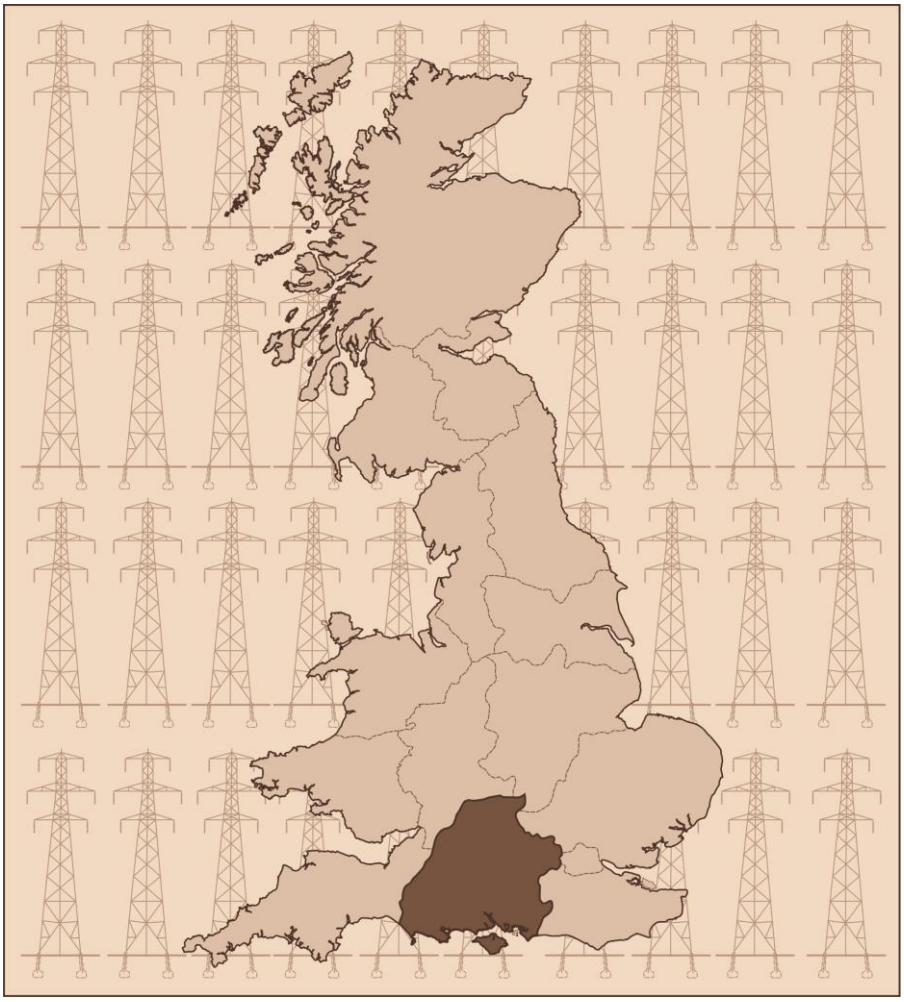

THE SOUTHERN ELECTRICITY BOARD AREA

Regional and Local Electricity Systems in Britain

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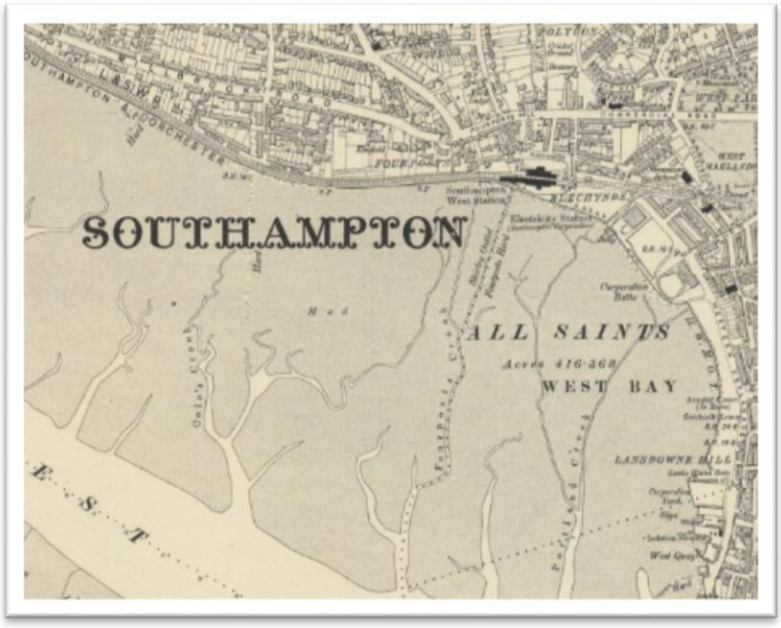

SOUTHAMPTON POWER STATION

Opened in 1903, after moving from a constricted site at Back-of-the-Walls, the station was extended many times, reaching its maximum capacity of 88,000kW in 1948. The mud flats of the River Test were reclaimed in the 1920s for the extended port.

Ordnance Survey, Six Inch Map, Hampshire LXV, SW. 1910 (National Library of Scotland).

Introduction

Public electricity supplies began in Britain during the 1880s. By 1900 most urban places with over 50,000 population had some form of service, at least in the town centre. Gradually the isolated points on the national map began to coalesce, especially when the national grid helped local organisations to connect small towns, villages and eventually farms.

In the process of electrification, hundreds of municipal and company organisations developed local and sometimes regional systems. Before nationalisation in 1948, however, there was little consolidation of areas.

The study of British electricity systems is a remarkably daunting task. While there is a rich legacy of detailed annual surveys, these publications have to be tracked down. The user is then faced with immense alphabetical listings of all sorts of enterprises, often in places which no longer have much meaning except to local residents. Since there are few contemporary maps, listing and grouping the electricity organisations geographically is difficult and often time-consuming.

These notes are offered as an outline guide to the pre-1948 local authorities and companies which developed electricity supplies in Southern England.

The Southern Electricity Board Area

The area was first defined by the Ministry of Fuel and Power in a White Paper published in January 1947, a month before debate began on the Electricity Bill.[1] Fourteen area boards were to be established for electricity distribution or retailing. Generation and transmission were to be the responsibility of the British Electricity Authority.

