations	649,685
Secondary Transforming Stations.	<u>64,182</u> £1,153,106

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42. Central Electricity Board, First Annual Report 1927/28, p.7.
43. Ibid.

By the end of 1928 one hundred towers out of approximately three hundred were completed, and the foundation work on the remaining towers and on the sites for sub-stations was well advanced.<sup>44</sup>

By the end of 1929, by which time the Board was able to report that contracts for all major equipment for the Central Scotland Scheme had been placed, the total value of contracts awarded was £1,379,534 i.e. an increase of £226,428 over the previous year. Moreover, during 1929 four sections of the 132KV transmission lines were commissioned. By 9th May, 1929 the lines connecting the Bonnybridge Power Station (Scottish Central Electric Power Company) and the Clyde's Mill Power Station (C.V.E.P. Company), and Clyde's Mill to the Dalmarnock Power Station (Glasgow Corporation) were completed while the sections joining Dalmarnock with Port Dundas (Glasgow Corporation) and Yoker (C.V.E.P. Company) and the line joining Yoker and Dellingburn (Greenock Corporation) went into service on 4th September, 1929 and 20th November, 1929 respectively. In addition, the associated transforming stations at Bonnybridge, Dalmarnock, Clyde's Mill, Yoker and Dellingburn were also in service and the Port Dundas Station was in use as a

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44. Ibid., p.p.24-25.



switching point. Thus, at 31st December, 1929, at which time the maximum rate of line construction attained on Scottish contracts was five miles of line per week, 244 circuit miles of 132 KV transmission lines were under construction and 47.8 circuit miles were in operation.<sup>45</sup>

During the year 1930 all major works had been completed with the exception of the connections between the transforming stations at Dunfermline and Kirkcaldy and their associated power stations and the transforming station at Dundee. In addition to the construction of the main transmission lines, the Board undertook to erect, under their general powers as authorised undertakers, a lower voltage transmission line from the Dellingburn Generating Station at Greenock to Skelmorlie to provide supplies at Wemys Bay, Inverkip and Skelmorlie. Considerable progress was also made with the standardisation of frequency in the area, and large sections of the grid were already in service, although the full benefits of interconnection and the selective operation of generating stations could not be realised until standardisation was completed.

The Central Scotland Scheme was the first scheme, under the auspices of the Board, to be put into general commission. Despite the fact that the entire scheme was

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45. Central Electricity Board, Second Annual Report 1929, p.p.10-12.

not complete, the official inauguration ceremony took place on 30th April, 1930 when Herbert S. Morrison, the then Minister of Transport, switched on the Portobello generating station, of Edinburgh Corporation, to the 132,000 volt system through the Portobello transforming station of the Board, immediately after his predecessor in office Lieutenant-Colonel Wilfred Ashley M.P. had formally set in motion a new generating set at the Portobello generating station.

The system was basically divided into two rings which were interconnected at Dalmarnock. The eastern ring which included the transforming stations at Clyde's Mill, Motherwell, Portobello and Bonnybridge was put into service on 10th September, 1930 while the western ring which included the transforming stations at Port Dundas, Yoker, Greenock, Saltcoats, Kilmarnock and Paisley was put into service on 23rd September, 1930. In addition, the supply of energy from the hydro-electric works of the Crampian Electric Supply Company at Loch Rannoch was switched onto the grid on 30th November, 1930. This supply was taken at the Board's switching station at Abernethy and was available for use at any point on the system.

Thus, by the 31st December, 1930 some 219 route miles of 132,000 volt transmission lines and eleven 132,000 volt transforming stations were in operation, and the



selected stations at Bonnybridge, Dalmarnock and Kilmarnock and (by agreement) the Dellingburn generating station of Greenock Corporation were being operated under the direction of the Board. Supplies of electricity in bulk were also being given to and by the Board at the Yoker and Motherwell stations of the C.V.E.P. Company, at the Portobello station of Edinburgh Corporation and at the Blackhall station of Paisley Corporation. In addition, the Board were, as indicated above, taking supplies of electricity from the Grampian Electric Supply Company and also from the C.V.E.P. Company at Clyde's Mill and giving supplies to Glasgow Corporation at Port Dundas and to the Ayrshire Electricity Board at Saltcoats.<sup>46</sup>

During 1931 twenty-one route miles of 132,000 volt lines linking up Dundee with Abernethy were completed and two 132,000 volt transforming stations, one at Dunfermline and the other at Dundee, were put into commission, thus completing the system in Central Scotland. Progress of standardisation of frequency was also accelerated with the result that, at the end of 1931, agreements totalling £2,163,000 were granted. Moreover, contracts for the conversion of generating plant were practically all placed, and the modification of equipment used in interconnection and distribution

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46. Central Electricity Board, Third Annual Report 1930, p.p.9-11.

was far advanced. Work was also proceeding on the conversion of consumers' apparatus and many large installations were changed over during 1931, principally in the iron and steel industry.<sup>47,48</sup>

Thus, by 1930 the Weir Report and the 1926 Act had an effect on Scotland and yet the effect must not be over-exaggerated. The basic weakness of the pre-1926 era was recognised in that there were too many small power stations and too many systems and the remedy of fewer and bigger stations, connected by a national grid with standardised frequencies was, at least in retrospect, obviously advantageous. However, the truly effective solution of 'scrap and rebuild' the entire system was too extreme, too costly and much too radical. Consequently, a compromise was effected whereby the grid was superimposed on the existing structure and a reliance

47. Central Electricity Board, Fourth Annual Report 1931, p.9.
48. The Central Electricity Board received from the Electricity Commissioners a South Scotland Electricity Scheme on 8th December, 1930. This scheme covered the counties of Wigtown, Kirkcudbright, Dumfries, Roxburgh, Berwick and Selkirk. The total area was about 4,308 square miles with a population, at the 1921 Census, of 255,954. There were five authorised undertakers within the area, much of which was forest or moorland. Of the six selected stations, five were new water power stations authorised by the Calloway Water Power Act 1929. The scheme was adopted by the Board on 31st July, 1931 and thus falls outside the remit of this research. - Central Electricity Board, Fourth Annual Report 1931, p.p.10-12; Garcke, op.cit. Vol.XXXIV p.281.



placed on rationalising this structure by gradually closing down small inefficient stations. However, in the years after 1926 this did not happen - and it was patently obvious that it did not happen and could not happen in Scotland prior to 1930.<sup>49</sup>

Nevertheless, the Central Electricity Board actively prosecuted its task of building the grid and standardising frequency and, as stated above, Central Scotland was first to feel the effect with its scheme being the first to be adopted in 1927 while on a national basis the first grid was completed by 1933. Moreover, since the Central Electricity Board bought all power from undertakers and resold their requirements back to them, this did centralise planning on a national basis. The grid also aided industrial change and freed industry from reliance on coal since power was now more readily available in the urban industrialised areas and later in the rural districts as well. The construction of the grid also provided employment opportunities at a time when they were required. For example, the Board estimated that, both directly and indirectly, the building of the grid provided about 120,000 jobs. During the late 1920's also British industry was cutting back on investment whereas the electricity supply industry was engaged

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49. The continuing process of private sector development prior to 1930 was discussed in Chapter 6, and local authority development at this time will be discussed in the following section of this chapter.

in heavy capital expenditure. The building of the grid required some 150,000 tons of steel and 12,000 tons of aluminium and many of these orders went to the depressed areas. Most of the aluminium was produced in Scotland, and Scottish shipbuilding yards were engaged in constructing pylons.<sup>50</sup>

In the strictest terms the effect of the 1926 legislation on Scotland in the period before 1930 was indeed limited. As already indicated above, during this period only the Central Scotland Scheme was underway and this was not finally completed until 1931, and, further, it is alleged that full grid trading, with the Board directing the operation of selected stations and buying and selling electricity from and to undertakings, did not begin until January 1933 while the South of Scotland Scheme did not formally inaugurate grid trading until 1937.<sup>51</sup> The Highlands during this period remained outside the pale of Board development with the exception of the Grampian Electric Supply Company which, as indicated above, was switched onto the grid in November 1930. The area covered by the Central Scotland Scheme, 4980 square miles, was relatively small and represented only between 16 and 17 per cent of the total area of Scotland. Such statistics if taken in

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50. Hannah, op.cit. p.p.118-119.

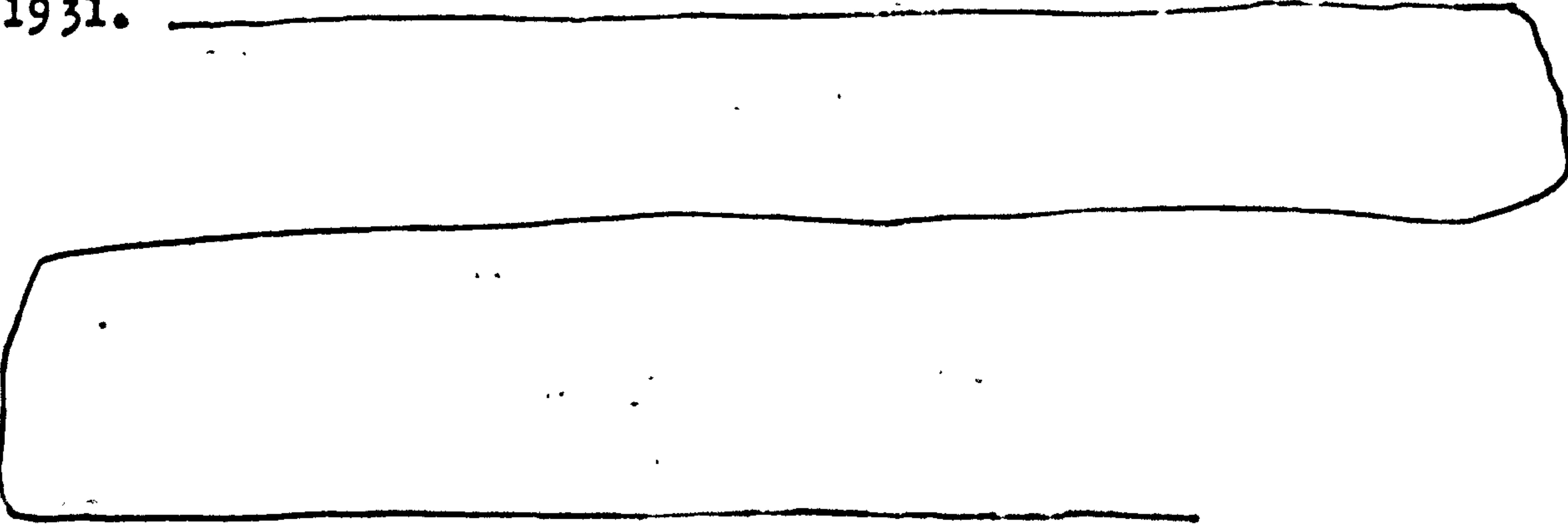
51. Ibid., p.121.



isolation over-simplify the situation, since within the area covered by the scheme there was a population, at the 1931 Census, of 3,785,035 which represented 78.15 per cent of the total Scottish population which was at that year 4,843,000.<sup>52</sup> Moreover, apart from any social and environmental benefits from the scheme, the area involved contained the major industrial and commercial centres of Scotland and thus, despite earlier criticisms of the 1926 Act, the developments that ensued could only but presage good for the future of the Scottish economy after 1930.

(2) Local Authority Development 1915/1916 - 1931.

Important though the 1919' Act and, more especially, the 1926 Act were, they did not inhibit the overall growth of electric supply in Scotland which continued to expand in both the company sector and also in the local authority sector during the period between 1915/1916 and 1931.<sup>53</sup>




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52. Mitchell and Deane, op.cit. p.10.

53. See Chapter 6.

Following upon the pattern established in earlier chapters Appendices 26 to 29 analyse the performance of the local authority sector, on a quinquennial basis between the stated years, on both a national and individual basis and in terms of both 'technical' and 'financial' aspects where such information is available.

Appendix 26 indicates the increase in provision made by the local authority sector to meet expanding demand. In national terms installed capacity rose from 92,752 KW in 1915/1916 to 379,387 KW in 1931 that is, an increase of 309.03 per cent. Throughout this period, and on a quinquennial basis, the growth rate varied and an evident deceleration process took place between 1925/1926 and 1931 when the growth in installed capacity nationally, although remaining positive, was only 10.61 per cent. This may reflect the very depressed nature of the economy in the latter years of that particular period or, indeed, may simply indicate that contemporary demand had been or was being satisfactorily supplied. The increase in installed capacity of 74,760 KW, or 80.60 per cent, between 1915/1916 and 1920/1921 can possibly be explained by the stimulus to the industry in the latter period of these years stemming from the pent-up demand of the war years themselves when,



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as indicated earlier, demand for electricity continued to rise but was artificially stifled by government intervention in the industry; extensions to plant capacity were governed by the need to accelerate the war effort. The quinquennial period ending 1925/1926 undoubtedly also reflected pent-up demand from the war period coupled with a further stimulus arising from the immediate post-war boom when supply was increased in expectation of a continuously healthy economy. Over the entire period from 1915/1916 until 1931 demand was influenced by a continual improvement in social amenities and in the environment, whether in the area of domestic housing supply or simply in public lighting. For example, it has been already noted that Glasgow Corporation requested a supply from the C.V.E.P. Company for its housing schemes at Sandyhills and Knightswood in 1922 and 1923 respectively,<sup>55</sup> and these can hardly be considered isolated examples in a period when the house-building industry was expanding partly due to government intervention in the form, for example, of the Addison Act 1919, the Chamberlain Act 1923 and the Wheatly Act 1924.

Generally, the pattern revealed by the statistics for installed capacity can also be noted in Appendix 27. This provides figures for electricity generated

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54. See Chapter 6, p.p. 223 - 226.  
 55. See Chapter 8, p. 457.

in B.T.U. by Scottish local authorities, although identical percentage increases for either the entire period or for the quinquennial time periods cannot be expected. For example, there must have been a time-lag between the installation of plant and its maximum utilisation and, moreover, as demand was increasingly satisfied, indicated by the increase in generation statistics, a deceleration process in the extension of plant would occur unless there was a renewed surge of demand. In particular, this appears to explain the situation between 1925/1926 and 1931 when, although electricity generated continued to rise substantially by 39.41 per cent, a marked deceleration in installed capacity extensions took place. Between 1915/1916 and 1920/1921 there was, on a national basis, a close correlation between the expansion of plant capacity and electricity generated which probably reflects the restrictions of the war-time emergency. In other words, where an expansion of plant was allowed this was matched by a corresponding increase in demand which had a mutual effect on electricity generated. On the other hand, the period from 1920/1921 to 1925/1926 witnessed a dramatic rise in plant capacity of 104.75 per cent but a much more modest growth of electricity generated of only 47.18 per cent. In this quinquennial period the time-lag explanation seems valid i.e. plant expansion took place in anticipation of



rising demand which did take place but not immediately. Thus, the optimum exploitation of plant capacity, in terms of units generated, must be studied over the decade of the 1920's rather than in each of the quinquennial periods.

The upward trend of activity between 1915/1916 and 1931, and the variances in quinquennial periods, evident in the 'technical appendices' 26 and 27 is reflected in the 'financial appendices' 28 and 29 which examine the authorised loans and also the capital expenditure of Scottish local authorities. This was to be expected. On a national basis, there was an obvious and close correlation between authorised loans and capital expenditure. For example, between 1915/1916 and 1931 authorised loans rose by £15,854,457 or 256.48 per cent and capital expenditure by £15,400,600 or 267.68 per cent. Both authorised loans and capital expenditure nationally, on this quinquennial analysis, 'peaked' at 1925/1926 and subsequently abated between then and 1931. This paralleled the trend, already indicated, with regard to installed capacity. Thus, there was, on a national basis, a general upward level of activity between 1915/1916 and 1925/1926 with the main acceleration beginning probably in 1919 with the end of the war and the releasing of pent-up demand, and further stimulated by the immediate post-war boom. This increase in demand

necessitated an expansion of plant which was reflected in both authorised loans and capital expenditure. From 1925/1926 to 1931 marked deceleration was evident which reflected the situation of existing demand and the deepening of the depression after 1929.

The national figures abstracted from Appendices 26 - 29 must be treated with some caution since even a cursory perusal of the appendices reveals a discontinuity in many of the statistics given for individual local authorities and also obvious omissions. Thus, some explanation is required. By the Edinburgh Boundaries Extension and Tramways Act of 2nd November, 1920 the Burgh of Leith was amalgamated with the City of Edinburgh,<sup>56</sup> and, therefore, the statistics given for Edinburgh for 1925/1926 and 1931 must take into consideration this amalgamation. Moreover, as examined earlier in this chapter, the nature of the Edinburgh undertaking changed when it became part of the Edinburgh and Lothians Electricity District on 16th December, 1924.<sup>57</sup> The statistics for Ayr and Kilmarnock also conclude at 1920/1921 but, again as indicated earlier in this chapter, some continuity was maintained since, together with Ayr County Council, they formed the Ayrshire Electricity Board by an electricity

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56. Garcke, op.cit. Vol.XXIV.

57. Electricity Commissioners, Fifth Annual Report 1924/25, p.14.



special order of 1924 which was retrospective to 15th  
 May, 1923.<sup>58</sup> The figures quoted against the independent  
 burghs of Motherwell and Wishaw are also complicated;  
 these burghs united in 1920 to become a single entity under  
 the Motherwell and Wishaw Amalgamation Act 1920;<sup>59</sup> a com-  
 plete run of figures is not available; and the combined  
 burghs received a bulk supply (quantity unknown) from the  
 C.V.E.P. Company which underestimates the true level of  
 demand within the area of the combined burghs and thus may  
 invalidate the 'technical' statistics given for 1925/1926  
 and 1931.<sup>60</sup> No figure for capital expenditure at Stirling  
 is available for 1915/1916 which undoubtedly means that the  
 national figure for capital expenditure for that year is  
 underestimated. Moreover, the overall statistics for  
 Greenock disguise the fact that from 29th December, 1923  
 the undertaking also provided a supply to Gourock Corpor-  
 ation and from 1925 to part of the burgh of Port Glasgow  
 in addition to the provision of a bulk supply to Paisley.<sup>61</sup>  
 This extension in the area of supply of Greenock is certain-  
 ly not evident in the technical statistics given in  
 Appendices 26 and 27 where negative growth rates in plant  
 installation are recorded for 1925/1926 and 1931 and also  
 for electricity generated between 1920/1921 and 1925/1926.

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58. Garcke, op.cit. VolXXVII.

59. S.R.A. Records of Strain and Robertson, TD83/6/5.

60. Garcke, op.cit. Vol.XXIX

61. Ibid.

Any attempt to interpret the situation at Paisley is fraught with difficulty. Paisley Corporation had its own generating station which was, in fact, interconnected with the undertaking at Greenock and also with the Ayrshire Electricity Board; in addition the burgh received, from 4th December, 1924, a bulk supply from the C.V.E.P. Com-  
<sup>62</sup>pany. Thus, Paisley received a bulk supply from three other undertakings in addition to generating a partial supply of its own.

During this period under examination a number of 'new' local authority undertakings came into existence. For example, in April 1926 the burgh of North Berwick took over the undertaking previously owned by the North Berwick and District Electric Light and Power Company, which itself had been formed on 15th December, 1912, at a purchase price of  
<sup>63</sup>£10,750. However, by 1931 the undertaking at North Berwick was supplied in bulk from the Lothians Electric Power Company which in turn received a bulk supply from Edinburgh Corpor-  
<sup>64</sup>ation. Thus, the financial statistics given in Appendices 28 and 29 are for distribution only. In a similar manner Dalkeith Burgh took over the local undertaking belonging to the Electric Supply Corporation on 1st April, 1926 at a purchase price of £18,000. However, despite the fact that the undertaking had a plant capacity of 185 KW, it was closed

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62. Ibid., Vol. XXXIV.

63. Ibid., Vols. XIX and XXIX.

64. Electricity Commissioners, Tenth Annual Report 1931, p.122. Garcke, op.cit. Vol. XXIV.



down and a supply in bulk was obtained via the Lothians Electric Power Company which purchased the Dalkeith undertaking for an unknown sum in 1929/1930.<sup>65</sup> On 15th August, 1926 the town council of Inverness took over the local undertaking which belonged to the North of Scotland Electric Light and Power Company, but in this instance the undertaking was retained as an autonomous working unit.<sup>66</sup> In 1922 the town council of Dumfries was authorised to purchase the undertaking of the Dumfries Electric Supply Company and to generate and supply electricity within the burghs of Dumfries and Maxwelltown. In accordance with the agreements between the town council and the company and also Maxwelltown Corporation the respective undertakings of the company and the corporation were acquired for £60,000 and £8,000 respectively; the transfer was completed on 9th January, 1923,<sup>67</sup> and at 1931 the town council of Dumfries was still operating the undertaking.

At Alloa the situation was different. This area had been served from 31st December, 1901 by the British Electric Plant Company which supplied electricity in bulk to the local corporation. However, at a date not known, the corporation acquired the undertaking of the company for

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65. Electricity Commissioners, Sixth Annual Report 1926, p.104. Electricity Commissioners, Tenth Annual Report 1931, p.122. Garcke, op.cit. Vol.XXIX.  
 66. Garcke, op.cit. Vol.XXIX.  
 67. Ibid.

£2983.33p and worked it until November 1926 when the town council unanimously adopted a resolution to dispose of the undertaking to the Scottish Central Electric Power Company for £93,860 and accordingly the undertaking was transferred on 1st January, 1927.<sup>68</sup> In view of the apparent level of profit earned by the local authority it is to be regretted that additional information is not available.

During this period also a number of entirely new undertakings were created. Generally, such undertakings were relatively small and established in the more remote and isolated areas and provide evidence of the growing demand for an electricity supply which undoubtedly did much to improve the social environment of the localities affected. The small town of Lossiemouth on the Moray Firth obtained a lighting order in 1913, and a supply began on 14th July, 1914.<sup>69</sup> Evidence of the growing demand for power can be noted from Appendix 26 which indicates that between 1920/1921 and 1931 the installed capacity of the undertaking increased by 206.00 per cent. In the 1920's at least four other small undertakings were established. In 1923 the Corporation of Invergordon was authorised to provide a supply within the burgh and in the Parish of Rosskeen in the County of Ross and Cromarty. A non-statutory supply had been provided here from 1920 but was replaced by the authorised supply in March 1923.<sup>70</sup> In 1923 also Kirkwall,

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68. Ibid., Vols. VI, IX and XXIV.

69. Ibid., Vol. XXXIV.

70. Ibid., Vol. XXIX.



in Orkney, received permission to provide a supply which began on 18th February, 1924.<sup>71</sup> In 1926 the town council of Tobermory, in Argyll, was authorised to provide a supply which began, date unknown, before 1931.<sup>72</sup> Similarly, in 1927 the northerly town of Wick in Caithness received permission to provide a supply which began on 27th September, 1928.<sup>73</sup>

Finally, of the local authorities named in Appendices 26 - 29, five remain viz., Oban, Rothesay, Lanarkshire County Council, Denny and Dunipace and Uphall and Broxburn. The first three of these authorities were long established,<sup>74</sup> and no adequate explanation can be given for either the omission of statistics or the discontinuity of statistics.<sup>75</sup> On the other hand, both Denny and Dunipace and Uphall and Broxburn<sup>76</sup> discontinued their own supply, at dates unknown, and purchased in bulk from the Scottish Central Electric Power Company.

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It is difficult to make any accurate comparison between or among Scottish local authorities because of the discontinuity in statistics and because their characteristics and features varied substantially. However,

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71. Ibid.  
 72. Ibid.  
 73. Ibid., Vol.XXXIV.  
 74. See Chapter 4, p.p. 122 - 123.  
 75. Garcke, op.cit. Vol.XIV.  
 76. Ibid., Vol.XXIX.

continuous statistics are available for Scotland's four major cities of Glasgow, Dundee, Aberdeen and Edinburgh which allow a comparison to be made. Appendices 26 - 29 reveal that, during the period between 1915/1916 and 1931, in each of the aspects examined, these four authorities experienced growth, in both the demand for electricity and in their own ability to satisfy that demand underpinned by financial investment; yet their individual growth rates were far from uniform. Although lack of uniformity could be expected since each city was unique to itself and had its own peculiar industrial, commercial and social framework, the variance in the rates of growth indicated in these appendices is quite marked.

The overall growth rates displayed by these four cities were not obviously totally influenced by population growth expressing itself in the form of increased domestic demand. Table 53 provides evidence of the growth of population in these four cities in the decade between 1921 and 1931 and although there is a margin of difference of 2.40 per cent between Aberdeen, which experienced the greatest relative growth of population, and Edinburgh, which experienced the lowest relative growth rate of population, this is not reflected in apparent demand as indicated by units generated. Edinburgh, for example, in the decade of the 1920's, from an increased installed capacity of 213.68 per cent experienced an increase in units generated of



486.45 per cent while on the other hand the respective figures for Aberdeen were 252.67 per cent and 308.94 per cent. By 1931, of course, Edinburgh was supplying outside its own city limits but nevertheless the difference is substantial. In addition, any attempt to correlate the growth of the population of Glasgow with increased demand, indicated by the statistics for Glasgow, must take into account, as indicated earlier, the fact that several of the city's housing schemes were supplied by the C.V.E.P. Company. Thus, population growth, by itself, is only of limited use at this time in attempting to explain the growth of electricity supply.

TABLE 53      Population Growth of Glasgow, Dundee, Aberdeen and Edinburgh, 1921.- 1931.

	<u>1921</u>	<u>1931</u>	<u>Percentage Increase</u>
Glasgow.	1,034,000	1,088,000	5.22
Dundee.	168,000	176,000	4.76
Aberdeen.	159,000	170,000	6.92
Edinburgh.	420,000	439,000	4.52

Source: S.G.E. Lythe and J. Butt, op.cit. p.245.

Despite the difference in growth rate displayed by the four cities there is little doubt that they, and in particular Glasgow, dominated the local authority electricity supply sector in Scotland throughout the entire period, although there were subtle changes to be observed in their relative positions to one another. In 1915/1916 the total installed capacity of the four cities was 72,867 KW which represented 78.56 per cent of the total installed capacity

of all Scottish local authorities. By 1931 their total installed capacity was 293,460 KW but in percentage terms the position had altered little since this still represented 77.35 per cent of the Scottish local authority total. Similarly, in terms of units generated the four cities generated 141,547,775 units in 1915/1916 representing 79.32 per cent of the Scottish local authority total and by 1931 had achieved a marginal percentage increase by generating 540,933,359 units or 80.04 per cent of the Scottish local authority total. However, such global figures disguise the fact that certain changes had taken place in the respective position of the four cities. In an attempt to clarify the situation, Table 54 has been drawn up which illustrates in percentage terms the installed capacity and units generated by the four cities and is based upon Appendices 26 and 27. Moreover, because of the various omissions and the discontinuity of statistics in these appendices, the analysis provided is based upon the totals for the four cities alone and not presented as a percentage of the Scottish totals. It is hoped that in this way greater accuracy of analysis can be achieved. However, in an endeavour to provide additional information, the individual city totals expressed as a percentage of the known Scottish totals, as given in Appendices 26 and 27, are given in brackets in Table 54.



TABLE 54.

Installed Capacity and Units Generated  
by Glasgow, Dundee, Aberdeen and  
Edinburgh at 1915/1916 and 1931  
expressed in percentage terms.

	<u>Installed Capacity</u>		<u>Units Generated</u>	
	<u>1915/1916</u>	<u>1931</u>	<u>1915/1916</u>	<u>1931</u>
Glasgow	52.99(41.63)	54.69(42.31)	65.20(51.72)	53.51(42.82)
Dundee	15.78(12.40)	11.59(8.96)	10.43(8.28)	9.90(7.92)
Aberdeen	6.50(5.10)	11.93(9.23)	8.26(6.55)	8.84(7.08)
Edinburgh	24.73(19.43)	21.79(16.86)	16.11(12.77)	27.75(22.21)
Total	100.00	100.00	100.00	100.00

Source: Appendices 26 and 27.

From Table 54 it can be noted that throughout the period Glasgow was overwhelmingly the dominant local authority. Between 1915/1916 and 1931 it had increased its superiority in installed capacity from 52.99 per cent to 54.69 per cent, but significantly its share of units generated among these four leading local authorities had fallen from 65.20 per cent to 53.51 per cent and in total Scottish terms it was generating by 1931 only 42.82 per cent of the total units generated by local authorities. Glasgow, experienced, in this period between 1915/1916 and 1931, its greatest increase in units generated, which reflected rising demand, in the quinquennial period between 1915/1916 and 1920/1921 when an increase of 91.65 per cent can be witnessed. In the subsequent quinquennial time periods between 1920/1921 and 1925/1926 and between 1925/1926 and 1931 a deceleration in the rate of increase of 30.33 per cent and 25.56 per cent respectively was evident. Consequent upon this and, perhaps, in

anticipation of ever rising demand installed capacity reached a peak growth of 151.13 per cent between 1920/1921 and 1925/1926 but experienced a negative rate of growth of 3.58 per cent between 1925/1926 and 1931. This deceleration in the expansion of units generated and the ultimate decline in plant capacity may well reflect the gradual deepening of the inter-war depression as the period between 1920/1921 and 1931 evolved. For example, it has been stated that,

"Throughout the 1920's there was never less than 14 per cent of the region's insured work force unemployed, and the worst was still to come ... Between 1929 and 1932 the proportion of insured workers registered as unemployed increased from 12 to 25 per cent in Ayrshire, and from 10 to 50 per cent in Dunbartonshire; in Lanarkshire unemployment doubled from 14 to 33 per cent of the work force, and a similar proportion was out of work in Renfrewshire."<sup>77</sup>

In such a situation Glasgow, obviously, could not escape and thus a deceleration in demand by industrial, commercial and domestic consumers must, at least, partially explain the decline in the rate of growth of units generated and the apparent rationalisation of plant capacity, of a negative

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77. A. Slaven, The Development of the West of Scotland 1750-1960, (London and Boston, 1975), p.184.



3.58 per cent, between 1925/1926 and 1931.

However, between 1915/1916 and 1931 Glasgow did experience an increase in installed capacity and in units generated of 315.67 per cent and 213.61 per cent respectively. It would appear that such growth was only obtained by an intensive and concentrated marketing campaign within Glasgow's statutory area of supply. For example, it has already been stated that the C.V.E.P. Company supplied electricity to the Glasgow Corporation housing schemes. In addition, the Corporation of Glasgow claimed that,

"The area of supply of the Corporation is peculiar in this respect that it is completely surrounded on all sides by the authorised area of the C.V.E.P. Company, and, in addition, on the west and south sides by areas assigned to the Strathclyde Electricity Supply Company, and on the south-east, east and north sides by electricity areas of the Lanarkshire County Council."<sup>78</sup>

Thus, bearing in mind, the economic adversity experienced by this district in the decade of the 1920's and the comparative enforced isolation of the City of Glasgow, bound by regulation within a restricted area of supply, a much broader view should be taken which would indicate that the Corporation of Glasgow had a propensity to expand to meet

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78. S.R.A. Records of Strain and Robertson, TD83/6/5.

increased demand and that, from the evidence of Appendices 28 and 29, it had a willingness to support such developments financially.

From Table 54 it can be observed that after Glasgow, Edinburgh, in terms of local authority electricity supply, was next in importance although in terms of size and scale it was much smaller than the former city. From Appendix 26 it can also be noted that Edinburgh experienced a peak growth of installed capacity between 1920/1921 and 1925/1926 when the rate of growth was 164.64 per cent, but in the other quinquennial periods there was a marked difference between Edinburgh and Glasgow. Between 1915/1916 and 1920/1921 Edinburgh had only a 13.14 per cent increase in installed capacity as against 71.45 per cent for Glasgow which may indicate that Glasgow (and the West of Scotland) benefited much more from the war and the immediate post-war boom than Edinburgh and the East of Scotland generally - a rise of 26.09 per cent in installed capacity at Dundee during this quinquennial period can hardly be considered dramatic. However, the major difference between Edinburgh and Glasgow occurred in the quinquennial period 1925/1926 and 1931 when, as indicated earlier, Glasgow experienced a negative growth rate whereas the installed capacity at Edinburgh rose by 18.53 per cent. Appendix 27 illustrates the fact that at Edinburgh demand, reflected in electricity generated, grew much faster over



the entire period than at any of the other three cities. Admittedly, in the quinquennial period between 1915/1916, and 1920/1921 the growth of electricity generated was low, 12.30 per cent, but in the subsequent quinquennial periods between 1920/1921 and 1925/1926 and 1925/1926 and 1931 electricity generated rose by 211.13 per cent and 88.49 per cent respectively while for the entire period under examination the increase was 558.56 per cent. However, in terms of its comparative position vis-a-vis the other three cities, Edinburgh experienced a relative diminution in its installed capacity from 24.73 per cent to 21.79 per cent of the total but had strengthened its relative position with regard to units generated from 16.11 per cent to 27.75 per cent of the total units generated by the four cities, thereby indicating a greater efficiency in the use of plant.<sup>79</sup> Moreover, Edinburgh's willingness and ability to finance developments during this period was not in doubt. For example, Appendices 28 and 29 indicate that between 1915/1916 and 1931 the authorised loans of the city increased by 350.41 per cent and capital expenditure in the same period rose by 325.45 per cent; in percentage terms these were the greatest financial increases incurred by any of the four major cities.

Edinburgh had, of course, and as indicated earlier, a fairly strong base which undoubtedly provided a degree of

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79. See Table 57, p. 573.

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 stability. Moreover, Edinburgh was not as adversely affected by the inter-war depression as, for example, the West of Scotland. In the inter-war period, when Scotland's traditional heavy industries were languishing, Edinburgh witnessed success in such diverse developments as printing and publishing, rubber manufacture and in the production of a variety of foodstuffs, and consequently it was claimed that,

"By the 1930's ... certain districts, especially those near Edinburgh, which had a high proportion of service and light industries, had unemployment rates as low as in the Midlands."<sup>81</sup>

However, the diversification of the local economy and Edinburgh's importance as a capital city can only partially explain the expansion and development of its electricity supply industry. For example, as indicated earlier in this chapter, in 1920 Edinburgh extended its boundaries to include Leith and Musselburgh which provided an immediate stimulus; by 1920/1921 Leith had an installed capacity of 3,450 KW, was generating over 5 million units and with authorised loans of £174,500 had expended £200,286.<sup>82</sup> More important, and by comparison with Glasgow which was confined in its supply virtually within its own boundaries, by the Edinburgh and Lothians Electricity District Order 1924, the city and

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80. See Chapter 4, p.95

81. R.H. Campbell, Scotland Since 1707, (Oxford, 1967), p.249.

82. See Appendices 26 - 29.



corporation of Edinburgh was placed at the centre of an area not only comprising the city's own boundaries but also including the Counties of Midlothian and East Lothian; moreover, the new generating station of the city at Portobello was to be utilised not only for the requirements of the statutory area of Edinburgh Corporation but also for providing bulk supplies required for the development of the other parts of the District; the other two stations belonging to Edinburgh at Dewar Place and McDonald Road were to be temporarily used.<sup>83</sup>

Under the terms of the Edinburgh and Lothians Electricity Scheme, therefore, Edinburgh was to provide a bulk supply of electricity to the Lothians Electric Power Company and to construct main transmission lines in connection with this supply. In return the company was responsible for the distribution of electricity to districts not included in the areas of supply of existing authorised distributors and also for the construction of secondary transmission lines. Thus, any increase in demand brought about by the activities of the Lothians Electric Power Company reverberated upon the units generated by Edinburgh and ultimately upon installed capacity. By June 1925 Edinburgh erected and equipped a 33,000 volt step-up transformer at the Portobello generating station

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83. Electricity Commissioners, Third and Fourth Annual Reports 1923 and 1924; Garcke, op.cit. Vols. XXIV and XXXIV.

and completed the construction of a 33,000 volt ring main with a circuit of 22.2 miles for delivering the supply at various step-down sub-stations. In addition, by 31st March, 1925 the Lothians Electric Power Company erected and brought into commission five sub-stations in the County of East Lothian and eight sub-stations in the County of Midlothian so that, with the laying of low tension distribution cables, a supply of electricity was provided to an ever-increasing number of small towns and villages.

Furthermore, a bulk supply was given to the Musselburgh and District Electric Light and Traction Company and a partial bulk supply to the Dalkeith undertaking which at that time still belonged to the Electric Supply Corporation Limited.<sup>84</sup>

During the period between 1924 and 1930 the Lothians Electric Power Company steadily expanded its distribution network which had an effect on the demand made upon Edinburgh. The extent of demand can be measured in Table 55 which indicates the units sold by the Corporation of Edinburgh to the company in the years stated.

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84. Electricity Commissioners, Fifth Annual Report 1925, p.99.



**TABLE 55. Units Sold by the Corporation of Edinburgh to the Lothians Electric Power Company, 1926 - 1931**

<u>Year Ending</u>	<u>Units Sold</u>	<u>Percentage Increase</u>
31st March, 1926	3,695,528	-
31st March, 1927	5,702,468	54.31
31st March, 1928	6,396,065	12.16
31st March, 1929	6,766,904	5.80
31st March, 1930	6,435,229	- 4.90
31st March, 1931	8,726,158	35.60

Source: Electricity Commissioners, Sixth - Eleventh Annual Reports.

This table indicates the contribution made by the company to the unit sales of Edinburgh. Company purchases provided an expanding market for the city, with the exception of 1930 when a decrease of 4.90 per cent was recorded. However, the fact that this market increased by 136.13 per cent between 1926 and 1931 made it an important asset to the Corporation of Edinburgh. Much more important, perhaps, was the improvement in social and environmental amenities brought about by the extension of the distribution network. For example, by March 1931 low tension supplies were available in twenty-three towns or districts in East Lothian, while street lighting was installed in thirteen towns or districts, and in Midlothian low tension supplies were available in twenty-two towns or districts, in eleven of which street lighting was either wholly or partially given by electricity. The only other statistical information

available concerning the actual sales of the Lothians Electric Power Company relates to the number of consumers which the company had in both East Lothian and Midlothian, and this has been given in Table 56. The table indicates the steady expansion in the number of consumers; between 1925 and 1930 the number of consumers in East Lothian and Midlothian rose by 175.41 per cent and 631.23 per cent respectively.

TABLE 56. Lothians Electric Power Company,  
Number of Consumers 1925 - 1930.

<u>Year Ending</u>	<u>East Lothian</u>		<u>Midlothian</u>	
	<u>Number of Consumers</u>	<u>Percentage Increase</u>	<u>Number of Consumers</u>	<u>Percentage Increase</u>
31st Dec., 1925	614	-	253	-
31st Dec., 1926	860	40.07	350	38.34
31st Dec., 1927	1,037	20.58	451	28.86
31st Dec., 1928	1,183	14.08	756	67.63
31st Dec., 1929	1,467	24.01	1,401	85.32
31st Dec., 1930	1,691	15.27	1,850	32.05

Source: Electricity Commissioners, Sixth - Eleventh Annual Reports.

An analysis of the remaining two cities of Dundee and Aberdeen provides an interesting comparison. It can be noted from Appendix 26 that during the period from 1915/1916 to 1931 Aberdeen achieved the highest percentage increase in installed capacity, 639.49 per cent, of the four major cities, whereas Dundee only managed an increase of 196.65 per cent which was by far the lowest percentage increase of any of the four cities. . Consequently, this



was reflected in the relative positions of the two cities as indicated in Table 54 (p.560). From Table 54 it can be observed that at 1915/1916 Aberdeen was only responsible for 6.50 per cent of installed capacity and was in fourth place in this table with a much smaller installed capacity than Dundee which at that time was responsible for 15.78 per cent of installed capacity and was in third position. By 1931 the relative positions of Dundee and Aberdeen were reversed. An examination of the quinquennial periods given in Appendix 26 indicates that Aberdeen expanded rapidly between 1915/1916 and 1920/1921; this development accelerated between 1920/1921 and 1925/1926 before decelerating, fairly severely, in the last period. On the other hand, Dundee experienced a much more modest and gradual increase of installed capacity but this upward trend was continued, and only Dundee, of all the four major cities, did not experience a deceleration in the final quinquennial period ending in 1931.

The pattern of demand, indicated by units generated, of both Aberdeen and Dundee, which had reasonably similar populations, requires similar scrutiny. From Appendix 27 it can be noted that at Aberdeen electricity generated experienced a very substantial rise of 98.17 per cent between 1915/1916 and 1920/1921, which approximates fairly closely with the increase in installed capacity during the same period of 110.04 per cent. However, in the quinquennial period ending in 1925/1926, whereas the percentage

increase in installed capacity 'peaked' at 166.57 per cent, electricity generated only rose by 39.74 per cent which illustrates the time-lag between the installation of plant and the maximisation of its use. In the final quinquennial period ending in 1931 there was a resurgence of demand at Aberdeen, and electricity generated rose by 47.68 per cent. However, the relatively low rate of growth of installed capacity indicates that contemporary demand was gradually being satisfied. Dundee, on the other hand, experienced a relative decline in percentage growth rates of electricity generated with percentage rises falling from 76.20 per cent to 47.53 per cent and to 39.49 per cent in the respective quinquennial time periods indicated; this contrasts markedly with the continual growth of installed capacity referred to above. From Table 54 it can be noted that, despite this, at 1931 Dundee still maintained its relative position in the table and was responsible for 9.90 per cent of units generated as against 8.84 per cent for Aberdeen.

It is difficult to be precise about the effect of the inter-war depression on electricity supply at either Aberdeen or Dundee since not even a broad analysis is available concerning the nature and type of consumers involved and, moreover, Appendices 26 to 29 illustrate that growth rates, although varying, were positive and supply increased to meet expanding demand and also a heavy financial commitment was involved. Generally, unemployment was less severe in



Aberdeen than in Dundee, although in Aberdeen the fishing and granite trades were increasingly adversely affected. However, the jute industry of Dundee, which employed about 30,000 people, suffered from the increased competition of Indian mills although it was artificially stimulated in both 1922 and 1927 when Indian manufacturers could not meet demand. On the other hand, both cities must have benefited from the development of newer industries such as paper-making at Aberdeen, printing and publishing at Dundee and the preservation of fruit and vegetables near the Carse of Gowrie at Dundee but, as stated earlier, without an adequate analysis of the structure of demand for electricity at both cities, it is impossible to make an accurate interpretation of such developments.<sup>86</sup>

One method of measuring the efficiency of an undertaking is to calculate the number of units generated by one kilowatt and compare the result over a given period of time. Of course, such a process is not fully accurate, and other factors should be taken into account in consideration of any conclusions. Such factors may include the type and even age of the plant installed, the date of installation i.e. the question of recent installation in anticipation of rising demand, the structure of the market and whether the composition of the market is weighted in favour of domestic

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86. R.H. Campbell, Scotland Since 1707, (Oxford, 1967), p.p. 249, 251 and 271; W.H. Marwick, Scotland in Modern Times, (1964), p.159.

or commercial or industrial demand and also the human factor involved in the operation and administration of the undertaking. It is impossible to take all of those factors, and others, into consideration at this point, but that does not mean that this method of measuring the efficiency of an undertaking based on the units generated by one kilowatt is totally invalid since it does provide a general impression of the development of an undertaking over a stated time period and does allow a comparison to be made with other undertakings over a similar period. Thus, Table 57 provides such figures for the four major cities of Glasgow, Dundee, Aberdeen and Edinburgh at 1915/1916 and 1931 and indicates the percentage increase or decrease involved.