Each area board was defined to provide a diversity of load between urban and rural areas and, where possible, avoided cutting across distribution networks. The Southern Area, as defined at this time, had been part of the South West England and South Wales Electricity Scheme Area since 1929. Other parts of this very large region were transferred to the South Western, Midlands and South Wales areas.

In detail the Southern Area included the whole of the counties of Berkshire, Hampshire, Isle of Wight, Wiltshire and parts of the counties of Buckinghamshire, Dorset, Gloucestershire, Middlesex, Oxfordshire, Somerset, Surrey and Sussex. The western and northern limits of Wessex Electricity shaped those parts of the boundary of the new Board area. Parts of the South Eastern Electricity Scheme area in Middlesex and Surrey were added to increase the urbanised zone of the SEB. The boundary lines drawn in 1947 continue to be entrenched in the distribution franchise area of the present day.

[1] Ministry of Fuel and Power, ***Electricity Supply Areas***, Cmd 7007. (London: HMSO, 1947).

Constituents of the Southern Electricity Board Area

When the Southern Electricity Board Area began operations on 1 April 1948 it incorporated the distribution services and areas of 22 local authorities and 26 companies.[2] The constituent areas varied enormously in size. Wessex Electricity covered over 1,000 square miles while Dorchester Corporation occupied an area of less than three square miles. Portsmouth Corporation's electricity department served an area of 192 square miles, considerably larger than the county borough. As in many places, electricity service areas did not always coincide with those of local authorities.

With a total area of about 6,528 square miles and an estimated population of about 3,716,000, the Southern Electricity Board covered every type of district from rural parts of Dorset to densely populated areas in Portsmouth and parts of Middlesex. Domestic sales at 45.6 percent were considerably higher than industrial sales at 32.9 percent.[3]

Unlike some of the regions, there was no single dominant centre in the SEB area for the location of the head office. Office accommodation at this time was very scarce, so the new board acquired two properties at Littlewick Green on the Bath road (A4) west of Maidenhead.[4]

Development of Electricity Supply Areas

The 1948 pattern illustrated in Figure 1 represented the climax of over 50 years of development. Unusually for a new innovation, electricity for public supply was subject to tight national regulations from an early stage. The Electric Lighting Act 1882 required "undertakings" to apply for a licence or provisional order from the Board of Trade.[5] This requirement followed the precedents for earlier public utilities which had to "break up the streets" to lay mains or tracks. Electric Lighting Orders provided the basic conditions of a franchise to operate within a defined area, limiting the maximum prices that could be charged to consumers and, for private companies, a time limit of 21 years after which the local authority could purchase the system. An amendment in 1888 extended the time period to 42 years. All the Electric Lighting Orders were subject to Parliamentary approval. Major changes such as amalgamation of companies and extension of area required special acts.

Only a few public electricity systems were established under the 1882 Act. By 21 December 1882 the Board of Trade had received 109 applications for Electric Lighting Orders. After scrutiny by the office and Parliament, 69 ELOs were granted to local authorities and companies. Eight of these came to fruition over the next decade, while the others were abandoned as the

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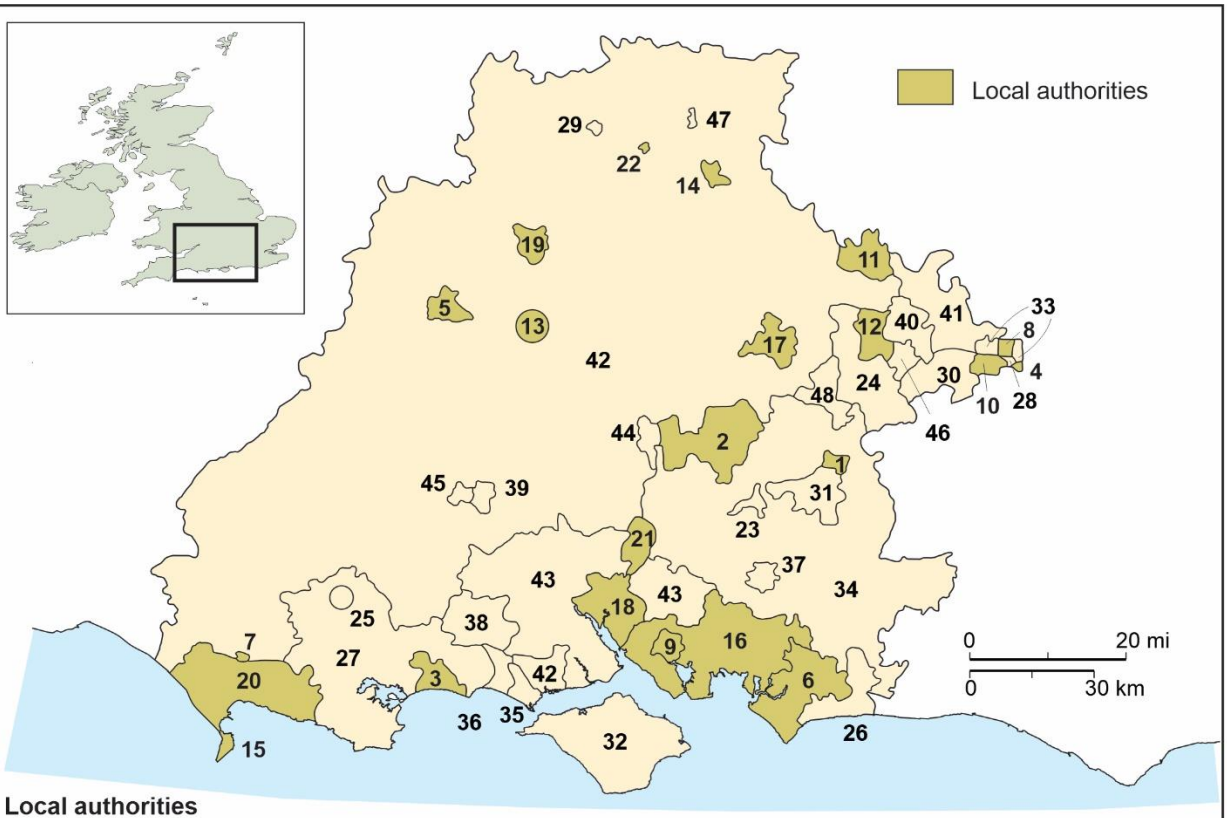
[2] SEB, ***First Annual Report and Accounts***, HC240 (London: HMSO, 1949), p.2.
[3] The averages for the area boards in England and Wales were 34.5 percent domestic and 50.2 percent industrial in 1948/49. Calculated from data in Electricity Council, ***Handbook of Electricity Supply Statistics*** 1977 edition, pp.64-65.
[4] SEB, ***First Annual Report,*** 1948/49, p.2.
[5] Basic details of this Act and subsequent legislation are outlined in ***Electricity Supply in Great Britain: A chronology*** (London: Electricity Council, 1977).

early optimism waned given the uncertainties of the market for electricity and the limitations of the early technology.



Local authorities

1	Aldershot MB	6	Chichester MB	12	Maidenhead MB	18	Southampton CB
2	Basingstoke MB	7	Dorchester MB	13	Marlborough MB	19	Swindon MB
3	Bournemouth CB	8	Ealing MB	14	Oxford CB	20	Weymouth & Melcombe Regis MB
4	Brentford & Chiswick MB	9	Fareham UD	15	Portland UD	21	Winchester MB
5	Calne MB	10	Heston & Isleworth MB	16	Portsmouth CB	22	Witney UD
		11	High Wycombe MB	17	Reading CB		

Companies

23	Alton District E Co Ltd	31	Farnham G&E Co	38	Ringwood ES Co Ltd	45	Wilton ES Co Ltd
24	Ascot District G&ECo	32	Isle of Wight EL&P Co Ltd	39	Salisbury ES Co Ltd	46	Windsor Electrical Installation Co Ltd
25	Blandford Forum & District ES Co Ltd	33	Metropolitan ES Co Lt	40	Slough & Datchet ES Co	47	Woodstock & Dist Electrical Distribution Co Ltd
26	Bognor & District G&ECo	34	Mid Southern Utility Co	41	Uxbridge & Dist ES Co Ltd	48	Yorktown (Camberley) G&E Co
27	Bournemouth & Poole ES Co Ltd	35	Milford-on-Sea ES Co Ltd	42	Wessex E Co		
28	Brentford ES Co Ltd	36	Milton & Barton-on-Sea ES Co Ltd	43	West Hampshire E Co Ltd		
29	Burford EL&P Co Ltd	37	Petersfield EL&P Co Ltd	44	Whitchurch (Hants) G&E Co Ltd		
30	Egham & Staines E Co Ltd						

Key to Abbreviations

CB:	County Borough	ES Co:	Electricity Supply Company
E Co:	Electricity Company	ES&P Co:	Electricity Supply & Power Company
EL Co:	Electric Light Company .	G & E:	Gas & Electric MB: Municipal Borough
EL&P Co:	Electric Light & Power Company	RD:	Rural District
EP Co:	Electric Power Company	UD:	Urban District

Source: Southern Electricity Board, ***First Report and Statement of Accounts for the period 1 January 1948 to 31 March 1949***. HC340 1948-9 (HMSO 1949) pp. 26-27. Appendix D.

Figure 1 and Table 1 CONSTITUENT AREAS OF THE SOUTHERN ELECTRICITY BOARD, 1948.

Three of the applications in 1882 came from the Southern area. An ELO was granted to the Metropolitan (Brush) Electric Light and Power Co. for Chiswick, only part of the application which had included Fulham, Acton and Ealing. The application by the Provincial (Brush) Electric Light and Power Co. for High Wycombe was also successful. The Union Electric Light and Power Co.'s application for a franchise in Southampton was, however "…not considered as the provisions of the Act had not been complied with."[6] Since the British companies were unable to implement the local schemes, the ELOs for Chiswick and High Wycombe were revoked in 1884.

The experimental public lighting project in Godalming, opened in September 1881, also came to an end in 1884.[7] Siemens Brothers, suppliers of the operating equipment and later managers of the small system, were unable to build up a viable market for electricity at that time. In September 1981 the Southern Electricity Board was a major sponsor of a week's events celebrating the centenary of the first "public electricity in the world".[8]

Although general urban electrification failed to take off in the region, private systems began to develop. Private systems provided a market for electrical equipment, helped in the training of electrical workers, and gave opportunities to refine details of the new technology. Examples of private systems in the area include the installation of electric lighting at Windsor Castle and Blenheim Palace and the electrification of the St Catherines Point lighthouse on the Isle of Wight. In 1886 Siemens built the Ryde Pier electric tramway which operated successfully until 1927.[9]

Public electricity supply schemes began to take off in 1889-90 when applications for Electric Lighting Orders resumed. Nationally, there were 17 applications in 1889 and 161 in 1890. Six ELOs were granted for towns in the Southern area in 1890: Bognor, Bournemouth (2), Oxford, Portsmouth and Windsor.[10] The inaction of the promoters in Bognor and the South of England House-to-House Company in Bournemouth led to these ELOs being revoked in 1892. The Windsor ELO was revoked in 1892. The three other promoters built successful local systems.

While the Board of Trade developed regulations for safety, inspected and approved new systems as well as collecting annual returns, the Board provided no guidance on general policy or technical matters. These were left to the operator and consulting engineer to decide. Consequently after 1888 large numbers of fragmented operators developed DC and AC systems with little attempt at co-ordination. AC systems with frequencies varying from 25 cycles (Hz) to 100 cycles were established. The lack of standardisation would become a major problem when interconnection between areas became advantageous.

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[6] "Report by the Board of Trade respecting the applications to and Proceedings of, the Board of Trade under the Electric Lighting Act 1882." ***Parliamentary Papers*** 1883. HC 237.

[7] The opening was noted in ***The Engineer***, Vol 52, 1881, p.245. See also: "The "Old Mill on the Stream", chapter 4 in Gavin Weightman, ***Children of Light: How electricity changed Britain forever*** (London: Atlantic Books, 2011).