TABLE 57. Units Generated by 1 KW at Glasgow, Dundee, Aberdeen and Edinburgh at 1915/1916 and 1931.

	<u>1915/1916</u>	<u>1931</u>	<u>Percentage Increase (+) / Decrease (-).</u>
Glasgow	2390.11	1803.26	-24.55
Dundee	1284.37	1575.27	+22.65
Aberdeen	2470.74	1366.34	-44.70
Edinburgh	1264.93	2347.23	+85.56

Source: Appendices 26 and 27.

Table 57 indicates that, when the efficiency of the several undertakings is measured by this method, very varied results are given. The efficiency of the two quite disparate cities of Glasgow and Aberdeen appears to have lessened and both appear to be suffering from excess capacity, with



Aberdeen in the less favourable position of the two. It can be argued that the situation at Glasgow reflects the deepening of the inter-war depression and the effect that it had on the more traditional industries in the West of Scotland generally, but from Appendix 26 it is clear that Glasgow had not increased its plant capacity since 1925/1926 and had, in fact, adopted, what appears to have been, a policy of rationalisation so that plant capacity fell by 3.58 per cent in the final quinquennial period. Moreover, it can also be pointed out from Appendix 27 that the percentage increase in units generated by Glasgow in that final quinquennial period was the lowest experienced by any of the four cities. The situation at Aberdeen was, in many ways, more complex since, as indicated earlier, Aberdeen was not so adversely affected by the depression as either Glasgow or the West of Scotland. Thus, the figures for Aberdeen undoubtedly reflect the tremendous increase in plant capacity between 1915/1916 and 1925/1926 which was added to by a further substantial increase in the final quinquennial period. However, further explanation is required. In that final quinquennium units generated rose markedly by 47.68 per cent, an indication of growing demand. Thus, the Aberdeen figure for 1931 (Table 57) may well distort the true position, for plant capacity was possibly extended in anticipation of demand which came to fruition after 1931.

The position of Dundee and Edinburgh, as presented in Table 57, indicates a radically different situation, with these cities experiencing, respectively, a 22.65 per cent and 85.56 per cent increase in efficiency. The position at Edinburgh has already been examined in some detail (see above) and its greater relative efficiency, as measured in Table 57, can be understood, it is believed, by an examination of these earlier comments. Succinctly, Edinburgh's unique position as the capital city, the fact that it was not so adversely affected by the inter-war depression and the fact that it was at the centre of the Edinburgh and Lothians Electricity District were all factors which contributed to the efficiency of the city. Dundee also experienced an increased efficiency, but without adequate detailed information it is not possible to provide a precise interpretation suggesting why this should be. Moreover, Dundee, as an industrial city and one adversely affected by the inter-war depression, might be expected to show a trend similar to that of Glasgow. From Appendix 26 it is clear that Dundee was more cautious in its capital expenditure on plant. Between 1915/1916 and 1920/1921 Dundee increased its plant capacity by only 26.09 per cent (only Edinburgh was lower) and in the quinquennial period ending 1925/1926, the peak years for the other major cities, plant capacity rose by only 51.72 per cent. Therefore, by comparing the percentage increase figures for installed capacity, given in Appendix 26, with the percentage increase



figures for electricity generated, given in Appendix 27, actual demand rather than anticipated demand was a major factor in any decision to increase installed capacity at Dundee. For example, in the quinquennial period ending 1925/1926 electricity generated, indicative of demand, rose by 47.53 per cent at Dundee, which was greater than that experienced by either Glasgow or Aberdeen, and yet installed capacity rose by only 51.72 per cent which was the lowest percentage increase of the four major cities. In the final quinquennial period ending 1931 Dundee experienced a 54.55 per cent increase in installed capacity and although electricity generated rose by only 39.49 per cent in the same period this does not necessarily invalidate the view that at Dundee a policy of caution was adopted and an attempt<sup>made</sup> to equate supply with demand.

Generally, the period was one of expansion as demand rose necessitating an increased supply and additional financial commitment by local authorities. Nationally, the growth of such activities was at its greatest in the quinquennial period ending 1925/1926 and then decelerated, but the rate of individual local authority development varied. Throughout the period there was a trend towards the larger area of supply served by the one large statutory authority, and this process was enhanced by the legislation of 1919 and 1926 but the real benefit of this legislation was not felt until after 1930. During the period a number of new undertakings were established, normally in the more isolated areas, and a number of other undertakings were acquired from private companies but the four major cities - Glasgow,

Dundee, Aberdeen and Edinburgh - continued to dominate the local authority sector. The social and environmental advantages of supply were undoubtedly great and much more widespread both in terms of a local intensive supply and a geographically extensive one. Between 1915/1916 and 1931 the local authority sector expanded electricity supply rapidly, despite the adverse effects of the trade cycle. That expansion, coupled with the 1926 Act, made further growth in the 1930's more certain.



## Chapter 10

### The Scottish Electricity Supply Industry in Wider Context

This chapter has three broad objectives. First, it attempts to relate the development of the industry to the general economic context in which it was established and developed. Thereby it was hoped to assess the effects of booms and slumps more generally in the economy. Secondly, it is designed to compare Scottish experience with that of the rest of the United Kingdom, and in so doing to highlight similarities and differences. Thirdly, some attempt will be made to examine the effect of the industry on the rest of the Scottish economy. Even allowing for the deficiencies in data which undoubtedly exist, it is clear that some generalisations are possible and even more, relevant detail can often be provided to support more speculative hypotheses.

#### (1) The Industry and the Trade Cycle.

From the birth of the industry in 1878 to the outbreak of the First World War fluctuating trends in the economy were an important general influence on its development. During the so-called 'Great Depression' prices and profits were falling and the rate of new capital formation was less

than in previous periods.<sup>1</sup> Locally in Glasgow, for example, the City of Glasgow Bank failed in 1878,<sup>2</sup> "interest rates soared," house construction was greatly reduced<sup>3</sup> and the extent of the crisis caused "many business closures throughout the country."<sup>4</sup> More generally 1879 was a particularly depressed year in that more people were unemployed than in any year between 1855 and 1921.<sup>5</sup> Thus, the discoveries of Swan and Edison in 1878 occurred at an unpropitious time.

The 1880's were relatively depressed despite short-lived upswings, and the early 1890's saw little general revival in business confidence. Economic circumstances improved markedly after 1896 with exports and industrial production expanding, the construction industry responding

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1. It is not the function of this thesis to provide a detailed analysis of the 'Great Depression' but simply to indicate the broad trends against which the electricity supply industry developed. However, a more detailed examination of this period can be found in inter alia:-  
 H.L. Beales, 'The Great Depression in industry and trade, Economic History Review, 1934, 5, Number 1.  
 A.E. Musson, 'The Great Depression in Britain, 1873-1896: a reappraisal, Journal of Economic History, 1959, 19, Number 2.  
 S.B. Saul, The Myth of the Great Depression, 1873-1896, (1969)  
 W.W. Rostow, The British Economy of the 19th Century, (Oxford, 1948).
  2. R.H. Campbell, Scotland Since 1707, (Oxford, 1965), p.p. 146-147.  
 Slaven, op.cit., p.55.
  3. J. Butt, 'Working-class Housing in Glasgow, 1851-1914, p.61 in S.D. Chapman, The History of Working-Class Housing, (Newton Abbot, 1971).
  4. Slaven, op.cit., p.55.
  5. Mitchell and Deane, op.cit., p.p.64-65.



to relatively low interest rates and employment substantially reviving.

Despite the increasing wealth of the nation and the gains made by consumers who retained employment,<sup>6</sup> the electricity supply industry suffered along with others as capital flowed abroad or made its way into domestic sectors likely to show more immediate returns. Yet in the early 1890's the first public undertakings providing a public supply were constructed, but the technology needed to improve, and initial teething difficulties had to be soothed. Thus, experiments conducted by the major cities commonly revealed technical deficiencies<sup>7</sup> and the number of private promotions was limited.<sup>8</sup> Many local authorities were apathetic or guilty of procrastination; occasionally the ruling bodies contained representatives from vested interests notably the gas industry. Moreover, the private sector suffered initially from partial legislation in addition to the more general difficulties associated with raising large capital sums. Even when a company was successfully promoted, the general economic environment was often hostile, and the danger of exploitation by a parent concern and mismanagement was not uncommon. A number of companies were formed with an

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6. Net national income (at 1900 prices).  
 1873 - £857m (£26.6 per head).  
 1896 - £1,627m (£41.1 per head).  
 Retail prices (1850 = 100)  
 1873 - 122; 1896 - 83.  
 Mitchell and Doane, op.cit., p.p. 343 and 367
7. See Chapter 2.  
 8. See Chapter 3.

inadequate capital base and, faced with a downturn in the trade cycle, found it difficult to survive.

As indicated in Chapter 2, private installations, including hydro-electric undertakings, flourished throughout the period of the 'Great Depression' contrary to trends in the provision of a public supply. Some of these installations were purely domestic and undoubtedly being constructed to the orders of wealthy individuals who could often court modernism while ignoring adverse circumstances in the economy. Elsewhere a number of advantages motivated installations. For instance, industries such as iron, steel and engineering recognised the advantages of electric lighting for safety; in the textile industries this new source improved the ability to deal with fine work and in many locations, for example, railway stations, workshops and hotels, safety combined with modernism. Yet these installations had to be funded, and it seems likely that large firms or very profitable small businesses financed them without recourse to external sources, avoiding loans at high rates of interest. From about 1895 private installations declined relatively in importance and there was increased provision of a public supply.

Local authority development of a public electricity supply between 1888 and 1914 was examined in detail in Chapter 4. Scotland's four major cities - Glasgow, Dundee, Aberdeen and Edinburgh - obtained provisional orders in the early 1890's and were providing a public supply by 1895;



Glasgow was the earliest in 1892 and Edingurgh the last in 1895. At Glasgow the groundwork had been laid, of course, by a private public supply undertaking (Muir, Mavor and Coulson) which the local authority purchased in 1892 for £15,000 and following upon this Glasgow had opened its fully operational generating station at Waterloo Street in March/April 1893 at a cost of £ 80,000: the other three cities did not have the benefit of a previous foundation on which to build. Thus, the four cities were constructing and/or opening generating plant during a period of short-term downswing in the economy between 1891 and 1894. This may, in fact, have advantaged these authorities since, although interest rates were still relatively high in the early 1890's, unemployment at a national level was historically high between 1892 and 1895<sup>9</sup> and this may well have ensured low labour costs and competitively low contract tendering. In any event local authority debt was small, and town lighting by this new mode was very attractive.

More significantly, smaller local authorities rarely brought any new electricity supply scheme to fruition before 1895. Many municipal authorities were actively discussing the idea during the early 1890's but few installations were generating power before 1900. Caution and conservatism were prevalent, and indecision and delay common. Moreover, local interests, including businessmen - councillors, were

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9. Mitchell and Deane, op.cit., p.64.

often hostile to the concept of civic or municipal involvement in industry.<sup>10</sup>

Between 1896 and 1904/1905 the economy remained relatively buoyant; capital formation increased;<sup>11</sup> industrial expansion was accompanied by low unemployment;<sup>12</sup> aided by low interest rates construction expanded. From 1905 the domestic economy fell into the doldrums, although there was a resurgence of foreign investment accompanied by a substantial increase in total exports. However, net domestic fixed capital formation fell sharply until 1909, and the recovery afterwards was only gradual except in industries affected by the armaments race. In the Glasgow area between 1907 and 1909 there was a fairly severe depression "which struck Clydeside's heavy engineering and ship-building industries with devastating effect," leading to high unemployment and much social suffering.<sup>13</sup> Nonetheless, the years immediately preceding the First World War found the business community confident and self-satisfied and nowhere more so than in Scotland where in 1914 the Glasgow Herald Trade Review found "The ... impregnable position of ... trade and commerce ... strikingly emphasised."<sup>14</sup>

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10. Passim, Chapter 4, Section 2.

11. Net domestic fixed capital formation (at 1900 prices) 1896 - £88m; 1902 - £158m (pre-1914 peak); 1904 - £147m Mitchell and Deane, op.cit., p. 374.

12. The 6 per cent figure for unemployment in 1904 was the highest since 1894. Mitchell and Deane, op.cit., p.p.64-65.

13. J.H. Treble, Urban Poverty in Britain, (1979), p.90.

14. Quoted in R.H. Campbell, The Rise and Fall of Scottish Industry 1707-1939, (Edinburgh, 1980), p.72.



. There is a reasonably close correlation between the development of the electricity supply industry by the local authority sector and these cycles up to 1914. Broad trends can be discerned from Tables 58 and 59 which are based on Appendices 6,7,8 and 9; these latter analyse the growth of the local authority sector on a quinquennial basis from 1896 to 1915/1916.

**TABLE 58** Actual Increase in Items Specified in Local Authority Sector in Scotland on a quinquennial basis between 1890 and 1915/1916.

	Loans Authorised (£)	Capital Expenditure (£)	Installed Capacity (Kw)	Electricity Generated (B.T.U.)
1890 - 1900/1901	1,081,000	944,735	8,515	8,729,596
1900/1901 - 1905	2,205,777	2,000,056	50,300	35,127,008
1905 - 1910	1,395,700	1,113,832	39,698	50,062,523
1910 - 1915/1916	1,137,001	1,048,702	7,816	81,166,011
1890 - 1915/1916	5,619,478	5,412,476	86,430	175,686,428

Source: Appendices 5, 7, 8 and 9



**TABLE 59** Percentage Increase in Items Specified in Local Authority Sector in Scotland on a quinquennial basis between 1895 and 1915/1916.

	Loans Authorised	Capital Expenditure	Installed Capacity	Electricity Generated
1895 - 1900/1901	293.6	277.1	136.3	316.0
1900/1901 - 1905	152.9	153.6	202.8	305.7
1905 - 1910	38.3	43.2	37.8	108.7
1910 - 1915/1916	22.5	22.3	9.2	83.4
1895 - 1915/1916	1,507.6	1,587.4	1,367.1	6,359.7

Source: Appendices 5, 7, 8 and 9

From the low base revealed in these tables for loans authorised and capital expenditure there were remarkable increases which, however, peak in the quinquennium up to 1905. After 1905 both figures show a marked decline, no doubt reflecting the upward trend of interest rates which also adversely affected residential construction and almost certainly influenced local authority borrowing decisions. Installed capacity increased sharply to 1905, and less rapidly in the following quinquennium, falling markedly after 1910. This pattern contrasts sharply with the figures for electricity generated, although there was some slackening in the rate of growth between 1905 and 1910. Undoubtedly technical teething problems were being conquered, and this was reflected in the more efficient operation of plant and the more economic generation of electricity.

Methodological problems abound in making any assessment of the growth of the private sector.<sup>15</sup> However, Table 9 (p.226) records company flotations. Only three were formed before 1895; this suggests that in the latter years of the 'Great Depression' businessmen were not disposed towards investment in the electricity supply industry. Yet it should be borne in mind that legislation protecting the local authorities was liberalised by the Act of 1888<sup>16</sup> and hostility towards private sector development of a public supply was probably at its apogee. Between 1896 and 1905,

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15. Passim, Chapter 6.

16. See introduction to Chapter 4.



during the general upswing in the economy, eleven new companies, including the four regional power firms, were registered;<sup>17</sup> the latter, of course, had been allowed only after Parliament had taken account of the recommendations of the Cross Committee Report of 1898.<sup>18</sup> A further thirteen companies were registered between 1906 and 1914, seven before 1910. Thus, although there was no spectacular take-off, the evidence does suggest that the private electricity supply industry did develop at a faster rate than the general economic climate might lead one to suppose.

Despite difficulties arising from inadequate data,<sup>19</sup> capital formation statistics were collated and are summarised in Table 10 (p.238). An examination of that table reveals that there was a sharp increase in authorised and issued capital from the admittedly low base of 1896 until 1905. After 1905 the increase in authorised capital was relatively slight compared with the rise in issued capital.<sup>20</sup> Additional expenditure upon plant and equipment was being financed by a range of choices including the preference for issued capital which allowed firms to avoid onerous bank charges in a period of rising interest rates.<sup>21</sup>

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17. For evidence of registration of individual companies see Appendix 17.
18. See Chapter 6, Section 1.
19. See Appendices 17 and 18.
20. Between 1896 and 1905 authorised capital increased by £2,801,000  
Between 1896 and 1905 issued capital increased by £684,964.  
Between 1905 and 1915/1916 authorised capital increased by £274,600  
Between 1905 and 1915/1916 issued capital increased by £802,189.
21. Passim, Chapter 6, Section 5 and Chapter 8, Section 3.

. During the First World War the importance of the electricity supply industry was recognised by employers and government alike, but it was not a period favourable to company flotation for only one relatively minor company was formed.<sup>22</sup> Moreover, in the quinquennial period ending in 1920 only two additional companies were formed viz., the small private undertaking at Symington and the Dunblane and District Electric Supply Company; the latter company was formed in 1920 but did not provide a public supply until 1925 when bulk power was purchased from the Scottish Central Electric Power Company.<sup>23</sup> Nevertheless, an examination of the total figures given in Appendices 17 and 18 indicates that capital formation in the private sector continued to expand in the period to 1920. Authorised capital rose by £1,037,500 (32.2 per cent) but of that figure the C.V.E.P. Company was responsible for £1m which was not issued until after 1920. Indeed during this period of high interest rates this company relied on overdraft facilities and government loans to finance its activities.<sup>24</sup> In this period issued capital rose by £492,430 but as Appendix 18 indicates two companies (the Fife Electric Power Company and the Scottish Central Electric Power Company) were responsible for £404,090 or 82.1 per cent of the total. Thus,

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22. See Chapter 6, Section 3.

23. Ibid.

24. See Chapter 8, Section 3.



overall the war years and their immediate aftermath down to 1920 create an impression of consolidation rather than expansion, and stability rather than flurried activity and this was to be expected; high interest rates, scarcity of capital goods, indirect government control leading to requirements for approval and the granting of priority certificates and also scarcity of labour were prejudicial to rapid growth. In addition, of course, this period witnessed the passing of the Electricity (Supply) Act 1919, and in the prelude to this legislation a number of official committees had been established to investigate the industry. Several of these strongly recommended state intervention, including the compulsory purchase of generating stations, and consequently this atmosphere was unsettling and not conducive to new company flotation nor to massive investment in the industry.<sup>25</sup>

Local authorities probably experienced difficulties similar to those of private industry during the war period since both their activities were governed by the national emergency. This is not entirely evident from a study of Appendices 26-29 which analyse the growth of the industry in the public sector on a quinquennial basis between 1915/1916 and 1931. Appendices 26 and 27 reveal that in the quinquennial period ending 1920/1921 installed capacity

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25 State involvement in the industry during the war and post-war period was fully discussed in Chapter 9, Section 1.

and units generated rose substantially, and Appendices 28 and 29 indicate that this was accompanied by an increase in authorised loans and in capital expenditure. However, it seems reasonable to conclude that the main period of growth occurred in the latter years when it was stimulated by pent-up demand from the war period and further fuelled by the immediate post-war boom.

Nonetheless, such an interpretation requires qualification. In industrial sectors, particularly those relating to war industries, the war years witnessed an increasing demand for electrical motors and generating plant and the progressive application of electricity in steel furnaces and the welding processes of engineering trades which generally increased demand for an electricity supply, and more widely "throughout the country the numerous military camps required electric lighting."<sup>26</sup> Thus, the financial and technical increases noted may have been more evenly spread throughout this quinquennial period.

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26. W.R. Scott and J. Cunnison, The Industries of the Clyde Valley During the War, (Oxford, 1924), p.118.



TABLE 60 Actual Increase in Items Specified in Local Authority Sector in Scotland on a Quinquennial Basis between 1920/1921 and 1931.

	Loans Authorised (£)	Capital Expenditure (£)	Installed Capacity (KW)	Electricity Generated (B.T.U.)
1920/1921-1925/1926	7,883,261	7,535,593 <sup>1</sup>	175,477	155,402,016
1925/1926 - 1931	3,973,674	4,511,181	36,398	191,066,208
1920/1921 - 1931	12,046,774	211,875	346,468,224	

Source: Appendices 26, 27, 28 and 29

1. This figure has been taken to the nearest £.

**TABLE 61** Percentage Increase in Items Specified in Local Authority Sector in Scotland on a quinquennial basis between 1920/1921 and 1931.

	Loans Authorised	Capital Expenditure	Installed Capacity	Electricity Generated
1920/1921-1925/1925	77.5	82.7	104.8	27.2
1925/1925 - 1931	22.0	27.1	10.6	39.4
1920/1921 - 1931	116.5	132.3	122.5	105.2

Source: Appendices 26, 27, 28 and 29



As Tables 60 and 61 reveal the decade of the 1920's was one of positive expansion for the local authority sector. However, there was very clearly a watershed after 1925 in regard to loans authorised, capital expenditure and installed capacity. This deceleration up to 1931 was not so apparent in terms of electricity generated, although Table 61 shows that there was retardation when percentage increases are taken into account. Before 1925 the effect of removing war-time restrictions, the stimulus from the post-war boom and the release of pent-up demand stimulated investment and expenditure but, of course, there was a time-lag between installation of plant and its optimum utilisation (as indicated by units generated) and this may partly explain the differences in the last column of both Table 60 and Table 61. Borrowing and expenditure were almost certainly affected by the down-turn in the national economy and the gold standard policies which were pursued.<sup>27</sup> Moreover, downswings in particular sectors and stagnation in others undoubtedly affected sales both to industrial and domestic consumers, and this is most clearly mirrored in the decline in installed capacity.

Adjustment to higher interest rates and/or declining markets often had to occur when plant capacity had been extended and financial provision made. In the late 1920's Scotland with its traditional emphasis on heavy industry

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27. For a more detailed analysis of government economic and financial policies in the 1920's see, S. Pollard, The Development of the British Economy 1914-1967, (1970), p.p.214-223.

could not hope to escape from the effects of deepening depression. Installed capacity which grew by just over 10 per cent in the quinquennium ending 1931 reflected the earlier over-confidence which made it possible for slight additions to plant to provide an increase of almost 40 per cent in units generated. During the 1920's local government provided greater electrical services and in industry there was a shift to electrical power to achieve cost reductions.<sup>28</sup> Wherever possible private firms and local authorities attempted in these periods of high interest rates to finance expansion out of current revenue and additional share subscriptions.

A direct comparison between the relative development of the local authority sector and that of private companies is difficult to make. For example, the deficiency of data concerning units generated/sold, installed capacity and capital expenditure of the latter sector has already been noted in Chapter 6 and can be readily observed from even a cursory perusal of Appendices 19 and 20. However, using a different source and covering only one aspect (unit sales), an analysis of Table 75 (p. 638) in Section (3) of this Chapter emphasises the faster progress made by private companies between 1924 and 1930; the most significant aspect of company growth between these years was the increasing importance of industrial supply, followed by the expanding

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28. The points are discussed in greater detail in Section 3 of this Chapter.



provision of bulk supply to authorised distributors. Thus, the decade of the 1920's, one normally associated with depression, was a time of expanding markets for the company sector. This increase in sales was accompanied by an almost 40 per cent rise in the number of companies operating in Scotland<sup>29</sup> and by quite spectacular growth in the amounts of both authorised and issued capital; between 1920/1921 and 1931 authorised capital increased by £7,678,900 (180.1 per cent) and issued capital by £7,551,350 (377.5 per cent).<sup>30</sup> Thus, the decade of the 1920's was one of expansion both for new companies and for those longer established. Moreover, on the basis of capital actually issued the final five years ending in 1931 appear the most active since, of the overall decennial increase of £7,551,350, 72.6 per cent was issued in that period i.e. £5,480,890. This was to be expected since, in a period of high interest rates, companies naturally looked to their shareholders to finance their activities. However, perhaps surprisingly in this period of high interest rates, evidence has been found of at least one company issuing ordinary shares above par and having them apparently successfully publicly.

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29. The record of company flotations was analysed in detail in Chapter 6, Section 3.

30. See Appendices 17 and 18.

subscribed.<sup>31</sup>

It would be fair to conclude that correlation between the trade cycle and activity in the electricity supply industry, although often close, is never simple. The industry grew substantially from the middle of the 1890's in good times and bad. The former provided greater opportunities for profit and expansion of installed capacity, and the latter the possibility of lower labour costs and advantageous construction contracts. Nonetheless, in down-turns it was natural to consolidate, since this still allowed greater output without major additions to investment or loan capital. In the 1930's, as the Galloway scheme indicates, the government had learned to see such contracts as public works. Generally, that attitude did not prevail before 1931.

(2) Scottish Experience Compared with the Rest of the United Kingdom.

This thesis has chronicled the growth of the Scottish electricity supply industry in both <sup>the</sup> public and private sector before 1930. Yet before 1907, when the first national Census of Production was taken,<sup>32</sup> full evidence which allows

31. The Scottish Power Company issued 500,000 Ordinary Shares of £1 each at £1.20 per share in July 1927; 600,000 similar shares at £1.30 per share in June 1928; 1,000,000 similar shares at £1.40 per share in July 1929 and a further 650,000 shares at £1.35 per share in April 1930. See Chapter 7, Section 1.
32. Final Report on the First Census of Production 1907, Cmd. 6320, 1907



an assessment of overall Scottish development - or for that matter comparisons to be made with the rest of the United Kingdom - is lacking. In this section use has been made of the various censuses of production to chart progress in the period under review.<sup>33</sup>

TABLE 62

Average Number of Persons Employed in the  
Scottish Electricity Supply Industry in  
the Years Stated.

Year	Average Number of Persons Employed. <sup>1</sup>						
	Companies			Local Authorities			Overall Total
	Number	% <sup>2</sup>	% <sup>3</sup>	Number	% <sup>2</sup>	% <sup>3</sup>	Number
1907	318	14	-	1,972	86	-	2,290
1924	1,552	30	88	3,631	70	84	5,183
1930	1,996	33	29	4,045	67	11	6,041

Source: Final Report on the First Census of Production 1907, p.889  
Final Report on the Third Census of Production 1924, Part 5, p.p.345, 350.  
Final Report on the Fourth Census of Production 1930, Part 4, p.p.500, 504.

1. In Table 62 all percentage figures have been taken to the nearest whole number.
2. Expressed as a percentage of the overall Scottish total.
3. Percentage increase over previous year.

Details relating to employment in the industry at the census years are contained in Table 62. In 1907 the private sector was small by comparison with the public sector but the former grew in importance and by 1930 was employing about one-third of those in the industry.

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33. Final Report on the Third Census of Production, 1924, H.M.S.O. 1924.  
Final Report on the Fourth Census of Production, 1930, H.M.S.O. 1930.

Although employment in local authority undertakings more than doubled between 1907 and 1950 the greatest rate of growth clearly occurred in the private sector. This may be partly explained by the fact that in 1907 company activity was still in its infancy whereas the local authority sector was relatively well-established.<sup>34</sup> After 1907 local authorities tended to be confined within their own boundaries - Glasgow complained of this<sup>35</sup> - and, therefore, their opportunities to provide additional employment were more limited. On the other hand, private companies continued to be promoted, and the larger power companies in consequence of statutes had sizeable areas of supply which required continual construction and maintenance involving the employment of additional labour.<sup>36</sup>

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34. For the private sector see Chapter 6 and for the local authority sector see Chapter 4.  
35. See Chapter 9, Section 1.  
36. See Chapter 8.



TABLE 63

Analysis of the Average Number of Persons  
Employed by Companies in the Scottish  
Electricity Supply Industry in the  
Years Stated<sup>1</sup>

Year	Operatives			Administrative, Technical etc.			Overall Total	
	Number	% <sup>2</sup>	% <sup>3</sup>	Number	% <sup>2</sup>	% <sup>3</sup>	Number	% <sup>3</sup>
1907	265	83	-	53	17	-	318	-
1924	1,314	85	396	238	15	349	1,552	388
1930	1,558	78	19	438	22	84	1,996	29

Source: Final Report on the First Census of Production  
1907, p.889.  
Final Report on the Third Census of Production  
1924, Part 5, p.p.345, 340.  
Final Report on the Fourth Census of Production  
1930, Part 4, p.p.500, 504.

1. In Table 63 all percentage figures have been taken to the nearest whole number.
2. Expressed as a percentage of the overall total.
3. Percentage increase over previous year.

TABLE 64

Analysis of the Average Number of Persons  
Employed by Local Authorities in the  
Scottish Electricity Supply Industry in  
the Years Stated.

Year	Operativon			Administrative, Technical etc.			Overall Total	
	Number	% <sup>2</sup>	% <sup>3</sup>	Number	% <sup>2</sup>	% <sup>3</sup>	Number	% <sup>3</sup>
1907	1,728	88	-	244	12	-	1,972	-
1924	2,998	83	74	633	17	159	3,631	84
1930	3,298	82	10	747	18	.18	4,045	11

Source: Final Report on the First Census of Production  
1907, p.889.  
Final Report on the Third Census of Production  
1924, Part 5, p.p.345, 350.  
Final Report on the Fourth Census of Production  
1930, Part 4, p.p.500, 504.

1. In Table 64 all percentage figures have been taken to the nearest whole number.
2. Expressed as a percentage of the overall total.
3. Percentage increase over previous year.



Tables 63 and 64 provide information, albeit somewhat crude, on the composition of the labour force in both the private and public sectors. A comparative examination of the total rises in the respective labour forces between 1907 and 1924 is indicative of the expansion of the industry generally, but the detailed break-down of the figures given in these tables emphasises the faster rate of growth achieved by the companies and noted earlier. The figures also, apparently, highlight the growing bureaucracy in the local authority sector between 1907 and 1924 when, as a proportion of the total labour force, the number of administrative and technical staff rose by 5 per cent whereas the company sector experienced a decline of 2 per cent. Differences in the nature of the market for public and private suppliers may well account for changes in the number of administrative staff required to service them. For instance, the extension of street lighting - an important local government service - obviously increased the demand for maintenance staff and for their supervisors.

In the period between 1924 and 1930, in some ways a reverse process took place; there was a slowing down in the rate of growth of employment. Moreover, in both sectors there was an increase in the proportion of administrative staff but in the private sector the increase was of the order of 7 per cent whereas in the local authority sector it was only 1 per cent. It is difficult to make adequate comment on these figures. They may reflect

increasing technical sophistication requiring additional technical staff and in the private sector the progressive development of hydro-electric power in the 1920's.<sup>37</sup>

Equally, of course, it might well have been the case that as generating stations reached greater production, more administrative staff were required, for example in marketing, with relatively fewer operatives required in production.

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37. See Chapter 5, Section 2,



TABLE 65 Comparative Analysis of the Average Number of Persons (Including operatives and administrative, technical and clerical) employed in Scotland, England and Wales and Great Britain in Electricity Undertakings in the years stated.

Year	Scotland		England and Wales		Great Britain	
	Number	Percentage of Total	Number	Percentage of Total	Total Number	Percentage Total
1907	2,290	12.4	19,702	89.6	21,992	100.00
1924	5,133	10.0	45,607	90.0	51,790	100.00
1930	5,071	7.5	74,130	92.5	80,171	100.00

Source: Final Report on the First Census of Production 1907, p. 339  
 Final Report on the Third Census of Production 1924, Part 5, p.p. 345, 350  
 Final Report on the Fourth Census of Production 1930, Part 4, p.p. 500, 504

Comparisons between England and Wales and Scotland can be made from Table 65. In both regions of mainland Britain the total number employed rose substantially between 1907 and 1930, and between 1907 and 1924 their relative positions as employers remained virtually unchanged. After 1924 a significant change occurred. During that period employment in Scotland rose by only 858 persons whereas in England and Wales the number of persons employed increased by 27,523. Thus, as Table 65 indicates, by 1930 Scotland only accounted for 7.5 per cent of direct employment in mainland Britain and England and Wales now accounted for 92.5 per cent of the total number.

The growth in monetary value of electricity supplied by undertakings is another method by which the development of the electricity supply industry can be measured. However, there are obvious difficulties which detract from total accuracy. Global figures ignore differences in rate charges made by individual undertakings and differences in rates charged to different consumers by an undertaking.<sup>38</sup> Moreover, a comparative assessment of monetary value of electricity supplied over a fairly lengthy time period tends to ignore changes in the very value of money itself. Nevertheless, such a study, outlined in Tables 66 and 67, is a useful tool for measuring growth and achievement in this industry.

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38. The example of the pricing policy of the C.V.E.P. Company has already been examined in detail, see Chapter 8, Section 6.



TABLE 65  
Total Monetary Value of Electricity Supplied by Companies and Local  
Authorities in Scotland in the years stated, 1

Year	Monetary Value of Electricity Supplied		Local Authorities		Total	
	Companies	Local Authorities	Companies	Local Authorities	Companies	Local Authorities
	Amount (£000)	Percentage of Total	Amount (£000)	Percentage of Total	Amount (£000)	Percentage
1907	79	3.1	763	90.6	842	100.00
1924	1,259	31.5	2,731	68.5	3,990	100.00
1930	1,051	32.5	3,426	67.5	4,477	100.00

Source: Final Report of the First Census of Production 1907, p. 883

Final Report of the Third Census of Production 1924, Part 5, p.p. 344, 349

Final Report of the Fourth Census of Production 1930, Part 4, p.p. 498, 503

1. The figures in the Table do not include Work for Consumers i.e. Work on Consuming Devices beyond the meter (current consuming apparatus, fittings and wirings on consumers' premises) and work on Public Lamps.

Table 66 provides information on the total monetary value of electricity supplied by both companies and local authorities in Scotland and also a total Scottish figure. This table in many respects provides no great surprises. In 1907 company development was in its infancy, and electricity supply was dominated by the local authority sector which supplied 90.6 per cent of all electricity sold. In simple money terms the latter sold £763,000 of electricity and the former £79,000. By 1924, however, the situation had altered substantially, and the rapid company development, noted earlier,<sup>39</sup> meant that by that date the companies had 31.5 per cent of the market valued at £1,259,000. Nevertheless, local authorities continued to dominate and still controlled 68.5 per cent of total sales valued at £2,734,000. There was no open competition between companies and local authorities for the same market since areas of supply for the major power companies were defined by statute. However, there can be no doubt that the market potential provided by industry was greater than that available to the local authorities. Outside the major cities, where much of Scotland's heavy industry was based, companies supplied power to industrial users on an increasing scale. What was happening was an increase in the production of electricity for a variety of consumers some of whom were in local authority areas and

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39. See Table 9, p.226.



most of whom were not. Thus, it is not a question of explaining the expansion of the private sector in terms of superior marketing strategy or greater efficiency than the local authority undertakings could deploy.

From 1924 to 1930 progress continued, but the pace had lessened and was more evenly spread between both sectors. By 1930 the monetary value of electricity supplied by companies had increased by £392,000 to £1,651,000 and they had marginally increased their position to 32.5 per cent. In contrast, local authorities increased the monetary value of their supply by £692,000 to £3,426,000, although their overall dominance had marginally declined to 67.5 per cent. The rate of growth had obviously slackened. Undoubtedly both sectors were affected by the downturn in the economy and, in particular, by the failure of Scotland to attract light engineering firms. However, between 1907 and 1930 the monetary value of electricity supplied by companies, starting from an admittedly low base, rose by almost 2000 per cent and that of the local authorities by a more modest 350 per cent. Nationally this meant that within Scotland, from 1907 to 1930, the monetary value of electricity supplied had risen by just over 500 per cent.

**TABIE 67** Comparative Analysis of Monetary Value of Electricity Sold by Electricity Undertakings in Scotland, England and Wales and Great Britain in the years stated.

Year	Scotland		England and Wales		Great Britain	
	Amount (£000)	Percentage of Total	Amount (£000)	Percentage of Total	Total (£000)	Total Percentage
1907	842	9.6	7,893	90.4	8,735	100.00
1924	3,993	9.6	37,723	90.4	41,716	100.00
1930	5,077	8.3	56,341	91.7	61,418	100.00

Source: Final Report on the First Census of Production 1907, p.333  
Final Report on the Third Census of Production 1924, Part 5, p.p. 344, 349  
Final Report on the Fourth Census of Production 1930, Part 4, p.p.493, 503

1. The figures in the Table do not include Work for Consumers i.e. Work on Consuming Devices beyond the meter (current consuming apparatus, fittings and wirings on consumers' premises) and Work on Public Lamps.



Table 67 attempts to measure, with regard to the monetary value of electricity sold, the progress of Scotland in the context of mainland Britain. At 1907 the separate Scottish industry was responsible for 9.6 per cent and that of England and Wales for 90.4 per cent of the monetary value of electricity sold i.e. £842,000 and £7,893,000 respectively. In percentage terms these figures are reasonably similar to those already noted at 1907 for employment in Table 65 (p.604). Taking account of the respective size of markets these figures are not entirely unexpected and suggest that progress in Scotland was relatively close to that achieved in England and Wales. Between 1907 and 1924 this parallel development continued. In that year Scotland was again responsible for 9.6 per cent, or £3,993,000, of total British sales and England and Wales 90.4 per cent or £37,748,000. For Scotland the 1924 monetary figures represented an increase over 1907 of 374.2 per cent and for England and Wales a slightly larger increase of 378.3 per cent. The disparity in the respective rates of growth - just over 4 per cent - was not significant.

Between 1924 and 1930 progress was severely retarded, and Scotland suffered more than England and Wales, although both continued to show positive growth rates. By 1930 the Scottish market, relative to that of England and Wales, had fallen to 8.3 per cent despite the fact that the monetary value of electricity sold had increased by

£1,084,000 to £5,077,000. Correspondingly, the market in England and Wales was now responsible for 91.7 per cent of the total sold in mainland Britain i.e., an increase of £18,593,000 to £56,341,000. Indeed in this period between 1924 and 1930 the value of electricity sold in Scotland grew by 27.2 per cent and in England and Wales by 49.3 per cent.

The reasons for the disparity in growth in each of the time periods examined, but particularly in the latter period between 1924 and 1930, are difficult to determine, and compounded by the problems faced when dealing with the monetary value of sales of this kind. For example, there was no common or national pricing policy, different tariffs were charged by individual concerns and within undertakings customers were rated differently. Nonetheless, from the evidence of Table 68 (p.61<sup>2</sup>), it is possible to say that sales per head of population grew more in Scotland than in England and Wales between 1907 and 1924 and then more slowly; it is to be noted that in the latter period sales continued to expand and that population fell. Of course, the effects of the downswing in the economy in the later 1920's cannot be ignored in explaining the deceleration in growth and the greater severity by which the Scottish economy generally was affected, because of its particular industrial structure, must be a contributory factor in explaining such dis-similarity after 1924. Nevertheless, between 1907 and 1930 Scotland did achieve a substantial measure of growth in the monetary value of electricity sold of almost 503 per cent. England and Wales



experienced a higher rate of growth of nearly 614 per cent but, as indicated, this disparity only became glaringly obvious after 1924 and, therefore, the Scottish performance must be judged with this in mind.

TABLE 68

Sales per Head of Population in Scotland and England and Wales in the Years Stated.

Year	Scotland			England and Wales		
	Total Sales (£'000)	Population ('000)	Sales per Head (£)	Total Sales (£'000)	Population ('000)	Sales per Head (£)
1907	842	4,650	0.18	7,893	34,699	0.23
1924	3,993	4,862	0.82	37,748	38,795	0.97
1930	5,077	4,828	1.05	56,341	39,801	1.42

Source: Table 67. Mitchell and Deane, op.cit., p10.

The growth of the Scottish electricity supply industry between 1907 and 1930 in terms of employment and in the increase in the monetary value of electricity supplied was accompanied by technical growth in terms of the installed capacity of prime movers and electric generators and, fortunately, statistics for 1907, 1924 and 1930 are available and given in Tables 69 and 70 (see p.p.613, and 614). These tables further analyse total Scottish figures for the installed capacity of both ordinary prime movers and electric generators between companies and local authorities and, for 1924 and 1930, provide additional analysis of installed capacity ordinarily in use and that which was either in reserve or idle,

**TABLE 69** Total Capacity of Prime Movers, including Reciprocating Steam Engines, Steam Turbines, Gas Engines, Petrol and Light Oil Engines, Heavy Oil Engines and Water Power Installed in the Scottish Electricity Supply Industry in the years stated.

	Ordinarily in use		In Reserve or Idle		Total Installed	
	h.p.	%	h.p.	%	h.p.	%
1907 <sup>1</sup>						
Companies					24,991	16.9
Local Authorities					122,667	83.1
Total					147,658	100.0
1924						
Companies	110,394	23.0 <sup>2</sup>	55,461	39.1	165,855	26.7
Local Authorities	369,032	77.0 <sup>3</sup>	86,267	60.9	455,299	73.3
Total	479,426	100.0	141,728	100.0	621,154	100.0
1930						
Companies	290,800	32.7	60,044	51.6	350,844	34.9
Local Authorities	598,634	67.3	56,247	48.4	654,881	65.1
Total	889,434	100.0	116,291	100.0	1,005,725	100.0

Source: Final Report of First Census of Production 1907, p.p.886,890  
 Final Report of Third Census of Production 1924, Part 5,  
 p.p.347, 352  
 Final Report of Fourth Census of Production 1930, Part 4,  
 p.p. 501,505/6

1. Only total installed capacity figures are available for 1907.
2. Actual percentage figure 23.03
3. Actual percentage figure 76.97



**TABLE 70** Total Capacity of Electric Generators Driven by Reciprocating Steam Engines, Steam Turbines, Gas Engines, Petrol and Light Oil Engines, Heavy Oil Engines and Water Power Installed in the Scottish Electricity Supply Industry in the years stated.

	Ordinarily in Use		In Reserve or Idle		Total Installed	
	KW	%	KW	%	KW	%
1907 <sup>1</sup> Companies					17,296	17.2
Local Authorities					83,242	82.8
Total					100,538	100.0
1924 Companies	77,940	23.2	40,176	39.5	118,116	27.0 <sup>2</sup>
Local Authorities	257,595	76.8	61,579	60.5	319,174	73.0 <sup>3</sup>
Total	335,535	100.0	101,755	100.0	437,290	100.0
1930 Companies	214,450	33.4	43,792	50.6	258,242	35.4
Local Authorities	428,378	66.6	42,797	49.4	471,175	64.6
Total	642,828	100.0	86,589	100.0	729,417	100.0

Source: Final Report of First Census of Production 1907, p.p.886,890  
 Final Report of Third Census of Production 1924, Part 5,  
 p.p.347, 352  
 Final Report of Fourth Census of Production 1930, Part 4,  
 p.p.501,505/6

1. Only total installed capacity figures are available for 1907
2. Actual percentage figure 27.01
3. Actual percentage figure 72.99

From Table 69 it can be observed that at 1907 the small number of private companies in operation had almost 16.9 per cent, or 24,971h.p., of the total Scottish installed capacity of prime movers whereas the local authorities with their longer association with the industry had just over 83 per cent. The upsurge of development in the private sector between 1907 and 1924 is evident from the fact that in the latter year it now controlled 26.7 per cent (165,855h.p.) whereas <sup>the</sup> local authority position had declined and it now controlled 73.3 per cent (455,299h.p.). Thus, in the period between 1907 and 1924 the private sector, with regard to installed capacity of prime movers, grew at a much faster rate than the local authority sector.