[8] Southern Electricity Board, ***Annual Report*** 1982-82. The Electricity Council also sponsored an exhibition at the Science Museum.

[9] ***The Telegraphic Journal and Electrical Review*** Vol 18, 18 March 1886, p.251.

[10] Board of Trade, Proceedings under the Electric Lighting Acts. ***Parliamentary Papers*** 1890. HC 273.

An outline of development is presented in three phases: local initiatives from the 1880s to World War I, state intervention to the 1940s and nationalisation from 1948.

I Local Initiatives

Figure 2 and Table 2, derived from a rare map of electricity undertakings in the British Isles, provide a snapshot of the development of public supply areas over the previous three decades.

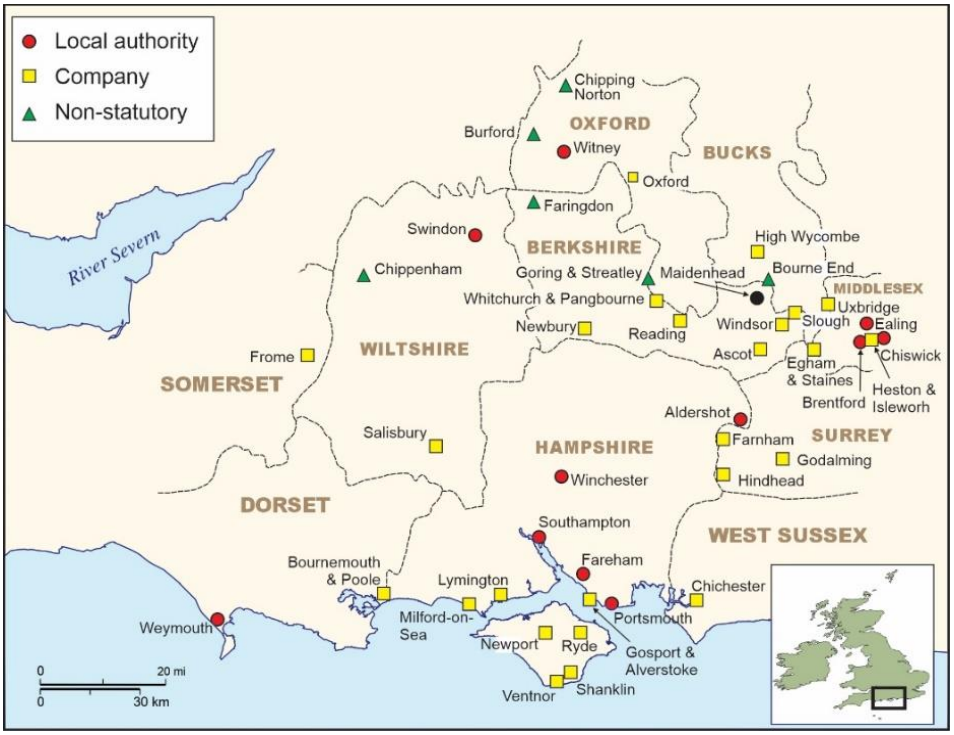

Figure 2 ELECTRICITY UNDERTAKINGS IN SOUTHERN ENGLAND C. 1912.

The eleven local authorities were clear examples of local initiative in developing electric lighting and power. Portsmouth County Borough (population 233,578 in 1911) was the largest of the local authorities and Witney Urban District (population 3,429) was the smallest. Public electricity supply had begun in Portsmouth and Ealing in 1894 and others followed, sometimes as in the cases of Fareham, Southampton, Winchester and Witney, taking over an earlier private company.

Two-thirds of the undertakings in 1912 were companies operating with an Electric Lighting Order which had the approval of the local authority. Bournemouth, Oxford and Reading were the largest urban centres served by companies. In five cases, the operators were non-statutory companies with arrangements for overhead wire service outside the constraints of the Electric Lighting Acts. Non-statutory companies were significant in rural areas from the 1880s until the late 1920s when larger undertakings began expanding beyond town boundaries.[11]

[11] It is possible that the companies in Reading and Bournemouth began supplying electricity before Electric Lighting Orders were granted. Avebury, Wiltshire was supplied by a non-statutory company from 1926 to 1948 when taken over by the SEB.

Table 2 SOUTHERN ENGLAND: ELECTRICITY SUPPLY UNDERTAKINGS C1912.

UNDERTAKINGS	COUNTY	SUPPLY BEGAN
Local Authorities		
Aldershot	Hants	1902
Ealing	Middx	1894
Fareham	Hants	1890[1]
Heston & Isleworth	Middx	1904
Maidenhead	Berks	1902
Portsmouth	Hants	1894[2]
Southampton	Hants	1891
Swindon	Wilts	1903
Weymouth	Dorset	1904
Winchester	Hants	1898[3]
Witney	Oxon	1900[4]
Companies		
Ascot	Berks	1907
Bourne End N/S	Bucks	1908
Bournemouth & Poole	Hants/Dorset	1891
Brentford	Middx	1911
Burford N/S	Oxon	1910
Chichester	W Sussex	1909
Chipping Norton N/S	Oxon	1912?
Chippenham N/S	Wilts	1909
Chiswick	Middx	1900
Egham & Staines	Berks/Middx	1912
Faringdon N/S	Berks	1912?
Farnham	Surrey	1912
Frome	Somerset	1904
Godalming	Surrey	1902
Goring & Streatley N/S	Oxon/Berks	1900
Gosport & Alverstoke	Hants	1907
High Wycombe	Bucks	1898
Hindhead	Surrey	1900
Lymington	Hants	1900
Metropolitan ES CO.	London/Mddx	1905[5]
Milford-On-Sea	Hants	1903
Newbury	Berks	1905
Newport/Cowes	IoW	1903
Oxford	Oxon	1892
Reading	Berks	1889
Ryde	IoW	1903
St Helens	IoW	1902?
Salisbury	Wilts	1898
Sandown/Shanklin	IoW	1901
Slough & Datchet	Bucks	1903
Uxbridge	Middx	1902
Ventnor	IoW	1899
Whitchurch & Pangbourne	Berks/Oxon	1903
Windsor	Berks	1896

[1]By a company. Taken over by Urban District Council 1896.
[2]By a company. Taken over by Corporation 1896.
[3]By a company. Taken over by Corporation 1911.
[4]By a company. Taken over by Urban District Council c1912.
[5]By Acton UDC. Sold to Metropolitan Company in 1911.
N/S non-statutory undertaking (outside 1882/1888 Acts).

Source: "Map showing Electric Lighting, Power and Traction Undertakings in Operation." Supplement to ***Garcke's Manual of Electrical Undertakings.*** Undated but c 1912. [Copy from National Library of Scotland]

While most companies were local in management, some were subsidiaries of larger national businesses. In the "electricity boom" from the mid-1890s several contracting firms began to develop and operate complete local systems. The largest was Edmundson's Electricity Corporation Ltd which by 1910 was operating 46 systems from Inverness to Guernsey. Eleven of these were in the Southern Region--at Frome, High Wycombe, Lymington, Isle of Wight (5), Salisbury[12] and Winchester (later sold to the Corporation). Godalming and Newbury were operated by the Urban Electric Supply Co., an Edmundson's subsidiary.

In the Middlesex suburbs of London, the Metropolitan Electric Supply Co. had begun to expand its service area, first to Acton and then to Southall-Norwood. An Act of 1907 gave the company powers of bulk supply to other undertakings in the area.

Several new undertakings began electricity supply shortly after 1912, including two local authorities—Dorchester (1913) and Basingstoke (1914) and six companies—Abingdon (1913), Blandford Forum (1913), Bognor (1913)[13], Cirencester (c1913)[14], Aldershot District Gas, Water and District Lighting (1914), and Swanage Gas & Electric Co. (1914).

Electrification in the Southern region around 1912 was still incomplete and mostly confined to major towns and some smaller places where local enterprise had developed a system. Significant towns without an electricity service included Portland (population 17,011 in 1911), Eastleigh (15,247), Yeovil (14,487), and Trowbridge (11,815). Only a very small part of the region was covered by Electric Lighting Orders; most of the territory was still unclaimed.

Lighting was the dominant use for electricity until the late 1890s. The most profitable demand was in shops, offices, hotels, theatres (and later cinemas) and public buildings. Residential sales were more limited—by the expense of installation and the high retail prices. With lighting, much of the load on generating equipment was confined to the evening hours, a feature that also contributed to the high prices. Diversification of the load to other uses, especially in the daytime, was essential if electricity was to become a viable alternative to gas. Such diversification began with the electrification of tramways and the substitution of electric motors for small steam engines and manual power.

The 1912 data do not cover private generation which was very important at the time, not only in isolated establishments but also in urban centres where there was already a public supply. Some examples are outlined here to give a sense of the scale and scope of private generation otherwise absent in many accounts of electrification.

Industrial firms were early adopters of electricity, not only for lighting but also for power. At Swindon, the Great Western Railway had a central generating station for the woorkshops,

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[12] David Coe, ***Salisbury Electric Light and Supply Company*** (Salisbury: South Wiltshire Industrial Archaeology Society, Historical Monograph 19, 2008).

[13] William Gage, "Bognor Gas, Light & Coke Co. Ltd, 1865-1939", ***Sussex Industrial History—Journal of the Sussex Industrial Archaeology Society***, No. 17, 1987, pp.2-13.

[14] D.G. Tucker, ***How towns got electric light and tramways: A case study of Gloucestershire and neighbouring towns*** (London: Science Museum, 1978). Chapter 6: Cirencester.

similar in size to the Corporation's electric light plant. Other major factories in north Wiltshire such as Saxby & Farmer (Chippenham), Spencer & Co. (Melksham), and C & T Harris (Calne) generated their own electricity.[15] The Thornycroft motor works in Basingstoke had begun generating power a decade before the town supply began.[16] When the London & South Western Railway relocated its locomotive works from Nine Elms to Eastleigh in 1909, the new complex included a power station.[17] Southampton Docks was also self-sufficient as was the Naval Dockyard in Portsmouth.[18] In the Isle of Wight, J. Samuel Wight's shipyard at Cowes included two power houses.[19]

Early major factories in western Middlesex also generated their own electricity. The Gramophone Co. (later EMI) works at Hayes begun in 1907 was developed before any local power supply was available.[20] The Great Western Railway also built a 6,000kW powerhouse at Park Royal in 1906. This station, on the northern boundary of Acton, was needed for the electrification of the Hammersmith & City line and for modernizing the lighting of Paddington station and adjacent yards.[21]

Military establishments began to electrify from about 1900. Aldershot camp had a large power station by 1902 and Tidworth, a new garrison town in Wiltshire had its own power and an "Electric Cinema" by 1914.[22] World War I expanded the number of military camps and depots all requiring diesel-engined generating equipment. New munitions factories at Hayes and Perivale, as well as the vast Royal Navy cordite plant at Holton Heath, west of Poole, also had independent generating facilities.[23] The Government Rolling Mills at Weston Grove, Southampton, had a 6,000 kW power house.[24] The size of these power stations reflected not only the pace and scale of wartime industrial growth but the inadequacy of public supply systems.

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[15] ***Proceedings of the Institution of Mechanical Engineers***, 1908, pp.769-778. Members at the Bristol meeting visited these works. See also ***The Engineer*** Vol 94, 1902, p.325 for details of the GWR works in Swindon.

[16] ***The Engineer***, Vol 94, 1902, p.510, noted: "The whole of the power used in driving the works and supplying light is electrical and supplied by two steam dynamos."

[17] ***The Engineer***, Vol 110, 1910, pp.55-57, 86-88.

[18] By 1928 the RN power station had a capacity of 19,000kW, similar in size to the Portsmouth Corporation's generating plant. I.Mech.E ***Proceedings***, 1928, p.602

[19] ***The Engineer***, Vol 143, 1929, pp.598-600.

[20] The EMI power station had a capacity of 8,000kW in 1947. I.Mech,E., ***Proceedings***, 1947, p.226.

[21] E.T. McDermot, ***History of the Great Western Railway***, Vol. II, 1863-1920 (London: GWR, 1931), p.441.