Between 1924 and 1930 the private sector continued to maintain the momentum and expand faster than the local authority sector, although the latter remained by far the larger in overall terms. By 1930 private companies held 34.9 per cent (350,844h.p.) of the total capacity of prime movers installed in Scotland; the 1930 figure represents an increase of 111.5 per cent over that of 1924. On the other hand, local authorities by 1930 controlled 65.1 per cent (654,881h.p.) of the total capacity of prime movers installed in Scotland and this represents an increase of 43.8 per cent over 1924. This more rapid installation of prime movers in the private sector is further emphasised by the fact that the 1930 figure of



350,844h.p. represents an increase of 1303.9 per cent over the 1907 figure of 24,991h.p. By comparison the local authority sector increased its total capacity of prime movers by 433.9 per cent, that is from 122,667h.p. in 1907 to 654,881h.p. at 1930.

As might be expected the total capacity of electric generators installed in both the private and local authority sectors at 1907, 1924 and 1930 followed a broadly similar pattern to that of prime movers. From Table 70 it can be noted that at 1907 private companies had 17.2 per cent (17,296KW) of the total and local authorities 82.8 per cent (83,242KW). By 1924 the equivalent figures for private companies were just over 27 per cent (118,116KW) and for local authorities almost 73 per cent (319,174KW) and by 1930 39.4 per cent (258,242KW) and 64.6 per cent (471,175KW) respectively. Thus, between 1907 and 1924 private companies and local authorities increased their installed capacity of electric generators by 582.9 per cent and 283.4 per cent respectively and between 1924 and 1930 by 148.6 per cent and 47.9 per cent respectively. Overall the more rapid development of the private sector between 1907 and 1930 is indicated by the fact that its installed capacity of electric generators rose by a remarkable 1393.1 per cent whereas the local authority sector expanded by 466 per cent.

The irregular pattern of development both with regard to prime movers and electric generators between 1907 and 1924 and then between 1924 and 1930 acknowledges the growth

of the electricity supply industry in Scotland by 1924 and also the influence upon it of the downturn in the economy after that year. However, it is important to note that between 1924 and 1930 the industry, generally, did continue to expand and did achieve positive growth rates although deceleration is evident. This is more keenly reflected in the break-down of figures given in Tables 69 and 70.

In national terms the total capacity of prime movers installed in the Scottish electricity supply industry rose from 147,658h.p. in 1907 to 621,154h.p. in 1924 - a growth rate of 320.7 per cent. Deceleration between 1924 and 1930 is reflected in the fact that between 1924 and 1930 installed capacity of prime movers rose from 621,154h.p. to 1,005,725h.p. or by only 61.9 per cent. However, such figures are, to a certain extent, misleading. Nationally in 1924, of the total installed capacity of prime movers, 77.2 per cent (479,426h.p.) was ordinarily in use and 22.8 per cent (141,728h.p.) in reserve or idle. By 1930 88.4 per cent (889,434h.p.) of the installed capacity of prime movers was ordinarily in use and only 11.6 per cent (116,291h.p.) in reserve or idle. Rationalisation had certainly taken place (the 1926 legislation had secured this<sup>40</sup>) and from Table 69 appears to have affected local authorities rather than private companies since the latter's

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40. See Chapter 9, p.p. 531-533.



capacity in reserve or idle had actually increased. Further to these economies arising from government-inspired re-organisation it should be noted that the downswing in the economy had affected businessmen's expectations about demand for industrial products generally. More particularly, declining profitability reduced the incentives to invest in electrical capacity which might have stood idle for only a short period in better days. Deepening economic depression in 1930 provided few opportunities for such optimism among the business community in Scotland. Nevertheless, the total capacity of prime movers ordinarily in use by local authorities and companies had, between 1924 and 1930, markedly increased in total overall capacity and in percentage terms.

A similar exercise can be conducted with regard to the capacity of electric generators given in Table 70. Between 1907 and 1924 the total capacity of electric generators rose from 100,538KW to 437,290KW or by 335 per cent and then between 1924 and 1930 from 437,290KW to 729,417KW or 66.8 per cent. In 1924 76.7 per cent (335,535KW) were ordinarily in use and 23.3 per cent in reserve or idle. By 1930, when as indicated total capacity had increased, 88.1 per cent (642,828KW) was ordinarily in use and only 11.9 per cent (86,589KW) in reserve or idle.

Thus, Tables 69 and 70 indicate that technical resources, in terms of prime movers and electric generators, had increased in capacity between 1924 and 1930 in both the company and local authority sector and also that a much

more efficient use was being made of these resources. Local authorities, serving a less elastic market, made much more effective use of these technical resources and, indeed, experienced a reduction both in percentage terms and in absolute terms in the capacity of prime movers and electric generators idle or in reserve between 1924 and 1930. Companies suffered an absolute increase in the capacity of both prime movers and electric generators in reserve or idle reflecting the close relationship between power company supply and industrial demand, although in percentage terms there was a reduction. In 1924 81.1 per cent (369,032h.p.) of prime movers utilised by local authorities were ordinarily in use and 18.9 per cent (86,267h.p.) in reserve or idle. In 1924 also 80.7 per cent (257,595KW) of electric generators were ordinarily in use and 19.3 per cent (61,579KW) in reserve or idle. By 1930 the much greater exploitation of these technical resources can be observed. In that year 91.4 per cent (598,634h.p.) of prime movers were ordinarily in use and only 8.6 per cent (56,247h.p.) either in reserve or idle; for electric generators the equivalent figures were 90.9 per cent (428,378KW) and 9.1 per cent (42,797KW) respectively.

The pattern of development of the Scottish electricity supply industry set in the wider British context with regard to technical resources, such as prime movers and electric generators, approximates to the trends already



noted with respect to employment and monetary value of electricity sold by undertakings. In the three years for which figures are available Scotland employed approximately one-tenth of the British total of prime movers and electric generators; specific figures are given in Tables 71 and 72.

**TABLE 71: Total Capacity of Prime Movers, including Reciprocating Steam Engines, Steam Turbines, Gas Engines, Petrol and Light Oil Engines, Heavy Oil Engines and Water Power Installed in Electricity Undertakings in Scotland, England and Wales and Great Britain in the years stated.**

	Ordinarily in Use		In Reserve or Idle		Total Installed	
	h.p.	%	h.p.	%	h.p.	%
1907 <sup>1</sup>						
Scotland					147,658	9.6
England and Wales					1,384,876	90.4
Great Britain					1,532,534	100.0
1924						
Scotland	479,426	11.0 <sup>4</sup>	141,728	12.0 <sup>6</sup>	621,154	11.2
England and Wales	3,882,483	89.0 <sup>5</sup>	1,038,091	88.0 <sup>7</sup>	4,920,574	88.8
Great Britain	4,361,909	100.0	1,179,819	100.0	5,541,728	100.0
1930						
Scotland	889,434	10.4	116,291	7.8	1,005,725	10.0 <sup>2</sup>
England and Wales	7,675,965	89.6	1,376,279	92.2	9,052,244	90.0 <sup>3</sup>
Great Britain	8,565,399	100.0	1,492,570	100.0	10,057,969	100.0

Source: Final Report of the First Census of Production 1907, p.p.886,890  
 Final Report of the Third Census of Production 1924, Part 5, p.p.347, 352  
 Final Report of the Fourth Census of Production, 1930, Part 4, p.p. 501, 505/6

1. Only total installed capacity figures are available for 1907.
2. Actual percentage figure 9.99
3. Actual percentage figure 90.01
4. Actual percentage figure 10.99
5. Actual percentage figure 89.01
6. Actual percentage figure 12.01
7. Actual percentage figure 87.99



**TABIE 72: Total Capacity of Electric Generators, Driven by Reciprocating Steam Engines, Steam Turbines, Gas Engines, Petrol and Light Oil Engines, Heavy Oil Engines and Water Power, Installed in Electricity Undertakings in Scotland, England and Wales and Great Britain in the years stated.**

	Ordinarily in Use		In Reserve or Idle		Total Installed	
	KW	%	KW	%	KW	%
1907 <sup>1</sup>						
Scotland					100,538	10.0 <sup>2</sup>
England and Wales					901,426	90.0 <sup>3</sup>
Great Britain					1,001,964	100.0
1924						
Scotland	335,535	10.7	101,755	12.0 <sup>4</sup>	437,290	10.9
England and Wales	2,814,541	89.3	744,152	88.0 <sup>5</sup>	3,558,693	89.1
Great Britain	3,150,076	100.0	845,907	100.0	3,995,983	100.0
1930						
Scotland	642,828	10.3	86,589	7.8	729,417	9.9
England and Wales	5,612,360	89.7	1,017,279	92.2	6,629,639	90.1
Great Britain	6,255,188	100.0	1,103,868	100.0	7,359,056	100.0

Source: Final Report of First Census of Production 1907, p.p.886,890  
 Final Report of Third Census of Production 1924, Part 5,  
 p.p. 347, 352  
 Final Report of Fourth Census of Production 1930, Part 4,  
 p.p. 501, 505/6

1. Only total installed capacity figures are available for 1907.
2. Actual percentage figure 10.03.
3. Actual percentage figure 89.97
4. Actual percentage figure 12.03
5. Actual percentage figure 87.97

In 1907 the total installed capacity of prime movers in the Scottish electricity supply industry was 147,658h.p. or 9.6 per cent of the British total with the corresponding figures for England and Wales being 1,384,876h.p. and 90.4 per cent. Between 1907 and 1924 Scotland achieved a much faster rate of growth in the installation of prime movers. Between these years Scotland increased its total capacity of prime movers by 320.7 per cent whereas England and Wales only managed to achieve an expansion of 255.3 per cent. Thus, at 1924 Scotland employed 11.2 per cent (621,154h.p.) of the total British capacity of prime movers and England and Wales 88.8 per cent (4,920,574h.p.). However, although expansion continued between 1924 and 1930, the rate of growth in the installation of prime movers lessened and the Scottish industry was more severely affected than that of England and Wales. Between 1924 and 1930 the installation of prime movers in Scotland increased by only 61.9 per cent as against 83.9 per cent for England and Wales. Therefore, by 1930 the balance indicated at 1907 had almost been restored. In 1930 Scotland was responsible for nearly 10 per cent (1,005,725h.p.) of the British total of prime movers and England and Wales just over 90 per cent (9,052,244h.p.). Despite the evident slackening in the rate of installation of prime movers after 1924 in Scotland, Table 71 indicates that between 1907 and 1930 Scotland experienced an increase in the installation of prime movers of 581.1 per cent and England



and Wales 553.7 per cent,

Table 72 reveals a virtually parallel pattern of development with regard to the installation of electric generators. Beginning in 1907 Scotland had just over 10 per cent (100,538KW) of the total British figure and England and Wales nearly 90 per cent (901,426KW). Between 1907 and 1924 there was a percentage increase in the total capacity of electric generators in Scotland of almost 335 per cent as against 294.0 per cent for England and Wales. At 1924, therefore, the Scottish share of the total British capacity of electric generators installed had increased to 10.9 per cent (437,290KW) and that of England and Wales fallen to 89.1 per cent (3,558,693KW). In broad accord with the expansion of prime movers between 1924 and 1930, the rate of increase in the installation of electric generators in Scotland was reduced to 66.8 per cent and 86.3 per cent for England and Wales. Consequently at 1930 Scotland's share of the total British capacity of electric generators installed had fallen to 7.9 per cent (729,417KW) and England and Wales now held 90.1 per cent (6,629,639KW). However in the installation of electric generators Scotland did not quite match the achievement of England and Wales, although the gap between them was not as wide when, as indicated in the previous paragraph, Scotland had achieved superior figures in the installation of prime movers between 1907 and 1930. In Scotland between 1907 and 1930 there was an increase in

the total capacity of electric generators of 625.5 per cent, England and Wales achieved an expansion of 635.5 per cent.

Tables 71 and 72 provide additional analysis at 1924 and 1930 of the total capacity of both prime movers and electric generators ordinarily in use and those in reserve or idle. From Table 71 it can be noted that at 1924 Scotland had actively in use almost 11 per cent (479,426h.p.) of the total British capacity of prime movers ordinarily in use and England and Wales 89 per cent (3,882,483h.p.); the total capacity in reserve or idle was 12 per cent (141,728h.p.) and nearly 88 per cent (1,038,091h.p.) respectively. In regional terms these figures indicate that within Scotland in that year 77.2 per cent of prime movers were regularly employed and that 22.8 per cent were normally either in reserve or idle. By comparison England and Wales regularly used in that same year 78.9 per cent of the total capacity of prime movers and retained in reserve or idle 21.1 per cent; in 1924 Scotland had a slightly greater excess capacity than England and Wales.

However, by 1930 this situation had altered. In 1930 Scotland had a marginally reduced share of the total British capacity of prime movers ordinarily in use. In that year Scotland regularly employed 10.4 per cent (889,434h.p.) of the British total and England and Wales 89.6 per cent (7,675,969h.p.). By comparison it would



appear that Scotland made much more effective use of its total plant capacity of prime movers since of the total British figures 7.8 per cent (116,291h.p.) of Scotland's prime movers were either idle or in reserve in 1930 whereas the total capacity of prime movers in England and Wales which were in the same category now amounted to 92.2 per cent (1,376,279h.p.) of the overall British total figure. Indeed, between 1924 and 1930 Scottish undertakings, as Table 71 indicates, had reduced prime movers, in reserve or idle, by almost 18 per cent while during the same time period their English and Welsh counterparts found that their prime movers in this same category had increased by nearly one-third.

The greater relative efficiency of Scotland in the use of prime movers in 1930 brought about by the reduction in excess capacity - perhaps encouraged by the rationalisation process inherent in the Central Scotland Scheme adopted by the Central Electricity Board on 29th June, 1927 and officially inaugurated on 30th April 1930.<sup>41</sup> - is further emphasised by the fact that in 1930 within Scotland 84.4 per cent of all prime movers were ordinarily in use and only 11.6 per cent in reserve or idle and this despite the fact that between 1924 and 1930 the total capacity of prime movers normally in use had increased by 85.5 per cent. During this same time period, 1924-1930, the number of

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41. See Chapter 9, p.p. 536-546,

prime movers ordinarily in use in England and Wales increased by 97.7 per cent but of the overall total capacity of prime movers installed at 1930 only 84.8 per cent were normally in use and 15.2 per cent were either in reserve or idle. Businessmen's expectations in the Midlands and the South-East of England, where light engineering industries were establishing themselves, might have been more optimistic. Thus, their willingness to invest in spare electrical capacity might have been stronger.

Comparable statistics can be abstracted from Table 72 dealing with the capacity of electric generators installed in Scotland and England and Wales. In 1924 Scotland had ordinarily in use 10.7 per cent (335,535KW) of the total capacity of electric generators normally in use in Britain and had in addition slightly in excess of 12 per cent (101,755KW) of the British total which was either in reserve or idle; the equivalent figures for England and Wales<sup>were</sup> 89.3 per cent (2,814,541KW) and nearly 88 per cent (744,152KW) respectively. Thus, of the overall Scottish total capacity of electric generators, 76.7 per cent were regularly in use in 1924 and 23.3 per cent either in reserve or idle. By comparison just over 79 per cent of electric generators in England and Wales were ordinarily in use and nearly 21 per cent in reserve or idle. From Table 72 it can be further observed that at 1930 of the overall British capacity ordinarily in use Scotland now



utilised 10.3 per cent (642,820KW) and England and Wales 89.7 per cent (5,612,360KW). Of the total British plant in reserve or idle at 1930, Scotland was responsible for 7.8 per cent (86,589KW) and England and Wales 92.2 per cent (1,017,279KW). Further analysis reveals that in 1930 within Scotland itself 88.1 per cent of the total capacity of electric generators were ordinarily in use so that 11.9 per cent were in reserve or idle. By contrast 84.7 per cent of the total capacity of electric generators in England and Wales were ordinarily in use in that year and 15.3 per cent were in reserve or idle. Between 1924 and 1930 the capacity of electric generators ordinarily in use in England and Wales rose by 99.4 per cent but excess capacity over the same period rose by 36.7 per cent. On the other hand, within Scotland, although plant capacity ordinarily in use in terms of electric generators rose by 91.6 per cent, there was an absolute decline in the capacity of electric generators held in reserve or idle of 15,166KW or 14.9 per cent.

From the evidence so far presented several significant trends are observable, and in some senses could be expected, and are illustrated in broad terms on the next page. Table 73 based on data already given in earlier tables, indicates that from a position of relative weakness in 1907 company promotion had been pursued with some vigour, despite opposition from local authority interests, so that by 1930, with regard to the aspects examined, companies controlled

approximately one-third of the Scottish electricity supply industry.

TABLE 73

Control of the Scottish Electricity Supply Industry Exerted by Companies and Local Authorities at 1907 and 1930, Exemplified by Specific Aspects.

	1907		1930	
	Co.	L.A.	Co.	L.A.
Employment <sup>1</sup>	14	86	33	67
Monetary Value of Electricity Supplied	9.4	90.6	32.5	67.5
Technical Resources:				
Prime Movers	16.9	83.1	34.9	65.1
Electric Generators	17.2	82.8	35.4	64.6

Source: Tables 62, 66, 69 and 70.

1. As in Tables 62, 63 and 64 percentage figures for population have been taken to the nearest whole number.

This table additionally emphasises the fact that the private sector achieved a much faster rate of growth than the public sector. For example, and as indicated earlier, between 1907 and 1930 employment in the company sector grew by 527.7 per cent whereas in the local authority sector the increase was 105.1 per cent. Thus, although still numerically smaller in absolute numbers, private companies made a very significant contribution to the industry in the years stated. In a similar manner, between 1907 and 1930, the monetary value of electricity supplied by companies rose by 1989.9 per cent and that of the local authorities by 349 per cent. Technical resources, in terms



of prime movers and electric generators, in the company sector expanded by 1303.9 per cent and 1393.1 per cent respectively whereas in the local authority sector the equivalent figures were 433.9 per cent and 466 per cent respectively. Admittedly the private sector was starting from a relatively low base but, nevertheless, the growth rates achieved, in all three aspects, were impressive.

In the wider British context (excluding Ireland) the Scottish electricity supply industry, although undergoing a process of continuous expansion, did not keep pace with that of England and Wales during the period between 1907 and 1930.<sup>42</sup> In 1907 Scotland provided employment for 10.4 per cent of those employed in the British electricity supply industry but by 1930 was only employing 7.5 per cent of the total; the corresponding figures for England and Wales were 89.6 per cent and 92.5 per cent respectively. In actual numbers the Scottish labour force had grown from 2,290 persons in 1907 to 6,041 persons in 1930 and the labour force in England and Wales from 19,702 persons to 74,130 persons but whereas the total number of employees in England and Wales had expanded by 276.3 per cent those in Scotland had increased by 163.8 per cent. In a

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42. The varying rates of growth between 1907 and 1924 and 1924 and 1930 have already been examined in detail and, therefore, only global figures between 1907 and 1930 will be examined at this point.

similar manner, in 1907 Scottish undertakings had been responsible for 9.6 per cent of the monetary value of electricity supplied by all British undertakings but by 1930 this had fallen to 8.3 per cent; the equivalent figures for England and Wales were 90.4 per cent and 91.7 per cent respectively. Thus, the monetary value of electricity supplied by Scottish undertakings had grown by almost 503 per cent between 1907 and 1930 but that of their English and Welsh counterparts by nearly 614 per cent.

In the area of technical resources the pattern was not entirely similar. In Scotland the total capacity of prime movers expressed as a percentage of the overall British total marginally increased from 9.6 per cent to 9.9 per cent; a growth rate of 511.1 per cent between 1907 and 1930. In England and Wales over the same period the increase was 553.7 per cent with the result that the total capacity of prime movers utilised in England and Wales fell from 90.4 per cent of the British total in 1907 to slightly over 90 per cent in 1930. On the other hand, in Scotland the total capacity of electric generators marginally fell from just over 10 per cent in 1907 to 9.9 per cent in 1930 of the overall British capacity whereas that of England and Wales rose, again marginally, from almost 90 per cent to 90.1 per cent. Thus, the respective increases achieved by Scotland and England and Wales with respect to electric generators between 1907 and 1930 were 625.5 per cent and



635.5 per cent. It would appear, therefore, that the Scottish electricity supply industry, generally, did not keep pace with that of England and Wales during the period between 1907 and 1930 but, from evidence presented earlier, the real divergence occurred after 1924 when due to the impact of the inter-war depression a major deceleration took place which affected Scotland to a much greater extent than England and Wales.

(3) The Effect of the Industry on the Rest of the Economy.

By 1930 the growth of the electricity supply industry in Scotland was clearly respectable by British standards and the industry was geographically widespread. Little in the way of original research has been done on the social and economic effects of the growth of the industry on the rest of the economy. Yet the industry was obviously of major qualitative importance, and its indirect influence was potentially of great significance. The purpose of this section is to attempt some assessment of the direct gains made by other sectors as a consequence of the expansion of the electricity supply industry.

Industrial interests in the West of Scotland and more widely in the country welcomed the beginning of a public supply. The C.V.E.P. Company, as indicated in Chapter 8, had already begun to exploit demand from heavy industry,<sup>43</sup>

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43. See Chapter 8, Section 5.

and there is no reason to suppose that Scottish industrialists were not prepared to support the development of a new source of energy. Similarly, commercial and domestic consumers, the latter increasingly supplied by local authorities, favoured the development of the industry.<sup>44</sup> The pattern of demand in 1924 and 1950 is given in Table 74. Clearly most sectors witnessed an absolute increase in consumption of electrical power, but particular points of interest arise and are worthy of comment.

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44. This is shown by the example of selected undertakings in Table 6, p.136.



TABLE 74 Total Electricity Supplied by the Electricity Undertakings in Scotland for designated purposes in 1924 and 1930.

Electricity Supplied for	1924		1930		
	B.T.U. (m)	%	% <sup>2</sup>	B.T.U. (m)	%
Public Lighting	9.2	1.5	112.0	19.5	1.6
Traction	37.8	6.1	191.0	110.0	8.8
Power and Manufacturing purposes	312.6	49.6	118.8	683.9	54.7
Private Lighting, Heating and Cooking	108.9	17.3	130.7	251.2	20.1
General Supply at Uniform Charges <sup>3</sup>	101.7	16.1	-	4	
Bulk Supply to Authorised Distributors	34.9	5.5	388.5	170.5	13.6
Purposes not separately distinguished	24.8	3.9	-	4	
Units not accounted for	-	-	-	15.0 <sup>5</sup>	1.2
<b>Total</b>	<b>629.9</b>	<b>100.0</b>	<b>911.5</b>	<b>1,250.1</b>	<b>100.0</b>

Source: Final Report of Third Census of Production 1925, Part 5, p.p.344, 349  
 Final Report of Fourth Census of Production 1930, Part 4, p.p.498/9, 503

1. Separate Scottish figures are not provided in the Final Report of First Census of Production 1907
2. The figures given in this column represent the percentage increase of the 1930 figures over those of 1924.
3. In 1930 this sub-heading was changed to Miscellaneous Charges
4. References state that owing to the possible disclosure of information relating to individual undertakings separate figures cannot be given
5. Because of the omissions in the evidence it was necessary to insert this figure to allow the addition of this column to equate with the stated total

The level of demand in the industrial sector in 1924 - nearly 50 per cent of the total supply - indicated the possibilities of industrial demand and, although in relative terms this category expanded slowly to 1930, it was a dynamic sector particularly considering the general state of the industrial economy. This phenomenon whereby industrialists used more electricity at a time when the economy was moving into decline will be the subject of comment later.

Private lighting, heating and cooking was the next major component in demand accounting for slightly more than one-fifth of total supply in 1930. Undoubtedly, this reflected the expansion of the housebuilding sector of the construction industry in the inter-war period and the general upgrading of existing residential property as consumers moved from gas to electricity.<sup>45</sup> These developments were in many respects linked with the expansion in public lighting which was also an important element in local authority activity. The development of public housing was matched by the provision of new streets and street lighting, and suburban ratepayers expected the most modern service from their councils even if they lived in owner-occupied houses. Generally, the increase in the number of H.T.U. for public lighting reflected an improvement in living standards and an enhancement in the social environment.

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45. See Chapter 8, Section 6 and Chapter 9, Section 2.



The category 'Bulk Supply to Authorized Distributors' was third in order of significance. This anonymous category increased in importance as a result of the growth of large power companies sufficiently sizable to meet the demands for street lighting and other socially useful purposes from burghs like Wishaw, Motherwell and Hamilton.<sup>46</sup> The implementation of the Central Scotland Scheme in 1927 was of great significance in the expansion of municipal demand measured under this category.<sup>47</sup>

One mystery requiring explanation arises from the figures showing the expansion of electricity supply for traction. Apart from bulk supply, this was the sharpest increase between 1924 and 1930 and yet it should be borne in mind that none of the major Scottish railway companies conducted schemes of electrification and in the British context Hannah has indicated that the tramways "had their heyday in the post-war boom of 1911-21."<sup>48</sup> Between 1924 and 1930 the capital stock of tramcars in Britain remained static at 14,000<sup>49</sup> and it is doubtful if there was any expansion of mileage in Scotland or greater intensification of use which would account for the figures given in Table 74. More likely, tramway companies found it more economic to buy electricity from the public supply and close their

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46. See Chapter 8, Section 5.

47. See Chapter 9, Section 1.

48. Hannah, op. cit., p.p.163 and 168.

49. Mitchell and Deane, op. cit., p.230.

own private generating stations.

Of the other categories outlined in Table 74 it is particularly unfortunate that no statistics survive for 'General Supply at Uniform Charges' and the miscellaneous category 'Purposes not separately distinguished' in 1930. These two in 1924 accounted for about one-fifth of total electricity supplied. It is, of course, possible that greater care was taken in 1930 to assign precise categories to users of electricity and thus the category 'Units not accounted for' had shrunk very considerably by that year.

In summary, Table 74 reveals that, despite the depressed nature of the Scottish economy in the late 1920's, demand in all sectors increased and, more significantly, industrial demand took a greater share of total output. More negatively, the potential level of demand from industry was very considerable, and the unusual feature was that the Scottish economy relative to the rest of Britain absorbed electrical energy at a slower pace and with less indirect effect.



TABLE 75 Analysis of Electricity Supplied by Companies and Local Authorities in Scotland for designated purposes in 1924 and 1930.†

Electricity Supplied for:-		Companies		Local Authorities	
	1924	1930	1924	1930	
	B.T.U. (M)	B.T.U. (M)	B.T.U. (M)	B.T.U. (M)	B.T.U. (M)
Public Lighting	0.4	1.8	0.3	8.8	17.7
Traction	11.0	3	26.8	6.95	110.0
Power and Manufacturing Purposes	157.2	63.1	66.6	153.4	287.2
Private Lighting, Heating and Cooking	13.3	5.4	6.6	95.6	211.7
General Supplies at Uniform Charges	37.1	11.0	3	67.6	17.54
Bulk Supply to Authorised Distributors	31.3	12.8	25.4	3.6	0.93
Purposes not separately distinguished	0.1	0.05	-	27.7	6.41
Units not accounted for	-	6.84	1.1	-	8.24
Total	277.4	100.0	100.0	385.5	657.2

Source: Final Report of the Third Census of Production 1924, Part 5, p.p.344, 349  
 Final Report of the Fourth Census of Production 1930, Part 4, p.p. 495, 499 and 503

1. Separate Scottish figures are not provided in the Final Report of the First Census of Production 1907
2. In 1930 this sub-heading was changed to 'Miscellaneous Supplies'
3. References state that owing to the possible disclosure of information relating to individual undertakings separate figures cannot be given
4. Because of the omissions in the evidence it was necessary to insert these figures to allow the addition of the relevant columns to equate with their stated totals
5. Actual figure 0.04

The figures in Table 74 can be further analysed in terms of supply made by companies and local authorities, and these data are given in Table 75. Undoubtedly the private sector became much more significant between 1924 and 1930, and the local authorities made slower progress. Whereas in 1924 private companies accounted for less than 40 per cent of the market, by 1930 supply from local authorities and private companies was almost evenly balanced; the former just maintaining the edge at 52.3 per cent of total supply. Deceleration in the growth of the public sector and the rise of the private sector in the late 1920's occasioned little surprise for both have been the subject of comment in previous chapters.<sup>50</sup> Most significant was the outstanding importance of industrial supply. In 1924, as Table 75 reveals, the companies lagged slightly behind the local authorities in the provision of supply for Power and Manufacturing Purposes - by 4.2m B.T.U. By 1930, however, the position had been completely reversed and in that year private companies supplied 109.5m B.T.U. more than local authorities. It seems likely that the major regional power companies adopted a much more vigorous marketing policy and persuaded industry to adopt electrical power in this period of downswing in the economy as a means of achieving reductions in costs. Equally possible is the explanation that local

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50. See Chapter 6, Section 3 and Chapter 9, Section 2.



authorities adopted a more conservative attitude towards industry and concentrated their resources on the relatively safe market for public lighting, traction and private lighting, heating and cooking.

Exceedingly important was the expansion of company provision of bulk supply to authorised distributors. The private companies and in particular the power companies supplying extensive areas, were not averse to absorbing small undertakings and continuing a supply from their own much larger and cost effective generating stations.<sup>51</sup> By comparison local authorities were generally operating within their own boundaries and therefore had a narrower range of options. Rationalisation and in particular the formation of the Central Scotland Scheme in 1927 also played its part.

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51. See Chapter 7.





Examining Scottish industry more widely, comparative data before 1924 suffer from lack of continuity, thereby making analysis less meaningful, but good statistical evidence is available for 1924 and 1930. From the groups of industries and trades given in Table 76 (page 641) it is obvious that there was a decline in power applied mechanically and an increase in power applied electrically between 1924 and 1930. Although the use of electrical power gave greater flexibility to industry, this cannot be the only reason for the changes. The downturn in the economy in the 1920's adversely affected these industries; output measured in monetary terms and also employment contracted.<sup>52</sup>

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52. R.H. Campbell, The Rise and Fall of Scottish Industry 1707-1939, (Edinburgh, 1980), p.p.197-201.





Yet as an examination of the data in Table 77 makes clear, it was not only industries faced with the bleak necessity to reduce costs or face collapse which were most forward in the increased use of electrical power. Spirit distilling, however, did have its share of problems, notably in its principal export markets of the United States of America where prohibition prevailed and in Canada where the depression of the late 1920's was particularly severe. The hosiery industry, established in areas where cheap local coal was not readily available, also embraced the new technology warmly and especially in the Borders where in the late 1920's the Balfour Beatty group of companies were extending their influence.<sup>53</sup> Cotton spinning and weaving were sectors clearly under pressure from competition in Lancashire and further afield, but their decline was being fought using cost-reducing techniques. The more successful brewing and malting sector was also applying the new technology, although its major markets were domestic, and there was also considerable development in the iron and steel industry. Thus, it is reasonable to suppose that in some industries electricity was being introduced to make more intensive use of resources, and the decline in employment may reflect more than a simple downturn in demand to take account of the re-organisation of production which the application of new power made likely.

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53. See Chapter 7, Section 1.

**TABLE 78** Total Number of Coal Cutting Machines in use in Scotland in the years stated.

Year	Number of Machines Powered by			Total Number of Machines
	Electricity	% of Total	Compressed Air	
1900	1	2.2	44	45
1905	102	47.4	113	215
1910	425	73.2	156	581
1920	1,149	89.8	131	1,280
1925	1,530	94.2	94	1,624
1930	1,582	96.1	64	1,646

Source: Inspectors of Mines Report 1900, East of Scotland Report, p.6; West of Scotland Report, p.7  
 Inspectors of Mines Report 1905, East of Scotland Report, p.8; West of Scotland Report, p.7  
 Inspectors of Mines Report 1910, General Report, p.139  
 Inspectors of Mines Report 1920, General Report, p.82  
 Annual Report of the Secretary for Mines 1925, p.145  
 Inspectors of Mines Report 1930, Scottish Division Report, p.10



One industry quick to realise the advantages of electricity was coal mining. The early introduction of electric lighting in 1881 to Earnock Colliery at Hamilton has already been noted,<sup>54</sup> and it was for lighting that the new source of energy was most commonly deployed initially. However, by the First World War it was being more widely used for such operations as pumping, haulage and winding and for coal-cutting machinery.<sup>55</sup> Apart from coal-cutting operations precise information about the consumption of electricity in the pits is lacking. However, as Table 78 (page 645) makes clear, compressed air ceased to be the main source of power after 1905 probably because of its many drawbacks. Pipes to carry compressed air were expensive, subject to leakages, and "in seams of two feet or less it was of little value."<sup>56</sup> Many of the best and most accessible seams in the Scottish coalfield had been exhausted by 1914, and the working of deeper and thinner seams necessarily involved greater costs. Generally in Scotland, and in particular in the Western coalfield, where thin seams were very common, electricity was introduced to offset higher costs. Moreover, electric coal-cutting

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54. See Chapter 2, p.28.

55. For a detailed examination of the development of the coal industry in Britain, including the effect of the introduction of electricity, see N.K. Buxton, The Economic Development of the British Coal Industry, (1978).

56. N.K. Buxton, The Economic Development of the British Coal Industry, (1978), p.115.

equipment was particularly efficient in working thin seams because it produced a higher proportion of marketable coal - hand cut coal from similar seams was produced in minute pieces for which the market was limited. The sharp rise in the use of electrically driven coal-cutters from 425 in 1910 to 1582 in 1930, representing at the latter date over 96 per cent of all such machines, is the clearest evidence that this troubled industry was not lacking in the application of cost-reducing techniques, and it seems likely that the particular operational difficulties which normally led to diminishing returns forced coalmasters to mechanise and in coal-cutting to apply machinery powered by electricity. In the 1920's the percentage of Scottish output mechanically cut was twice as high as in Great Britain as a whole.<sup>57</sup>

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57. Ibid, p.183.



**TABLE 79** Aggregate Horse-power of Electric Motors in use on the Surface and Underground in Scotland and Great Britain in the years stated.

Year	Scotland		Great Britain					
	Surface	%	U/ground	%	Surface	%	U/ground	%
1920	43,050	20.6	166,192	79.4	461,954	42.7	618,868	57.3
1925	63,574	22.3	221,207	77.7	715,834	46.0	840,401	54.0
1930	73,200	23.3	241,518	76.7	861,680	47.3	951,948	52.7

Source: Annual Report of the Secretary for Mines 1920, p.49  
 . Annual Report of the Secretary for Mines 1925, p.145  
 Annual Report of the Secretary for Mines 1930, p.143

1. Percentage of Total Scottish Horsepower
2. Percentage of Total British Horsepower

Although there are difficulties in ascertaining precisely how electricity was used in pits and what amounts were applied to other operations than coal-cutting, aggregate figures are available for the total horse-power of electric motors used in Scottish mines and more generally for the British industry for the years 1920, 1925 and 1930 - both underground and on the surface. This information is given in Table 79 (page 648) and clearly demonstrates that Scotland was mechanising underground operations more intensively than was the case elsewhere in Great Britain. Indeed, during the 1920's the gap widened in Scotland's favour, although there was a fall in percentage terms everywhere. The attempt to reduce labour costs, to increase productivity, and to offset diminishing returns was particularly acute, but it seems clear that Scottish coalmasters were more anxious than their counterparts in other coalfields to achieve these objectives. Moreover, it is worthy of note that the average selling price per ton in Scotland remained below the British average<sup>58</sup> partly as a consequence of improved efficiency, and partly because Scotland possessed relatively low grades of coal; in addition, the depressed nature of Scotland's other heavy industries, the major coal users, adversely influenced demand and lowered price.

The apparent paradox that between 1920 and 1930

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58. Ibid., p.187.



aggregate use of electricity in the Scottish coalmining industry rose less than for Britain as a whole (just over 50 per cent as compared with 69 per cent) is readily explained by the fact that the rest of Britain had more leeway to make-up, and some other British coalfields had greater profit potential and less depressed markets.

According to the 1930 Census of Production, the furniture industry was slower to change its motive power to electricity than was true of industry in Britain as a whole. Although this may be partly explained by a reluctance to change, there was a practical reason why the tendency to change from steam was slow. The generation of electricity provided no outlet for wood shavings and chippings and sawdust which with steam prime movers could be fed into the furnace,<sup>59</sup>

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59. Scottish Economic Committee, Light Industries in Scotland, A Case for Development, (1938), p.39.

TABLE 80 Average Number of Persons Employed in the Electrical Engineering Industry in Scotland, England and Wales and Great Britain in 1924, and 1930.

	1924		$\left. \begin{array}{l} \% (+) \\ \% (-) \end{array} \right\} 1$	1930	
	Number	%		Number	%
Scotland	3,383	2.2	-29.5	2,385	1.2
England & Wales	150,439	97.8	+26.0	189,585	98.8
Great Britain	153,822	100.0	+24.8	191,970	100.0

Source: Final Report of Third Census of Production 1924, Part 3, p.280  
 Final Report of Fourth Census of Production 1930, Part 2, p.304

1. Percentage increase (%+) or decrease (%-) between 1924 and 1930



**TABLE 81** Value of Goods Made and Work Done in the Electrical Engineering Industry in Scotland, England and Wales and Great Britain in the years stated.

	1907		1924		1930	
	Value £000	%	Value £000	%	Value £000	%
Scotland	422	3.0	1,291	1.8	987	1.1
England and Wales	13,467	97.0	68,859	98.2	86,687	98.9
Great Britain	13,889	100.0	70,150	100.0	87,674	100.0

Source: Final Report of First Census of Production 1907, p.191  
 Final Report of Third Census of Production 1924, Part 3, p.280  
 Final Report of Fourth Census of Production 1930, Part 2, p.304

Using measures such as employment, monetary value of electricity sold and total capacity installed the Scottish electricity supply industry represented 10 per cent of the total British industry in 1907, 1924 and 1930<sup>60</sup> and the unwary historian might have assumed that a similar pattern of development might have prevailed in the electrical engineering industry down to 1930.<sup>61</sup> This was not the case. As Table 80 (page 651) makes clear the Scottish industry was small and shrinking between 1924 and 1930. Consequently, by 1930 Scotland had only 1.2 per cent of the total number employed in the electrical engineering industry

60. See Tables 65, 67, 71 and 72.

61. The electrical engineering industry was a multi-product industry including the manufacture of all types of electrical machinery, batteries, insulated cables, telephone, telegraph and wireless apparatus and other electrical plant, appliances and accessories. In assessing the overall monetary value of the industry the 1930 Census of Production also included contract and constructional work carried out by manufactures outside their own factories. The pre-1930 censuses were slightly broader in scope and included firms for example which by 1930 were being defined under the Motor and Cycle Trade rather than electrical engineering. However, alterations in the collation of data were not thought to affect the comparability of census results seriously.

Final Report of the Fourth Census of Production 1930, Part 2, p.282.



in Britain.<sup>62</sup> Table 81 (page 652) confirms this impression, in this case in terms of gross output. In neither 1924 nor 1930 did Scotland's share of overall British gross output in electrical engineering exceed the 1907 figure of 3 per cent, although in absolute terms the monetary value of Scottish gross output did increase. Thus, the Scottish electrical engineering industry failed to maintain its market share during a period of growth.

Efficiency and productivity in the Scottish electrical engineering industry rapidly improved between 1924 and 1930 as measured by gross output per capita and indicated in Table 82.

TABLE 82.

Gross Output Per Capita in the Electrical Engineering Industry in Scotland and England and Wales in 1924 and 1930. (£.)

Year	Scotland	England and Wales
1924	381.61	457.72
1930	413.84	457.52

Source: Tables 80 and 81.

Nonetheless, although the gap had narrowed between Scotland and the rest of the United Kingdom, per capita output in

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62. Employment statistics for the Electrical Engineering Industry are not provided in the Final Report of the First Census of Production, 1907.

England and Wales was still greater.<sup>63</sup> A reduction in manning levels and more effective use of capital assets in Scotland had produced a closer run race, but in the process the Scottish electrical engineering industry had become more minute.

The relative decline of the electrical engineering in Scotland had a number of roots. Some historians have noted at length the overt commitment to the heavy industrial sector<sup>64</sup> and it can be suggested that this was detrimental to the accumulation of electrical engineering skills. Certainly by the middle 1930's there was difficulty in obtaining skilled electrical fitters, engineers for switch gear assembly and testing and draughtsman.<sup>65</sup> Yet from the 1880's there was wide academic interest and practical training available at Dundee and more particularly in the West of Scotland at the Royal Technical College.<sup>66</sup> Few

63. Although in Tables 80, 81 and 82 England and Wales have been grouped together, the Welsh contribution was negligible. In 1930 only about 0.1 per cent of gross British output came from Wales and as late as 1939 only 424 persons were employed in the electrical engineering industry in Wales.

R.E. Catterall, *Electrical Engineering*, p.270 in N.K. Buxton and D.H. Aldcroft, British Industry between the Wars, (1979)

64. Inter Alia, A. Slaven, The Development of the West of Scotland 1700-1900, (1975), H.H. Campbell, The Rise and Fall of Scottish Industry 1707-1939, (Edinburgh, 1980).

65. Scottish Economic Committee, op. cit., p.208.

66. See Chapter 3, Section 1.



firms had apprenticeship schemes and one firm indicated in 1936 that the supply of houses was inadequate to attract migratory workers and staff.<sup>67</sup>

However, the major problem was undoubtedly English competition and certainly Scotland no longer had wage rates which compensated for other economic disadvantages. Scottish firms needed to buy most malleable castings in England and special materials, particularly shafting, were bought from England. Practically no die-casting was done in Scotland and little extruded metal-work. Copper and brass parts and rods were also bought from England together with special steels in sheet or stamp form. England was also the source of over half the insulating materials used by manufacturers in Scotland, and fabrics for cable manufacturing, glass tubing, bulbs and rods for neon sign and light manufacture and such basic components as electric boiling rings, meters, insulating bases and arc shields and starters were also obtained outside Scotland.<sup>68</sup>

The composition of output was distinctly lop-sided, reflecting the comparative advantage enjoyed by English manufacturers. In particular, heavy lathes, boring and punching machines, large scale heating and ventilation equipment, air conditioning and refrigeration machinery were produced in Scotland,<sup>69</sup> often to meet the demands of the

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67. Scottish Economic Committee, op-cit., p.208

68. Ibid., p.p.208-209

69. Ibid., p.p.83-84, 90-91, 209.

heavy industrial sector but much electrical engineering machine tooling was supplied from English manufacturers, from America and Germany.<sup>70</sup> In such new areas as radio manufacture there was virtually no development in Scotland and little component production. Too many sets were already being produced in England, and the growth of combines in the South, particularly Electrical and Musical Industries Limited, made any development unlikely - the small Scottish market was a tolling factor.<sup>71</sup> There is also some evidence that Government contracts were distributed to suit the ease of organised inspection from London, and thus Scotland suffered. Scottish firms were often too small to withstand the long delay in Government payments, and more generally they were handicapped by lack of knowledge of commercial law.<sup>72</sup>

Customers believed that Scottish firms did not provide them with the service provided by English companies. From their viewpoint English firms had a well organised after-sales service, they were more considerate of customers' needs and more prompt in their delivery.<sup>73</sup> This group of subjective views may well confirm the weaknesses of the small Scottish firm which did not do the volume of business to enable it to provide the kind of after-sales service

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70. Ibid., p.p.209-210.