[22] Wiltshire Community History – Tidworth. Website www.history-wiltshire.gov.uk.

[23] Wayne D. Cocroft, ***Dangerous Energy: the archaeology of gunpowder and military explosives manufacture*** (Swindon: English Heritage, 2000), Chapter 6.

[24] ***The Engineer***, Vol.127, 1919, pp.191-193, 217-219.

Electric Tramway Systems in the Southern Region[1]

	Years operating	*Route miles*	*Max No of Cars*
Bournemouth Corporation	1902-1936	16.1	132
Gosport & Fareham Tramway Co.	1905-1929	7.8	18
London United Tramways Co.	1901-1933[2]	53.8	390
Poole & District Co.	1901-1905[3]	3.8	17
Portsdown & Horndean Co.	1903-1935	6.0	24
Portsmouth Corporation	1901-1936	17.7	112
Reading Corporation	1901-1939	7.4	36
Southampton Corporation	1900-1949	13.7	142
Swindon Corporation	1904-1929	3.7	13

Nine electric tramway systems were opened between 1900 and 1905. Five were owned and operated by local authorities. The Gosport & Fareham Company also supplied power to the related Gosport & Alverstoke Electric Supply Company.

Only Southampton and Swindon combined generation for lighting and traction. All the other systems had separate traction power stations. London United's powerhouse in Chiswick was the largest and grandest with a capacity of 3,000kW in 1910.[4] When the tramway company became part of the Underground Group, electricity supply was gradually transferred to the large and efficient station at Lots Road, Chelsea. Other tramway power stations in the region varied in size from 2,000kW at Portsmouth, 1,000kW at Bournemouth, Hoeford (Gosport & Fareham); 400kW at Reading and 200kW at Horndean. The latter station was one of the earliest to use diesel engines.

Tramway supply as a proportion of electricity sales was still significant in 1925-26. Southampton's trams accounted for 16.9 percent of the Corporation's sales. The Bournemouth & Poole Company's proportion of sales was very similar, although it only sold current to Bournemouth Corporation trams working in Poole and Christchurch outside the County Borough boundaries.

Electric tramways provided fast, efficient and cheap urban transport and were very profitable before 1914. Motor bus competition after the war quickly eroded the viability of the smaller systems.

In the western suburbs of London, electric railways were being developed at the same time as the tramways. The District line to Ealing was developed in 1905 and the Metropolitan line to Uxbridge was converted to electric traction.[5] These lines and other extensions would have a powerful influence on the development of the territory in the interwar period.

Electrification of mainline suburban services began in 1916 when the London & South Western Railway completed work on the lines to Chiswick, Brentford, Hounslow and Shepperton. Current was generated at a new railway-owned power station at Durnsford Road, Wimbledon (initial capacity 25,000kW). Further extensions by the Southern Railway included lines to Windsor (1930), Aldershot and Alton (1936) and Reading (1939). Power for the Aldershot and Reading lines was drawn from the grid substations at West Byfleet and Reading.[6]

[1] Compiled from Keith Turner, ***Directory of British Tramways***, Vol 1 (Stroud: Tempus Publishing, 2007).
[2] Transferred to London Passenger Transport Board in 1933. Many of the tramways in the area were quickly converted to trolleybus operation already begun by London United Tramways.
[3] Acquired by Bournemouth Corporation Tramways.
[4] Geoffrey Wilson, ***London United Tramways: A history 1894-1933*** (London: Allen & Unwin, 1971), p.58.
[5] See T.C. Barker & M. Robbins, ***A history of London Transport: Passenger travel and the development of the metropolis, Vol. II*** (London: Allen & Unwin, 1974).
[6] G.T. Moody, ***Southern Electric*** (London: Ian Allan, 1957).

Hotels were early in adopting electric lighting a one of the amenities of high-class modern hospitality. This was very evident in Bournemouth but also in isolated hotels. The Forest Park Hotel in Brockenhurst in the New Forest and the White Hart at Sonning-on-Thames noted "electric light throughout" in their 1910 advertisements.[25] Other large institutions of a different type were also replacing gas with electric lighting. The Wiltshire County Asylum in Devizes converted in 1898[26] and later institutions such as the Park Prewett Hospital (1914-1917) near Basingstoke had generating facilities from the beginning.

Throughout the region country houses, estates and larger farms added electricity. Arundel Castle had a permanent supply installed by 1895[27] and Highclere near Newbury had a private system by the following year.[28] The slow extension of electricity distribution networks in rural areas often meant that even new country mansions built in the 1930s needed their own generators. One late example was Middleton Park (1935-38) near Bicester.[29]

II State Intervention

Difficulties of interconnection, differences in AC frequencies, and the need for coal conservation by the use of large-scale plant became major issues in World War I when electricity usage nearly doubled. The Electricity (Supply) Act 1919 created a new organisation, the Electricity Commissioners, to replace the role of the Board of Trade. While the initial proposals for national restructuring were thwarted, the Electricity Commissioners managed to develop plans for more efficient and lower-cost generation and to encourage the expansion of service areas to supply small towns and rural villages.

Table 3 lists the statutory supply undertakings in 1925/26. The non-statutory undertakings noted earlier in Table 2 generally continued in existence until acquired by new supply companies or, as in the case of the Bourne End company, were "legitimized" by Special Order. This took place in 1923 when Bourne End became part of a larger utility—Cookham & District Electric Supply Co.[30]

In the local authority sector, Portsmouth extended its supply area in 1922 to include the Havant and Warblington UD and Havant RD and in 1925 the Rural Districts of Catherington and Fareham. Southampton also extended northwards to cover the Eastleigh and Bishopstoke UD. New municipal undertakings formed after 1919 included Marlborough, initially supplied by a

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[25] ***Bradshaw's April 1910 Railway Guide*** (reprinted Newton Abbot: David & Charles, 1968), pp. 1007-1189. Includes hotel advertisements from Aberdeen to York.

[26] "The Asylum List"—Roundway Hospital, Devizes. Website: county.asylums.co.uk.

[27] ***Victoria County History, Sussex,*** Vol.5, pt 1 (1997) p.85. the town received only a general supply from c1934 by the Bognor Gas & Electricity Co,

[28] ***The Electrical Engineer***, Vol.17, 5 June 1896, p.640.

[29] Mark Girouard, ***Life in the English country house*** (London: Yale University Press, 1978), p.309.

[30] The competing proposals from Bourne End and promoters in Cookham are considered in the ***Annual Reports*** of the Electricity Commissioners 1921-22, p.34; 1922-23, p.50; 1923-24, p.37.

power house owned by Marlborough College.[31] In Chichester and Dorchester earlier companies were bought out by the corporations.

Table 3 SOUTHERN AREA: ELECTRICITY SUPPLY UNDERTAKINGS 1925/26.

UNDERTAKING	COUNTY	SYSTEM	GENERATING CAPACITY kW	PER CAPITA CONSUMPTION kWh
Local Authorities				
Aldershot MB	Hants	DC	480	30,0
Basingstoke MB	Hants	DC	1,320	106.9
Chichester MB	W. Sussex	AC/DC	422	47.7
Dorchester MB	Dorset	DC	260	21.5
Ealing	Middx	AC	4,250	52.6
Fareham UD	Hants	AC	-[1]	32.0
Heston & Isleworth UD	Middx	DC	2,350	64.9
Maidenhead MB	Berks	DC	970	55.1
Marlborough MB	Wilts	DC	-[2]	11.2
Portsmouth CB	Hants	AC	13,750	41.9
Southampton CB	Hants	AC/DC	18,760	116.9
Swindon MB	Wilts	AC/DC	4,100	117.3
Weymouth MB	Dorset	DC	1,481	76.4
Winchester MB	Hants	DC	1,350	67.6
Witney UD	Oxon	DC	165	43.6
Companies				
Abingdon ES Co	Berks	DC	140	9.7
Aldershot Gas, Water & District Lighting Co.	Hants	AC/DC	637	90.4
Ascot District G & E Co.	Berks	AC/DC	500	15.6
Blandford Forum ES Co.	Dorset	DC	200	25.0
Bognor Gas, Light & Coke Co.	W. Sussex	DC	553	32.7
Bournemouth & Poole ES Co.	Hants	AC/DC	11,400	67.2
Brentford ES Co.	Mddx	AC	-[3]	47.1
Chipping Norton ES Co,	Oxon	DC	160	35.8
Chiswick ES Co.	Middx	DC	1,220	70.9
Cirencester ES Co.	Gloucs	DC	284	20.4
Cookham & District ES Co.	Berks	DC	270	7.2
Egham & Staines Electricity Co.	Berks/Middx	AC	-[3]	32.5
Farnham G & E Co.	Surrey	DC	530	23.4
Frome[a]	Somerset	DC	725	132.4
Godalming[b]	Surrey	DC	600	30.7
Gosport & Alverstoke	Hants	DC	-[4]	27.1
Hindhead & District El Co	Surrey	AC/DC	515	15.9
Isle of Wight El&P Co:				24.8
--Newport	IoW	DC	730	
--Ryde	IoW	AC/DC	650	
--Sandown/Shanklin	IoW	DC	565	
--Ventnor	IoW	DC	355	
Lymington El&P Co.	Hants	DC	240	41.2
Malmesbury	Wilts	DC	44	7.2
Metropolitan ES Co.	Middx	AC/DC	--[5]	
Milford-On-Sea ES Co.	Hants	DC	86	12.6

[31] Herbert Leaf's gift of electricity to Marlborough College in 1923 was made on condition that the town should also benefit. Mains from the College plant were laid in the Borough between 1924 and 1926. Later bulk supply was provided by the Wessex Company. ***Victoria County History***, ***Wiltshire*** Vol.12 (1983) pp.199-229. British History on Line.

(cont'd)

UNDERTAKING	*COUNTY*	*SYSTEM*	*GENERATING CAPACITY kW*	*PER CAPITA CONSUMPTION kWh*
Newbury[b]	Berks	DC	775	52.6
Oxford E Co.	Oxon	AC/DC	5,275	54.0
Reading ES Co.	Berks	AC/DC	7,060	62.2
Ringwood ES Co.	Hants	AC	72	2.6
Salisbury Ep&S Co.	Wilts	DC	1,550	37.1
Sherborne ES Co.	Dorset	DC	120	6.4
Slough & Datchet ES Co.	Bucks	AC/DC	2,200	68.3
Swanage G&E Co.	Dorset	AC	225	20.4
Tetbury ES Co.	Gloucs	DC	56	9.7
Uxbridge & District ES Co.	Middx	AC	4,500	279.4
Wantage ES Co.	Berks	DC	98	5.7
Wareham ES Co.	Dorset	DC	50	8.3
Warminster ES Co.	Wilts	DC	106	5,2
West Wilts El&P Co.	Wilts	AC/DC	-[6]	
Whitchurch & Pangbourne ES Co.	Bucks/Berks	DC	119	21.9
Windsor El Co Ltd	Berks	AC/DC	452	49.0
Wycombe (Borough) El&P Co.	Bucks	DC	2,430	63.5
Yeovil El&P Co.	Somerset	DC	310	7.3
York Town & Blackwater Gas Co.	Berks/Hants	AC	-[7]	5.9

Notes:

[a] Edmundson's Electricity
[b] Urban Electric Supply Co.
[1] Bulk supply from Portsmouth
[2] Supply from Marlborough College.
[3] Bulk supply from Metropolitan ES Co.
[4] Supply from tramway company.
[5] Supply from Willesden power station.
[6] Bulk supply from Bath.
[7] Supply from Ascot Co.

Source: Electricity Commissioners, ***Engineering and Financial Statistics 1925/26***

Ten new companies, mostly serving towns and suburbs, were added in the early 1920s. These included Malmesbury (1924), Ringwood (1925), Sherborne (1923), Tetbury (1924), Wantage (1924), Wareham (1923), Warminster (1923), West Wilts (1925), Yeovil (1923) and Yorktown & Blackwater (1921).