71. Ibid., p.211.

72. Ibid., p.212.

73. Ibid., p.213.



obtainable in England. Moreover, the larger English combines had established their reputation for an extensive range of products and could afford like the General Electric Company to spend heavily on advertising the promotion of a new product,<sup>74</sup>

Many Scottish electricity supply undertakings were consumers of electrical machinery and accessories. Possibly the principal cause of their buying from English firms was the financial involvement of substantial shareholders from South of the Border or even from overseas. Such shareholders and consultants were more likely to recommend the award of major contracts for machinery and parts to English companies. In this regard it is possible to cite the long-term connection between the C.V.E.P. Company and the British Westinghouse Electric and Manufacturing Company,<sup>75</sup> and among others the financial and contractual relationship of the British Power Company, Edmundsons' Electricity Corporation, Crompton and Company and the National Electric Construction Company with major Scottish electricity supply undertakings.<sup>76</sup> This reliance on imported technology in the private sector adversely affected the native electrical engineering industry, and it should be borne in mind that relatively the local authority sector lacked the dynamism

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74. Ibid., p.214.

75. See Chapter 8, Section 2.

76. See Chapter 7.

to generate a major level of demand for the industry.

From the available evidence the Scottish electrical engineering industry was largely confined to the provision of electrically driven coal mining and pumping equipment. Bruce Peebles and Company of Edinburgh supplied machinery to the Fife and Lothian pits, while in the West of Scotland Mavor and Coulson and Anderson Doyes and Company served a similar purpose for the local industry.<sup>77</sup> At Alloa the Harland Engineering Company made electrically driven pumping sets which by the 1930's were being exported in number.<sup>78</sup> Nevertheless, the nature of the problems of the coal mining industry in the inter-war period suggest that this market had limitations and the lack of balance within the Scottish electrical engineering industry was most marked by the absence of the mass production of consumer durables.

Thus, despite the substantial foundation provided by academic institutions from at least the 1880's the electrical engineering industry in Scotland developed mainly as an adjunct to a heavy industrial sector, and where novelty occurred, as for example in the provision of refrigeration and air conditioning in ships, demand was linked with the fluctuating fortunes of the capital goods sector. The early foothold obtained by non-Scottish concerns in the provision of heavy electrical machinery for power stations and the long-term financial obligations of Scottish undertakings to alien

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77. Oakley, op. cit., p.p.142, 272.

78. Ibid., p.273.



holding companies further inhibited the diversification of the Scottish electrical engineering industry. That industry expanded narrowly until 1924 but by 1930 was apparently in decline.

## Chapter II

### Conclusion

Scotland, which had made major contributions to industrial development generally, both as a nation and through the efforts of particular individuals, played no significant part in the early development of the electricity supply industry. At a time when innovation in the electrical industry was taking place on an international basis, Scotland remained firmly committed to the heavy industrial sector and steampower. Individuals were aware of the new form of energy, but the continuing profitability of traditional areas in shipbuilding, coal, and iron and steel and the highly competitive provision of an excellent gas supply inhibited greater exploitation of contemporary knowledge and the necessary investment in the, as yet, embryonic industry.

In the decade following the discoveries of Swan and Edison numerous experiments in electric lighting took place nationally in Scotland by local authorities, large and small, and by private firms and individuals. The reaction of local government and private enterprise, however, differed. Scotland's major cities did experiment with electric lighting but these experiments were very temporary, and the negative attitude taken by large authorities was adopted also by smaller burghs. Indeed, many of the smaller burghs refused to consider the new form of illuminant. The private



sector, on the other hand, was much more enthusiastic, and a number of firms in Scottish industry were quick to realize the potential of the new form of energy, at this time principally as an illuminant. There is no firm general evidence to suggest why companies in such diverse industries as shipbuilding and textiles, mining and distilling decided to adopt electric lighting. Particular reasons only can be given - a savings on cost, greater safety, an ability to see fine work, a desire for modernism or even the prevention of pilfering. However, it is possible that the major savings did not accrue from immediate cost reductions but arose principally from an ability to increase output significantly; for instance it was easier to adopt twenty-four hour working on a more efficient basis in some industries than it had been before.

The almost total disregard of local authorities is even more difficult to explain. The Electric Lighting Act 1882 placed them in a very favourable position vis-a-vis private enterprise namely, a certain power of veto in the case of Board of Trade licence and the right of purchase after twenty-one years in the case of <sup>u</sup>provisional order. This statutory interference, however, giving local authorities virtual monopoly, reinforced inherent conservatism and resistance to innovation which was further compounded by a conflicting framework of local administration consisting of town council, police commission and gas commission. Many local authorities had, of course, their own gas undertaking which was evidently of greater cost efficiency than electric lighting, but the quality of gas supply was not universally good and in the private sector electrical installations, of both the arc and incandescent variety, were applied in both relatively large and small ~~\_\_\_\_\_~~

units, and were not only apparently cost effective but also successful illuminants. Industry had, certainly, power for generation purposes available whereas in the local authority sector it had to be installed and this may have been an inhibiting factor, but this does not fully explain the negative approach of local authorities during this initial phase.

During the decade which followed the birth of the modern electricity industry in 1878 there was, in Scotland, no shortage of companies, both public and private and national and international, willing to provide a supply of electricity on either an individual or public basis. Moreover, the promotion of company development was underpinned by academic institutions at Dundee, and particularly at Glasgow where the College of Science and Art and later the Glasgow and West of Scotland Technical College (now University of Strathclyde) held courses of both a theoretical and practical nature which proved popular not only with native Scottish students but also with those of other countries. However, the multiplicity of companies and the adverse effects of the trade cycle in the 1880's combined with expected teething problems during this early period undoubtedly influenced company development; the apathy and hostility of established interests did not help. Shareholders were also plentiful to a degree that speculation cannot be ruled out; in several instances



companies were founded and financed almost parochially and yet shareholders did not actively promote the company's business, by participating in its operations. Nevertheless, the extant evidence of this period reveals that a number of companies failed as a result of, what could be loosely termed, business malpractice. Marketing was also a severe problem, especially in view of the hostility of local authorities which denied companies the opportunity of providing a public supply, and also in the face of competition from gas which provided heat as well as light. Despite the apparent abundance of investors, certain companies were undercapitalised, and this lack of liquid capital militated against their development. Moreover, those companies associated with extra-national or international concerns were adversely affected by concessionary payments for the use and purchase of patents. These disbursements further weakened the viability of companies. Thus, by 1888 a foundation had been laid and a general awareness created in the new form of energy - and the development of a public supply of electricity gradually accelerated after that year.

The Electric Lighting Act 1888 took a slightly more moderate view of company promotion of electricity supply; nevertheless, it still favoured local authorities which continued to deny company schemes. In the 1890's local authorities were slow to exploit this position and the

period from initial discussions until the provision of a public supply was a lengthy process; this was true of burghs, both large and small and urban and rural. Undoubtedly, inherent conservatism played its part, but a lack of ability in the decision-making process compounded native caution and denied Scotland, generally, the benefits of the new form of energy for unreasonable periods of time. There was a division of local politico-industrial interests also, and an apparent opposition to civic involvement in industry by businessmen-councillors who may have wished themselves to invest in the electricity supply industry because of its potential profitability. Whatever the reasons, indecision and delay were evident.

Despite criticism, local authority undertakings, once established, made remarkable progress in the period before the First World War, and this is reflected in financial and technical statistics, and in the number of consumers supplied. There was almost an inevitability of expansion as demand grew in all sectors but undertakings grow at varying rates, influenced by the size of the statutory area of supply and the character of the area of the local authority. Throughout the period under review Scotland's major cities - Aberdeen, Dundee, Edinburgh and, in particular, Glasgow - dominated the local authority sector in all aspects of electricity supply, and this was to be expected. However, lesser towns also expanded their supply and, like the major cities, generally indicated an



improvement in technical efficiency and utilisation of resources. Thus, by the outbreak of the First World War a framework of electricity supply was apparently firmly established by a large number of autonomous local authority undertakings. This supply was undoubtedly beneficial and did much to improve not only the social environment of Scotland but also helped to enhance the overall efficiency of industry within the areas involved. However, the disparity in unit size and the autonomy enjoyed by individual undertakings was an obvious weakness undermining the promotion of even greater national efficiency.

Until the late 1890's numerous private installations in the domestic, commercial and industrial sectors continued to expand. Their continuing growth reflected the inactivity of local authorities and the restrictive nature of earlier legislation. They also, of course, revealed the ever-rising popularity of electricity which underpinned central station development and their demise at this time coincided with that development, the extension of public supply by local authorities and companies and with the growth of the power company.

Contemporaneous with the widening use of conventional generating plant was the extensive use of water power to generate electricity. This was an attempt to utilise, mainly in the Highlands, the natural resources of Scotland. Many of these installations were purely for private use, of small unit size and had little impact on the general economic

and social life of their area. These schemes were normally to be found on the estates of wealthy landowners where there was a sufficient head of water; the one notable exception was that of Fort William where a public supply was given by a local private company from 1896. More generally, successful schemes surrounded the activities of the British Aluminium Company at Foyers from 1896, at Loch Loven from 1909 and much later at Lochaber where the first stage was completed in 1929; at these three schemes the power generated was taken mainly by the company for the production of aluminium. The scheme with the longest history was probably that of the Falls of Clyde where initial proposals were made at least as early as 1886, but which only came into use in 1928. The 1920's, of course, witnessed the beginnings of the large hydro-electric developments at Grampian and Galloway and, although these schemes were completed too late to be fully considered within the scope of this research, they mark increasing interest in Scotland's natural water-power resources.

From the 1890's certain local authorities decided not to provide a public supply but to allow private enterprise to do so. Generally, these were the smaller, less industrialised and rural authorities and their very smallness may have influenced their decision. Later the growth of the power company may have been a determining factor. An examination of the growth of company development between 1888 and 1931 is difficult because of the lack of continuous financial and



technical data. Nevertheless, this period witnessed a dramatic increase in the number of company undertakings, indicative of rising demand, an extension of markets and the widening geographical distribution of electricity supply. Companies varied in size and scale from the large power companies providing a regional supply, to the small non-statutory undertakings which served a small locality. As already indicated, the period prior to 1900 was one of hostility to company promotion, but after that year there was growth with the regional power company becoming increasingly significant as the benefits of large scale generation and distribution became recognized.

The decade between 1911 and 1920 was important, but the First World War undoubtedly interrupted the growth in the number of company promotions as emphasis was focused on established undertakings. In the 1920's there was a veritable explosion of company promotion - almost 40 per cent of all companies were formed during this period - but, with the exception of the hydro-electric schemes, most of the new companies were small and concerned to provide lighting mainly and were found in the more remote areas where demand, because of low population density, was inadequate, and also there was an obvious difficulty of supply from existing undertakings, coupled with little incentive from the point of view of profitability. Despite evident 'gaps', the power companies, and the major hydro-electric schemes of the 1920's, dominated private sector growth whether from the point of view of the provision of supply or capital

formation. In private sector development throughout this period there was latent under-capitalisation and the part played by banks, in providing overdraft facilities, and private financing facilitated the growth of many concerns, both large and small.

Private sector development was further complicated since superficially it comprised independent concerns. However, in reality, individual companies, were controlled by national and international holding companies and linked by a series of interlocking directorates. Few Scottish companies, by 1931, remained outside of such control. Probably the major holding company was that of Balfour, Beatty and Company which from its inception in 1909 gradually extended its control over large areas of private sector development in Scotland, becoming by 1931 the centre of a multi-million pound empire stretching from the Highlands in the north to the extreme south of Scotland. Other holding companies operating in Scotland during this period were Edmundsons' Electricity Corporation, the Electric Supply Corporation, the National Electric Construction Company and the British Westinghouse Electric and Manufacturing Company which controlled the major power company in Scotland, the C.V.E.P. Company, for the greater part of the period under examination; the latter company was itself a holding company within Scotland. Generally, these holding companies effected absolute control over their subsidiaries but by no



means can they be regarded entirely as exploiters. They were, of course, advantaged by the financial and contractual obligations of subsidiaries, and their continued presence throughout this period underpins this return. Nevertheless, through these holding companies necessary foreign investment was attracted to Scotland - investment which was not immediately profitable - and since many of their subsidiaries operated in the less profitable rural areas (there were notable exceptions) they made a major contribution to the development of the Scottish economy nationally.

Despite the advances made by public and private enterprise, by the mid-1890's it was becoming increasingly obvious that existing legislation required modification. Until this time the ideal area of supply was the confines of a city or town, but technical improvements in large scale transmission and generation now allowed a much larger area of supply. Consequently, the optimum supply area was much larger and had the added social advantage of including small towns and villages which by themselves could not justify a public supply. This was recognised by Parliament and led to the setting up of power companies by Private Act to supply much wider areas. In Scotland several regional power companies were established, and the most important was the C.V.E.P. Company established in 1901 which covered over 700 square miles of the industrial heartland in the West of Scotland.

The foundation of the C.V.E.P. Company was welcomed by major industrialists in the area who believed that it would be a source of cheap electrical energy, and consequently all objections to its creation were quickly overcome. Throughout the promotion of this company emphasis was placed on its inherent nationalism but after inception contractual obligations and inadequate domestic investment brought the company, very positively, under Anglo-American influence which only began to diminish, somewhat, in the 1920's; a similar control was exerted over the company's several subsidiaries. As might be expected of a power company with such a large statutory area of supply, its authorised capital was equally substantial rising from £900,000 in 1901 to £2,900,000 by 1924, all of which was issued by 1929; in addition, the company made extensive use of loans and overdraft facilities of a semi-permanent nature. This company exemplifies the benefits obtained by external (to Scotland) investors from contractual obligations of both a short-term and long-term nature, and thus the multiplier effect of its establishment, and expansion, on local industry and employment is questionable.

The continual expansion of plant capacity at the two, and later three, generating stations of this company illustrates the rapid growth of demand in industrial, commercial and domestic sectors. It also, of course, reveals the vigorous marketing policy pursued, underpinned by canvassing and rapid sub-station construction, highlighted by total



contracts entered, and by unit sales and revenue. No common pricing policy can be determined, and decisions taken were arbitrary and influenced by what the market would accept. As noted earlier, the C.V.E.P. Company was a holding company in its own right and the subsidiaries under its complete control were used to further its interests and remained apparently profitable. The overall profitability of the company is of obvious interest, particularly in view of foreign sponsorship. No dividends on ordinary share capital were paid during the first eleven years of the company's history, but unknown sums were paid out of capital. The first ordinary share dividend payments were recorded in 1916 when a moderate 2.50 per cent was paid, but by 1920 this had risen to 7.50 per cent and from 1922 to 1930 it remained at 8.00 per cent. In addition, two issues of 6 per cent Cumulative Preference Shares (from 1913) and 8 per cent Cumulative Preference Shares (from 1922) received their respective dividend payments, and overall the company was revealed as a fairly profitable concern, providing a secure return on capital invested. On the more human side, the company was apparently motivated to look after the physical and literary aspirations of employees and also provided financial support, by means of grants and allowances, at the incapacity or death of employees. However, such support was at the discretion of directors. Nevertheless, the company provided a degree of security to

employees and their families, particularly during the depression of the inter-war years, and, more generally, aided the economic and social development of the West of Scotland.

The performance of the company sector between 1915/1916 and 1931 has already been examined, and, throughout this period also local authority electricity supply continued to expand to meet rising demand. Installed capacity rose, although decelerating in the latter part of the 1920's, and this pattern corresponded closely with units generated and was reflected in financial expenditure. The progress of individual local authorities varied, of course, and national statistics are complicated by acquisitions of undertakings from companies, the establishment of new undertakings and by the discontinuity of data. Nevertheless, as previously indicated in the company sector, demand continued to grow, although the trade cycle was not without effect. As expected the four major cities continued to dominate, but the onset of the inter-war depression created subtle changes in their positions; boundary changes and statutory interference were also significant. Thus, in this period, the performance of local authorities, especially in the major cities, was crucial, and the indicators were that, despite imperfections in the system, these authorities enhanced economic and social life within their areas of supply.

More generally, the industry, in both the public and private sectors, was influenced by fluctuating trends in the national economy. Periods of upswing were naturally beneficial, and expanding markets encouraged investment in additional plant and equipment and allowed greater profit potential to be realised. However, even



In periods of acute economic and social distress, the industry continued to expand, although in such times growth was not so marked. Indeed the development of the Scottish industry was respectable by United Kingdom standards until the mid-1920's when, with the onset of the inter-war depression and with the greater severity with which it affected the Scottish economy, progress in England and Wales forged ahead. Lack of continuous data make it difficult to assess accurately the impact of the industry itself on the rest of the Scottish economy. Clearly its growth improved the social environment, and industrial consumption in most sectors rose. The use of electrical power gave greater flexibility to industry and commonly an ability to raise output, but where there was a need to offset increasing costs or diminishing returns its use was equally important.

The First World War had been, of course, a watershed and the importance of the electricity supply industry to the economy was now generally recognised; this was emphasised by the establishment of a series of government inquiries. These investigations culminated in the Electricity Supply Act 1919. The initial Bill recognised the inherent weaknesses in the industry and recommended the appointment of a central controlling body, the Electricity Commissioners, with specific control over the industry and financed with government assistance. The Bill faced strong opposition in Parliament and, consequently, the Act itself weakened the position of the Electricity Commissioners and placed emphasis on voluntary co-operation rather than compulsory powers. In Scotland two districts were provisionally determined viz., the West of Scotland Electricity District and the Edinburgh and Lothian Electricity District. The latter district was established in 1924, but the formation of the former was much more

difficult, principally because of alienation among major vested interests which emphasised the need for compulsory powers. This was recognised in the Electricity (Supply) Act 1926 which established the Central Electricity Board with executive powers, and an obligation to set up the national grid, although the actual operation of undertakings remained with existing owners.

The first project to be implemented by the Central Electricity Board was the Central Scotland Scheme in 1927, encompassing east and west central Scotland, which was put into general commission in 1930. This scheme was a compromise with the national grid superimposed on the existing structure and by 1930, although some rationalisation had taken place, existing individual generating stations continued to operate and new undertakings were established. Thus, in the period prior to 1930/1931 the effectiveness of the 1926 legislation should not be exaggerated. The electricity supply industry from its humble beginnings was generally affected by government intervention and, although latterly efficiency had been stimulated by government, further centralisation was necessary to promote a nationally efficient industry. The legislation of 1926 reflected that need.



Appendix IList of Electrical Suppliers and  
Installers Operating in Scotland pre - 1888.

Anderson & Munro, Electrical Engineers, Glasgow.  
 R.E. Crompton and Company.  
 Swan Electric Lighting Company.  
 D. & G. Graham, Glasgow.  
 Anglo-American Brush Electric Light Corporation Ltd.  
 The Northern Electric Light, Power and Appliances  
 Company Ltd.  
 Maxim-Weston Electric Company.  
 Universal Electric Company Ltd.  
 Scottish Brush Electric Light and Power Company Ltd.  
 Scottish Pilsen, Joel and General Electric Company Ltd.  
 Edison Electric Light Company.  
 Brush Electric Light and Power Company of Scotland Ltd.  
 Electric Carbon, Storage and Apparatus Manufacturing  
 Company of Scotland Ltd.  
 Scottish Gölcher Electric Light and Power Company Ltd.  
 Railway and Electric Appliances Company.  
 National Electric Company of Glasgow.  
 Electric Construction and Maintenance Company.  
 Electric Sun Lamp and Power Company.  
 Woodhouse and Rawson, London.  
 Edison & Swan United Electric Light Company.  
 E.W. Beckingsdale, Glasgow and London.  
 B.P. Stockman, London.  
 Norman and Sons, Glasgow.  
 R. Miller, Glasgow.  
 Paget Higgs Ltd., Edinburgh.  
 Woodside Electric Works, Glasgow.  
 J. Edmundson & Company.  
 J. Campbell, Glasgow.  
 W. Harvie and Company, Glasgow.  
 Muir, Mavor and Coulson.  
 H. Bennett and Company.  
 J.D. Andrew and Company.  
 D.P. Menzie, Glasgow.  
 Jarman Electrical Company.  
 King, Brown and Company.  
 Thomson-Houston Company.  
 Macwhirter and Company, Faraday Electric Light Works,  
 Glasgow.  
 Robertson and Company, Paisley.  
 Lowdon and Company, Dundee.  
 W.A. Bryson.

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Source: Telegraphic Journal, Vols. VI - XXIII.

Appendix 2Northern Electric Light, Power and Appliances  
Company Ltd.List of Shareholders at 23rd February, 1882.

<u>Name.</u>	<u>Shares Hold.</u>
John Leng, Bank Street, Dundee, Managing Proprietor, <u>Wundel Advertiser</u> <sup>1</sup>	500
John Mitchell Keiller, Bivocock, Dundee, Confectioner, <sup>1</sup>	800
Thomas Anderson Smeton, Manufacturer, Dundee. <sup>1</sup>	500
James Martin White, Merchant, Dundee. <sup>1</sup>	500
George Halley, Manufacturer, Dundee. <sup>1</sup>	500
Wm. W. Urquhart, Engineer, Dundee. <sup>1</sup>	500
James Luke Jnr., Manufacturer, Dundee. <sup>1,2</sup>	500
J. Grimmond, Manufacturer, Dundee.	500
G. Grimmond, Manufacturer, Dundee.	500
G. Armnstead, Merchant, Dundee.	500
C.C. Maxwell, Windsor St., Dundee.	500
A. Nicoll, Manufacturer, Dundee.	250
D. Pirie, Painter, Dundee.	200
E. Gilbert, Manager Dundee & Arbroath Railway, Dundee.	200
A. McKay, Accountant, Dundee.	200
F.H. Mackie, Merchant, Edinburgh.	100
J. Adam Snr., Magdalen Place, Ropemaker, Dundee.	100
J. Adam Jnr., Magdalen Place, Ropemaker, Dundee.	100
B. Gray, Brewer, Broughty Ferry.	100
H. Gourlay, Engineer, Dundee.	100
D. Air, Merchant, Dundee.	150
A.W. Cumming, Solicitor, Dundee.	70
Isabella, Philip, Mary, Ann and Jessie Banks, Broughty Ferry.	30
W. McKay, Contractor, Laurel Terrace, Carnoustie.	50
D. Croll, Seedsman, Broughty Ferry.	50
G. McKay, Jnr., Ravenhill, Broughty Ferry, Mate.	50
J.C. Robertson, Accountant, Dundee.	<u>50</u>
carry for'd.	7,600



<u>Name.</u>		<u>Shares Held.</u>
	brought for'd	7,600
J. Gibson, Rock St., Dundee, Acroage Adjuster.		100
W.B. Ritchie, Shipbroker, Dundee.		25
J. Todd, 7 North Lindsay St., Dundee, Fine Merchant.		10
C. Morris, 69 Reform St., Dundee, Clerk.		8
J.S. Ritchie, 2 Airlie Terr., Dundee, Ship Agent.		57
J.P. Smith, Manufacturer, Alyth.		500
A.A. Watt, Kincaig House, Dundee.		350
J.H. Lews, Merchant, Dundee.		250
F. Stevenson, Nelson Terr., Dundee, Dyer.		200
G.H. Nicoll, Bank St., Dundee, Ironmonger.		200
J. Ogilvy, Manufacturer, Kirriemuir.		150
J.M. Cochrane, Shipmaster, 14 King St., Dundee.		50
A. Gourlay, Airlie Lodge, Broughty Ferry.		100
A. Harris, Auctioneer, Dundee.		100
R. Smith, Solicitor, Dundee.		100
T. Harris, Grocer, Newport.		100
J. Miln, Accountant, Dundee.		100
		<u>10,000</u>

1. Original subscribers of the company.
2. At 14th July, 1882 his shares were forfeited.

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Source: R.C. Dissolved Company Files, B.T. 2/1061.

Appendix 3Universal Electric Company Limited.List of Shareholders at 12th May, 1882.

<u>Name.</u>	<u>Shares Held.</u>
R.P. Dunbar, St. Albans Place, Lancs. M.D. <sup>1</sup>	200
W.H. Akister, 111 Gt. Western Rd., Glasgow, Electrician. <sup>1</sup>	1,200
J. Baird, Belgrove St., Glasgow, Manufacturer <sup>1</sup>	200
L. Baird, Belgrove St., Glasgow, Manufacturer <sup>1</sup>	200
R.J. Galt, 58 West Regent St., Glasgow, C.A. <sup>1</sup>	20
J. Dunbar, 31 St. Vincent Street, Glasgow, Solicitor. <sup>1</sup>	250
W.D. Baird, 31 St. Vincent St., Glasgow, Solicitor.	250
J. Burns, 15 Fitzroy Place, Glasgow, Surgeon.	40
A. Wilson, 6 Campvale, Crossmilooft, Dealer in Horses.	20
H. Grieve, 34 Howard St., Glasgow, Warehouseman.	20
J. Gill, 2 Herriot Row, Edinburgh, S.S.C.	40
J. Taylor, 132 Trongate, Glasgow, Wholesale Druggist.	50
W. Clark, 47 King St., Glasgow, Cotton Thread Manufacturer.	200
R. Falconer, 10 Ibrox Terr., Glasgow, Merchant	20
A.B. Kirsop, 33 Hope St., Glasgow, Iron Merchant	20
G. Proudfoot, 11 Onslow Dr., Glasgow, Minister of Gospel.	20
J. Filshill, 420 Gallowgate, Glasgow, Confectioner.	20
D.L. McQueen, Main St., Coatbridge, Clothier.	20
G. Bogle, 47 Oswald St., Glasgow, Yacht Merchant.	5
J. Campbell, Valleyfield, Pollokshields, Gentleman.	100
W. Stewart, 115 Finlay Dr., Glasgow, Clothier.	5
R. Sorley, Buchanan St., Glasgow, Jeweller.	10
	<hr/>
carry forward.	2,910



<u>Name</u>	<u>Shares Hold.</u>
brought forward	2,910
Annie G. Duncan, Craignish House, Callender, Housekeeper.	14
W.J. Mackie, Little Tarbullock, Dufftown, Traveller.	10
D. Dougal, East Overton, Strathaven, M.D.	20
T. Marr, 35 St. Vincent Pl., Glasgow, Actuary.	120
J.W. Downie, 26 Canning St., Glasgow. Physician.	40
D. Dougal, East Overton, Strathaven, Physician.	20
W. Burns, 13 Annfield Place, Glasgow, Physician	20
J. Lamont, 49 Virginia St., Glasgow, Merchant.	50
T.S. Chalmers, Dumfries, Procurator-Fiscal.	20
M. Robinow, 39 St. Vincent St., Glasgow, Merchant	40
R. Davidson, 106 Ingram St., Glasgow, Writer.	50
A. Henderson, 28 Austen-Friars, London, Gentleman.	100
T. Marr, 35 St. Vincent Pl., Glasgow, Actuary.	60
J. McCulloch, 29 Cadogan St., Glasgow, Tea Merchant.	100
H. Grieve, 34 Howard St., Glasgow, Warehouseman	20
Helen J. Dunbar, 109 Douglas St., Glasgow, Married Woman.	20
A. Bait, 75 Irish St., Dumfries, Collector of Inland Revenue.	10
T. Johnstone, 233 West Regent St., Glasgow, Surgeon.	20
L. Baird, 70 Armadale St., Glasgow, Manufacturer.	100
J. Baird, 185 Thomson St., Glasgow, Manufacturer.	100
J. Hall, 85 Queen St., Glasgow, Cotton Yarn & Goods Agent.	20
J. Campbell, Valleyfield, Pollokshields, Gentleman.	50
W. Burns, 13 Annfield Place, Glasgow, M.D.	20
F.Y. Henderson, 92 St. Vincent St., Glasgow, Sharebroker.	<u>10</u>
carry forward	3,944

<u>Name</u>	<u>Shares Held.</u>
brought forward	3,944
I. Wilson, 92 St. Vincent St., Glasgow Sharebroker.	10
I.M. Wilson, 42 Glassford St., Glasgow, Manufacturer.	25
D. Whyte, 51 Buchanan St., Glasgow, Warehouseman.	<u>21</u>
	<u>4,000</u>

:

1. Original members of the company.

N.B. Rankin Kennedy, 176 Alison St., Glasgow,  
Engineer and Electrician was one of the original  
members of the company and held 40 shares.  
These shares were forfeited on 18th March, 1882.

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Source: R.C. Dissolved Company Files, B.T. 2/1076.



Appendix 4Scottish Brush Electric Light and Power  
Company Limited.List of Shareholders at 21st April, 1882.

<u>Name</u>	<u>Shares Held.</u>
F.M. Haldane, 19 Constitution Street, Loith, Merchant.	25
W. Whitfield, 17 Gracechurch St., London, West India Merchant.	75
S.J. Musson, Kincaird House, Highfield London.	75
W. Lyons, 8 Randolph Cliff, Edinburgh, Auctioneer.	25
R. Morris, 1 Old Hall St., Liverpool, Produce Broker.	10
R. Dick, Greenhead, Glasgow, Guta-percha Merchant.	100
E. Mather, The Lee, Merchiston, Edinburgh, Engineer.	100
T. Landale, 4 Mayfield Terr., Edinburgh, Engineer.	50
S. Davison, Boswell House, Edinburgh, Engineer.	25
R. Whigman, Headingley, Leeds, Engineer.	25
D. Gregg, Steam Plough Works, Leeds, Engineer.	25
J. Bonche, 1 Old Hall Street, Liverpool.	10
D. McNaughton, 79 Mark Lane, London, Produce Broker.	40
W. Montgomery, 75 Mark Lane, London, Merchant.	10
J.W. Hope, 54 Bernard Street, Leith, Merchant.	25
J. Crankirton, (address unknown), Manufacturer.	50
G. Skinner, 477 Sauchiehall St., Glasgow, Confectioner.	50
T. Mackie, Coutts Place, Edinburgh, Merchant.	100
R. Lockhart, 9 Royal Terr., Edinburgh, Manufacturer.	25
Anglo-American Brush Electric Light Corporation Limited, London.	2,000 <sup>1</sup>
W.P. Hope, 54 Bernard Street, Leith, Merchant	<u>150<sup>1</sup></u>
carry forward.	2,995

<u>Name</u>	<u>Shares Hold.</u>
brought forward.	2,995
D. Tullis, Glengariu, Rutherglen, Leather Merchant.	10
J. Humphreys, Arundel House, South Howood Park, London, Engineer.	25
W.J. Gardner, 45 Lillyville Road, Fulham Road, London.	<u>25</u>
	<u>3,055</u>

1. These shares are listed as fully paid.

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Source: R.C. Dissolved Company Files, B.T. 2/1068.



Appendix 5The Electric Carbon, Storage and  
Apparatus Manufacturing Company of Scotland.List of the Largest Shareholders at 5th February, 1883.

<u>Name</u>	<u>Shares Held.</u>
A. Ainslie, Dalkeith	400
E.W. Bradley, Birmingham	200
J.E. Brock, Kirkleston.	200
G.B. Bryan, Stockport.	200
J. Cran, Inverness.	200
J.G. Davidson, Ardishaig, Argyll.	300
J. Dalrymple, Edinburgh.	200
J.D. Fraser, J.P.	300
H. Gilmour, Edinburgh.	200
J.W. Hope, Edinburgh.	1,000
F.M. Haldane, Leith.	200
W.P. Hope)	
J.W. Hope)	
B.W. Hope)	
J.A. P. Hope)	14,400
H. Knoblanck, Leith.	200
R. Lockhart, Edinburgh.	300
J. Lyon, Edinburgh.	250
T. Lonsdale, Edinburgh.	400
J. Murray, Stirling.	400
E. Mather, Edinburgh.	500
J.D. Peddie, M.P.	400
W. Paddon, Oakhampton.	200
D.R. Ratcliffe, J.P., St. Alne, Warwick.	300
E.O. Walleston, Bournemouth.	500
G.M. Wood, S.S.C.	250
W. Whyte, Edinburgh.	200
D.J. Wilson, Kirkcaldy.	200
	<u>21,900</u>

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Source: Telegraphic Journal, Vol. XIII, 25th August, 1883.

## Appendix 6

## INSTALLED CAPACITY OF SCOTTISH LOCAL AUTHORITIES ON QUINQUENNIAL BASIS 1896-1915/1916

Local Authority	1896	1900/1901		1905		1910		1915/1916		Percentage Increase From Base Year
	KW	Percentage Increase	KW	Percentage Increase	KW	Percentage Increase	KW	Percentage Increase		
Glasgow	1,939	230.17	6,402	113.59	13,674	177.04	37,882	38,612	1.93	1891.34
Dundee	821	56.27	1,283	134.61	3,010	132.89	7,010	11,500	64.05	1300.73
Aberdeen	537	86.22	1,000	110.00	2,100	119.52	4,610	4,733	2.67	781.38
Edinburgh	3,035	55.02	4,705	139.26	11,257	24.52	14,017	18,022	28.57	493.81
Ayr			255	488.24	1,500	-11.66	1,325	1,325		419.61
Govan			190	926.32	1,950		1,950			
Leith			428	238.18	1,640	73.17	2,840	3,450	21.48	706.07
Motherwell			225	183.55	910	109.89	1,910	3,050	59.69	235.16
Stirling					638		638			183.56
Falkirk					500		500	1,500	200.00	200.00
Greenock			450	300.00	1,800	27.78	2,300			411.11
Kilmarnock					480	57.29	755	1,030	36.42	114.58
Kirkcaldy					1,030	5.83	1,070	2,290	110.09	122.33
Oban					180			243		35.00
Paisley					3,200	31.25	4,200	3,900	-7.14	21.88
Partick					1,050	38.10	1,450			
Perth					695	71.94	1,195	1,195		71.94
Rothesay					34		34			147.06
Broughty Ferry					90	66.67	150			66.67
Hamilton							780	1,180	51.28	51.28
Wishaw							300			
Total	6,322	136.29	14,938	202.84	45,238	87.75	84,936	72,752	9.20	1367.13

Sources: Carke, op. cit. Vols. I, V, IX, XIV, XII.



## Appendix 7

## ELECTRICITY GENERATED (IN B.T.U.) BY SCOTTISH LOCAL AUTHORITIES ON QUINQUENNIAL BASIS 1896-1915/1916

Local Authority	1896		1900/1901		1905		1910		1915/1916		Percentage Increase from Base Year
	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase	
Glasgow	1,279,687	308.45	5,226,818	239.99	17,770,488	133.49	41,493,033	122.42	92,286,953	7111.68	
Dundee	252,667	191.39	736,242	361.94	3,400,978	76.07	5,988,161	146.66	14,770,281	5745.75	
Aberdeen	159,777	75.21	279,953	1385.30	4,158,141	45.98	6,070,192	92.65	11,693,994	7218.95	
Edinburgh	1,070,378	332.12	4,625,367	153.04	11,704,182	50.68	17,636,385	29.26	22,796,547	2029.77	
Ayr			366,784	225.16	1,192,629	41.36	1,685,933	15.04	1,939,421	428.76	
Govan					1,003,596	186.77	2,877,979				
Leith			256,941	503.96	1,551,819	119.32	3,403,394	24.93	4,251,877	1554.81	
Motherwell					782,780	236.51	2,634,145	37.43	3,620,089	362.47	
Stirling					228,790	74.81	399,948	18.29	473,100	106.78	
Falkirk							372,200	299.05	1,485,277	299.05	
Greenock							4,421,908	195.12	13,049,840	723.23	
Kilmarnock					1,585,206	178.95	794,211	234.33	2,655,248	234.33	
Kirkcaldy					615,353	169.65	1,659,306	34.69	2,234,964	263.20	
Oban									175,871		
Paisley					1,215,055	165.21	3,222,456	19.16	3,839,857	216.02	
Partick					783,276	204.65	2,386,275				
Perth					627,810	64.16	1,031,611	16.75	1,204,392	91.84	
Rothesay							25,372		25,372		
Broughty Ferry							142,667				
Allon							94,865	341.06	418,410	341.06	
Hamilton							736,972	107.26	1,527,444	107.26	
Wishaw							203,913				
Total	2,762,509	316.07	11,492,105	305.67	6,620,103	100.67	17,282,726	83.43	178,443,937	6359.69	

Source: Carle's *etc.* Vols. I, V, II, III, VII.

## Appendix 8

## AUTHORISED LOANS OF SCOTTISH LOCAL AUTHORITIES ON QUINQUENNIAL BASIS 1896-1915/1916

Local Authority	1896		1900/1901		1905		1910		1915/1916		Percentage Increase from Base Year
	£	Percentage Increase	£	Percentage Increase	£	Percentage Increase	£	Percentage Increase	£	Percentage Increase	
Glasgow	200,000	250.00	700,000	100.00	1,400,000	42.86	2,000,000	41.07	2,821,478	1310.74	
Dundee	40,000	140.00	96,000	129.17	220,000	18.18	260,000	76.15	458,000	1045.00	
Aberdeen	32,000	109.38	67,000	273.13	250,000	32.00	330,000	24.24	410,000	1181.25	
Edinburgh	90,000	333.33	390,000	120.51	860,000	20.35	1,035,000	7.25	1,110,000	1133.33	
Ayr			50,000	70.00	85,000	41.18	120,000	8.33	130,000	160.00	
Govan			50,000	60.00	80,000	87.50	150,000				
Leith			35,000	275.14	125,000	28.00	160,000	6.25	170,000	385.71	
Motherwell			30,000	100.00	60,000	66.67	100,000	20.00	120,000	300.00	
Stirling			25,000	48.00	37,000	18.92	44,000		44,000	76.00	
Falkirk					35,000	42.86	50,000	20.00	60,000	71.43	
Greenock					100,000	75.00	175,000	64.00	287,000	187.00	
Kilmarnock					35,000	51.43	53,000	25.47	66,500	90.00	
Kirkcaldy					50,000	60.00	80,000		80,000	60.00	
Oban					20,000				26,500	32.50	
Paisley					141,327.85	48.59	210,000	5.95	222,500	57.44	
Partick					69,450	76.35	122,477		62,500	25.00	
Perth					50,000	12.00	56,000	11.61	4,000		
Rothesay					4,000		4,000				
Broughty Ferry					15,000	33.33	20,000		34,000	33.33	
Allea					12,000		12,000			153.33	
Derry and Donipace					2,000		2,000				
Hamilton					61,000		61,000		75,000	22.95	
Total	342,000	299.62	1,443,000	152.86	3,648,777.85	38.25	5,044,477	22.54	6,181,478	1,607.59	

Source: Carroll op. cit. Vols. I, V, II, III, VII.



Appendix 9

CAPITAL EXPENDITURE OF SCOTTISH LOCAL AUTHORITIES ON QUINQUENNIAL BASIS 1896-1915/1916

Local Authority	1896 £	1900/1901		1905		1910		1915/1916		Percentage Increase from Base Year
		Percentage Increase	£	Percentage Increase	£	Percentage Increase	£	Percentage Increase	£	
Glasgow	131,961.55	361.87	609,484.91	83.61	1,119,047.70	60.87	1,800,202.52	36.47	2,456,782.46	1761.74
Dundee	35,474.81	28.00	45,409.38	259.02	163,028.71	48.78	242,551.82	62.08	393,130.14	1008.20
Aberdeen	29,542.97	135.97	69,713.38	216.64	220,742.85	34.82	297,601.48	49.16	443,897.34	1402.55
Edinburgh	143,979.37	174.59	395,356.59	113.82	845,336.87	19.38	1,009,164.60	8.96	1,099,556.96	663.69
Ayr			43,877.10	108.38	91,473.23	10.00	100,616.52	7.85	108,512.00	147.20
Govan			30,000.00	137.49	71,246.63	84.20	131,234.28			
Leith			36,833.45	159.68	95,650.64	58.07	151,192.84	12.89	170,687.46	363.40
Motherwell			30,000.00	93.29	57,986.63	58.94	92,165.27	25.03	115,234.10	284.11
Stirling			25,000.00	53.08	38,270.78	6.80	40,873.64			
Falkirk					26,000.00	31.94	34,303.24	76.63	60,588.90	133.03
Greenock					86,174.80	105.17	176,808.11	77.01	312,969.26	263.18
Kilmarnock					30,000.00	68.81	50,643.67	34.32	68,023.96	126.75
Kirkcaldy					52,578.04	24.84	65,638.65	20.12	78,843.46	49.96
Oban					20,000.00				25,005.03	25.03
Paisley					133,397.19	44.82	193,189.55	9.84	212,205.86	59.08
Partick					55,649.00	119.38	122,082.48			
Perth					50,237.64	17.04	58,798.37	3.94	61,115.12	21.65
Rothesay					3,816.01	-8.28	3,500.00		3,500.00	-8.28
Broughty Ferry					13,584.00	42.80	19,398.90			
Gourock					15,000.00					
Kirkintilloch					20,000.00					
Malrn					12,000.00					
Wishav					20,000.00	-2.50	19,500.00	25.74	24,519.00	22.60
Dunoon										
Canbuslang					10,000.00	400.00	20,000.00	-56.00	22,000.00	120.00
Allon					9,530.00	3.53	9,866.82	156.79	25,337.35	165.87
Dumbarton					25,000.00					
Deary &										
Dunipace					1,200.00		1,200.00			
Rutherglen					3,900.00		3,900.00			
Pannfrew					10,300.00		10,300.00			
Haillon									71,526.17	
Total	340,958.70	277.08	1,295,694.81	155.56	3,285,750.72	43.19	4,704,732.76	22.29	5,753,434.57	1587.43

Source: Carke, *op. cit.* Vols. I, V, IX, XIV, XIX.

Appendix 10

Position of Glasgow vis-a-vis other Scottish Local Authorities.  
on Quinquennial Basis 1896 - 1915/1916

ASPECT (expressed as a percentage)	1896		1900/01		1905		1910		1915/16	
	Glasgow	Others	Glasgow	Others	Glasgow	Others	Glasgow	Others	Glasgow	Others
INSTALLED CAPACITY	30.62	69.38	42.86	57.14	30.23	69.77	44.61	55.39	41.63	58.37
ELECTRICITY GENERATED	46.32	53.68	45.48	54.52	38.12	61.88	42.65	57.35	51.72	48.28
AUTHORISED LOANS	55.25	44.75	48.51	51.49	38.37	61.63	39.65	60.35	45.64	54.36
CAPITAL EXPENDITURE	38.70	61.30	47.41	52.59	34.06	65.94	38.26	61.74	42.70	57.30

Source: Garecke, op. cit. Vols, I, V, IX, XIV, XIX.



Appendix II

Analysis of Electricity Sold in E.I.U. by Aberdeen, Dundee, Edinburgh and Glasgow 1896 - 1915/1916

Local Authority	Type of Sale	1896			1900/1901			1905			1910			1915/1916		
		Units Sold	% Increase	Prop. of Total	Units Sold	% Increase	Prop. of Total	Units Sold	% Increase	Prop. of Total	Units Sold	% Increase	Prop. of Total	Units Sold	% Increase	Prop. of Total
Aberdeen	Public Lamps	8,257	196.49	5.97	24,481	97.16	9.54	258,803	12.77	7.31	291,848	5.64	308,825	5.82	320	3610.16
	Customers	130,115	78.44	96.03	232,172	581.35	90.46	1,581,909	6.54	44.70	1,685,390	32.60	2,314,340	37.32	23,95	1678.70
	Traction	-	-	-	-	-	-	1,698,314	23.31	47.99	2,094,119	40.50	2,347,243	12.09	24.29	38.21
	Power and Heat	-	-	-	-	-	-	-	-	-	1,099,064	21.26	4,692,626	326.97	48.56	326.97
<b>Total</b>		138,372	-	100.00	256,653	-	100.00	3,539,026	-	100.00	5,170,421	100.00	9,663,054	-	100.00	
Dundee	Public Lamps	-	-	-	88,081	40.10	14.25	123,400	19.21	4.30	147,104	2.84	251,112	70.70	2.08	183.09
	Customers	202,437	161.92	100.00	530,221	102.43	85.75	1,073,347	134.14	37.42	2,513,133	48.58	9,292,542	269.76	77.04	4490.34
	Traction	-	-	-	-	-	-	1,671,819	59.30	58.28	2,512,799	48.58	2,518,274	0.23	20.88	50.65
	<b>Total</b>		202,437	100.00	618,302	-	100.00	2,868,566	-	100.00	5,173,036	100.00	12,062,228	-	100.00	
Edinburgh	Public Lamps	32,043	222.41	35.48	1,044,733	25.50	25.03	1,311,174	39.77	12.36	1,832,637	12.01	1,942,841	6.01	10.26	499.56
	Customers	56,292	454.64	63.52	3,129,808	123.71	74.97	7,003,715	40.44	66.03	9,833,301	64.46	10,039,239	8.20	56.17	1753.41
	Traction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Power and Heat	-	-	-	-	-	-	2,291,976	56.61	21.61	3,597,527	27.52	6,232,459	73.71	32.92	172.06
<b>Total</b>		88,335	-	100.00	4,174,541	-	100.00	10,604,865	-	100.00	15,255,465	100.00	18,940,948	-	100.00	
Glasgow	Public Lamps	224,353	126.02	18.73	441,874	216.27	10.87	1,460,780	6.46	9.67	1,555,150	4.51	2,687,777	72.96	3.49	1216.25
	Customers	836,006	327.34	81.27	3,798,775	299.06	89.13	13,604,119	10.14	90.05	14,983,012	43.47	19,940,921	33.09	21.90	2149.13
	Traction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Power and Heat	-	-	-	-	-	-	42,766	306.17	0.28	17,733,046	51.52	54,047,228	204.44	70.17	204.44
<b>Total</b>		1,090,779	-	100.00	4,250,649	-	100.00	15,107,665	-	100.00	34,644,911	100.00	77,020,871	-	100.00	

Source: Goods, 1896, 1, 7, 13, 1916

Appendix 12

Analysis of Units Sold by Selected Towns, at 1900/1901, 1905, 1910 and 1915/1916

Local Authority	Type of Sale	1900/1901		1905		1910		1915/1916	
		Units Sold	Propn. of Total	Units Sold	Propn. of Total	Units Sold	Propn. of Total	Units Sold	Propn. of Total
Ayr	Consumers	110,554	37.17	292,760	27.94	461,918	.31.98	529,899	34.77
	Public Lamps	183,566	61.72	430,864	41.12	413,766	28.65	305,461	20.04
	Contract Tramways Power and Heat	3,300	1.11	324,157	30.94	49,695	3.44	54,651	3.58
	Total	297,420	100.00	1,047,781	100.00	82,207	5.69	202,565	13.29
Hotherwell	Consumers			352,964	48.73	335,713	15.48	546,642	18.65
	Public Lamps			152,721	21.09	508,200	23.43	476,883	16.27
	Tramways Power and Heat			218,594	30.18	1,325,354	61.09	1,907,471	65.08
	Total			724,279	100.00	2,169,267	100.00	2,930,996	100.00
Paisley	Consumers			671,372	79.18	1,002,244	39.12	3,609,708	94.01
	Public Lamps			176,499	20.82	279,315	10.90	230,149	5.99
	Tramways			847,871	100.00	1,280,487	49.98	3,839,857	100.00
	Total			1,695,742	100.00	2,562,046	100.00	7,679,714	100.00
Perth	Consumers			329,219	65.68	466,826	50.07	618,490	56.93
	Public Lamps			171,993	34.32	146,743	15.74	172,068	15.84
	Tramways			501,212	100.00	318,796	34.19	295,846	27.23
	Total			1,002,424	100.00	932,365	100.00	1,086,404	100.00
Stirling	Consumers			122,417	59.73	246,935	68.36	324,248	73.63
	Public Lamps			81,854	39.94	113,790	31.50	113,787	25.92
	Contract			674	0.33	495	0.14	839	0.20
	Total			204,945	100.00	361,220	100.00	438,874	100.00

Source: Carke, op.cit., Vols. V, II, XIV, XIX



## Profitability of Selected Local Authority : Undertakings 1876 - 1915/1916

	Revenue from Sale of Current £	Other Revenue £	Total Revenue £	Average Revenue Per Unit Sold d.	Working Expenses £	Per Unit Sold d.	Other Expenses £	Total Expenses £	Profit £	Loss £	Percentage Total Cost to Revenue from Sale of Current
<u>GLASGOW</u>											
1876	24,995.72	866.70	25,862.42	5.49	17,919.38	3.94	5,562.05	23,481.43	2,380.99		71.69(71.76)
1900/1901	59,762.10	-	59,762.10	3.37	34,999.80	1.97	24,722.57	59,722.37	39.73	3,553.94	58.57(58.56)
1905	158,190.23	-	158,190.23	2.51	61,669.40	0.98	100,074.77	161,744.17	-	3,544.72	38.98(38.98)
1910	245,673.26	-	245,673.26	1.71	104,902.13	0.73	144,315.85	249,217.98	-	-	42.70(42.67)
1915/1916	369,594.10	8,720.95	378,315.05	1.16	192,128.98	0.60	186,186.07	378,315.05	-	-	51.98(51.98)
<u>EDINBURGH</u>											
1876	16,365.64	1,597.18	17,962.82	4.42	7,165.65	1.94	6,620.25	13,985.90	3,976.92		43.78(43.78)
1900/1901	48,209.75	28.25	48,238.00	2.77	24,360.93	1.40	17,990.59	42,351.52	5,886.48		50.53(50.53)
1905	115,900.97	277.97	116,178.94	2.63	42,382.63	0.96	49,798.94	92,181.57	23,997.37		36.57(36.56)
1910	127,791.24	62.16	127,853.40	2.00	64,042.35	1.00	61,739.23	125,781.58	2,071.82		50.11(50.20)
1915/1916	139,029.45	5,993.24	145,022.69	1.76	71,463.61	0.91	69,724.26	141,187.87	3,834.82		51.40(51.40)
<u>AIR</u>											
1900/1901	3,811.98	88.70	3,900.68	3.08	2,554.84	2.06	2,072.96	4,647.80	627.75	747.12	67.02(67.02)
1905	10,943.25	615.43	11,558.68	2.51	5,653.62	1.29	5,277.31	10,930.93	524.32		51.66(51.67)
1910	13,928.08	230.81	14,218.89	2.32	7,186.17	1.19	6,508.40	13,694.57	1,444.05		51.37(51.37)
1915/1916	15,547.00	255.86	15,802.86	2.44	8,466.77	1.33	5,892.04	14,358.81	1,444.05		54.46(54.46)
<u>NOTTINGHAM</u>											
1905	6,031.03	704.37	6,735.40	2.00	3,033.38	1.00	3,538.50	6,571.88	163.52		50.30(50.00)
1910	11,220.53	665.75	12,486.28	-	6,139.20	0.68	6,118.93	12,257.13	229.15		51.93(51.92)
1915/1916	14,477.06	1,862.24	16,361.30	1.18	7,356.55	0.60	8,615.14	15,971.69	387.61		50.74(50.74)
<u>PAISLEY</u>											
1905	10,484.77	370.42	10,875.19	2.97	6,024.70	1.73	5,935.68	11,960.38	-	1,085.19	57.46(58.22)
1910	19,958.83	1,075.07	21,033.90	1.87	11,285.26	1.11	9,148.64	21,033.90	395.19		59.55(59.55)
1915/1916	23,745.83	1,170.50	24,917.36	1.48	13,574.42	0.85	10,929.77	24,524.19	-		57.24(57.24)
<u>LEITH</u>											
1905	5,759.78	161.74	5,921.52	2.76	3,377.85	1.61	2,540.05	5,877.90	21.62		58.68(58.68)
1910	7,970.30	406.95	8,377.25	2.04	4,454.55	1.14	3,533.58	7,973.13	404.15		55.75(55.74)
1915/1916	9,217.86	7.92	9,225.78	2.03	5,509.21	1.21	3,708.75	9,217.96	7.82		59.77(59.76)
<u>STIRLING</u>											
1905	3,513.24	959.52	4,472.76	4.11	1,974.48	2.26	2,447.50	4,383.98	88.78		55.12(55.10)
1910	5,477.74	137.37	5,615.11	3.64	2,779.93	1.98	2,635.20	5,615.13	-		54.40(54.37)
1915/1916	5,833.00	-	-	3.02	No other figures available						

Appendix 14.Sir Charles Ross.

Sir Charles Henry Augustus Frederick Lockhart Ross, 9th Baronet of the Ross-shire estate of Balnagowan and owner of the Bonnington estate through which the River Clyde flowed, was in 1924 some 52 years of age. He was, allegedly, the largest landowner in the United Kingdom, of Scots-Canadian nationality, a British subject and a resident alien in the U.S.A. In 1924 he lived in New York where he had important, though unspecified interests.

In 1784 his ancestors, it is claimed, gave free water from the River Clyde to the New Lanark Mills of David Dale to allow the factory machinery to be driven. However, in the 1890's he himself was a poor man and had, therefore gone to Canada to seek his fortune. It is not known what type of technical training he received but between 1896 and 1899 he, apparently, installed a 4,250 KW power plant on the falls of the Kootenay River in British Columbia; falls which he named Corra Linn and Bonnington after the Falls of Clyde. At thirty years of age he sold his interest in that plant for £80,000 and went to South Africa where he fought in the South African War. After that he returned to Canada where he invented the well-known Ross rifle which he put at the disposal of the Canadian Government and it is



"no exaggeration to say that the fact that the Canadian troops were able to take the field so early in the war (i.e. The First World War) was due to the efforts of Sir Charles Ross in the production of this rifle." In 1916 he was loaned by the Canadian Government to the U.S.A. as an adviser in munitions and he was given a seat on the Council of National Defense at Washington where he advised the American Government on how to prepare themselves for war. In 1918 and 1919 when the Peace Conference was in session President Wilson offered him a seat at the Conference. Meanwhile, when the war ended the Canadian Government felt that his munitions factory should not be in the hands of a private individual and therefore the factory was sold to the Government for \$10,920,000 of which Sir Charles Ross's share was substantial.

In addition to all this and in the purely Scottish context Sir Charles, it was claimed, succeeded in revolutionising the whole of the agriculture of the North of Scotland by the introduction of the American system of silos which he constructed at his own expense and, allegedly, "he has done what no other landowner has done." In 1923/1924 Sir Charles Ross, who was also a member of the American Society of Engineers and the Engineering Institute of Canada, had an ambition to bring

prosperity to the people of Lanarkshire by the introduction of a hydro-electric scheme utilising the Falls of Clyde, and based on his experience of the Ontario Hydro-Electric Commission, at a much cheaper rate per unit than that charged by the C.V.E.P. Company from its conventional generating stations. However, despite this evidence to suggest his enthusiastic interest in the well-being of his native land, it was also alleged that not only had his Donnington estate house burned down some time previously but also that in December 1923 Sir Charles visited his estates for the first time in twenty years.

Source: S.R.A. Records of Strain and Robertson,  
TD 83/6/6A, TD 83/6/6B and TD 83/6/6C.



Appendix 15.The Power and Traction Finance  
Company Limited

The Power and Traction Finance Company was registered as a private company on 20th April, 1922 and had a nominal capital of £250,000. It was formed as a central company designed to investigate and undertake contracts which involved civil, mechanical and electrical work and which necessitated the co-operation of more than one of its constituent firms in any part of the world. The constituent firms were:-

Sir William Arrol and Company Limited;  
John Brown and Company Limited;  
Cammell Laird and Company Limited;  
The English Electric Company Limited;  
The North British Locomotive Company Limited;  
The Prudential Assurance Company and  
John Ackroyd and Company.

Fundamentally, this company hoped to create work which would not have been possible without its financial intervention. In this way it was hoped to overcome competition from Metropolitan Vickers and Armstrong Whitworth which the company saw as its principal competitors. The interest of the company in the Falls of Clyde Hydro-Electric Scheme was to create a showcase or model installation which would attract possible customers from overseas.

The issued share capital of the company in 1925 was £6,002 but directorship of the company required no formal share qualification. In that year the

directors were:- P.J. Pybus C.B.E., Chairman, who was a director of The English Electric Company; Sir Charles E. Ellis C.B.E., K.C.B., who was managing director of John Brown and Company; W.L. Hichens, who was chairman of Cammell Laird and Company; Sir John Hunter K.B.E., who was managing director of Sir William Arrol and Company; Sir George May K.B.E., who was a director of The Prudential Assurance Company; The Right Honourable Lord Meaton, K.C.S.I., who was a director of The English Electric Company and V. Watlington, who was managing director of The English Electric Company. By 1931 Sir George May had been replaced by E.H. Lever F.I.A. of The Prudential Assurance Company.

Source: S.R.A. Records of Strain and Robertson,  
TD 83/6/6B and TD 83/6/6C. Carcke,  
op.cit. Vols. XXIX and XXXIV



Appendix 16.List of Electric Companies Operating  
in Scotland, 1919.

<u>Name and Address.</u>	<u>Area of Supply</u>
1. Arbroath Electric Light and Power Company Limited, Brothock Bank House, Arbroath.	Arbroath
2. Ardrossan and Saltcoats Electric Light and Power Company Limited, 63 Castle Street, Edinburgh.	Ardrossan and Saltcoats.
3. Clyde Valley Electric Power Company, 53 Bothwell Street, Glasgow.	Parts of the Counties of Lanark, Renfrew, Dunbarton and Stirling.
4. Dumfries Electricity Supply Company Limited, Dumfries.	Dumfries
5. Duncan's Electricity Supply Company Limited, 1 Gloden Square, Aberdeen.	Aboyne, Ballater and Ellon.
6. Fife Electric Power Company, 8 New Row, Dunfermline.	County of Fife, Distribution Order for Dunfermline and District.
7. Fife Tramway, Light and Power Company Limited, 63 Castle Street, Edinburgh.	Cowdenbeath, Lochgolly and District.
8. Galashiels and District Electricity Supply Company Limited, 23 Rutland Street, Edinburgh.	Burghs of Galashiels and Selkirk, Parts of the Parishes of Galashiels, Selkirk and Melrose.

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| 9. Kilmacolm Electric Lighting Company Limited,<br>163 Hope Street,<br>Glasgow.  | Part of Parish<br>of Kilmacolm.  |
| 10. Musselburgh and District Electric Light and Traction Company Limited,<br>3 Laurence Pountney Hill,<br>Canon Street, E.C. | Musselburgh<br>and Inveresk.   |
| 11. North of Scotland Electric Light and Power Company Limited,<br>Montrose.   | Brechin,<br>Montrose and<br>Inverness.   |
| 12. Port Patrick Electric Supply Company Limited,<br>Dunskey Estate Office,<br>Port Patrick,                                 | Part of<br>Portpatrick.  |
| 13. Richmond, Gordon and Lennox, Duke of K.G.<br>Factor, D.J. Cunningham Esq.,<br>Fochabers, N.B.                            | Fochabers, N.B.  |
| 14. Scottish Central Electric Power Company,<br>63 Castle Street,<br>Edinburgh.  | Counties of<br>Linlithgow and<br>Clackmannan,<br>Parts of Counties<br>of Dumbarton and<br>Stirling, have<br>also Distribution<br>Order for Grange-<br>mouth. |
| 15. Scottish Midlands Electricity Supply Company Limited,<br>63 Castle Street,<br>Edinburgh.                                 | Linlithgow and<br>Falkirk.   |
| 16. Skelmorlie Electric Supply Company Limited,<br>2 West Regent Street,<br>Glasgow.   | Skelmorlie.  |
| 17. Strathclyde Electricity Supply Company Limited,<br>53 Bothwell Street,<br>Glasgow.                                       | Old and New<br>Kilpatrick,<br>Eastwood, Cath-<br>cart, Barrhead,<br>Clydebank and<br>Rutherglen.   |



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|--|-------------------------------------|
| 18. Tayside Electric, Gas and Light Company Limited,<br>46 Reform Street,<br>Dundee.         | Wormat and<br>Woodhaven.            |
| 19. Urban Electric Supply Company Limited,<br>Broad Sanctuary Chambers,<br>Westminster, S.W. | Hawick and<br>Berwick-on-<br>Tweed. |

Source: S.R.O. Records of the Scottish Development Department, DD 11/5.

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Appendix IV

Authorized Capital of Companies Incorporated to provide a public supply of electricity in Scotland 1896 - 1931

Name of Company	Date Registered	1896	1900/1901	1905	1910	1915/1916	1920/1921	1925/1926	1931	Supply Begins
Kelvinside Electricity Co.	26/6/1899	£ 50,000	£ 50,000	-	-	£ -	£ -	£ -	£ -	August 1893
Scottish House-to-house Electricity Co.	26/6/1899	100,000	100,000	£100,000	-	-	-	-	-	March 1894
Fort William Electric Light Co.	16/12/1895	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	August 1896
North British Electricity Supply Co.	29/6/1897	-	1,000	-	-	-	-	-	-	-
Clyde Valley Electric Power Co.	1901 Act	900,000	900,000	900,000	900,000	900,000	2,900,000	2,900,000	2,900,000	1905
Pife Electric Power Co.	1902 Act	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	January 1904
Kilmacolm Electric Lighting Co.	12/6/1902	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	-
Lothians Electric Power Co.	1904 Act	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	-
North of Scotland Electric Light & Power Co.	24/3/1899	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	July 1901
Portpatrick Electric Supply Co.	1904	2,000	2,000	2,000	2,000	2,000	No figure given	No figure given	No figure given	September 1904
Scottish Central Electric Power Co.	1903	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	October 1905
Rayside Electric & Gas Light Co.	24/6/1899	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	-
Arbroath Electric Light & Power Co.	30/1/1908	30,000	40,000	40,000	40,000	40,000	No figure given	No figure given	No figure given	19/8/1908
Dumfries Electric Supply Co.	7/1/1909	40,000	40,000	40,000	40,000	40,000	55,000	100,000	100,000	21/12/1906
Shalmarie & Wemyss Gas & Electric Supply Co.	1910	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	£ December 1911
Strathpeffer & Dingwall Electric Co.	5/5/1909	100	100	100	100	100	100	100	100	-
Contraidge & Alford's Electric Supply Co.	19/6/1906	1,000	1,000	1,000	1,000	1,000	200,000	200,000	200,000	March 1894
Inverlorn & District Electric Light & Traction Co.	6/7/1905	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	1910
Loch Leven Electric Supply Co.	25/7/1910	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	-
Ardsrossan & Saltcoats Electric Light & Power Co.	11/3/1911	20,000	20,000	20,000	20,000	20,000	20,000	No figure given	No figure given	-
Bunaly Electric Supply Co.	17/7/1912	1,000	1,000	1,000	1,000	1,000	1,000	2,000	2,000	December 1912
Dunans' Electric Supply Co.	24/6/1914	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	23/12/1914
Calashiels & District Electric Supply Co.	22/6/1913	30,000	30,000	30,000	30,000	30,000	50,000	100,000	200,000	October 1914
North Berwick Electric Light & Power Co.	15/12/1912	7,500	7,500	7,500	7,500	7,500	7,500	7,500	-	-
Scottish Islands Electric Supply Co.	24/6/1913	20,000	20,000	20,000	20,000	20,000	20,000	20,000	100,000	-
Strathclyde Electric Supply Co.	Sept. 1905	50,000	50,000	50,000	50,000	50,000	50,000	100,000	100,000	-
Fochaber (Elgin) Electric Lighting	1906	No figure given	No figure given	No figure given	No figure given	No figure given	No figure given	No figure given	No figure given	-
Dumblane & District Electricity Supply Co.	5/5/1920	500	500	500	500	500	500	15,000	15,000	March 1925
Springton Electrical Supply Co.	5/2/1920	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	£ 1920
Craighill Electric Supply Co.	19/10/1922	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	May 1923
Dalbattie Electric Light & Power Co.	11/9/1924	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	-
Dairy Electric Supply Co.	20/3/1926	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	-
Elgin Electric Supply Co.	23/3/1922	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	19/12/1922
Grospan Electric Supply Co.	1922 Act	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	November 1930
Grospan & District Electric Supply Co.	30/11/1925	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	-
Lancashire Hydro-Electric Power Co.	1924 Act	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	-
Lancashire Gas & Electricity Supply Co.	11/1/1924	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	-
Lochar Power Co.	1921 Act	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	December 1929
Strichen Electric Supply Co.	1/11/1921	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	-
West Kilbride Electric & Light Co.	9/11/1922	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	October 1923
Dunoon & District Electric Supply Co.	2/12/1929	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	15/9/1930
Calloway Water Power Co.	1929 Act	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	1911
Grantown-on-Spey Electric Supply Co.	31/10/1930	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	1/10/1922
Greenlaw Electric Supply Co.	7/4/1921	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	1926
Laing Electric Supply Co.	16/4/1929	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	1922
Invercailton Electric Supply Co.	9/5/1922	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	2/2/1929
Peterhead Electricity Co.	22/6/1927	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	-
Rose-shire Electric Supply Co.	1/10/1926	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>£190,000</b>	<b>£160,000</b>	<b>£2,951,000</b>	<b>£3,052,100</b>	<b>£3,225,000</b>	<b>£4,263,100</b>	<b>£10,600,600</b>	<b>£11,942,000</b>	

Source: Gazette, Stat. etc. Vols. I, V, IX, XIV, XVI, XVII, XXII, XXXV.



Issued Capital of Companies Incorporated to Provide Public Supply of Electricity in Scotland 1890 - 1921

Name of Company	Date Registered	1890	1900/1901	1905	1910	1915/1916	1920/1921	1925/1926	1931
Kelvinside Electricity Co.	28/1/1899	£16,306	£16,306	Taken over by Glasgow Corp	Disallowed	-	-	-	-
Scottish House-to-house Electricity Co.	26/1/1899	4,258	5,350	15,350	£ 9,000	-	£ 9,000	£ 9,000	£ 9,000
Fort William Electric Light Co.	16/12/1895	-	9,000	9,000	-	-	-	-	-
North British Electricity Supply Co.	29/1/1897	-	300	Disallowed	-	-	-	-	-
Clyde Valley Electric Power Co.	1901 Act	-	-	600,000	600,000	900,000	900,000	2,000,000	2,900,000
Pife Electric Power Co.	1902 Act	-	-	30,000	62,830	182,330	439,000	600,000	900,000
Elmwood Electric Lighting Co.	12/6/1902	-	-	8,165	8,165	8,190	8,190	10,160	10,160
Leithian Electric Power Co.	1904 Act	-	-	No figure given	No figure given	No figure given	No figure given	94,830	360,000
North of Scotland Electric Light & Power Co.	24/1/1899	-	-	50,000	50,000	50,000	50,000	75,000	75,000
Portpatrick Electric Supply Co.	1904	-	-	300	1,550	1,550	1,550	No figure given	No figure given
Scottish Central Electric Power Co.	1903	-	-	No figure given	137,156	118,580	270,000	550,000	750,000
Dumfries Electric & Gas Light Co.	24/1/1899	-	-	2,713	2,713	2,713	2,713	No figure given	No figure given
Ayrath Electric Light & Power Co.	30/1/1906	-	-	22,270	31,215	31,215	31,215	70,500	70,500
Dumfries Electric Supply Co.	7/1/1909	-	-	No figure given	31,400	31,400	50,000	Transferred toburgh	-
Helensburgh & Wemyss Bay Gas & Electric Supply Co.	1910	-	-	2,500	5,630	5,630	5,630	5,630	5,630
Sturthoffer & Maxwell Electric Co.	5/5/1909	-	-	No figure given	No figure given	No figure given	100	100	Liquidated 1926
Cambridge & Airside Electric Supply Co.	19/1/1906	-	-	1,000	1,000	1,000	1,000	200,000	158,000
Wasselburgh & District Electric Light & Traction Co.	6/7/1905	-	-	87,207	101,407	101,407	101,407	101,407	101,407
Loch Green Electric Supply Co.	25/7/1910	-	-	No figure given	No figure given	No figure given	5,000	5,000	5,000
Ardsroon & Saltcoats Electric Light & Power Co.	11/8/1911	-	-	No figure given	1,005	1,005	1,005	No figure given	No figure given
Bonaly Electric Supply Co.	17/7/1912	-	-	20,000	20,000	20,000	20,000	20,000	20,000
Dumfries Electric Supply Co.	22/1/1914	-	-	No figure given	46,476	46,476	100,000	100,000	200,000
Salisbury & District Electric Supply Co.	24/1/1913	-	-	No figure given	5,740	5,740	5,990	5,990	Transferred toburgh
Forth Services Electric Light & Power Co.	15/12/1912	-	-	No figure given	No figure given	No figure given	16,500	16,500	95,000
Scottish Atlantic Electric Supply Co.	24/1/1913	-	-	43,697	50,300	50,300	100,000	100,000	100,000
Strathclyde Electric Supply Co.	Sept. 1905	-	-	No figure given	No figure given	No figure given	No figure given	No figure given	No figure given
Fochassers (Edin) Electric Lightin.	1906	-	-	No figure given	No figure given	No figure given	5,016	5,016	11,300
Dumfries & District Electricity Supply Co.	5/1/1920	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Yarrow Electric Supply Co.	5/1/1920	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Yarrow Electric Supply Co.	13/10/1922	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Albion Electric Supply Co.	11/9/1924	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	20/3/1926	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	23/8/1922	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	1922 Act	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	30/11/1925	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	1924 Act	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	11/1/1924	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	1921 Act	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	1/11/1921	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	9/11/1922	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	2/12/1929	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	1929 Act	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	31/10/1930	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	7/1/1921	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	16/2/1929	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	9/1/1922	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	2/1/1927	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
Edin Electric Supply Co.	1/10/1926	-	-	No figure given	No figure given	No figure given	11,027	11,027	15,000
		£20,564	£1,016	£705,528	£72,391	£1,507,717	£2,000,147	£4,570,607	£9,551,497

1. Scottish Central Electric Power Company at 1910, Figure as per Cartha.  
 2. Scottish Central Electric Power Company at 1915 1916, Figure as per Cartha.  
 3. Cambridge and Airside Electric Supply Company at 1925/1926, Figure as per Cartha.  
 4. Cambridge and Airside Electric Supply Company at 1931, Figure as per Cartha.

Capital Expenditure (where known) of Companies operating in Scotland on Quinquennial Basis 1896 - 1921

Date Registered	1896	1900/1901	1905	1910	1915/1916	1920/1921	1925/1926	1931
Salvage Electricity Co.	£23,527.01	£27,556.59			£ 10,660.00 <sup>7</sup>	£ 10,660.00 <sup>7</sup>	£ 9,700.00 <sup>7</sup>	£ 11,784.00
Scottish House-to-House Electricity Co.	18,504.14	22,213.06	22,213.06	Disallowed	1,505,580.97	2,902,649.00	2,902,649.00	3,748,112.00
Port William Electric Light Co.	-	9,000.00					675,692.00	
Clyde Valley Electric Power Co.					11,978.07	12,607.08	169,824.00	76,094.00 <sup>11</sup>
Flie Electrical Power Co.					111,168.04 <sup>1</sup>	123,182.74 <sup>1</sup>	160,855.00	
Williamsons Electric Lighting Co.					40,805.00	45,799.00	437,957.00	
Johnsons Electric Power Co.			80,068.21 <sup>1</sup>	£ 33,840.96 <sup>1</sup>		54,317.84	88,412.00	53,587.00 <sup>7</sup>
North of Scotland Electric Light & Power Co.							Transferred to Perth	
Scottish Central Electric Power Co.								14,200.00
Arbroath Electric Light & Power Co.								227,409.00
Dumfries Electric Supply Co.								63,437.00
McLaurie & Messys Gas & Electric Supply Co.				51,991.76	54,534.96	59,578.56	61,549.00	6,565.00
Southburn & Altrive Electric Supply Co.						1,100.00	2,746.00	2,780.00
Wassellburgh & District Electric Light & Traction Co.								16,814.00
Loch Leven Electric Supply Co.					9,500.00 <sup>8</sup>	40,655.95	111,230.00	259,916.00
Beaulie Electric Supply Co.							21,187.00	
Duncan's Electric Supply Co.					20,000.00	17,500.00	19,760.00	
Salisbury & District Electric Supply Co.				14,600.00			13,455.00	24,473.00
Scottish Islands Electric Supply Co.							71,218.22	1,848,700.00
Forchburn (Egils) Electric Lighting							10,000.00	
Edin Electric Supply Co.								
Craigan Electric Supply Co.								
Crantoncoo-By Electric Supply Co.								
Craiff Electric Supply Co.								
Dunblane & District Electric Supply Co.								
Islair Electric Supply Co.								
Ferintosh Electric Supply Co.								
Rose-shire Electric Supply Co.			27,763.96 <sup>2</sup>	84,323.65 <sup>3</sup>	123,310.31 <sup>3</sup>	112,954.82 <sup>9</sup>	65,993.70 <sup>10</sup>	93,099.00 <sup>12</sup>
Electric Supply Corp.			91,432.46 <sup>5</sup>	65,432.32 <sup>6</sup>		87,625.58 <sup>8</sup>	94,459.00 <sup>6</sup>	51,879.00 <sup>12</sup>
Urban Electric Supply Co.								105,731.00 <sup>8</sup>

1. Capital Expenditure by this Company at Inverness, Montrose and Brechin.
2. Capital Expenditure by this Company at Carnoustie, Dollar, Jedburgh and Melrose.
3. Capital Expenditure by this Company at Hamilton and Perth.
4. Figure given by Carice, but discrepancy presumed.
5. Capital Expenditure by this Company at Carnoustie, Dalkeith, Dollar, Jedburgh, Melrose and St. Andrews.
6. This figure is for Melrose alone.
7. Figure as given by Carice.
8. Capital Expenditure by this Company at Dalkeith, Dollar, Dunbarton, Jedburgh, Melrose and St. Andrews.
9. Capital Expenditure by this Company at Dalkeith, Dollar, Jedburgh, Melrose and St. Andrews.
10. Capital Expenditure by this Company at Dollar, Jedburgh, Melrose and St. Andrews.
11. In 18/3/1916 Inverness Town Council took over the Inverness undertaking from this company.
12. Capital Expenditure by this Company at Dollar and St. Andrews.

Sources: Carice, *op. cit.*, Vols. I, V, IX, XL, XLV, XLVI, XLVII, XLVIII, XLIX, L, LI, LII, LIII, LIV, LV, LVI, LVII, LVIII, LIX, LX, LXI, LXII, LXIII, LXIV.



Installed Capacity and Units Generated (where known) by Companies operating in Scotland on a biennial basis 1906 - 1921.

Name of Company	1896		1900/1901		1905		1910		1915/1916		1920/1921		1925/1926		1931	
	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated	Installed Capacity (KW)	Units (B.T.U.) Generated
Kelvinside Electricity Co.		\$ 37,000	150	2,095	800	-	158	-	158	-	158	2,279,903	158	\$ 1,938,958	258	\$ 1,650,969
Scottish House-to-House Electricity Co.		\$ 50,000	150	-	-	-	600	1,639,209	-	-	6,150	11,669,820	11,500	\$ 85,217,178	1,680	\$ 15,565,582
Urban Electric Supply Co. at Harwick																
Conbridge & Airdrie Electric Supply Co.																
North of Scotland Electric Light & Power Co.					282	\$ 155,251	66	711,648	66	-	66	-	733	\$ 617,491	828	\$ 134,560
Electric Supply Corp. at Cairness																
Electric Supply Corp. at Collier																
Electric Supply Corp. at Jedburgh																
Port Patrick Electric & Gas Light Co.							50		50		11,500		38		38	\$ 57,337
Thyde Electric & Gas Light Co.							50		50		1,050		64		64	
Arbroath Electric & Gas Light Co.											1,050		290		290	\$ 665,499
Dumfries Electric Light & Power Co.																
Dumfries Electric Supply Co.																
Musselburgh & District Electric Light & Traction Co.																
Musselburgh & District Electric Supply Co.																
Galashiels & District Electric Light & Traction Co.																
Galashiels & District Electric Supply Co.																
Pife Electric Power Co.																
Fochabers (Elgin) Electric Lighting																
Milmacola Electric Lighting Co.																
C.V.E.P. Co.																
Crieff Electric Supply Co.																
Dalbattie Electric Light & Power Co.																
Elgin Electric Supply Co.																
North Berwick Electric Light & Power Co.																
Scottish Central Electric Power Co.																
Sturthoffer & McNeill Electric Co.																
Dumfries Electric Supply Co.																
Glasgow Electric Supply Co.																
Glasgow-on-By Electric Supply Co.																
Lairg Electric Supply Co.																
Leamishire Hydro-Electric Power Co.																
Perthshire Electric Supply Co.																
Peterhead Electric Co.																
Perthshire Electric Supply Co.																
Stirling Electric Supply Co.																
Stirling Electric Supply Co.																

K.L. S = Sales. G = Generated

1. Figure for 1906.
2. Combined figures for Ventrose, Brechin and Inverness.
3. Figure for 1912.
4. Figure for 1923.
5. Figure for Brechin and Inverness only at 1924.
6. Figure for 1924.
7. Figure for 1922.

Sources: Cartha, *et alii*, Vols. I, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV.

Appendix 21     Major Promoters of the C.V.E.P. Company  
at 1901.

Shipbuilders.

Sir W.G. Pearce and Dr. Francis Elgar, directors of Fairfield Shipbuilding and Engineering Company Limited, the largest shipbuilders on the River Clyde with a capital of £850,000. Pearce was a past president of the Institution of Civil Engineers and was also in partnership with a Major Cardew who, himself, had been an electricity advisor to the Board of Trade. Pearce and Cardew, together with Strain and Robertson, were consultant engineers for the C.V.E.P. Bill.

John Shearer, a shipbuilder at Kelvinhaugh, Glasgow, who in 1901 was engaged in constructing a graving dock and shipbuilding yard on 25 acres of ground at Yoker on the north bank of the River Clyde. Shearer was also a member of Glasgow Town Council and a member of the Clyde Trustees.

Anderson Rodger, Shipbuilder, Port Glasgow.

Frederick Lobnitz, managing director of Lobnitz Company Limited, Shipbuilders, Renfrew.

Robert McMillan of Archibald McMillan and Son Ltd., Shipbuilders, Dumbarton.

Owners of Public Works.

W. Bow and J. McLachlan, managing directors of Bow, McLachlan and Company Limited of Paisley with a capital of £160,000.

Sir David Richmond, managing director of David Richmond and Company Ltd., tube manufacturers of Govan and Glasgow with a capital of £75,000. Richmond was also a director of John Gray and Company Ltd., wholesale confectioners of Glasgow with a capital of £160,000 and a director of the Broxburn Oil Company Ltd., with a capital of £335,000. Richmond had also been Lord Provost of Glasgow between 1896 and 1899.



John Ross, director of the Lanarkshire Steel Company Limited of Motherwell.

John Cowan, director of the Stirling Boiler Company of Motherwell and Edinburgh, and of Redpath, Brown and Company Ltd., of Edinburgh.

James Rowan of David Rowan and Son, Engineers, Glasgow.

James Howden of James Howden and Company, Glasgow.

Robert Harvey of McCuie, Harvey and Company Ltd., Engineers, Glasgow.

Charles C. Mowbray of Smith and Maclean Limited, Clyde Galvanising Works, Gartcosh Steel and Iron Works and Milnwood Steel and Iron Works, Mossend with a total capital of £300,000.

Alexander and Richard Pillans, directors of the Rivet, Bolt and Nut Company Ltd., which had fifteen works in Lanarkshire with a combined capital of £550,000.

G.F. Loudon of Loudon Brothers, Engineers, Glasgow and Johnstone.

Alexander Findlay of Alexander Findlay and Company, Bridge and Roof Builders, Motherwell with a capital of £100,000. Findlay was also a member of Motherwell Town Council.

Andrew Lamberton of Lamberton and Company, Engineers, Airdrie and a director of Mirrlees Watson Company Limited.

John F. McLaren of Robert McLaren and Company, Pipe Makers, Glasgow.

Hugh Steven of McDowall, Steven and Company, Iron Founders, Glasgow.

Andrew S. Nelson of Hurst, Nelson and Company Ltd., Railway Wagon Builders, Motherwell.

James B. Reid of Alexander Chaplin and Company, Engineers and Crane Makers, Govan.

Charles MacIntosh King, director of Hurler and Campsie Alum Company, Chemical Manufacturers with works at Campsie and Falkirk.

Robert Machill, chairman of Laidlaw, Machill and Company, Manufacturing Chemists, Glasgow with a capital of £35,000 and chairman of Machill Steamship Company Ltd., Glasgow with a capital of £200,000.

Robert Allison of Allison, Cousland and Company, Timber Merchants, Glasgow.

James Kennedy of James Kennedy and Company, Timber Merchants, Glasgow.

Robert and James Anderson, directors of W. Anderson and Company Ltd., Glasgow.

W. Ewing, director of African Lakes Corporation and the New Zealand Shipping Company.

#### Coalmasters.

Andrew Rintoul, James M. Strain and James Moffat of John Watson Limited, Lanarkshire Collieries with collieries at Earnock, Eddlewood, Neilsland and Motherwell with a capital of £375,000; Rintoul was also a corn factor and grain merchant.

Hugh Strain of Strain Brothers and Ferrier and Strain, Coalmasters with collieries in Lanarkshire.

Arthur Logan of D. Logan and Company Ltd., Coal Merchants of Paisley, and director of United Collieries Company Ltd., which had collieries throughout Lanarkshire, and the Craigton Brickmaking Company.

#### Landowners.

Lord Hamilton of Dalzell who initially agreed to be a director and chairman of the C.V.E.P. Company but who later declined both positions. However, he gave land at moderate terms for the Motherwell generating station to indicate his interest



in the scheme and in the town of Motherwell. The Hamilton Estates were about 44,000 acres in extent, and 24,000 acres were within the C.V.E.P. Company's area of supply. There were also 36 collieries with an aggregate output of 4 million tons on his estates.

Sir Charles W. Cazzar, Member of Parliament for Barrow and a member of the Corporation of Barrow Electricity Supply who had an estate at Ralston near Paisley which in 1901 was being laid out for villas and residences. He was also chairman of Clan Line Steamers Ltd., which had a fleet of fifty steamers trading between Glasgow, India and South Africa.

Richard H. Hunter of Glentyan Estate near Johnstone. He was also managing director of Hunter, Barr and Company Limited.

Source: S.R.A. Records of Strain and Robertson, TD83/7.

## Appendix 22.

## The Clyde Valley Electrical Power Company.

# INVENTORY OF WORKS

## WITHIN THE AREA OF SUPPLY.

### GENERATING STATION No. 1 (Near Motherwell).

No.	Name of Work.	Description.	Owner.
<b>I.—Works within radius of 2 Miles.</b>			
✓ 1	Hamilton Palace Colliery, ...	Coal Pits, Nos. 1 and 2, ...	Best Coal Co.
✓ 2	Motherwell Colliery, ...	Coal Pit, No. 4, ...	John Watson, Ltd.
✓ 3	Do. North Colliery, ...	do. No. 1, ...	Merry & Cunninghame, Ltd.
✓ 4	Do. do. ...	do. No. 2, ...	do.
✓ 5	Do. do. ...	do. No. 3, ...	do.
✓ 6	Do. Colliery, ...	do. No. 2, ...	John Watson, Ltd.
✓ 7	Do. Roof and Bridge Works, ...	Roof and Bridge, ...	The Motherwell Roof and Bridge Co., Ltd.
✓ 8	Dalzell Roof and Bridge Works, ...	do. ...	Dalzell Roof and Bridge Co., Ltd.
✓ 9	Engine Works and Foundry, ...	Engineering Works, ...	Potts, Cassels & Williamson.
✓ 10	Caledonian Railway Works, ...	Engine and Plant, ...	Caledonian Railway Co.
✓ 11	The Brandon Roof and Bridge Works, ...	Roof and Bridge, ...	The Brandon Roof and Bridge Building Co., Ltd.
✓ 12	Parkgrove Forge, ...	Gates, Railings, &c., ...	James Walker.
✓ 13	Motherwell Iron and Steel Works, ...	Iron, ...	Glasgow Iron and Steel Co., Ltd.
✓ 14	Parkneuk Works, ...	Steel Roof and Bridge Builders, ...	Alex. Findlay & Co., Ltd.
✓ 15	Globe Iron and Steel Works, ...	Iron and Steel, ...	A. & T. Millar.
✓ 16	Braidhurst Colliery, ...	Coal Pit, No. 1, ...	Summerlee and Mossend Iron and Steel Co., Ltd.
✓ 17	Do. do. ...	do. No. 2, ...	do.
✓ 18	Loganlea Brick Works, ...	Bricks, ...	William Dixon, Ltd.
✓ 19	Cartin do. ...	do. ...	Loganlea Coal Co.
✓ 20	Loganlea Colliery, ...	Pit, No. 3, ...	do.
✓ 21	Jenny Lind Brick Work, ...	Bricks, ...	Millar & Park.
✓ 22	<del>Clelland Colliery, ...</del>	<del>Pit, No. 3, ...</del>	<del>William Dixon, Ltd.</del>
✓ 23	Cartin do. ...	Pits, Nos. 1 and 2, ...	do.
✓ 24	Do. do. ...	do. Nos. 6 and 9, ...	do.
✓ 25	Victoria Pit, ...	Coal Pit, ...	United Collieries Co., Ltd.
✓ 26	Middlejohnstone Colliery, ...	Pit, No. 10, ...	do.
✓ 27	Netherjohnstone do. ...	Pits, Nos. 1 and 2, ...	do.
✓ 28	Dalziel Colliery, ...	Pit, No. 3, ...	J. M'Andrew & Co.
✓ 29	Do. ...	do. No. 2, ...	do.
✓ 30	Lanarkshire Steel Works, ...	Steel, ...	The Lanarkshire Steel Co., Ltd.
✓ 31	Knowetop Quarry, ...	Freestone, ...	Robert Park.
✓ 32	Builders' Works, ...	Stone Cutting, ...	Millar & Ferguson.
✓ 33	Glasgow Rolling Stock & Plant Works, ...	Wagon Building Works, ...	Hurst, Nelson & Co., Ltd.
✓ 34	Caledonian Bolt Works, ...	Bolts and Nuts, ...	Alex. Pillans.
✓ 35	Delburn Works, ...	Cranes, &c., ...	Marshall, Fleming & Jack.
✓ 36	Dalziel Iron and Steel Works, ...	Iron and Steel, ...	D. Colville & Sons, Ltd.
✓ 37	Motherwell Crane and Engine Works, ...	Cranes and Engines, ...	John Grieve & Co.
✓ 38	Clyde Boiler Works, ...	Boilers, &c., ...	J. Marshall & Co.
✓ 39	Dalziel Engineering Works, ...	Engineering Works, ...	Chambers, Scott & Co.
✓ 40	Coursington Street Engine Works, ...	do. ...	James Dunlop.
✓ 41	Dalziel Saw Mills, ...	Timber, ...	Wm. Chambers & Sons.
✓ 42	Motherwell Brass Foundry, ...	Castings, ...	John Russell.
✓ 43	Do. Spade and Shovel Works, ...	Spades and Shovels, ...	James Brown.
✓ 44	Do. Printing Work, ...	Printers, ...	John Meikle.
✓ 45	Do. Saw Mills, ...	Saw Mills, ...	Thos. Millar.
✓ 46	Coursington Street Saw Mills, ...	Timber, ...	Alex. Brown.



No.	Name of Works	Description.	Owner.
<b>Station No. 1. I.—Works within radius of 2 Miles—Continued.</b>			
47	Motherwell Co-operative, ...	...	Motherwell Co-operative Society.
48	Alpha Works, ...	Engineering Works, ...	Geo. Russell & Co.
49	Glencairn Steam Laundry, ...	Laundry, ...	B. W. Gilmore.
50	Parkhead Colliery, ...	Coal Pit, ...	Glasgow Iron and Steel Co., Ltd.
51	Airbles Street Silk Factory, ...	Silk, ...	Amler & Robertson, Ltd.
52	Camp Colliery, ...	Pit, No. 2, ...	Camp Coal Co., Ltd.
53	Do. ...	Pit, ...	do.
54	Dalzell and Broomside Collieries, ...	do. ...	The Wishaw Coal Co.
55	Stirling Boiler Works, ...	Boilers, ...	Redpath, Brown & Co., Ltd.
56	Motherwell Wagon Works, ...	Wagons, ...	Motherwell Wagon Works & Rolling Stock Co., Ltd.
57	Shields Colliery, ...	Pit, ...	Glasgow Iron and Steel Co., Ltd.
58	Etna Iron and Steel Works, ...	Iron, ...	Etna Iron and Steel Co.
59	Muirhouse Engine do. ...	Engineering & Foundry, ...	W. Paton & Son.
60	Do. Boiler do. ...	Boilers, ...	Wm. Chambers.
61	Excelsior Iron and Steel Works, ...	Iron and Steel, ...	J. Williams & Co.
62	Clydesdale Wagon Works, ...	Wagons, ...	Archd. Russell.
63	Carbarus Colliery, ...	Pit, ...	Wm. Hudsphill & Co.
64	Muirhouse do. ...	do. ...	United Collieries, Ltd.
65	Clydesdale do. ...	do. ...	do.
66	Merryton Farm, ...	Farm, ...	Jas. Brown.
67	Home Farm Colliery, ...	Pit, ...	Hamilton, McCulloch & Co.
68	Bog Colliery, ...	do. ...	do.
69	Merryton Colliery and Brick Work, ...	do. and Brick Work, ...	Merryton Coal Co.
70	Allanton do. ...	do. ...	Wm. Barr & Sons.
71	Fernigaie do. ...	do. ...	Archd. Russell.
72	Avon Mill, ...	Flour, &c., ...	do.
73	Coltness Colliery, ...	Pit, ...	Coltness Iron and Steel Co., Ltd.
74	Ross do. ...	do. ...	Thos. Barr.
75	Silverton do. ...	do. ...	Archd. Russell.
76	Barncluith do. ...	do. ...	do.
77	Saffronhall Factory, ...	Factory, ...	do.

**II.—Works within zone 2 to 4 Miles.**

78	Greenfield Foundry, ...	General Foundry, ...	Kerr & Campbell.
79	Auchinraith Colliery, ...	Pits, Nos. 1 and 2, ...	Merry & Cunningham, Ltd.
80	Priestfield do. ...	Pit, No. 1, ...	Wm. Dixon, Ltd.
81	Bothwell Castle Colliery, ...	Pits, Nos. 3 and 4, ...	Wm. Baird & Co.
82	Blantyre Foundry, ...	General Foundry, ...	Gilbert Taylor & Co.
83	Do. Saw Mills, ...	Timber, ...	Jas. Dow & Sons.
84	Do. Oil Works, ...	Oil, ...	Wm. Sommerville.
85	Craighead Colliery, ...	Pits, Nos. 1 and 2, ...	Wm. Baird & Co.
86	Whistleberry do. ...	do. ...	Archd. Russell.
87	Greenfield do. ...	do. ...	do.
88	Whitehill do. ...	Pit, ...	do.
89	Lanarkshire Bolt Works, ...	Bolts and Nuts, ...	The Lanarkshire Bolt and Nut Co., Ltd.
90	Clyde Colliery, ...	Pit, No. 3, ...	Wilson & Clyde Coal Co., Ltd.
91	Clydesdale Oil Works, ...	Oil, ...	Clydesdale Oil Co.
92	Blantyre-Works, ...	Cotton Mills, ...	Kerr & Co.
93	Bothwell Castle Colliery, ...	Pits, Nos. 1 and 2, ...	Wm. Baird & Co.
94	Bothwell Park do. ...	Colliery, ...	do.
95	Douglas Park do. ...	Pits, Nos. 1 and 2, ...	Wilson & Clyde Coal Co., Ltd.
96	Orbiston Colliery, ...	do. ...	Summerlee and Mossend Iron and Steel Co., Ltd.
97	Longhales Laundry, ...	Laundry, ...	Wm. Rolger.
98	Fallside Quarry, ...	Freestone, ...	Miller Bros.
99	Bothwell Park Brick Works, ...	Bricks, ...	Bothwell Park Quarries and Brick Works, Ltd.
100	Do. Quarry, ...	Freestone, ...	do.
101	Do. do. ...	do. ...	Miller & Renwick.
102	East Parkhead Colliery, ...	Pits, Nos. 1 and 2, ...	Wilson & Clyde Coal Co., Ltd.
103	Ballshill Colliery, ...	Pit, No. 3, ...	Summerlee and Mossend Iron and Steel Co., Ltd.
104	Do. Valve Works, ...	Valvemakers, ...	Scoble & Co.
105	Milnwood Colliery, ...	Pit, ...	Coltness Iron and Steel Co., Ltd.
106	Huttonrigg do. ...	do. ...	Summerlee and Mossend Iron and Steel Co., Ltd.
107	Mossend Works, ...	Iron and Steel, ...	do.
108	Oil Works, ...	Oil, ...	Wm. Barr.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. II.—Works within zone 2 to 4 Miles—Continued.</b>			
109	Milnwood Steel and Iron Works,	Iron and Steel,	Smith & McLean, Ltd.
110	Clydesdale Iron and Steel Works,	do.	A. & J. Stewart & Menzies, Ltd.
111	Thunkerton Colliery,	Pit, No. 2,	John McAndrew & Co., Ltd.
112	Do. do.	do. No. 3,	do.
113	Woodhull do.	do. No. 1,	do.
114	Thunkerton do.	do. No. 6,	do.
115	Do. do.	do. No. 4,	do.
116	Do. do.	do. No. 7,	do.
117	Holytown do.	do. No. 3,	Jas. Nimmo & Co. Ltd.
118	Do. Brick Works,	Bricks,	do.
119	Carlin Boiler Works,	Boilers,	A. Anderson & Sons.
120	Do. Chemical Works,	Chemical,	D. McQueen.
121	Onion Boiler Works,	Boilers,	Russell & Co.
122	Do. Foundry,	General Foundry.	A. & J. Moffat.
123	Bellsida Quarry,	Stone,	Thos. King & Co.
124	Auchinlea Brick Works,	Brick,	Taylor & King.
125	Bellsida Brick Works,	do.	Thos. King & Co.
126	Do. Colliery,	Pit,	John Forsyth (Limited Collieries Ltd.)
127	Baillismuir Pit,	do.	Coltness Iron and Steel Co., Ltd.
128	Murdoston Colliery,	Westwood Pits, Nos. 2 and 3,	J. McAndrew & Co.
129	Swinston do.	Pumping Station,	do.
130	Spindleshlo do.	Pit, No. 3,	do.
131	Knowenoble do.	Pit,	Kenneths Coal Co. (Limited Collieries Ltd.)
132	Sunyside do.	do.	Coltness Iron Co., Ltd.
133	Collvash Pit,	do.	do.
134	Clelland Pottery,	Pottery,	J. B. Kennedy.
135	Ravenhall Colliery,	Pits, Nos. 35 and 40,	Ravenhall Coal Co., Ltd.
136	Do. do.	Pit, No. 43,	do.
137	Do. do.	do. No. 44,	do.
138	Do. do.	do. No. 45,	do.
139	Knowenoble do.	Pit,	Kerr & Mitchell.
140	Glenclelland do.	Pits, Nos. 1 and 2,	do.
141	Clelland do.	Pit, No. 3,	Wm. Dixon, Ltd.
142	Clydesdale Distillery,	Distillery,	Clydesdale Distillery Co., Ltd.
143	King's Confectionery Works,	Confections,	Jas. King.
144	Steam Laundry (Wishaw),	Laundry,	Clydesdale Steam Laundry Co.
145	Royal George Washery,	Dress Washer,	Coltness Iron Co., Ltd.
146	Heathery Colliery,	Pit, No. 2,	Glasgow Iron and Steel Co., Ltd.
147	Bellhaven Works,	Confection Engineers	Morton & Sons.
148	Brick, Tile, Fireclay, and Sewage Pipe Works,	Bricks and Pipes,	Wm. Hud-pith & Co.
149	Wishaw Sewing Factory,	Sewing Factory,	D. McArthur & Co.
150	Stenton Iron and Steel Works,	Iron and Steel Works,	C. F. McLaren & Co.
151	Steel Axle Works,	Steel Axle,	The Indestructible Rolled Steel Axle Box Co., Ltd.
152	Railway Wagon Works,	Wagons,	R. Y. Pickering & Co., Ltd.
153	Thornlie Colliery,	Pit,	Loggatt.
154	Netherton do.	do.	Glasgow Iron and Steel Co., Ltd.
155	Glasgow Iron and Steel Works,	Iron and Steel,	do.
156	Wishaw Engine Works,	Pit Engines,	John Bell.
157	Pit Engine Works,	do.	Stewart & Shearer.
158	Cambusnethan Colliery,	Pit,	Thos. Barr.
159	Father Iron Works,	Iron,	Father Iron and Steel Co.
160	Wheel Works,	Wheels,	Russell & Millar.
161	Aukton Colliery,	Pit,	Brandt Co.
162	Ashgillhead do.	do.	do.
163	Cornhillhead do.	do. No. 3,	Archd. Russell.
164	Do. Brick Works,	Bricks,	do.
165	Do. Colliery,	Pit, No. 2,	do.
166	Hirkrigg do.	do. No. 2,	Darnaguir Coal Co.
167	Do. do.	do. No. 1,	do.
168	Shawaburn do.	do.	Wm. Dunsin.
169	Shawarigg Fireclay and Enamel Works,	Fireclay and Enamel,	Shawarigg Enamel Co., Ltd.
170	Do. do.	Fireclay Pit,	do.
171	Melburn Chemical Works,	Chemical,	Richd. Smith, Ltd.
172	Skellyton Pit,	Pit, No. 4,	United Collieries, Ltd.
173	Do. Colliery,	Pits, Nos. 2 and 3,	do.
174	Dykehead do.	Pit,	Summerlee and Mowat Iron and Steel Co., Ltd.
175	Strathor do.	Fireclay and Coal,	Eastfield Fireclay Co.
176	Do. do.	do.	do.
177	Shawa do.	Pit,	Larkhall Collieries, Ltd.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. II.—Works within zone 2 to 4 Miles—Continual.</b>			
178	Machan Colliery, ... ..	Pit, ... ..	Larkhall Collieries, Ltd. <i>Union Collieries Ltd.</i>
179	do Quarry, ... ..	Freestone, ... ..	A. H. Boyle.
180	Broomhill Colliery, ... ..	Pit, ... ..	Broomhill Coal Co.
181	Machan do, ... ..	do, ... ..	Larkhall Collieries, Ltd. <i>Union Collieries Ltd.</i>
182	Silk Factory, ... ..	Silk Factory, ... ..	Caldwell, Young & Co.
183	Fairholm Colliery, ... ..	Coal, ... ..	United Collieries, Ltd.
184	Avonbank Works, ... ..	Blanch Works, ... ..	David C. Millar & Co., Ltd.
185	Wellgate Street Saw Mills, ... ..	Timber, ... ..	James Watson.
186	Colliery, ... ..	Pit, ... ..	United Collieries, Ltd.
187	do, ... ..	do, ... ..	do.
188	Quarter do, ... ..	do No. 5, ... ..	(Colin Dunlop & Co.)
189	Laigh Quarter Colliery, ... ..	do No. 1, ... ..	do.
190	Quarter Iron Works, ... ..	do, ... ..	do.
191	Do. Collieries, ... ..	Pit, No. 4, ... ..	do.
192	Do do, ... ..	do No. 6, ... ..	do.
193	Do do, ... ..	do No. 7, ... ..	do.
194	Do do, ... ..	do No. 8, ... ..	do.
195	Tuphall Quarry, ... ..	Freestone, ... ..	Brown Bros.
196	Fairhill Colliery, ... ..	Pit, ... ..	Archd. Russell.
197	Cadzow do, ... ..	do, ... ..	Cadzow Coal Co.
198	Neilsland do, ... ..	do, ... ..	John Watson, Ltd.
199	Eddlewood do, ... ..	do, ... ..	do.
200	Udston do, ... ..	do, ... ..	Udston Coal Co., Ltd. <i>1911-3</i>
201	Earnock do, ... ..	do, ... ..	John Watson, Ltd. <i>1911-3</i>
202	Bent do, ... ..	Coal Pit, ... ..	Bent Coal Co.
203	Allanshaw do, ... ..	do, ... ..	Allanshaw Coal Co.
204	Townland do, ... ..	do, ... ..	Wilson & Clyde Coal Co., Ltd.
205	Burnbank Engineering Works, ... ..	Engineering, ... ..	Baird & Son.
206	Clydesdale Steam Laundry, ... ..	Laundry, ... ..	do.
207	Hamilton Cloth Factory, ... ..	Weaving, ... ..	Mitchell Bros.
208	Do. "Advertiser" Works, ... ..	Printing, ... ..	William Naismith.
209	Do. "Herald" do, ... ..	do, ... ..	Thos. Stothers (Publisher).
210	Do. Steam Laundry, ... ..	Laundry, ... ..	do.
211	Do. Saw Mills, ... ..	Saw Mills, ... ..	Walter Henderson.
212	Do, ... ..	do, ... ..	John Frew & Co.
213	Wellhall Colliery, ... ..	Coal, ... ..	Wm. Dixon, Ltd.
214	Glenles Quarry, ... ..	Freestone, ... ..	R. & J. Purdie. <i>1911-3</i>
215	Blantyre Colliery, ... ..	Coal, ... ..	Wm. Dixon, Ltd.

**III.—Works within zone 4 to 6 Miles.**

216	Blantyre Colliery, ... ..	Pit, No. 2, ... ..	Wm. Dixon, Ltd. <i>1911-3</i>
217	Do. Saw Mills, ... ..	Saw Mill, ... ..	Warnock, Walker & Co.
218	Do. do, ... ..	do, ... ..	Wm. Adam.
219	Do. Colliery, ... ..	Pit, No. 4, ... ..	Wm. Dixon, Ltd.
220	Do. Aerated Water Works, ... ..	Aerated Water Works, ... ..	P. Robertson.
221	Bardyke Colliery, ... ..	Pit, ... ..	Merry & Cunningham, Ltd.
222	Dechmont do, ... ..	do, ... ..	Archd. Russell.
223	Barnhoek Quarries, ... ..	Freestone, ... ..	Jas. Aitkenhead & Son.
224	Lanhead Colliery, ... ..	Coal, ... ..	Archd. Russell.
225	Hallside do, ... ..	do, ... ..	Jas. Dunlop & Co., Ltd. <i>Union Collieries Ltd.</i>
226	Gilbertfield do, ... ..	Coal & Brick Works, ... ..	(Cambuslang Coal Co., Ltd.)
227	Gateside do, ... ..	Coal, ... ..	Flemington Coal Co., Ltd.
228	Westburn do, ... ..	do, ... ..	Westburn Coal Co.
229	Clyde Nail Works, ... ..	Nails, ... ..	Clyde Nail Co., Ltd.
230	Hallside Steel Works, ... ..	Iron and Steel, ... ..	Steel Co. of Scotland, Ltd.
231	Newton Colliery, ... ..	Pit, No. 2, ... ..	Jas. Dunlop & Co., Ltd.
232	Do, ... ..	do No. 1, ... ..	do.
233	Blantyre Fems Colliery, ... ..	Pit, ... ..	Ralph Moore & Son
234	Haughland do, ... ..	do, ... ..	Glasgow Coal Co.
235	Val of Clyde Preserves Works, ... ..	Preserves, ... ..	Halton & Co. <i>1911-7</i>
236	Uddingston Laundry, ... ..	Laundry, ... ..	Uddingston Steam Laundry Co., Ltd. <i>1911-9</i>
237	Do. Saw Mills, ... ..	Saw Mills, ... ..	J. Copland & Sons. <i>1911-9</i>
238	Do. Smith Work, ... ..	Smithy, ... ..	Archd. Forrest.
239	Galamuir Foundry, ... ..	Foundry, ... ..	Alex. Gohlin. <i>1911-7</i>
240	View Park Colliery, ... ..	Pits, 1 and 2, ... ..	Robt. Addie & Sons, Ltd. <i>1911-7</i>
241	Braeisholm Quarry, ... ..	Freestone, ... ..	do.
242	Do. Collieries, ... ..	Pit, No. 2, ... ..	United Collieries, Ltd.
243	Tannochside Colliery, ... ..	Pits, Nos. 1 and 2, ... ..	Archd. Russell.
244	Do. do, ... ..	Pit, No. 3, ... ..	do.
245	Bushall do, ... ..	do No. 4, ... ..	Robt. Addie & Sons, Ltd.
246	Do. do, ... ..	do No. 13, ... ..	do.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. III.—Works within zone 4 to 8 Miles—Continued.</b>			
247	Rosshall Colliery...	Pit, No. 7, ...	Robt. Addie & Sons, Ltd.
248	Do. do. ...	do. No. 12, ...	do.
249	Do. do. ...	do. No. 3, ...	do.
250	Do. do. ...	do. No. 11, ...	do.
251	Do. do. ...	do. No. 5, ...	do.
252	Do. do. ...	do. No. 6, ...	do.
253	Do. do. ...	do. No. 10, ...	do.
254	Bartonshill do. ...	Colliery, ...	Bartonshill Brick Co.
255	Bredisholm do. ...	Ellismuir Pit, No. 2, ...	United Collieries Co., Ltd.
256	Do. Brick Works, ...	Bricks, ...	do.
257	Do. Colliery, ...	Ellismuir Pit, No. 3, ...	do.
258	Do. do. ...	do. No. 1, ...	do.
259	Do. do. ...	do. No. 6, ...	do.
260	Braehead Brick Works, ...	Silica Brick, ...	Scottish Silicate Brick Co.
261	Kirkwood Collieries, ...	Pits Nos. 2 and 3, ...	(Kirkwood Coal Co.)
262	Do. do. ...	Pit, No. 4, ...	do.
263	Do. do. ...	Bricks, ...	do.
264	Heatheryknowe Colliery, ...	Pit, No. 3, ...	do.
265	Drumpellier do. ...	Pits, Nos. 3 and 4, ...	Summerlee and Mossend Iron Co., Ltd.
266	Summerlee (Kirkwood) Colliery, ...	Pit, ...	do.
267	Souterhouse Colliery, ...	do. No. 2, ...	R. Pettigrew.
268	Do. do. ...	do. No. 1, ...	do.
269	Do. Brick Works, ...	Bricks, ...	Jas. Scobbie.
270	British Tube Works, ...	Tube Works, ...	A. & J. Stewart & Messies, Ltd.
271	Coatbridge Iron Works, ...	Iron do. ...	Hugh Martin & Sons.
272	Dundryan Foundry, ...	Foundry, ...	Maxwell Bros.
273	Do. Iron and Steel Works, ...	Iron and Steel, ...	William Martin.
274	Eglinton Silica Works, ...	Bricks, ...	Eglinton Silicate Brick Co., Ltd.
275	Coatbridge Boiler Works, ...	Boiler Works, ...	Wm. Arnot & Co.
276	Dundryan Bolt Works, ...	Bolts and Rivets, ...	Jas. Kennedy.
277	Stobcross do. ...	do. ...	Jas. Miller & Co., Ltd.
278	North British Iron Works, ...	Iron Works, ...	Thos. Ellis, Ltd.
279	Coatbridge Works, ...	Tubes, ...	Jas. Wilson & Sons.
280	Drumpellier Colliery, ...	Coal, ...	John Horn & Co., Ltd.
281	Do. Iron Works, ...	Iron, ...	John Spencer & Co., Ltd.
282	Langloan Iron and Chemical Works, ...	Iron and Chemical, ...	Langloan Iron and Chemical Co.
283	Victoria Tube Works, ...	Tube Works, ...	Jas. Allan & Co.
284	Woodside Steel and Iron Works, ...	Iron and Steel, ...	Woodside Steel and Iron Co.
285	Langloan Mills, ...	Mills, ...	Jas. McMillan.
286	Drumpellier Colliery, ...	Coal Mine, ...	Jas. Wood & Co.
287	Do. do. ...	Esperide Pit, No. 3, ...	do.
288	Monkland do. ...	Pits, Nos. 3 and 6, ...	Jas. Dunlop & Co., Ltd.
289	Do. do. ...	do. Nos. 7 " 8, ...	do.
290	Do. do. ...	do. Nos. 9 " 10, ...	do.
291	Do. do. ...	Pit, No. 4, ...	do.
292	Craignuek do. ...	do. No. 3, ...	do.
293	Victoria Engine Works, ...	General Engine Works, ...	Gibb & Hoag.
294	Coatbridge, ...	Priesters, ...	Baird & Hamilton.
295	Airdrie, ...	do. ...	do.
296	Do. Steel Foundry, ...	General Foundry, ...	Airdrie Steel Foundry Co., Ltd.
297	Alert Iron do. ...	do. ...	Alert Foundry Co.
298	Belladyke Colliery, ...	Pit, No. 3, ...	John Pettigrew.
299	Do. do. ...	Pits, Nos. 4 and 5, ...	do.
300	Alert Engineering Works, ...	Engineering & Boilers, ...	J. Inglis & Co., Ltd.
301	Wellwyn Engine do. ...	Colliery Plant, ...	John Smith.
302	Caledonian Work, ...	Rope, ...	Caledonian Rope Co., Ltd.
303	Imperial Tube Work, ...	Tubes, ...	A. & J. Stewart & Messies, Ltd.
304	Rochalloch Brick Works, ...	Bricks, ...	David Brownlee.
305	Do. Iron and Steel Works, ...	Iron and Steel, ...	Waverley Iron Co.
306	Sheepford Boiler Works, ...	Boilers and Girders, ...	Thos. Hulman & Co.
307	Union Tube Works, ...	Tubes, ...	Wilson & Usher Tube Co., Ltd.
308	Victoria Iron and Steel Works, ...	Iron and Steel, ...	Victoria Iron & Steel Co., Ltd.
309	Clyde Tube Works, ...	Tubes, ...	A. & J. Stewart & Messies, Ltd.
310	Crown Iron do. ...	Iron, ...	J. Tullhopp.
311	Cliftonhill Foundry, ...	General Foundry, ...	Robt. Dick.
312	Coats Iron Works, ...	Iron, ...	Pattison, Downes & Jardine.
313	Do. Tube do. ...	Tubes, ...	Coats Tube Co.
314	Phoenix Iron Works, ...	Iron, ...	John Spencer & Co., Ltd.



No. Name of Work. Description. Owner.  
 Station No. 1. III.—Works within zone 4 to 6 Miles—Continued.

No.	Name of Work.	Description.	Owner.
315	Clifton Iron Works, ...	Iron, ...	John Wylie.
316	Coatbridge Tinplate Works, ...	Sheet Iron, ...	Coatbridge Tinplate Co., Ltd.
317	North British Iron Works, ...	Iron, ...	Thos. Ellis & Co.
318	Lochrin Iron Works, ...	do. Fence, ...	Wm. Bain & Co.
319	Do. Engine Works, ...	Engines, ...	Murray & Paterson.
320	Do. File Manufactory, ...	File, ...	R. & T. Hutton.
321	Vulcan Boiler Works, ...	Boiler, ...	Hamilton & Calvert.
322	Preserves do. ...	Preserving, ...	Thos. Phillips.
323	Bakery, ...	Bakery, ...	J. & W. Sword.
324	Crown Smelting Works, ...	Smelting, ...	Anderson Bros.
325	Whifflet Foundry, ...	General Foundry, ...	R. B. Tennant.
326	Clydesdale Tube Works, ...	Tube, ...	Clydesdale Tube Co., Ltd.
327	Forge Works, ...	Forge, ...	John Tennant.
328	Iron do. ...	do. ...	do.
329	Calder Iron and Chemical Works, ...	Iron, &c., ...	Wm. Dixon, Ltd.
330	Do. Brick Works, ...	Bricks, ...	do.
331	Do. Colliery, ...	Pit, ...	do.
332	Briton Pit, ...	Coal, ...	do.
333	Calder Fireclay Works, ...	Fireclay, ...	Calder Fireclay Brick Co.
334	Carnbroe Iron do. ...	Iron, ...	Merry & Cunningham, Ltd.
335	Do. Chemical do. ...	Chemical, ...	do.
336	Palncecraig Works, ...	Bricks, ...	— Synnington.
337	Faskine Brick Works, ...	do. ...	Wm. Baird & Co., Ltd.
338	Cairnhill Colliery, ...	Pit, No. 6, ...	do.
339	Hillhead do. ...	do. No. 5, ...	do.
340	Do. do. ...	do. No. 2, ...	do.
341	Faskine do. ...	Pit, ...	do.
342	Calderbank Steel Works, ...	Steel, ...	Jas. Dunlop & Co.
343	Woodhall Colliery, ...	Ellimuir Pit, ...	Barr & Higgins.
344	Blackridge do. ...	Pit, ...	John McAndrew & Co., Ltd.
345	Springbank do. ...	do. ...	Barr & Haddow.
346	Chapelhall do. ...	do. ...	do.
347	Dunsynton do. ...	Pits, Nos. 4 and 5, ...	Summerlee and Mossend Iron Co., Ltd.
348	Do. do. ...	Pit, No. 2, ...	do.
349	Gartness do. ...	Pits, Nos. 1 and 2, ...	Gartness Coal Co.
350	Moffat Mills, ...	Paper, ...	Robt. Craig, Ltd.
351	Springbank Colliery, ...	Nos. 5 and 6, ...	Springbank Coal Co.
352	Newhouse do. ...	Pit, No. 1, ...	United Collieries, Ltd.
353	Greenside do. ...	Nos. 1, 2, and 3, ...	do.
354	Woodhall Brick Works, ...	Bricks, ...	do.
355	Linrigg Colliery, ...	Pit, No. 2, ...	Linrigg Coal Co., Ltd. } <i>do. do.</i>
356	Do. do. ...	do. No. 3, ...	do. } <i>do. do.</i>
357	Linridge do. ...	do. No. 1, ...	Linridge Coal Co. } <i>do. do.</i>
358	Mossbank do. ...	Pits, Nos. 1 and 2, ...	do. } <i>do. do.</i>
359	Brownhill do. ...	Pit, ...	Barr & Higgins. } <i>United Collieries Co.</i>
360	Biggarford do. ...	do. ...	Biggarford Coal Co.
361	Greenhill do. ...	do. ...	Greenhill Coal Co.
362	Do. do. ...	do. No. 4, ...	do.
363	Do. do. ...	Pits, Nos. 9 and 10, ...	do.
364	Auchinlea Quarry, ...	Freestones, ...	Thos. Gibb & Son.
365	North Auchinlea Quarry, ...	do. ...	do.
366	Greenhill Quarry, ...	do. ...	Col. Wm. Scott.
367	Do. Brick Works, ...	Bricks, ...	do.
368	Auchinlea Tile do. ...	Tiles, ...	Thos. Gibb & Son.
369	Greenhill Colliery, ...	Pits, Nos. 9 and 12, ...	Greenhill Coal Co.
370	Do. Brick Works, ...	Bricks, ...	do.
371	Harehew Colliery, ...	Pit, No. 1, ...	John Higgins.
372	Newmains do. ...	Pit, ...	Cultness Iron and Steel Co., Ltd.
373	Cultness Iron Works, ...	Iron, ...	do.
374	Newmains Fireclay Works, ...	Bricks, ...	do.
375	Stonacerlags Colliery, ...	Pit, No. 4, ...	do.
376	Henshill do. ...	Pit, ...	do.
377	Law do. ...	Pit, No. 2, ...	Wilson & Clyde Co., Ltd.
378	Clydeside Preserve Works, ...	Preserves, ...	do.
379	Chapel Colliery, ...	Pit, ...	Chapel Coal Co., Ltd.
380	Do. do. ...	do. ...	do.
381	Watsonfoot do. ...	do. ...	do.
382	Do. do. ...	do. ...	do.
383	Allanton do. ...	do. ...	Morningside Coal Co., Ltd. } <i>United Collieries Co.</i>
384	Morningside do. ...	do. ...	do.
385	Do. Brick Works, ...	Brick, ...	do.
386	Allanton Foundry, ...	Foundry, ...	Allanton Foundry Co., Ltd.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. III.—Works within zone 4 to 6 Miles—Continued.</b>			
387	Allanton Brick and Tile Works,	Brick and Tile,	London & Russell
388	Maulslie Preserve Works,	Preserves,	J. Thomson & Co.
389	Hyndshaw Colliery,	Pit, No. 1,	Shotts Iron Co.
390	Millburn do,	Pit,	Archd. Russell
391	Lane do,	do. No. 3,	Wilson & Clyde Co., Ltd.
392	Do. do,	do. No. 4,	do
393	Do. do,	do. No. 3,	do
394	Do. do,	do. No. 1,	do
395	Shawfield do,	Pits, Nos. 1 and 2,	do
396	Browlee do,	Pit, No. 1,	do
397	Do. do,	do. No. 2,	do
398	Garriongill do,	do. No. 1,	Coltness Iron & Steel Co., Ltd.
399	Do. do,	Pits, Nos. 10 and 11,	do
400	Castlehill do,	Pit, No. 4,	Shotts Iron Co.
401	Halleraig Brick Works,	Bricks,	Gould & Co.
402	Woodside Colliery,	Pit, No. 2,	Woodside Coal Co.
403	Do. do,	do. No. 4,	do
404	Southlongrigg do,	Pit,	Jas. Gemmel.
405	Do. do,	do. No. 1,	do
406	Do. do,	do. No. 3,	do
407	Bentrigg do,	Pit,	Larkhall Collieries, Ltd. <i>under lease of</i>
408	Swinehill, do,	do. No. 4,	Darnogavil Coal Co.
409	Do. do,	Pit,	do
410	Do. do,	do. No. 2,	do
411	Do. do,	do. No. 3,	do
412	Avon Foundry,	Enamelled Baths,	Jackson & Elphwick.
413	Larkhall Brick Fields,	Bricks,	Larkhall Brick Field Co., Ltd.
414	Avondale Colliery,	Pit, No. 2,	Jas. Nimmo & Co., Ltd.
415	Stonehouse Brick and Tile Works,	Bricks and Tiles,	R. & J. Dorland.
416	Cauderside Pit,	Coal,	Jas. Nimmo & Co., Ltd.
417	Stewartfield Quarry,	Freestone,	M. Barlas.
418	Quarry,	do,	R. Aitkenhead & Sons.
419	Earnock Quarry,	Quarry,	E. McCrory.
420	Newfield Pit,	Colliery,	John Dickson.
421	Brick Works,	Bricks,	do.

#### IV.—Works within zone 6 to 8 Miles.

422	Wellshot Quarry,	Freestone Quarry,	Haird & Stevenson.
423	Do. Colliery,	Colliery,	United Collieries, Ltd.
424	Do. Brick Work,	Brick Work,	do.
425	Do. Brewery,	Brewery,	Wellshot Brewery Co., Ltd.
426	Kirkhill Colliery,	Coal,	Cambuslang Coal Co., Ltd.
427	Do. Brick Works,	Bricks,	do.
428	Cambuslang Hygienic Laundry,	Laundry,	do.
429	Do. Dye Works,	Dye,	T. P. Millar.
430	Clydeside Coal Pit,	Pit,	Glasgow Iron and Steel Co., Ltd.
431	Carmyle Bleach Works,	Bleach,	Jas. Park & Sons.
432	Clyde Iron Works,	Iron,	Jas. Dunlop & Co., Ltd.
433	Kennuirhill Colliery,	Newton Pit, No. 4,	Glasgow Coal Co.
434	Do. do,	Pit, No. 2,	do.
435	Tolleross Quarry,	Sand,	Clyde Iron Works.
436	Do. do,	do,	Robert Spittle.
437	Foxley Colliery,	Pit, No. 3,	Dunn & Steven.
438	Burnthorn do,	do. No. 1,	Glasgow Coal Co.
439	Dalhowie do,	do. do,	do.
440	Broomhouse do,	do. do,	do.
441	Calderbank do,	Pits, Nos. 1 and 2,	Glasgow Iron and Steel Co. Ltd.
442	Shettleston Oil and Chemical Works,	Oil and Chemical,	Shettleston Oil and Chemical Co.
443	Acme Steel Works,	Foundry,	Acme Steel Foundry Co.
444	Acme Machine Works,	Gas Engines, &c.,	Acme Machine Co.
445	Provanhall Fireclay Works,	Bricks,	R. & J. Mather.
446	Lochwood Colliery,	Pits, Nos. 1 and 2,	Lochwood Coal Co.
447	Gartsherrie Colliery,	Pit, No. 1,	John Nimmo & Sons, Ltd.
448	Do. do,	Pits, Nos. 8 and 9,	do.
449	Strathern Wellless Chain Work,	Chains,	Strathern Wellless Chain Co.
450	Hallowhill Colliery,	Pit, No. 1,	Wm. Rankine.
451	Gartsherrie Iron Works,	Iron,	Wm. Baird & Co.
452	Do. Chemical Works,	Chemical	do.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. IV.—Works within zone 6 to 8 Miles—Continued.</b>			
453	Sunnyside Engine Works, ...	Engineering, ...	Lamberton & Co.
454	Clydesdale Laundry, ...	Laundry, ...	Clydesdale Laundry Co.
455	Waverley Iron and Steel Works, ...	Iron and Steel, ...	Waverley Iron and Steel Co., Ltd.
456	Kipps Brick Works, ...	Brick, ...	Hugh Symington & Son.
457	Sun Tube do. ...	Tubes, ...	A. & J. Stewart & Menzies Ltd.
458	North Kipps Quarry, ...	Quarry, ...	Symington's Quarries, Ltd.
459	Kippslyre Colliery, ...	Mine and Pit, ...	Strain Bros.
460	Mossie Locomotive Works, ...	Locomotives, ...	N.B. Railway Co.
461	Airdriehouse Brick do. ...	Bricks, ...	Jonathan Hyslop.
462	Standard Iron do. ...	Iron, ...	Airdrie Iron Co.
463	Chapelside Foundry, ...	General Foundry, ...	Martyn Bros.
464	Rawyards Cotton Works, ...	Cotton, ...	Goldie & Co.
465	Saw Mills, ...	Saw Mills, ...	Wm. Shanks & Sons.
466	Boilermaking, ...	Boilermakers, ...	Shiels & Mc Nicol.
467	Biscuit Factory, ...	Biscuit Manufacturers, ...	Wheatholm, Ltd.
468	Tinplate Works, ...	Tinplate Works, ...	Richd. Roy.
469	Rivet Works, ...	Rivet, ...	Sunnyside Rivet Co., Ltd.
470	Braidenhill Colliery, ...	Pit, No. 2, ...	Ferrier & Strain.
471	Clachan Quarry, ...	Whinstone, ...	Glasgow Corporation.
472	Ryden do. ...	do. ...	John Gibson.
473	Kirk do. ...	do. ...	Glasgow Corporation.
474	Brackenbirst Quarry, ...	do. ...	do.
475	Rougheraig do. ...	do. ...	John More.
476	Threshbush do. ...	do. ...	do.
477	Wellside do. ...	do. ...	do.
478	Dalmacoulter do. ...	do. ...	Crawford Bros.
479	Rawyards Brick Works, ...	Bricks, ...	Alex. Frew & Co.
480	Barnhead Quarry, ...	Quarry, ...	David Riddle.
481	Airdriehill do. ...	Oil, ...	J. Jameson.
482	Stanrigg Oil Works, ...	do. ...	Wm. Black & Sons, Ltd.
483	Harttrigg Colliery, ...	Coal, ...	do.
484	Braidenhill do. ...	Pit, No. 1, ...	Ferrier & Strain.
485	Stanrigg do. ...	Victor Emmanuel Pits, Nos. 1 and 2, ...	Wm. Black & Sons, Ltd.
486	Brownieside do. ...	Colliery, ...	do.
487	do. do. ...	do. ...	do.
488	Craighead Quarry, ...	Quarry, ...	do.
489	Fortisiet Colliery, ...	Pit, ...	Scoble & Co.
490	Mainbank do. ...	do. ...	Morningside Coal Co.
491	Greystonelee do. ...	do. ...	United Collieries, Ltd.
492	Carlehead do. ...	Pit, No. 1, ...	Shotts Iron Co., Ltd.
493	Do. Foundry, ...	General Foundry, ...	Geo. Lindsay.
494	Currieside Colliery, ...	Pit, ...	Robt. Sneddon.
495	Hartwoodhill do. ...	do. No. 1, ...	Shotts Iron Co., Ltd.
496	Ladylands Mine, ...	Mine, ...	Coltness Iron Co., Ltd.
497	Kepplehill Colliery, ...	Colliery, ...	Turner's, Ltd.
498	High Mill, ...	Flour, &c., ...	T. Rodgerston.
499	Whitehaw Tile Works, ...	Tile, ...	Gibson & Co.
500	Milton Brick Works, ...	Brick and Pit, ...	Ravenshall Coal Co. — <i>hand w/ Collieries Ltd.</i>
501	Low Mill, ...	Flour, ...	Robt. Black.
502	Carluko Boot Factory, ...	Boot Factory, ...	John Watson.
503	Engineering Work, ...	Engineer's Pit, ...	R. B. Black.
504	Do. ...	do. ...	Hugh Martin.
505	Clydesdale Preserve Works, ...	Preserves, ...	R. & W. Scott.
506	Rae-gill Foundry, ...	General Foundry, ...	R. Russell & Sons.
507	Nellfield Brick and Tile Works, ...	Brick and Tile, ...	Nellfield Brick and Tile Co.
508	Do. Saw Mills, ...	Timber, ...	Jas. Martin's Trustees.
509	Meadow Brick Works, ...	Bricks, &c., ...	John McDonald & Sons.
510	Braidwood Tile Works, ...	do. ...	Thos. Hamilton.
511	Do. Chemical Works, ...	Chemical, ...	Jas. Martin's Trustees.
512	Overwood Quarry, ...	Freestone, ...	Haird & Stevenson.
513	Torrance Colliery, ...	Coal, ...	Melvin Bros.
514	Chapelrig Mine, ...	do. ...	Colquhoun & Laird.

#### V.—Works within zone 8 to 10 Miles.

515	Easterhouse Bolt and Rivet Works, ...	Bolt and Rivet, ...	Walter Donald.
516	Itasdale Preserve Works, ...	Preserving, ...	McFarlane, Paton & Co.
517	Shettleston Laundry, ...	Laundry, ...	John Donald.
518	Engineering Works, ...	Engineering, ...	A. & D. Turner.
519	Shettleston Saw Mills, ...	Timber, ...	Wm. Watson.
520	Shettleston Iron Works, ...	Engineers and Founders, ...	J. & T. Boyd.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. V.—Works within zone 8 to 10 Miles—Continued.</b>			
521	Clyde Bridge Steel Works	Steel Works	Clyde Bridge Steel Works, Ltd.
522	Easterhill Colliery	Colliery	Jas. Dunlop & Co.
523	Tollcross Quarry	Sand	John Watson.
524	Glasgow Rope Works	Rope, &c.	Arch. Thomson, Black & Co.
525	Govan Cross Dye Works	Dye Works	Manson & Henry.
526	Belvidere Brick do.	Brick Works	R. & D. Adams.
527	West Thorn Rope do.	Rope and Twine Works	Wm. Paterson.
528	Parkhead Girder do.	Girder and Roof do.	Bladen & Co. Ltd.
529	Carntyne Dyewood Mills	Dyewood Mills	The British Dyewood and Chemical Co., Ltd.
530	Avondale Works	Preserved Meat Factory	James Watt.
531	Firpark Iron Works	Engineering	Pollock, MacNab & Highgate.
532	Carntyne Mills	Cattle Food Manufacturers	Lowe & Co.
533	Carntyne Boiler Works	Boiler Works	M. Ferguson & Son.
534	Clyde Bedstead do.	Bedstead	A. Kirby & Sons.
535	Tallow Works	Tallow Melters	J. L. Burnisley & Co.
536	Stanley do.	Sheet Iron Works	Wm. Hunter & Co.
537	Carntyne Flock Mill	Flock Mill	Reuben Kitchen.
538	Kennyhill	Tallow Melter	Joseph Docherty.
539	Garterraig Colliery	Colliery	Garterraig Fireclay Co. do.
540	Garterraig Fireclay Works	Fireclay	do.
541	Provanhall Colliery and Fireclay Works	Colliery and Fireclay	Glasgow Iron and Steel Co., Ltd.
542	Comedie Colliery	Colliery	Hugh Bain & Sons.
543	Steps Road Quarry	Quarry	Garnkirk Fireclay Co.
544	Clyde Ropery	Rope Works	J. M'Gibbon.
545	Eastfield Ropery	do.	John Nelson & Son.
546	Clyde Factory	Waterproofing	Somerville & Morrison.
547	Do. Paper Mills	Paper Mills	Clyde Paper Co., Ltd.
548	Eastfield Steam Chair Works	Chair	H. & A. J. Alexander & Co.
549	Paper Mills	Paper Mills	Stewart Bros.
550	Farme Colliery	Colliery	Farme Coal Co., Ltd.
551	Rutherglen Cement Works	Cement	Thos. M'Ghie.
552	Scotia Bolt, Nut, and Rivet Works	Bolt, Nut, and Rivet	Jas. Smith & Co.
553	Clyde Bank Works	Cloth Finishing	A. Robertson & Son.
554	Clydesdale Tube Works	Tube Works	Jas. Eadie & Son.
555	Do. Dye do.	Dye do.	David Millar & Co.
556	Phoenix Tube do.	Tube do.	A. & J. Stewart & Messies, Ltd.
557	Clydesdale Ropery	Rope do.	Allan Whyte & Co.
558	Brick Works	Brick do.	Farme Coal Co., Ltd.
559	Rutherglen Rope Works	Rope do.	John Todd & Son.
560	Caledonian Pottery	Pottery	Caledonian Pottery Co., Ltd.
561	Stonelaw Colliery	Colliery	Farme Coal Co., Ltd.
562	Shawfield Chemical Works	Chemical Works	J. & J. White.
563	Do. Brick Work, No. 1	Brick Works	John Goldie & Sons.
564	Do. do. No. 2	do.	do.
565	Govan Colliery Pit, No. 5	Colliery	Wm. Dixon, Ltd.
566	Newfield Saw Mills	Chair Works	John Brown.
567	Westburn Factory	Factory	Reid & Son.
568	Avonbank do.	Hair Factory	Niven & Craig.
569	Stonelaw Colliery Pit, No. 1	Colliery	Farme Coal Co., Ltd.
570	Cathkin Laundry	Laundry	Giffen & Bissett.
571	Do. Quarry	Whinstone	A. Crum M'Leay.
572	Carmunnock do.	do.	Alex. Wilson.
573	Catleglen Works	Starch and Glue	Young & Strang.
574	Hairmyres Lime Quarry	Lime Quarry	A. M'Ar.
575	Springfield Shrinker Works	Shrinker	Thos. Key.
576	Do. Rope Works	Rope Works	Samuel Wilson & Co.
577	Greenfield Colliery	Coal and Brick	Greenfield Coal Co.
578	Cardowan Fireclay Works	Bricks	Heathfield and Cardowan Fireclay Co. do.
579	Heathfield do.	do.	do.
580	Garnkirk do.	do.	Garnkirk Fireclay Co.
581	Muirhead Saw Mills	Saw Mills	Jas. Buchanan.
582	Carpentry Works	Joiners, &c.	John Angus.
583	Avenuehead Quarry	Moulters' Sand	John Baird & Sons.
584	Drumcavil Rock Sand Works	Sand	Wm. Anderson & Co.
585	Inchneuk Clay Pit	Clay	Glenboig Union Fireclay Co., Ltd.
586	Garnqueen Fireclay Works	Bricks	P. & M. Hurll.



No.	Name of Work.	Description.	Owner.
<b>Station No. 1. V.—Works within zone 8 to 10 Miles—Continued.</b>			
587	Glenboig Fireclay Works, ...	Bricks, ...	Glenboig Union Fireclay Co., Ltd.
588	Star do. ...	do. ...	do.
589	Gartverrie do. ...	do. ...	do.
590	Rawmoan do. ...	do. ...	do.
591	Gartliston do. ...	do. ...	P. & M. Hurll.
592	Glenboig Saw Mills, ...	Timber, ...	Wm. Shaw.
593	Greenfoot Quarry, ...	Freestone, ...	Geo. M'Law & Co.
594	Gair do. ...	Crushed Rock and Sand, ...	do.
595	Meikle Drumgray Colliery, ...	Pit, No. 3, ...	Darngavil Coal Co.
596	Darngavil do. ...	do. No. 4, ...	do.
597	Cameron do. ...	do. No. 1, ...	Cameron Coal Co.
598	Darngavil do. ...	do. No. 10, ...	Darngavil Coal Co.
599	Do. do. ...	do. No. 14, ...	do.
600	Avonhead do. ...	do. No. 9, ...	Avonhead Coal Co., Ltd. } <i>United Collieries Ltd.</i>
601	Do. do. ...	Pits, Nos. 1 and 8, ...	do.
602	Meadowfield do. ...	Pit. ...	Wm. Black & Sons, Ltd.
603	Longriggend do. ...	do. No. 5, ...	Jas. Nimmo & Co., Ltd.
604	Do. do. ...	do. No. 7, ...	do.
605	Do. do. ...	do. No. 6, ...	do.
606	Do. Patent Fuel Works, ...	Patent Fuel, ...	do.
607	Do. Colliery, ...	do. No. 3, ...	do.
608	Do. do. ...	do. No. 9, ...	do.
609	Do. do. ...	do. No. 10, ...	do.
610	Barblues do. ...	do. No. 4, ...	A. & G. Anderson.
611	Arden do. ...	Pits, Nos. 8 and 9, ...	Wm. Black & Sons, Ltd. } <i>United Collieries Ltd.</i>
612	Longriggend do. ...	Pit, No. 1, ...	Jas. Nimmo & Co., Ltd.
613	Do. do. ...	do. ...	Wm. Black & Sons, Ltd.
614	Longriggend Colliery, ...	do. No. 2, ...	Jas. Nimmo & Co., Ltd.
615	Glengowan Print Works, ...	Print Works, ...	John Glen.
616	Caldercruix Paper Mills, ...	Paper Mills, ...	Robt. Craig & Sons, Ltd.
617	Barblues Colliery, ...	Arden Pit and Mine, ...	A. & G. Anderson.
618	Do. ...	Pit, No. 9, ...	do.
619	Longriggend Colliery, ...	Eastfield Pit, No. 1, ...	Jas. Nimmo & Co., Ltd.
620	Dewshill do. ...	Pits, Nos. 1 and 2, ...	Coltness Iron Co., Ltd.
621	Do. do. ...	Pit, No. 3, ...	do.
622	Haesockrigg do. ...	do. No. 1, ...	do.
623	Portrigg do. ...	do. ...	Morningside Coal Co. } <i>United Collieries Ltd.</i>
624	Baton do. ...	do. ...	do.
625	Batonrigg do. ...	do. ...	do.
626	Shotts Iron Works, ...	Iron, ...	Shotts Iron Co., Ltd.
627	Badallan (Allanrigg) Colliery, ...	Colliery, ...	John Nimmo & Sons, Ltd.
628	Westallan Colliery, ...	do. ...	do.
629	Stanes do. ...	do. ...	Turner's, Ltd.
630	Scottish Terra-Cotta and Metallic Brick Works, ...	Brick Works, ...	Scottish Terra-Cotta and Metallic Brick Co.

#### VI.—Works within zone 10 to 12 Miles.

631	Hogganfield Bleach Works, ...	Bleach Works, ...	Hogganfield Bleaching and Finishing Co.
632	Do. Colliery, ...	Coal Pit, ...	John Allan.
633	Provanmill Distillery, ...	Distillery, ...	Moses Risk & Sons, Ltd.
634	Blackhill Boat Yard, ...	Shipbuilders, ...	D. M. Cumming.
635	Chryston Mill, ...	Meal, ...	J. White.
636	Gartshore Coal Pits, ...	Pits, Nos. 9 and 11, ...	Wm. Baird & Co., Ltd.
637	Wood Mill, ...	Meal, ...	John Thomson.
638	Brondrigg Colliery, ...	Pit, No. 6, ...	John Nimmo & Son, Ltd.
639	Do. do. ...	do. No. 5, ...	do.
640	Roughrigg do. ...	do. No. 3, ...	Robt. Forrester & Sons.
641	Do. do. ...	do. No. 5, ...	do.
642	Do. do. ...	do. No. 2, ...	do.
643	Do. do. ...	do. No. 11, ...	do.
644	Meadowfield do. ...	Pits, Nos. 6 and 7, ...	Wm. Black & Sons, Ltd.
645	Brownrigg do. ...	Coal Pit, ...	McCracken Bros.
646	North Greengairs do. ...	do. ...	do.
647	Bogles do. ...	do. ...	Peter Cairns.
648	Hill of Drumgray do. ...	Pit, No. 7, ...	Darngavil Coal Co.
649	Darngavil, do. ...	do. No. 4, ...	do.
650	Lochend do. ...	do. do. ...	Jas. Nimmo & Co., Ltd.
651	Do. do. ...	do. No. 3, ...	do.

No.	Name of Work.	Description.	Owner.
<b>Station No. 1. VI.—Works within zone 10 to 12 Miles—Continued.</b>			
652	Drumbow Colliery,...	Pit, No. 1, ...	Darngavil Coal Co.
653	Do. do. ...	do. No. 2, ...	do.
654	Westlongrigg do. ...	do. No. 3, ...	do.
655	Longrigg do. ...	do. No. 4, ...	J. Nimmo & Co., Ltd.
656	Do. Engine Works, ...	Engines, ...	do.
657	Westraig Quarry, ...	Whinstone, ...	Bowden Lime Co.
658	Westrigg Colliery, ...	Pits, Nos. 2 and 3, ...	J. Wood, Ltd.
659	Southrigg do. ...	do. Nos. 1 and 2, ...	John Nimmo & Sons, Ltd.
660	Harthill do. ...	do. Nos. 4 and 5, ...	do.
661	Barblues do. ...	Pit, No. 10, ...	A. & G. Anderson.
662	Treosbanks Mine, ...	Coal, ...	Peter Dewar.
663	Leadlock Colliery, ...	Pit, No. 1, ...	John Nimmo & Sons, Ltd.
664	Cleghorn Terra-Cotta Works, ...	Bricks, ...	New Cleghorn Terra-Cotta Co., Ltd.
665	Lanark Saw Mills, ...	Timber, ...	Robt. Todd & Son.
666	Caledonian Wood Works, ...	do. ...	M'Kenzie & Meikle.
667	North Vennel Brewery, ...	Brewery, ...	Thos. Gillroy & Co.
668	Lanark Tannery, ...	Tannery, ...	John Vassie.
669	Hops Buildings Works, ...	Building, ...	Jas. Brown.
670	Linville Hosiery Works, ...	Hosiery, ...	Linville Hosiery Co.
671	Engineer's Works, ...	Engineering Works, ...	Thos. Struthers.
672	Do. ...	do. ...	Jas. Wilson.
673	Caledonian Mineral Oil Works, ...	Oil, ...	Caledonian Mineral Oil Co.
674	New Lanark Spinning Mills, ...	Spinning Mills, ...	Lanark Spinning Co.
675	Manufacturing Works, ...	Manufacturers, ...	A. M'Dougall.

**VII.—Works within zone 12 to 14 Miles.**

676	Gartshore Coal Pits, ...	Pit, No. 1, ...	Wm. Baird & Co., Ltd.
677	Do. do. ...	do. No. 2, ...	do.
678	Do. do. ...	do. No. 3, ...	do.
679	Do. do. ...	do. No. 4, ...	do.
680	Do. Works, ...	Coke Ovens, ...	do.



# GENERATING STATION No. II (Near Yoker).

No.	Name of Work.	Description.	Owner.
<b>I.—Works within radius of 2 Miles.</b>			
681	Graving Dock and Shipbuilding Yard,	Shipbuilding, Engineer- ing, and Slip Dock Yards, ... ..	John Shearer & Sons, Ltd.
682	Yoker Distillery, ... ..	Distillery, ... ..	Harvey's Yoker Distillery, Ltd.
683	Engineering and Shipbuilding,	Engineering and Ship- building, ... ..	Napier & Miller, Ltd.
✓684	Do.	do.	John Brown & Co., Ltd.
685	Machine Manufacturers, ... ..	Machine Manufacturers,	The Singer Manufacturing Co.
686	Kilbowie Iron Works, ... ..	Engineers and Iron- founders, ... ..	D. & J. Tullis, Ltd.
687	British Chemical Co. Works,	Chemical Works, ... ..	British Chemical Co.
688	Chemical Works, ... ..	do.	D. J. Playfair & Co.
689	Garscadden Brick and Tile Works,	Brick and Tile Works,	R. & W. Horn.
690	Knightswood Brick Works, ... ..	Bricks, Pipes, Cans, &c.	Peter & Mark Hurll.
691	Drumchapel do. ... ..	Brick Works, ... ..	Thomas Gilmour.
692	Jordanhill do. ... ..	do. ... ..	Coltness Iron and Steel Co., Ltd.
693	Castlebank Steam Laundry, ... ..	Steam Laundry, &c.,	Alexr. Kennedy.
694	Cyclops Foundry, ... ..	Iron Foundry, ... ..	James M'Ewan & Sons.
695	Engineering and Shipbuilding,	Engineering and Ship- building, ... ..	John Reid & Co., Ltd.
696	Do.	Shipbuilding and En- gineering, ... ..	Ritchie, Graham & Milne.
697	Scotatoun Shipbuilding Yard,	Shipbuilders, ... ..	Charles Connel & Co.
698	Do. Van Works, ... ..	Van and Lorry Builders,	Wm. Law & Sons.
699	Do. Iron Works, ... ..	Engineers and Con- tractors, ... ..	Mechan & Sons.
700	Merlin Iron Works, ... ..	do.	Dryden & Middleton.
701	Roxburgh Works, ... ..	Enamel Works, ... ..	Macfarlane Bros.
702	Clydeside Iron Works, ... ..	Structural Iron Works,	The Clyde Structural Iron Co., Ltd.
703	Balmoral Iron Yard, ... ..	Iron, Metal, and Ma- chinery Merchants,	Thos. Stewart & Co.
704	Scotatoun Steel and Malleable Foundry,	Steel Foundry, ... ..	Scotatoun Steel and Malle- able Foundry Co.
705	Carpentry Works, ... ..	Carpentry and Joinery Works, ... ..	Robert Rogerson.
706	Engineering and Millwright Works, ... ..	Engineers and Mill- wrights, ... ..	W. V. V. Ligertwood.
707	Shieldhall Works, ... ..	... ..	Scottish Co-operative Wholesale Society, Ltd.
708	Moorpark Weaving Factory, ... ..	Weaving Factory, ... ..	Geo. Wilson & Co.
709	Albert Cabinet Works, ... ..	Cabinet, ... ..	McGregor & Brodie.
710	Albert Saw Mills, ... ..	Saw Mills, ... ..	Buchanan & French.
711	Renfrew Forge and Steel Works, ... ..	Engineering, ... ..	Hibcock & Wilcox, Ltd.
712	General Engineering Works, ... ..	do. ... ..	Edward Chester & Co.
713	Atlas Foundry, ... ..	Foundry, ... ..	Messrs. Goodwin.
714	Bolt and Nut Works, ... ..	Bolt and Nut, ... ..	Reid & Co.
715	Renfrew Steam Laundry, ... ..	Laundry, ... ..	James Carruth.
716	London Works, ... ..	Engineering and Ship- building, ... ..	Wm. Simons & Co., Ltd.
717	Shipbuilding and Engineering Works,	do.	Lobnitz & Co., Ltd.
718	Engineering Works, ... ..	Engineering, ... ..	The Bull Metal Co.
719	Joinery Works, ... ..	Joinery ... ..	T. R. Duncanson.

## II.—Works within zone 2 to 4 Miles.

720	Dalmuir Iron Works, ... ..	Bridge and Roof Works,	Summerville & Co.
721	Barge Repairing Works, ... ..	Repairing Barges, &c.,	Clyde Navigation Trustees.
722	Docks, ... ..	Docks, ... ..	do.
723	Dalmuir Print Works, ... ..	Print Works, ... ..	The Calico Printers' Association.

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No.	Name of Work.	Description.	Owner.
<b>Station No. 2. II.—Works within zone 2 to 4 Miles—Continued.</b>			
724	Auchentoshan Distillery, ...	Distillery, ...	Alex. Ferguson & Co., Ltd.
725	Hardgate Mill, ...	Weaving Factory, ...	David Gilmour.
726	Faily Mills, ...	Furniture Works, ...	Faily Mills, Ltd.
727	Baljalfray Coal and Lime Works,	Coal and Lime Works,	James Young & Sons.
728	Do. do. ...	Pit. No. 2, ...	do.
729	Burnbrae Dye Works, ...	Dyers, ...	Alex. Reid.
730	Temple Saw Mills, ...	Saw Mills, ...	Robinson, Dunn & Co.
731	Garscube Brick and Tile Works,	Brick and Tile Works,	Peter & Mark Hurll.
732	Laundry, ...	Laundry, ...	J. A. Ferrier & Co.
733	Cement Works, ...	Cement Works, ...	The Glasgow Portland Cement Co.
734	Dawsholm Paper Mill, ...	Paper Mill, ...	John Craig & Son.
735	Garscube Brick Works, ...	Brick Works, ...	The Garscube Brick Co., Ltd.
736	Temple Iron Works, ...	Bridges, Roofs, &c., ...	William Baird.
737	Temple Croosoting Works, ...	Croosoting Works, ...	Robinson, Dunn & Co.
738	Iron and Repairing Works, ...	Iron Works, Repairs, &c.,	Wm. Kennedy.
739	Dawsholm Chemical Works, ...	Chemical Works, ...	James Ross & Co.
740	Temple Brick Works, ...	Brick Works, ...	J. Paterson & Son, Ltd.
741	Quarry, ...	Quarry, ...	do.
742	Annicland Quarry, ...	Sandstone Quarry, ...	M'Kissack & Son.
743	Scotstoun Mills, ...	Grain Mills, ...	John White & Son.
744	Gymnastic Apparatus Making Works,	Gymnastic Apparatus Manufacturer, ...	Daniel Mellis.
745	Horticultural Building Works, ...	Horticultural Builders,	Simpson & Farmer.
746	Weighing Apparatus Making Works,	Weighing Apparatus,	W. & T. Avery, Ltd.
747	Union Engineering Works, ...	Engineering, ...	D. Allan & Son.
748	Kelvin Rubber and Tarpaulin Works,	Rubber and Tarpaulin Works, ...	Robt. Munro & Co.
749	Thistle Cabinet Works, ...	Cabinetmaking, &c., ...	John Reid.
750	Bridge, Roof, and Fence Works, ...	Bridges, Roofs, Fences, &c., ...	P. & R. Fleming & Co.
751	Castlebank Bakery, ...	Bakery, ...	P. Dunlop & Co.
752	Partick Foundry, ...	Iron and Brass Foundry,	Robert Duncan.
753	Castlebank Grinding Mills, ...	Spice and Sausage Skin Manufacturer, ...	Waugh & Rigby.
754	Malt Works, ...	Malt Extract Factory,	Montgomerie & Co., Ltd.
755	Partick Steam Laundry, ...	Steam Laundry, ...	P. Strachan.
756	Partick Brass, Copper, and Lead Works,	Brass, Copper, and Lead,	Partick Brass Foundry Co.
757	Plumbing and Coppersmith Works, ...	Plumber & Coppersmith,	Archd. Lowe.
758	Meadowside Works, ...	Engineers & Shipbuilders	David & Wm. Henderson & Co., Ltd.
759	Engineer and Art Smith Works, ...	Engineers, Art Smiths,	J. Drysdale & Co.
760	Carpentry Works, ...	Joiner's Shop, &c., ...	Wm. Kennedy.
761	Building and Wright Works, ...	Builders and Wrights,	James Myles & Co.
762	Hay and Grain, ...	Hay & Grain Merchants,	Hugh Miller.
763	Partick Saw Mills, ...	Saw Millers, ...	Robinson, Dunn & Co.
764	Glenavon Engineering Works, ...	Engineers, ...	James Ritchie.
765	The West End Sanitary Steam Laundry,	Laundry, ...	A. B. Boyd & Co.
766	Bellfield Saw Mills, ...	Saw Mills, ...	Alexr. M'Dougall.
767	Galvanizing Works, ...	Galvanizing Works, ...	The Whiteinch Galvanis- ing Co., Ltd.
768	Victoria Park Hygiene Laundry, ...	Laundry, ...	Girvan & Scully.
769	Iucholm Works, ...	Engineers, ...	John Broadfoot & Sons.
770	Royal Laundry, ...	Laundry, ...	Wm. McConnell & Co.
771	Engineering and Saw Mill Works, ...	Engineering Shop and Saw Mills, ...	John Smellie, Jun.
772	Paperhanging Factory, ...	Paperhanging Factory,	The Wall Paper Manufac- turers, Ltd. (Wylie & Lochhead Branch).
773	Firewood Factory, ...	Firewood Factory, ...	J. & H. Watson.
774	Whiteinch Chemical Works, ...	Chemical, ...	D. D. Brown.
775	Shipbuilding and Engineering Works,	Shipbuilders and Engi- neers, ...	Barclay, Curle & Co., Ltd.
776	Foundry Works, ...	Foundry, ...	The British Hydraulic Foundry Co., Ltd.
777	Stick Factory, ...	Stick Factory, ...	Mrs. David Crawford.
778	Gates and Railing Making Works, ...	Gates and Railings, ...	Allan Gibson.
779	Great Western Steam Laundry, ...	Laundry, ...	The Great Western Steam Laundry Co., Ltd.
780	Stone Cutting Works, ...	Stone Cutting, &c., ...	P. M'Kissack & Gardner.
781	Crow Road Yard, ...	Machinery Merchants,	W. R. Fairlie.
782	Fairfield Laundry, ...	Steam Laundry, ...	George Reid & Co.
783	Stanley Works, ...	Stationery, &c., ...	John Thomlinson.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. II.—Works within zone 2 to 4 Miles—Continued.</b>			
784	Greenbank Works, ... ..	Leather Works, ...	Wm. Thomlinson.
785	Scientific Instrument Making Works,	Scientific Instruments,	Burr & Stroud.
786	Fairfield Works, ... ..	Shipbuilding and Engineering, ...	Fairfield Shipbuilding and Engineering Co., Ltd.
787	Govan Cabinet Works, .. ..	Cabinetmakers, ...	Stewart, Pollock & Co.
788	Flock Works, ... ..	Flock Works, ...	The Glasgow Flock Co.
789	Oil Refining and Printing Ink Works,	Oil Refiners and Printing Ink, ...	C. Wishart, Hall & Co.
790	John Street Factory, ... ..	Silk Throwsters and Dyers, ...	Anderson & Robertson, Ltd.
791	File Manufactory Works, ... ..	File Manufacturers, ...	J. Norris & Brash.
792	Manufacturing Chemists, ... ..	Manufacturing Chemists	Clyde Chemical Co.
793	Imperial Pickle Works, ... ..	Pickle and Sauce, ...	Rowat & Co.
794	Fairfield Bakery, ... ..	Bakery, ...	Henry Hood.
795	Drumoyne Brick Works, ... ..	Brick Works, ...	R. B. MacLachlan.
796	Moors Park Boiler Works, ... ..	Boilermakers, ...	Lindsay, Burnet & Co.
797	Govan Rope Work, ... ..	Rope Manufacturers,	Govan Ropework Co., Ltd.
798	North British Tube Works, ... ..	Tube do.	David Richmond & Co., Ltd.
799	St. James's Iron Works, ... ..	Iron, ... ..	Cockburn Bros.
800	St. Helen Engine Works, ... ..	Engine, ... ..	Hall, Brown, Buttery & Co.
801	Steering Gear and Block Works,	Steering Gear and Block Makers, ...	Wm. Alexander & Co.
802	Engineers, ... ..	Engineers, ... ..	Alex. Chaplin & Co.
803	The Glasgow Railway Engineering Works, ... ..	do. ... ..	The Glasgow Railway Engineering Co.
804	Aerated Water Manufactory, ... ..	Aerated Water Manufacturers, ...	Macdiarmid & Co.
805	Colonial Iron Works, ... ..	Iron Founders, ...	John MacNeil & Co.
806	Govan Tube Works, ... ..	Tube Manufacturers,	Wilson and Union Tube Co., Ltd.
807	Govan Bolt and Rivet Works, ... ..	Bolt and Rivet Manufacturers, ...	James Ross & Sons.
808	Engineering Works, ... ..	Engineers, ... ..	D. Watson & Co.
809	Govan Saw Mills, ... ..	Saw Millers, ... ..	Hamilton, Marr & Co.
810	Yacht and Boat Building Works, ... ..	Yacht and Boat Builder,	Hugh MacLean.
811	Govan Silk Factory, ... ..	Silk Throwsters and Dyers, ... ..	Anderson & Robertson, Ltd.
812	Govan Shipbuilding Yard, ... ..	Shipbuilding, ... ..	Mackie & Thomson.
813	Middletown do. ... ..	do. ... ..	London and Glasgow Engineering and Iron Shipbuilding Co., Ltd.
814	Shipbuilding Yard, ... ..	Shipbuilding, ... ..	Wm. Beattie & Co.
815	Engineering Works, ... ..	Engineering, ... ..	David Goodfellow & Co.
816	Waterproof and Canvas Manufactory,	Waterproof and Canvas Manufacturers,	James McIlwraith.
817	Match Manufactory, ... ..	Match Manufacturers,	McDonald, Cuthbert & Co., Ltd.
818	Broomloan Shipyard, ... ..	Boatbuilding, ... ..	Wm. Chambers & Co.
819	Do. Foundry, ... ..	Ironfoundry, ... ..	Anderson & Reid.
820	Albion Works, ... ..	Engineering, ... ..	G. & A. Harvey.
821	Boiler Making Works, ... ..	Boilermaking, ... ..	Marriott & Graham.
822	Hair Works, ... ..	Curled Hair Manufacturers, ...	The British Hair Co., Ltd.
823	Phoenix Copper Works, ... ..	Coppersmiths, ... ..	D. Brown & Co.
824	Clyde Match Works, ... ..	Match Manufacturers,	Mitchell & Co.
825	Broomloan Brass Works, ... ..	Brassfinishers, ... ..	Thomas Jack & Co.
826	Brush Manufactory, ... ..	Brush Manufacturer,	Wm. Morrier.
827	Glasgow Candle Works, ... ..	Candle Manufacturers,	Shenker & Harrey.
828	Glass Manufactory, ... ..	Glass do.	McPhie & Munro.
829	Whitefield Lifebuoy Works, ... ..	Lifebuoy Making, ... ..	John Wilson & Co.
830	Hammer Handle Making Works, ... ..	Hammer Handle Makers,	Robert Burdley & Sons, Ltd.
831	Whitefield Works, ... ..	Engineers and Boilermakers, ...	Ross & Duncan.
832	Chemical Works, ... ..	Chemists, ... ..	John H. Garty & Co.
833	Whitefield Brass Works, ... ..	Brassfounders, ... ..	France & Morgan.
834	Clydeside Engine and Boiler Works,	Engineering and Boiler,	Anderson & Lyell.
835	Copeland Works, ... ..	Engineering, ... ..	McKie & Baxter.
836	Cessnock Engine Works, ... ..	do. ... ..	A. & P. W. McOnie.
837	Govan Engine Works, ... ..	do. ... ..	Dunsmuir & Jackson, Ltd.
838	Silk Finishing Works, ... ..	Silk Finishing, ... ..	Thomas Howley.
839	Farnley Works, ... ..	Electric and Mechanical Engineers, ...	Claude Carter & Co.
840	Phoenix Engineering Works, ... ..	Engineers, ... ..	Cameron & Co.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. II.—Works within zone 2 to 4 Miles—Continued.</b>			
841	Windsor Saw Mills, ... ..	Sawmills, ... ..	Campbell, Wilkie & Downes, Ltd.
842	Victoria Steam Laundry, ... ..	Laundry, ... ..	Walter Yuill & Co.
843	Boiler and Pipe Covering Manufactory,	Boiler and Pipe Covering Manufacturers, &c., ... ..	Wormwald & Co.
844	Percy Crane and Engine Works, ... ..	Crane and Engine, ... ..	Butters Bros. & Co.
845	Ibrox Flour Mills, ... ..	Flour Mills, ... ..	J. White & Sons.
846	Do. Iron Works, ... ..	Heating and Ventilating, ... ..	J. M. Adam & Scott.
847	Linthouse Shipbuilding Yard, ... ..	Shipbuilders, ... ..	Alex. Stephen & Son.
848	Imperial Plant and Machinery Stores, ... ..	Plant and Machinery, ... ..	Robert A. King & Co.
849	Patent Safety Stop and Reducing Valve Manufactory, ... ..	Patent Safety Stop and Reducing Valves Manufacturers, ... ..	Cockburns, Ltd.
850	Cardonald Brick Works, ... ..	Brick, ... ..	P. & R. N. Dewar.
851	Seafield Engineering Works, ... ..	Safety Valve Makers, ... ..	John A. Grant & Co.
852	Cardonald Flour Mills, ... ..	Flour Mill, ... ..	Simon Andrew.
853	Granite Works, ... ..	Granite Works, ... ..	J. Gibson & Co.
854	Clyde Engine Works, ... ..	Engineers, ... ..	James Dennie & Sons.
855	Greenhaugh Saw Mills, ... ..	Saw Mill, ... ..	Mowat & Miller.
856	Craigton Brick Works, ... ..	Brick, ... ..	Craigton Brick Making and Feuing Co., Ltd.
857	Asbestos Manufactory, ... ..	Asbestos Manufacturers, ... ..	Scottish Asbestos Co., Ltd.
858	Hillington Brick Works, ... ..	Brick, ... ..	Kalston Brick Making Co., Ltd.
859	Anchor Thread Mill, ... ..	Thread Mill, ... ..	Clark & Co., Ltd.
860	Secdhill Mill, ... ..	Grain Mill, ... ..	J. & R. Ramsay.
861	Tannery, ... ..	Tannery, ... ..	Lang & Co.
862	St. Mirren Engine Works, ... ..	Engine, ... ..	Thomas Reid & Sons.
863	Manufactory, ... ..	Factory, ... ..	Walter Cook & Co.
864	Cumberland Dye Works, ... ..	Dye, ... ..	Wm. Cunningham & Co.
865	Lithographing Works, ... ..	Lithographing Works, ... ..	T. & R. Graham.
866	Saucel Brewery, ... ..	Brewery, ... ..	James Harvey & Co., Ltd.
867	Do. Distillery, ... ..	Maltsters and Distillers, ... ..	James Stewart & Co.
868	Gleniffer Soap Works, ... ..	Soap Works, ... ..	The Gleniffer Soap Co.
869	Blackhall Paper Works, ... ..	Paper do. ... ..	Wm. M'Intyre, Jun. & Co.
870	Do. Works, ... ..	Tapestry Works, ... ..	Kirkwood, Baird & Co.
871	Staley Dye Works, ... ..	Dyers and Cleaners, ... ..	A. Bell & Sons, Ltd.
872	Thrushgrove do. ... ..	Preserving, ... ..	Jas. Robertson & Sons.
873	Expedair Packing Works, ... ..	Packing Case Manufacturers, ... ..	Robert Paton.
874	Brass Foundry, ... ..	Brass Foundry, ... ..	Cochran & McGeachan.
875	Aerated Water Manufactory, ... ..	Aerated Water, ... ..	John Gilinour.
876	Steam Carpentry Works, ... ..	Carpentry, ... ..	John Clark & Co.
877	Vulcan Works, ... ..	Engineering, ... ..	Fullarton, Hogarth & Barclay.
878	Imperial Starch Works, ... ..	Starch, ... ..	Wm. Polson & Co., Ltd.
879	Laird Foundry, ... ..	Machine Tool Makers, ... ..	T. White & Sons.
880	Do. Dye Works, ... ..	Dye, ... ..	J. & J. McCallum.
881	Abercorn Foundry, ... ..	Moulders' Engineering, ... ..	Hanna, Donald & Wilson.
882	Sneddon do. ... ..	Iron Foundry, ... ..	Henry & Galt.
883	Snawdon Works, ... ..	Coppersmiths, ... ..	Geo. Robertson & Sons.
884	Engineering Works, ... ..	Engineering and Boiler, ... ..	Hanna, Donald & Wilson.
885	Adelphi Starch Works, ... ..	Starch, ... ..	R. Wilson, Johnston & Co., Ltd.
886	Soap Factory, ... ..	Soap Factory, ... ..	Robin & Houston.
887	Cartvale Chemical Works, ... ..	Chemical, ... ..	Cartvale Chemical Co., Ltd.
888	Victoria Saw Mills, ... ..	Saw Mill, ... ..	Wm. Allison.
889	Saw Mills, ... ..	Sawmills, ... ..	Cochrane & Keith.
890	Albion Works, ... ..	Engineers, ... ..	Walter M'Gee & Sons.
891	Dye do. ... ..	Dye Works, ... ..	Stewart & Henry.
892	Underwood Mills, ... ..	Thread, ... ..	Kerr & Co., Ltd.
893	Do. Dye Works, ... ..	Dye, ... ..	D. M'Farlane & Sons.
894	Caledonia Works, ... ..	Starch Works, ... ..	McKenzie Brothers.
895	Hot House do. ... ..	Hot House Works, ... ..	J. Boyd & Sons.
896	Drysalts do. ... ..	Drysalts do. ... ..	Wm. Caldwell & Co.
897	Oil do. ... ..	Oil Works, ... ..	Hugh Highgate & Co.
898	Retort do. ... ..	Retort Works, ... ..	Mechanical Retort Co., Ltd.
899	Caledonia Saw Mills, ... ..	Saw Mills, ... ..	John Highgate & Co.
900	Do. Fireclay Works, ... ..	Fireclay, ... ..	Spiers, Gibb & Co.
901	St. George's Works, ... ..	Preserves, ... ..	A. Cairns & Sons.
902	Engineering and Boiler Making Works,	Engineers and Boiler-makers, ... ..	A. F. Craig & Co., Ltd.
903	Baltic Saw Mills, ... ..	Saw Mills, ... ..	John Highgate & Co.



No.	Name of Work.	Description.	Owner.
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Station No. 2. II.—Works within zone 2 to 4 Miles—Continued.

904	Iron Foundry,	Ironfounders,	John Marshall & Co.
905	Steering Gear Making Works,	Steering Gear Makers,	Fisher & Co.
906	Sugar Factory,	Sugar Manufacturers,	Paisley Sugar Co.
907	St. Mirren Starch Works,	Starch,	Wm. Mackean, Ltd.
908	Burgh Saw Mills,	Saw Mills,	John Young & Co.
909	Soho Engine Works,	Engine,	Campbell & Calderwood.
910	Abercorn Rope Works,	Rope Works,	James Pirken.
911	Tobacco Factory,	Tobacco Manufacturers,	Dobie & Son.
912	Abercorn Oil Works,	Oil,	— Handyside.
913	Falcon Rope Works,	Rope,	MacGregor & Kerr.
914	Gockston Rope Works,	do.	Robert Watson.
915	Shortroads Saw Mills,	Saw Mills,	Hau-an & Hannah.
916	Mossvale Turning Works,	Turning Works,	John Barn.
917	Carpet Works,	Carpet do.	Ronald Jack & Co.
918	Shortroads Laundry,	Laundry,	— Park.
919	Brick Works,	Brick Works,	John Galt & Son.
920	Phoenix Works,	Shipbuilders and Engineers,	Fleming & Ferguson, Ltd.
921	Warksworth Yard,	Shipbuilding,	John Fullarton & Co.
922	Thistle Works,	Engineering, Foundry, and Shipbuilding	Bow, M'Lachlan & Co., Ltd.
923	Bakery,	Bakery,	J. & M. Swan.
924	Engineering Works,	Engineering,	S. Pollock & Son.
925	Waste and Sponge Cloth Factory,	Waste and Sponge Cloth Factory,	A. & D. McGowan.
926	Ralston Brick Works,	Brick Works,	Ralston Brick Making Co., Ltd.
927	Paisley Dye Works,	Dye,	Gibson & Reid.
928	Ladyburn Dye Works,	Dye Works,	A. Reid & Bros.
929	Victoria Works,	Engineering,	Earlie Bros. & Co.
930	Finishing Works,	Finishing,	Ross & Co., Ltd.
931	Sanitary Engineering Works,	Sanitary Engineering,	Doulton & Co., Ltd.
932	Arkleston Print Works,	Print Works,	Walker, Dryburgh & Co.
933	St. James's Dye Works,	Dye Works,	Stewart & Wallace.
934	Seedhill Finishing Works,	Finishing,	Seedhill Finishing Co.
935	Blackstone Brick Works,	Brick,	Wm. Black & Son.
936	Do. Works,	Mineral Oil,	do.
937	Walkinshaw, No. 2 Pit,	Ironstone,	Merry & Cunninghame, Ltd.
938	Walkenstane Brick Works,	Brick,	Spiers & MacLauchlan.

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III.—Works within zone 4 to 6 Miles.

939	Littlemill Slip Dock,	Shipbuilders,	Scott & Sons.
940	Do. Distillery,	Malt Distillers,	Wm. Hay Fairman & Co.
941	Ellangowan Paper Mills,	Paper Mills,	Ellangowan Paper Co.
942	Allander Grain Mill,	Corn Mill,	Ripley Ker.
943	West of Scotland Laundry,	Laundry,	Lairmont & Fairlie.
944	Cloverfield Bleach Works,	Bleach,	Bender & Sons.
945	Craigton do.	do.	Blackwoods, Ltd.
946	Tambowie Distillery,	Distillery,	Tambowie Distillery Co.
947	Victoria Pit,	Ironstone,	Wm. Baird & Co.
948	Lochburn Iron Works,	Iron Foundry,	M'Farlane, Strang & Co., Ltd.
949	Lambhill Foundry,	do.	R. Laidlaw & Son.
950	Do. Forge,	Forge,	John Purdie.
951	Cadder Pit, No. 15,	Ironstone Pit,	Carron Company.
952	Blackhill Colliery Pits, Nos. 8 and 9,	do. Pits,	Summerlee and Mossend Iron and Steel Co., Ltd.
953	Do. Brick Works,	Brick Works,	do.
954	Cadder Colliery No. 17 Pit,	Coal Pit,	Carron Company.
955	Ashfield Colliery,	do.	Ashfield Coal Co.
956	Kinning Park Saw Mills,	Saw Mills,	J. M'Kechnie & Son.
957	Do. Copper Works,	Copper-miths,	Campbell & Hattan.
958	Park Smith Works,	Engineer, Smith, and Machinist,	Alex. Rae.
959	Eruted Water Factory,	Eruted Water Manufacturers,	Schweppes, Ltd.
960	Stewartville Preserve Works,	Preserving,	Thos. Neil.
961	Strathelyde Paint Works,	Paint Manufacturers,	Strathelyde Paint Co.
962	Girdor Works,	Girdor,	P. & W. MacLellan, Ltd.
963	Confectionery Works,	Confectioners,	Hay Bros., Ltd.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. III.—Works within zone 4 to 6 Miles—Continued.</b>			
964	Kinning Park Co-operative Factory, ... ..	Boot Boot Factory, ...	Kinning Park Co-op. Society.
965	West Scotland Street Works,	Gold Extracting, ...	Cassell Gold Extracting Co., Ltd.
966	Soap Works, ... ..	Soap Maker, ... ..	Thos. Reid.
967	Clyde Copper Works, ... ..	Coppersmiths, ... ..	M'Donald & M'Adam.
968	Cement Works, ... ..	Cement Manufacturers,	The Carbon Cement Co., Ltd.
969	Kingston Bakery, ... ..	Bakery, ... ..	E. Archibald.
970	Wellington Works, ... ..	Paint and Engineering,	Glasgow Patents Co., Ltd.
971	Kinning Park Smelting Works,	Smelting, ... ..	R. & W. M'Kinley & Son.
972	Waste Factory, ... ..	Waste Manufacturers,	Gavin Lawson & Co.
973	Argyle Works, ... ..	Gas Stove Manufac- turers, ... ..	R. & A. Main.
974	Kinning Park Bread Factory,	Biscuit Manufacturers,	Gray, Dunn & Co., Ltd.
975	Do. Baking Works,	Bakery, ... ..	Kinning Park Bakery Co.
976	Star Foundry, ... ..	Castings, ... ..	A. Nisbet & Son.
977	Parkgrove Saw Mills, ... ..	Saw Mills, ... ..	Fraser & Co.
978	Soft Soap Works, ... ..	Soft Soap Makers, ...	David Dreghorn.
979	Wrights and Building Works,	Wrights and Builders,	Neil M'Kinnon & Sons.
980	Engineering and Tool Making Works,	Engineers and Tool Makers, ... ..	Smith Bros. & Co.
981	Engineering and Boiler Making Works,	Engineers and Boiler Makers, ... ..	J. S. Hume & Co.
982	Nut and Bolt Factory, ... ..	Nut and Bolt Manu- facturers, ... ..	Wm. Crocker & Co.
983	Candle Making Works, ... ..	Candle Makers, ... ..	Robin & Houston, Ltd.
984	Parkgrove Works, ... ..	Engineers, ... ..	Crows, Harvey & Co.
985	Packing Case Making Works,	Packing Case Makers,	Lawson & Co.
986	Kinning Park Iron Works, ... ..	Iron, ... ..	Chas. M'Neil, Jun.
987	Fishing Rod Making Works,	Fishing Rod Manufac- turers, ... ..	Napier & Craig.
988	Engineering Works, ... ..	Engineers, ... ..	Wm. Thomson & Co.
989	General Engineering Works, ...	General Engineer, ...	And. Gillespie.
990	Parkholm Foundry, ... ..	do. Founders, ... ..	Robertson & Thomson.
991	Engineering and Boiler Making Works,	Engineers and Boiler Makers, ... ..	Muir & Houston, Ltd.
992	Harbour Engine Works, ... ..	Engine, ... ..	do.
993	Bolt and Rivet Making Works,	Bolt and Rivet Makers,	Motherwell & Co.
994	Waste Factory, ... ..	Waste Factory, ... ..	J. Finlay & Co.
995	Stanley Engine Works, ... ..	Engine and Boiler, ...	Colin Houston & Co.
996	Brass Foundry, ... ..	Brass Founders, ... ..	Young & Co.
997	Kinning Park Bolt and Rivet Work,	Bolt and Rivet, ... ..	Edward Crocker.
998	Royal Biscuit Factory, ... ..	Biscuit Factory, ... ..	John Walker, Ltd.
999	Clutha Bakery, ... ..	Bakery, ... ..	Geo. Milne & Co.
1000	Do. Works, ... ..	General Engineers, ...	P. & W. MacLellan, Ltd.
1001	Plantation Foundry, ... ..	Iron Founders, ... ..	Wm. Moses & Co.
1002	Clyde Galvanizing Works, ... ..	Galvanising, ... ..	Smith & M'Lean, Ltd.
1003	Ship Chandlery, ... ..	Ship Chandlers, ... ..	Murray, M'Vinnie & Co.
1004	Starch Factory, ... ..	Starch Manufacturers,	Browns & Co.
1005	Slaterscroft Foundry, ... ..	Foundry, ... ..	Arch. Hutchison.
1006	Plantation Engine Works, ... ..	Engineering, ... ..	Leith, Cardle & Co.
1007	Springfield do. ... ..	Engineering and Boiler Making, ... ..	Chas. Collie & Co.
1008	Elmpark do. ... ..	Engineering, ... ..	Elmpark Engine Works Co.
1009	Coustonholm Weaving Factory,	Weaving Factory, ...	Coustonholm Weaving Co.
1010	Dolphin Works, ... ..	Stationers, ... ..	A. & W. Kennedy.
1011	Govanhaugh Paper Works, ... ..	Paper Works, ... ..	Govanhaugh Paper Co.
1012	Do. Laundry, ... ..	Laundry, ... ..	do. Laundry Co., Ltd.
1013	Engineer and Iron Foundry, ...	Engineers and Iron Founders, ... ..	Stewart & M'Keuzie.
1014	Riverbank Works, ... ..	Bleachers and Finishers,	Brown & Adam.
1015	Bridge Turbine Works, ... ..	Turbine, ... ..	John M'Donald & Co.
1016	Newlandsfield Bleach Works,	Bleachers and Finishers,	Stevenson, M'Kellar & Co.
1017	Rensfield Works, ... ..	Tapestry Works, ... ..	D. Barbour & Co.
1018	Auldfield Power Loom Factory,	Weaving, ... ..	Lownless, M'Donald & Co.
1019	Iron Foundry, ... ..	Iron Founders, ... ..	Allison Bros.
1020	Avenue Iron Works, ... ..	Engineers and Iron Founders, ... ..	John Dalgligh & Co.
1021	Boiler Works, ... ..	Boiler Work, ... ..	A. & W. Dalgligh.
1022	Victoria Pottery, ... ..	Pottery, ... ..	D. Lochart & Co.
1023	Auldfield Dye Works, ... ..	Dye, ... ..	J. & W. Campbell.
1024	Eastwood Beotling Works, ... ..	Beotling, ... ..	Eastwood Beotling Co.
1025	Do. Engineering Works, ... ..	Engineering, ... ..	John B. Smith & Co.
1026	Do. Brass Works, ... ..	Brass, ... ..	Wm. Hutchison.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. III.—Works within zone 4 to 6 Miles—Continued.</b>			
1027	Wellmeadow Laundry, ... ..	Laundry, ... ..	Donald Macfarlane.
1028	Nitshill Chemical Works, ... ..	Chemical, ... ..	The Scottish Alum Co., Ltd.
1029	Darnley Lime Works, ... ..	Lime, ... ..	Allan Kirkwood.
1030	Grahamston Foundry and Engineering Works, ... ..	Foundry & Engineering, ... ..	John Cochran.
1031	Dunferlie Boiler Works, ... ..	Boiler, ... ..	John Wallace & Co.
1032	Do. Foundry, ... ..	Castings, ... ..	Wm. Caldwell.
1033	Arthurlie Biscuit Factory, ... ..	Biscuit Factory, ... ..	J. Brownlie & Sons.
1034	Tubal Works, ... ..	Sanitary Engineering, ... ..	Shanks & Co., Ltd.
1035	Cross Arthurlie Mill, ... ..	Lappet Muslin Manu- facturers, ... ..	Wm. Craig & Sons.
1036	Tannery, ... ..	Tannery, ... ..	J. Paton & Sons.
1037	Glenfield Scouring Works, ... ..	Finishing Work, &c., ... ..	Wm. Fulton & Sons, Ltd.
1038	Blackland Mill, ... ..	Bleach Works, ... ..	Adam Hamilton & Co.
1039	Holm Steam Laundry, ... ..	Laundry, ... ..	Garner & Co.
1040	Thruskraig Bleach Works, ... ..	Bleach, ... ..	Hugh Cochran.
1041	Caledonia Soap Works, ... ..	Soap, ... ..	Isbitt & McCallum.
1042	Gleniffer Steam Laundry, ... ..	Laundry, ... ..	A. Bell & Sons.
1043	Colinslee Chemical Works, ... ..	Chemical, ... ..	Colinslee Chemical Co., Ltd.
1044	Do. Hair Works, ... ..	Hair, ... ..	Drew & Sons.
1045	Stonefield Laundry, ... ..	Laundry, ... ..	W. P. Robertson.
1046	Do. Mills, ... ..	Carpets, ... ..	C. Smith & Co.
1047	Royal Starch Works, ... ..	Starch, ... ..	Brown & Polson.
1048	Co-operative Works, ... ..	... ..	Paisley Co-operative Manu- facturing Society, Ltd.
1049	Bakery, ... ..	Bakery, ... ..	Paisley Equitable Co- operative Society.
1050	Glenfield Starch Works, ... ..	Starch, ... ..	Wm. Wotherspoon.
1051	Ferguslie Thread Mills, ... ..	Thread Mills, ... ..	J. & P. Coats, Ltd.
1052	Do. Fireclay Works, ... ..	Fireclay, ... ..	Robert Brown & Son.
1053	Meikleriggs Works, ... ..	Finishing and Dyeing, ... ..	J. McHardie.
1054	Chemical Works, ... ..	Chemical, ... ..	Richard Smith.
1055	Coppersmith Works, ... ..	Coppersmith, ... ..	John Morrison & Sons.
1056	Hawkhead Cooperage, ... ..	Cooperage, ... ..	H. McNaughton.
1057	Do. Brush Works, ... ..	Brush, ... ..	McKinn Bros.
1058	Engineering Works, ... ..	Engineering, ... ..	Lamont & Co.
1059	Jennyswell Laundry, ... ..	Laundry, ... ..	J. Templeton & Co.
1060	Hawkhead Flour Mill, ... ..	Flour Mill, ... ..	J. & R. Ramsay.
1061	Foxbar Scouring Works, ... ..	Scouring, ... ..	A. F. Stoddart & Co., Ltd.
1062	Nethercraig Bleach Works, ... ..	Bleach, ... ..	J. & P. Coats, Ltd.
1063	Glenpatrick Carpet Works, ... ..	Carpet, ... ..	A. F. Stoddart & Co., Ltd.
1064	Elderslie Mill, ... ..	Waterproofing Mill, ... ..	McLean & Co.
1065	Burnbank Chemical Works, ... ..	Chemical, ... ..	Wm. Forrest & Sons.
1066	Rope Works, ... ..	Rope, ... ..	Wm. Pencock.
1067	Patella Works, ... ..	Electrical & Mechanical, ... ..	Paton, Cooper & Co., Ltd.
1068	Linwood Paper Works, ... ..	Paper, ... ..	R. & W. Watson.
1069	Engineering Works, ... ..	Engineering, ... ..	James Reid.
1070	Abercorn, No. 3 Pit, ... ..	Ironstone, ... ..	Merry & Cunningham, Ltd.
1071	Do. No. 2 do, ... ..	do, ... ..	do.
1072	Do. No. 1 do, ... ..	do, ... ..	do.
1073	Do. No. 3 do, ... ..	do, ... ..	do.
1074	Inkerman Brick Works, ... ..	Brick, ... ..	D. R. Adams.
1075	Johnstone Saw Mill, ... ..	Saw Mill, ... ..	R. Simpson & Co.
1076	Globe Works, ... ..	Gas and Oil Engine Makers, ... ..	Pollock, White & Waldell.
1077	Machine Tool Making Works, ... ..	Machine Tool, ... ..	Louison Bros.
1078	Lathe Factory, ... ..	Lathe Manufacturers, ... ..	John Lang & Sons.
1079	Union Iron Works, ... ..	Iron, ... ..	Thos. Shanks & Co.
1080	Victoria Foundry, ... ..	Iron Foundry, ... ..	John Hubbard.
1081	Hercules Iron Works, ... ..	Tool Making, ... ..	Gen. Edward & Co.
1082	Linwood Brick Works, ... ..	Brick, ... ..	Linwood Brick Making Co., Ltd.
1083	Darnvill do, ... ..	do, ... ..	Whitelaw & Co.
1084	Craigton Quarry, ... ..	Whinstone, ... ..	Wm. George.

#### IV.—Works within zone 6 to 8 Miles.

1085	Milton Paper Mill, ... ..	Paper Mill, ... ..	The Milton Paper Co., Ltd.
1086	Laven Shipbuilding Yard, ... ..	Shipbuilders, ... ..	Wm. Denny & Bros.
1087	Bakery Works, ... ..	Bakery, ... ..	Dumbarrow Equitable Co- operative Society, Ltd.
1088	Carpentry and Building Works, ... ..	Joiners' and Builders' Workshop, ... ..	Dougal & Gibson.



No.	Name of Work.	Description.	Owner.
<b>station No. 2. IV.—Works within zone 6 to 8 Miles—Continued.</b>			
1089	Dumbarton Grain Mills, ... ..	Grain Mill, ... ..	Wm. Craig.
1090	Do. Rope, Sail, and Wire Rope Works, ... ..	Rope, Sail, and Wire Rope, ... ..	The Dumbarton Rope Works Co.
1091	Lennox Rope Works, ... ..	Rope, ... ..	John M'Arthur.
1092	Garshuke Mill, ... ..	Corn Mill, ... ..	J. & W. Kinloch.
1093	Milngavie Mill, ... ..	Grain Mill, ... ..	James Buchanan.
1094	Drumbrook Works, ... ..	Print Works, ... ..	
1095	Blanesfield, ... ..	do. ... ..	The Calico Printers' Association, Ltd.
1096	Balgrochan Mill, ... ..	Meal Mill, ... ..	James Ferris.
1097	St. Mungo Works, ... ..	Engineers and Valve Makers, ... ..	Alexr. Turnbull & Co., Ltd.
1098	Huntershill Quarry, ... ..	Freestone Quarry, ... ..	Thos. Gibb & Sons, Ltd.
1099	Crowhill Brick Works, ... ..	Brick, ... ..	The Bishopbriggs Brick Co., Ltd.
1100	Bishopbriggs Saw Mills, ... ..	Saw Mills, ... ..	J. & M. Barclay.
1101	Crowhill do. ... ..	do. ... ..	A. Barclay.
1102	Sawmilling Works, ... ..	Saw Millers, ... ..	Robt. Kemp & Sons.
1103	Cadder Mill, ... ..	Grain Mill, ... ..	James Kemp.
1104	Robroyston Brick Works, ... ..	Brick, ... ..	The Springburn Coal Co., Ltd.
1105	Do. Quarry, ... ..	Quarry, ... ..	The Robroyston Quarry Co.
1106	Holm Foundry, ... ..	Engineering, ... ..	G. & J. Weir, Ltd.
1107	Gelatine Dry Plate Works, ... ..	Gelatine Dry Plate, ... ..	F. W. Verel & Co.
1108	Railway Appliances Works, ... ..	Railway Appliances, ... ..	Henry Williams.
1109	Netherlee Cabinet Works, ... ..	Cabinet, ... ..	R. & J. S. Crockhart.
1110	Do. Tallow Works, ... ..	Tallow, ... ..	Adam M'Gowan.
1111	Merrylee Quarry, ... ..	Freestone, ... ..	Merrylee Property Investment Co.
1112	Burnfield Quarry, ... ..	do. ... ..	James M'Lean.
1113	Giffnock Quarries, ... ..	do. ... ..	Daird & Stevenson.
1114	Thornliebank Print Works, ... ..	Print, ... ..	The Thornliebank Co., Ltd.
1115	Millholm Paper Mill, ... ..	Paper Mill, ... ..	R. & J. Cooper.
1116	Cathcart do. ... ..	do. ... ..	Solomon Lindsay.
1117	Daruley Quarry, ... ..	Quarry, ... ..	Allan Kirkwood.
1118	Do. Brick Works, ... ..	Brick, ... ..	do.
1119	West Arthurlie Mill, ... ..	Cotton Mill, ... ..	J. Scott.
1120	Lavern Mill, ... ..	Weaving, ... ..	Stewart Bros.
1121	Co-operative Laundry, ... ..	Laundry, ... ..	Barrhead Co-operative Society, Ltd.
1122	Chapelfield do. ... ..	do. ... ..	M'Intyre, Hogg, Marshall & Co.
1123	Sanitas Works, ... ..	Sanitary Engineers, ... ..	Smith & Saunders.
1124	Fernlees Laundry, ... ..	Laundry, ... ..	Miss Johnston.
1125	Glen Copper Works, ... ..	Copper, ... ..	D. M'Callum & Son.
1126	Co-operative Bakery, ... ..	Bakery, ... ..	Barrhead Co-operative Society, Limited.
1127	Arthurlie Saw Mills, ... ..	Saw Mills, ... ..	Young & Pollock.
1128	Aitkenhead Colliery, ... ..	Coal, ... ..	Geo. Crookston & Son.
1129	Govan Colliery, ... ..	Pit, No. 6, ... ..	Wm. Dixon, Ltd.
1130	Williamswood Tile Works, ... ..	Tile, ... ..	Peter Brown & Co.
1131	Netherplace Bleach Works, ... ..	Bleach, ... ..	Wallace & Co., Ltd.
1132	Tofts Bleach Works, ... ..	do. ... ..	do.
1133	Fingalton Mill, ... ..	Oatmeal, &c., ... ..	Wm. Rodger.
1134	South Arthurlie Bleach Works, ... ..	Bleaching, ... ..	Blackwood, Ltd.
1135	Urnes Mill, ... ..	Flour Mill, ... ..	J. Gardner & Sons.
1136	Gateside Print Works, ... ..	Print, ... ..	Gateside Printing Co., Ltd.
1137	Millfield do. ... ..	do. ... ..	Millfield Printing Co., Ltd.
1138	Gateside Laundry, ... ..	Laundry, ... ..	M'Farlane & Co.
1139	Waterproof Making Work, ... ..	Waterproof Making, ... ..	The Waterproofing Co., Ltd.
1140	Killoch Glen Laundry, ... ..	Laundry, ... ..	J. M'Farlane.
1141	Bronlie Bleach Works, ... ..	Bleach and Dye Works, ... ..	J. & H. M'Connell.
1142	Crofthead Mill, ... ..	Thread Manufactory, ... ..	R. F. & J. Alexander, Ltd.
1143	Kirkton Bleach Works, ... ..	Bleach, ... ..	J. & A. M'Hattie.
1144	Do. Mill, ... ..	Feeding Stuff, ... ..	do.
1145	Crossford Mill, ... ..	Meal Mill, ... ..	James Browning.
1146	Milliken Park Crane Works, ... ..	Crane Works, ... ..	John Bowman & Co.
1147	Printing Machine Factory, ... ..	Printing Machine Factory, ... ..	Drysdale Bros.
1148	Cartwright Works, ... ..	Cartwright, ... ..	Wm. Walker.
1149	Thorn Works, ... ..	Machine Tool Making, ... ..	Craig & Donald, Ltd.
1150	Johnstone Boiler Works, ... ..	Boiler Works, ... ..	Geo. Smith.
1151	Walkinshaw Foundry, ... ..	Saw Mill Engineers, ... ..	John M'Dowall & Sons.
1152	Lillybank Flux Mills, ... ..	Flux Dressing, ... ..	Faulstich, Housfield & Co., Ltd.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. IV.—Works within zone 6 to 8 Miles—Continued.</b>			
1153	Cartside Foundry, ... ..	Iron Foundry, ... ..	Duncan Fullarton & Co.
1154	Clark Street Mills, ... ..	Thread Mills, ... ..	Wm. Paton, Ltd.
1155	Johnstone Mills, ... ..	Lace Mill, ... ..	do.
1156	High Street Mills, ... ..	Thread Mills, ... ..	Fmlayson, Douafeld & Co., Ltd.
1157	Divinity Street Foundry, ... ..	Foundry, ... ..	Jas. Carruthers.
1158	Williamson Works, ... ..	Tool Making, ... ..	Craig & Donald, Ltd.
1159	Vulcan Works, ... ..	Machine Making, ... ..	John Wilson & Son.
1160	Wick Factory, ... ..	Wick Manufactory, ... ..	John Biggart & Co.
1161	Johnstone Cooperage, ... ..	Cooperage, ... ..	Daly & Co.
1162	Do. Foundry and Engine Works,	Foundry and Engine Works	— Donald.
1163	Tool Making Works, ... ..	Tool Making, ... ..	Clifton & Waddell.
1164	Do. ... ..	do. ... ..	Crossleys & Co.
1165	Engineering Works, ... ..	Engineering, ... ..	— Robertson.
1166	Laird Cartside Saw Mill, ... ..	Saw Mill, ... ..	— Morrison.
1167	Cartside Paper Works, ... ..	Paper Mill, ... ..	Smith, McLaren & Co., Ltd.
1168	Milliken Park Saw Mill, ... ..	Saw Mill, ... ..	J. & H. Barr.
1169	Glentyne Laundry, ... ..	Laundry, ... ..	R. Gibson.
1170	Crosslee Mill, ... ..	Cotton Boot Lace Making, ... ..	R. & A. Jack.
1171	Formakin Mill, ... ..	Oatmeal, &c., Mill, ... ..	James Gibb.
1172	Locherfield Print and Dye Works,	Print and Dye, ... ..	Hardy, Stark & Co., Ltd.
1173	Do. Bleach Works, ... ..	Bleach, ... ..	do.
1174	Gryfe Woollen Mill, ... ..	Woollen Mill, ... ..	Wm. Shanks & Son.
1175	Do. Grove Laundry, ... ..	Laundry, ... ..	Miss B. McIntyre.
1176	Ranfurly Laundry, ... ..	do. ... ..	John Dalziel.
1177	Barachon Mill, ... ..	Meal Mill, ... ..	Robert Murray & Son.

#### V.—Works within zone 8 to 10 Miles.

1178	The Dock Yard, ... ..	Shipbuilders, ... ..	Archd. McMillan & Son, Ltd.
1179	Leven Saw Mills, ... ..	Saw Mills, ... ..	Brown & Co.
1180	The Brewery, ... ..	Brewery, ... ..	Gillicpie, Sons & Co.
1181	Boat Yard, ... ..	Boat Builders, ... ..	Robt. McAllister & Son.
1182	Boiler and Engine Works, ... ..	Boiler & Engine Works, ... ..	Denny & Co.
1183	Saw Mills, ... ..	Saw Mills, ... ..	McLeod & Sons.
1184	Brass Foundry, ... ..	Brass Foundry, ... ..	Geo. Easton.
1185	The Dumbartonshire Laundry,	Steam Laundry, ... ..	Dumbartonshire Laundry Co., Ltd.
1186	Victoria Brass Foundry, ... ..	Brass Founders, ... ..	Campbell & Cameron.
1187	Bakery, ... ..	Bakery, ... ..	Dumbartonshire Co-operative Society, Ltd.
1188	Lennox Herald, ... ..	Printers, ... ..	Wm. Thomson.
1189	Tannery, ... ..	Tannery, ... ..	Robt. Latta.
1190	Glue Works, ... ..	Glue, ... ..	John Buchanan.
1191	Levenford Engine Works, ... ..	Engineers and Boiler Makers, ... ..	M. Paul & Co., Ltd.
1192	Wood Yard, ... ..	Machinery, &c., Brokers, ... ..	David Galbraith.
1193	Dennystown Brass and Copper Works,	Brass and Copper, ... ..	Wm. L. Halley.
1194	Levenbank Foundry, ... ..	Iron and Steel Foundry, ... ..	Harly & Gordon.
1195	Dennystown Forge, ... ..	Engineers and Forge, ... ..	Dennystown Forge Co.
1196	Dalreoch Quarry, ... ..	Sandstone Quarry, ... ..	Wm. Barlas.
1197	Dalquhurn Dye Works, ... ..	Turkey Red Dye Works, ... ..	The United Turkey Red Co., Ltd. (Wm. Stirling & Son).
1198	Cordale do. ... ..	do. ... ..	do.
1199	Dillichip do. ... ..	do. ... ..	The United Turkey Red Co., Ltd. (Archd. Orr Ewing & Co.)
1200	Auchincarroch Quarry, ... ..	Sandstone, ... ..	The Auchincarroch Quarries, Ltd.
1201	Glengoyne Distillery, ... ..	Distillery, ... ..	Laird Bros., Ltd.
1202	Glenmill Bleach Works, ... ..	Bleachers and Finishers, ... ..	John Yull & Co.
1203	Balgruchan Lime Works, ... ..	Lime and Coal Works, ... ..	Matthew Muirhead.
1204	Lennoxmill Print Works, ... ..	Print Works, ... ..	R. Dalziel, Falconer & Co., Ltd.
1205	Balglas Lime Works, ... ..	Lime Works, ... ..	Matthew Muirhead.
1206	Bellfield Distillery, ... ..	Distillery, ... ..	Bellfield Distillery Co., Ltd.
1207	Iron and Shipbuilding Works, ... ..	Iron Shipbuilding Yard, ... ..	J. & J. Hay, Ltd.
1208	Slip Docks, ... ..	Small Slip Dock, ... ..	do.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. V.—Works within zone 8 to 10 Miles—Continued.</b>			
1209	Southbank Iron Works and Stat Foundry, ...	Foundry, ...	Cameron & Robertson, Ltd.
1210	The Sanitary Lead Lining and Pipe Bending Co., Ltd., ...	Lead and Pipe, ...	The Sanitary Lead Lining and Pipe Bending Co., Ltd.
1211	Canal Basin Saw Mills, ...	Saw Mills, ...	Peter Macgregor.
1212	Basin Iron Foundry, ...	Iron Foundry, ...	Napier, Dow & Co.
1213	Nickel Works, ...	Nickel, ...	The Nickel Co.
1214	Forth and Clyde Chemical Works, ...	Chemical, ...	Perry & Hope.
1215	F. McNeill & Co.'s Patent Slagwool and Felt Works, ...	Slagwool and Felt, ...	F. McNeill & Co.
1216	Broadcroft Saw Mills, ...	Saw Mills, ...	David Marshall.
1217	Kelvinside Factory, ...	Cotton Mills, ...	James Finlay & Co.
1218	Lion Foundry, ...	Iron Foundry, ...	Lion Foundry Co., Ltd.
1219	Kelvin Valley Cart, Van, and Carriage Works, ...	Cart, Van, and Carriage, ...	James Martin.
1220	Engineering Works, ...	Engineers, ...	— Shand.
1221	Kincaid Print Works, ...	Print Works, ...	Adam Murray & Co., Ltd. (The Calico Printers' Association, Ltd.)
1222	Glorat Lime Works, ...	Lime Works, ...	John Kirk.
1223	Lillyburn Print Works, ...	Print Works, ...	A. Macnab & Co., Ltd. (The Calico Printers' Association, Ltd.)
1224	Glorat Mill, ...	Grain Mill, ...	John Wallace.
1225	Campaie Alum Works, ...	Alum, ...	Hurlet and Campaie Alum Co.
1226	Underwood Chemical Works, ...	Chemical, ...	The Underwood Chemical Co.
1227	Cadder Coal Pit, No. 16, ...	Coal and Ironstone Pit, ...	Carron Company.
1228	Carpentry Works, ...	Joinery, ...	Gideon Turnbull.
1229	Busby Print Works, ...	Calico Printers, ...	Inglis & Wakefield, Ltd.
1230	Do. Lower Bleaching Mill, ...	Bleaching Mill, ...	The Busby Bleaching and Bleaching Co., Ltd.
1231	Dripps Mill, ...	Meal, &c., ...	Wm. Alexander.
1232	Hazelden Silk Printing Works, ...	Silk Printing Works, ...	J. Melville, Sen.
1233	Stirlford Saw Mill, ...	Saw Mill, ...	John Andrew.
1234	Do. Quarry, ...	Freestone, ...	James Porter.
1235	Bowfield Bleachfield, ...	Bleaching, ...	Adam Boyd & Son.
1236	Midtownfield Bleachfield, ...	do, ...	J. & A. McNab.
1237	Leather Works, ...	Leather Works, ...	Andrew Muirhead & Son.
1238	Tannery, ...	do, ...	The Gryfe Tannery Co.
1239	Pilmuir Mill, ...	Mill, ...	Wm. Rodger.
<b>VI.—Works within zone 10 to 12 Miles.</b>			
1240	Cardross Mill, ...	Corn and Grain Mill, ...	Alexr. Ferrier.
1241	Milburn Works, ...	Chemical Works, ...	W. S. Turnbull & Co.
1242	Vale of Leven Firewood and Fire-lighter Works, ...	Firewood, ...	John Miller & Co.
1243	Druss and Copper Foundry, ...	Brassfounders and Copper-smiths, &c., ...	Daird, McIntyre & Co.
1244	Vale of Leven Bread Factory, ...	Bread Factory, ...	John Angus & Son.
1245	Do. Laundry, ...	Steam Laundry, ...	— Fraser.
1246	Dalmonach Print Works, ...	Print Works, ...	James Black & Co., Ltd. (The Calico Printers' Association, Ltd.)
1247	Ferryfield Print Works, ...	do, ...	Ferryfield Printing Co.
1248	Vale of Leven Co-operative Society, ...	Bakery, ...	Vale of Leven Co-operative Society, Ltd.
1249	Colour Works, ...	Colour Works, ...	Archd. Stevens.
1250	Jennox Foundry, ...	Iron Foundry, ...	Sharp & Co.
1251	Charlestown Engraving Works, ...	Engraving, ...	Alexr. Brown.
1252	Alexandria Dye Works, ...	Dye, ...	The United Turkey Red Co., Ltd. (John Orr Ewing & Co.)
1253	Donhill Quarry, ...	Sandstone Quarry, ...	James Harlan.
1254	Saw Mills, ...	Saw Mills, ...	J. & W. Bryson.
1255	Milton Works, ...	Turkey Red Dye Work, ...	The United Turkey Red Co., Ltd. (Arch. Orr Ewing & Co.)
1256	Levenbank Print Works, ...	Print Works, ...	do.
1257	Mill of Dalloch, ...	Meal Mill, ...	do.



No.	Name of Work.	Description.	Owner.
<b>Station No. 2. VI.—Works within zone 10 to 12 Miles—Continued</b>			
1258	Dalvait Saw Mills, ... ..	Saw Mills, ... ..	Wm. Davison.
1259	Ballagan do, ... ..	Saw Mill and Cart- wrights, ... ..	T. & H. Lee.
1260	Woodilee Colliery Pits, Nos. 1 and 2,	Coal Pits, ... ..	Woodilee Coal and Coke Co.
1261	Duntiblae Forge, ... ..	Spade Forge, ... ..	Andrew Hill & Co., Ltd.
1262	Wester Gartshore Colliery, ... ..	Colliery, ... ..	J. & A. F. Wallace.
1263	Meiklehill Colliery, ... ..	Pit, No. 4, ... ..	James Wood, Ltd.
1264	Do, ... ..	Pit, No. 5, ... ..	do.
1265	Chemical Works, ... ..	Chemical Works, ... ..	Scott-Vogt Chemical Co., Ltd.
1266	St. Flannan's Pits, Nos. 1 and 2,	Coal Pits, ... ..	Wm. Baird & Co., Ltd.
1267	Millhall Flock Mill, ... ..	Flock Mill, ... ..	A. Jebb & Sons.
1268	Glenhead Mill, ... ..	Mill, ... ..	James Barr.
1269	Burnfoot Mill, ... ..	Silk Printing, ... ..	R. M. Kinley & Co.
1270	Caldershaugh Mill, ... ..	Silk Weaving, ... ..	J. H. Oliver.
1271	Lochhead Works, ... ..	Chair and Cabinet, ... ..	Hamilton & Crawford.
1272	Caldar Works, ... ..	do, ... ..	James Hunter.
1273	Viewfield Works, ... ..	do, ... ..	Joseph Johnstone.
1274	Curling Stone Works, ... ..	Curling Stone, ... ..	John Keane.
1275	Strand's Cabinet Work, ... ..	Cabinet, ... ..	Robert Stewart.
1276	Caldarbank Bleachfield, ... ..	Bleaching, ... ..	John Williamson.
1277	Caldar Glen Laundry, ... ..	Laundry, ... ..	Robert Williamson.
1278	Do. Park Mill, ... ..	Chair and Cabinet, ... ..	John Andrews.
1279	Roadhead Saw Mills, ... ..	Saw Mill, ... ..	Thos. Crawford.
1280	New Mill, ... ..	Mill, ... ..	Thos. Murray & Son.
1281	Glen Mill, ... ..	Saw Mill, ... ..	John Gibb.
1282	Margaret's Mill, ... ..	Mill, ... ..	Alex. Love.
1283	Pacemuir Mill, ... ..	do, ... ..	Robert Murray & Son.
1284	Kingston Works, ... ..	Shipbuilding, ... ..	Russell & Co.
1285	Galvanizing Works, ... ..	Galvanizing, ... ..	Smith & M'Leod, Ltd.
1286	Glen Mill, ... ..	Sailcloth, ... ..	Port-Glasgow and Newark Sailcloth Co.
1287	Glen Works, ... ..	Shipbuilding, ... ..	Wm. Hamilton & Co.
1288	Shipbuilding Works, ... ..	do, ... ..	Murdoch & Murray.
1289	Saw Mills, ... ..	Saw Mills, ... ..	Blackwood & Co.
1290	Shipbuilding Works, ... ..	Shipbuilding, ... ..	Robert Duncan & Co., Ltd.
1291	Clyde Rivet Works, ... ..	Rivet, ... ..	Clyde Iron Co.
1292	Clyde Copper and Brass Works,	Copper and Brass, ... ..	Wm. Hume & Co.
1293	Crown Engineering Works, ... ..	Engineering, ... ..	M'Bride & Co.
1294	Tin and Coppersmith Works, ... ..	Tin and Copper, ... ..	J. Campbell & Co.
1295	Gourock Rope Works, ... ..	Rope Works, ... ..	Gourock Ropework Co.
1296	Day Street Shipbuilding Yard,	Shipbuilding, ... ..	A. Rolzer & Co.
1297	Newark Works, ... ..	do, ... ..	Wm. Hamilton & Co.
1298	Shipbuilding Works, ... ..	do, ... ..	The Clyde Shipbuilding and Engineering Co.
1299	Foundry, ... ..	Foundry, ... ..	do.
1300	Shipbuilding Yard, ... ..	Shipbuilding, ... ..	David J. Dunlop & Co.
1301	Timber Works, ... ..	Timber, ... ..	Geo. Lang.

#### VII.—Works within zone 12 to 14 Miles.

1302	Twechar Works, ... ..	Engineering Repairs, &c., ... ..	Wm. Baird & Co., Ltd.
1303	Gartshore Pit, No. 10, ... ..	Coal Pit, ... ..	do.
1304	Twechar, No. 1 Pit, ... ..	do, ... ..	do.
1305	Kilmahew Saw Mills, ... ..	Saw Mills, ... ..	John Wm. Burns.
1306	Rothbank Silk Printing Works, ... ..	Silk Printing, ... ..	Hugh Melville & Sons.
1307	Meikle Millbank Mills, ... ..	Mills, ... ..	Robert Murray & Son.
1308	Muirshiel Mill, ... ..	Barytes Factory, ... ..	Muirshiel Mineral Co.

Source: S.R.A. Records of Strain and Robertson, TD. 83/6/1.

Appendix 23Total Contracts Entered by C.V.E.P. Company 1906 - 1930

Year	Total Contracts Entered in KW	Total Contracts Entered on Quinquennial Basis in KW	Percentage Increase on Quinquennial Basis
1906	7,358	31,381	-
1907	3,785		
1908	7,526		
1909	3,969		
1910	8,743		
1911	4,759	35,609	13.47
1912	6,959		
1913	8,387		
1914	4,243		
1915	11,261		
1916	9,403	44,760	25.70
1917	8,864		
1918	7,756		
1919	10,781		
1920	7,956		
1921	9,989	57,373	28.18
1922	13,031		
1923	16,352 1.2.		
1924	8,151 3.		
1925	9,850		
1926	15,051	78,809	37.36
1927	11,720		
1928	14,989		
1929	17,971		
1930	19,078		
Total	247,932	247,932	

1. Between 1906 and 1923, Source figures given in H.P. and converted to KW (0.746 H.P. = 1 KW)
2. Includes January 1924.
3. From February 1924, Source figures given in KW.

Source: S.R.O. Records of South of Scotland Electricity Board, SSE5, 1/1 - SSE5, 1/5.



Appendix 24

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Total Revenue Figures For C.V.E.P. Company 1906 - 1930

Year	Revenue from Sale of Current	Sundry Revenue	Total Revenue	Total Revenue on Quinquennial Basis	Percentage Quinquennial Increase
1906	£ 2,900.37	-	£ 2,900.37		
1907	17,991.74	335.84	18,327.58		
1908	25,003.97	1,792.02	26,795.99		
1909	36,952.12	1,463.94	38,416.06		
1910	61,816.82	2,849.46	64,666.28	£ 151,106.28	
1911	83,175.78	2,200.43	85,376.21		
1912	113,055.19	6,142.76	119,197.95		
1913	121,125.01	6,137.09	127,262.10		
1914	135,447.94	8,966.39	144,414.33		
1915	178,283.77	14,933.79	193,217.56	669,468.15	343.05
1916	237,777.08	22,045.03	259,822.11		
1917	307,762.87	19,629.64	327,392.51		
1918	354,122.02	38,248.15	392,370.17		
1919	404,096.59	30,878.85	434,975.44		
1920	597,588.33	71,002.02	668,590.35	2,083,150.58	211.17
1921	703,765.14	98,449.38	802,214.52		
1922	463,833.00	89,189.83	552,022.83		
1923	499,014.71	97,651.97	596,666.68		
1924	607,278.46	93,425.72	700,704.18		
1925	631,598.96	201,076.39	832,675.35	3,484,283.56	67.26
1926	627,357.11	116,696.85	744,053.96		
1927	809,579.72	434,960.44	1,244,540.16		
1928	729,214.16	424,947.68	1,154,161.84		
1929	977,922.68	76,940.88	1,074,863.56		
1930	1,473,776.68	-	1,473,776.68	5,691,396.20	63.36

1. From 24/4/1929, subsidiary companies specifically included.
2. This figure covers period to 10th April, 1929 only.

Source: S.R.O. Records of the South of Scotland Electricity Board, SCS 741 - SCS. 1/5.

## Appendix 25

Directors' Fees, Salaries, Wages and  
Expenses of C.V.E.P. Company 1902-1930

Year	Directors' Fees	Salaries	Wages and Expenses	Combined Salaries and Wages and Expenses
1902	£ 1,050.00	£ 270.00	£ 20.00	£ 290.00
1903	2,300.00	735.25	-	735.25
1904	2,000.00	1,443.64	-	1,443.64
1905	2,000.00	1,141.36	1,521.21	2,662.57
1906	1,825.00	3,228.79	4,913.50	8,142.29
1907	1,687.50	3,151.07	8,859.02	12,010.09
1908	1,677.93	3,023.16	14,370.14	17,393.30
1909	1,800.00	2,654.27	14,237.93	16,892.20
1910	1,675.00	3,797.29	18,000.65	21,797.94
1911	1,650.13	4,359.85	18,575.90	22,935.75
1912	1,800.00	4,432.93	20,833.64	25,266.57
1913	1,800.00	4,446.51	24,935.45	29,381.96
1914	1,800.00	5,407.51	27,266.86	32,674.37
1915	1,800.00	5,662.10	27,683.27	33,865.33
1916	1,800.00	5,954.32	44,309.53	50,943.68
1917	1,800.00	1,962.26 <sup>4</sup>	43,528.53	45,526.79
1918	1,800.00	- <sup>5</sup>	61,541.26	61,541.26
1919	2,400.00		107,148.53	107,148.53
1920	2,400.00		153,367.72	153,367.72
1921	2,400.00		167,216.35	167,216.35
1922	2,400.00		122,925.47	122,925.47
1923	2,400.00		113,437.06	113,437.06
1924	4,000.00		123,628.80	123,628.80
1925	4,000.00		151,893.26	151,893.26
1926	4,000.00		168,307.53	168,307.53
1927	4,000.00		160,833.59	160,833.59
1928	4,000.00		178,756.88	178,756.88
1929	4,000.00		198,868.16	198,868.16
1930	4,000.00		190,721.99	190,721.99

1. Includes Emergency War Allowance and War Bonus of £519.96p.
2. Includes Emergency War Allowance and War Bonus of £679.83p.
3. Includes Emergency War Allowance of £72.
4. January to March only.
5. Salary figures discontinued.

Source: S.R.O. Records of the South of Scotland Electricity Board,  
SSE5, 1/1 - SSE5, 1/5.



## Installed Capacity of Scottish Local Authorities on Quinquennial Basis 1915/1916 - 1931

Local Authority	1915/1916		1920/1921		1925/1926		1931		% Increase From 1915/1916	% Increase From Base Year	Actual Increase KW
	KW	% Increase	KW	% Increase	KW	% Increase	KW	% Increase			
Glasgow	38,612	71.45	66,200	151.13	166,250	- 3.58	160,500	315.67	8177.46	158,561	
Dundee	11,500	26.09	14,500	51.72	22,000	54.55	34,000	196.65	4041.29	33,179	
Aberdeen	4,733	110.04	9,941	166.57	26,500	32.08	35,000	639.49	6417.69	34,463	
Edinburgh	18,022	13.14	20,390	164.64	53,960	18.53	63,960	254.90	2007.41	60,925	
Leith	3,450	-	3,450								
Dumfries	1,325	66.04	2,200		185						
Kilmarnock	1,030	870.87	10,000								
Ayrshire Electricity Board	3,050	7.54	3,280		22,500	53.33	34,500				
Holburn & Winton	638		1,200		3,280	47.02	938	47.02	316.88	713	
Stirling	1,500		1,500	80.00	638	111.11	5,700	280.00	1040.00	5,200	
Falkirk	2,290		2,290	- 7.50	20,000	- 5.26	19,000	214.41	4122.22	18,550	
Greenock	243		243	214.41	7,200		7,200		597.03	6,170	
Kirkcaldy	3,900	75.64	6,850	30.45	317		6,300	61.54	96.88	3,100	
Oban	1,195	42.26	1,700	- 8.73	2,675	71.96	4,600	284.94	561.87	3,905	
Paisley	84		84	57.35	1,180	-18.00	1,000	-18.00	28.21	220	
Perth	1,180		1,180		805	2.48	825	175.00		525	
Rothsay	16		16		112	36.61	153	206.00		103	
Hamilton	300		300	168.33	3,129	82.01	2,650	82.01	82.01	1,194	
Denny & Dunipace	50		50	124.00	1,456	8.63	214	8.63	8.63	17	
Lanarkshire C.C.					1,605	48.91	2,390	48.91	48.91	785	
Lossiemouth							100				
Alloa							24				
Dumfries							333				
Kirkwall											
Inverness											
Invergordon											
Tobermory											
Mick											
	92,752	80.60	167,512	104.75	342,989	10.61	379,387	307.03	5701.06	373,055	

Source: Carcke, op. cit., Vols. XIX, XXIV, XXV, XXIV.

Appendix 27

Electricity Generated in B.T.U. by Scottish Local Authorities on Quinquennial Basis 1915/1916 - 1931

Local Authority	1915/1916		1920/1921		1925/1926		1931		Percentage Increase from 1915/1916	Percentage Increase from Base Year	Actual Increase in B.T.U.
	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase	B.T.U.	Percentage Increase			
Glasgow	92,286,953	91.65	176,866,781	30.33	230,513,212	25.56	289,423,543	213.61	22516.87	288,143,856	
Dundee	14,770,281	76.20	26,025,869	47.53	38,395,610	39.49	53,559,210	262.61	21077.54	53,306,543	
Aberdeen	11,693,994	98.17	23,174,220	39.73	32,381,830	47.68	47,821,900	308.94	29830.40	47,662,123	
Edinburgh	22,796,547	12.30	25,599,789	211.13	79,648,054	88.49	50,128,706	558.56	13925.87	149,058,328	
Leith	4,251,877	20.41	5,119,848		173,000						
Dalketh											
Ayr	1,939,421	60.94	3,121,266								
Kilmarnock	2,655,248	481.88	15,450,391								
Ayrshire Electricity Board											
Motherwell	3,620,089	31.28	4,752,448		33,605,300	51.73	50,990,900				
Wishaw			918,000								
Motherwell & Wishaw					7,039,461		787,196	66.39	244.07	558,406	
Stirling	473,100	28.65	608,621	98.53	1,208,295	-53.49	7,372,113	396.35	1880.69	6,999,913	
Falkirk	1,485,277	21.94	1,811,103	140.54	4,356,469	69.22	36,977,954	183.36	2232.69	35,392,788	
Greenock	13,049,840	135.51	30,733,644	-19.90	25,631,872	44.27	8,528,041	281.57	1285.88	7,912,688	
Kirkcaldy	2,234,964	37.53	3,073,689	179.83	8,601,152	-0.86					
Oban	175,871	-2.62	171,377	90.13	325,840						
Falsley	3,839,857	88.68	7,245,121	85.90	13,468,755	16.02	15,627,012	306.97	1186.12	14,411,957	
Perth	1,204,392	48.39	1,787,190	57.27	2,810,676	75.45	4,931,252	309.44	685.47	4,303,442	
Rothsay	25,372						330,367	1202.09	1202.09	304,995	
Alloa	418,410				1,391,058						
Hamilton	1,527,444	88.46	2,878,696	-29.85	2,216,991	89.49	4,200,930	175.03	470.03	3,463,958	
Lossiemouth			51,572	104.04	105,225	47.57	155,277		201.09	103,705	
Dumfries					1,303,316	49.98	1,954,714		49.98	651,398	
Kirkwall					55,753	243.91	191,740		243.91	135,987	
Lanarkshire C.C.					589,166	41.90	836,046		41.90	246,880	
Inverness					970,606	96.96	1,911,720		96.96	941,114	
Tobermory							19,962				
Wick							107,226				
	178,448,937	84.58	329,389,625	47.18	484,791,641	39.41	675,857,849	278.74	24365.44	673,075,340	

Source: Carcks, op. cit. Vols. XIX, XXIV, XXV, XXVI



Authorised Loans of Scottish Local Authorities on Quinquennial Basis 1915/1916 - 1931

Local Authority	1915/1916		1920/1921		1925/1926		1931		Percentage Increase from 1915/1916	Percentage Increase from Base Year	Actual Increase from Base Year £
	£	Percentage Increase	£	Percentage Increase	£	Percentage Increase	£	Percentage Increase			
Glasgow	2,821,478	79.75	5,071,478	71.97	8,721,478	-	8,721,478	207.11	4260.74	8,521,478	
Dumfries	458,000	65.72	759,000	59.38	1,209,668	17.96	1,426,893	211.55	347.23	1,386,893	
Aberdeen	410,000	34.15	550,000	128.87	1,258,759	28.64	1,619,216	294.93	4960.05	1,587,216	
Edinburgh	1,110,000	105.41	2,280,000	43.52	3,272,175	52.79	4,999,545	350.41	5455.05	4,909,549	
Leith	170,000	2.35	174,500								
Ayr	130,000	10.77	144,000								
Kilmarnock	66,500	330.94	286,575								
Ayrshire Electricity Board							1,728,768				
Motherwell	120,000	8.33	130,000								
Motherwell & Wishaw					160,500	36.43	218,964				
Stirling	44,000	21.59	53,500	29.67	69,376	47.89	102,600	133.18	310.40	77,600	
Falkirk	60,000	11.66	67,000	69.82	113,777	56.24	177,770	196.28	407.91	142,770	
Greenock	287,000				1,032,798	9.68	1,132,798	294.70			
Kirkcaldy	80,000	12.50	90,000	114.06	192,656	58.81	305,964	282.46	511.93	255,964	
Oban	26,500	7.55	28,500	35.30	38,560						
Falsley	222,500	52.81	340,000	54.55	525,465	30.53	685,835	208.26	385.31	544,557.15	
Perth	62,500	-	62,500	50.40	94,000	74.41	163,946	162.31	227.89	113,946	
Rothsay	4,000	-	4,000	242.50	13,700	335.62	59,680	1372.00	1392.00	55,680	
Allon	34,000	29.41	44,000	233.42	146,702						
Hamilton	75,000	13.72	85,287				181,501	142.00	197.54	120,501	
Dumy & Dalnypace			2,000	125.00	4,500				125.00	2,500	
Lossiemouth			6,660	98.63	13,229	17.45	15,537		133.29	8,877	
Dumfries					100,800	40.92	142,045		40.92	41,245	
Kirkwall					10,000	106.67	20,667		106.67	10,667	
Isarshire C.C.					74,076	16.57	86,373		16.57	12,277	
Invergordon							10,000				
Inverness							170,000				
North Berwick							27,157				
Tobarnory							5,383				
Uphall & Erxburn							9,600				
Vick							19,665				
	6,181,478	64.67	10,177,000	77.65	18,062,261	21.30	22,035,935	256.48	5957.27	21,673,935.15	





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