The creation of the West Wilts Electric Light & Power Company in 1924/25, with a bulk supply from Bath, was the result of 20 years of effort by James Herbert Edwards (1872-1956) and his two companies. Edwards & Armstrong Ltd established in 1899 first in Bristol, later in Stroud, was an electrical contractor. Early work included the installation of electric lighting in Cardiff City Hall and Colston Hall, Bristol. Western Electric Distributing Co. Ltd, registered in 1903, promoted electricity systems in small towns. Some operated under Electric Lighting Orders while others were non-statutory. By 1925/26 Western Electric controlled 14 undertakings from its offices at Cainscross, Stroud. Eleven were in the Southern region—at Abingdon, Andover Chippenham, Cirencester, Malmesbury, Melksham, Stroud, Tetbury, Trowbridge, Wantage and

Warminster; the other three at Ledbury, Leominster and Ruthin were more distant. Edwards was a major promoter of Wessex Electricity Ltd, incorporated in 1927. Many of his companies became part of this large organisation. His work in electrification, especially in western Wiltshire, deserves broader recognition and detailed exploration.[32]

The 59 undertakings in 1925/26 operated a variety of systems. DC was the most common, with 35 systems, and had been popular in the early years of electrification. With an economic operating radius of 1-1.5 miles from the generating plant, DC was suitable only for city centres or small towns and villages. The 24 undertakings with AC systems were further subdivided by different frequencies. All but three worked at 50 cycles (Hz) a frequency that had become a national standard after 1903. The exceptions were Ealing Corporation at 40Hz, parts of the Metropolitan Electric Supply Co. at 60Hz, and the Bournemouth & Poole Co. at 100Hz.

The data on generating capacity show that all but six of the 59 undertakings generated their own power. Most power stations had capacities of less than 1,000kW; only five were larger than 5,000kW. Steam turbines were dominant in all the larger stations and varied in size from a 6,000kW unit in Southampton to one of 300kW in Weymouth. Portsmouth was one of the early users of a Parsons turbine (installed in 1894).[33] Older reciprocating steam engines were common but Aldershot Corporation was the only power station in the region wholly dependent on this type of prime mover. Gas engines were common in many smaller stations while diesel engines were becoming very significant for supplementary power.

Most of the Middlesex area depended on bulk supplies or direct sales by the Metropolitan Electric Supply Co. with power generated at its Willesden station (capacity 49,000 kW in 1925/26). Two proposals for large power stations could, if they had been approved, have made the area a major centre of electricity generation.

The first proposal in January 1926, by the newly established London Power Co., was for powers to acquire 46 acres of land in Heston & Isleworth UD. Since the site probably included a section of Syon Park, there were strong objections to the Bill which was rejected by the House of Commons. Subsequent plans by the London Power Co. for a station with an ultimate capacity of 450,000kW at Battersea were approved in 1927.

The second proposal, in August 1926, was for a 100,000kW station, to be extended to 300,000kW and located on part of Dukes Meadow, Chiswick. It was proposed by the London and Home Counties Joint Electricity Authority as part of its plans for reorganizing electricity supply in London. There was strong objection to the proposal which would have destroyed much of the open space in this section of the River Thames. Plans for the South East England

[32] Biographical details of J.H. Edwards may be found in ***Who's Who in Engineering 1922*** (Grace's Guide), ***Journal of the Institution of Electrical Engineers*** November 1956, p.689. For company information see ***Garcke's Manual***.
[33] R.H. Parsons, ***The early days of the power station industry*** (Cambridge, 1939) p.127. Southampton installed its first turbine in 1910. ***The Engineer***, vol.181. 1946, p.460.

grid scheme being prepared at the time did not include a Chiswick power station, so this proposal "was not proceeded with."[34]

Statistics on electricity consumption per head of population reveal major contrasts among electricity undertakings. Only five places—Basingstoke, Frome, Southampton, Swindon and Uxbridge—exceeded 100.0kWh per person. Some places which had electricity supply for 20 years remained at around 20.0kWh per capita. Each place had a distinctive market profile reflecting the local economic and social geography. Southampton had a well-balanced profile in 1925/26, consisting of 31.1 percent of sales in the lighting segment, 3.3 percent in public lighting, 16.8 percent for the tramways and 48.8 percent in power. The Bournemouth & Poole Company, in contrast, had 65.7 percent in lighting, 0.4 percent in public lighting, 16.5 percent in traction[35] and only 27.4 percent in power. Two towns, Basingstoke and Bognor Regis with similar-sized populations (around 14,000) had very different market profiles. Bognor was dominated by lighting at 63.8 percent while in Basingstoke the power segment accounted for 70 percent of total sales. Annual per capita sales in Bognor amounted to only 32.7kWh while sales in Basingstoke had reached 106.9kWh per person.

Table 4 SOUTHERN AREA: ELECTRICITY SUPPLY UNDERTAKINGS 1935/36.

UNDERTAKING	***SYSTEM***	***GENERATING CAPACITY kW***	***PER CAPITA CONSUMPTION kWh***
Local Authorities			
Aldershot MB	AC/DC	-	161.5
Basingstoke MB	AC/DC	2,570	147.6
Brentford & Chiswick MB	AC/DC	1,220	127.8
Calne MB	DC	-	20,7
Chichester MB	AC	-	222.4
Dorchester MB	AC	-	112.8
Ealing MB	AC	-	215.9
Fareham UD	AC	-	117.7
Heston & Isleworth MB	AC/DC	2,100	404.4
Maidenhead MB	AC/DC	970	200.7
Marlborough MB	DC	-	60.2
Oxford CB	AC/DC	22,500	349.6
Portland UB	AC	-	69.1
Portsmouth CB	AC/DC	32,500	217.6
Reading CB	AC/DC	14,780	193.2
Southampton CB	AC/DC	44,137	307.6
Swindon MB	AC/DC	15,000	324.4
Weymouth & Melcombe Regis MB	AC/DC	6,450	200.8
Winchester MB	AC/DC	-	141.8
Witney UD	AC/DC	-	154.5

[34] Electricity Commissioners, ***Ninth Annual Report, 1928-29*** (London: HMSO, 1929) p.53. Details of the earlier proposals were published in the ***Sixth Annual Report 1925-26***, p.25; ***Seventh Annual Report 1926-27***, p.53; ***Eighth Annual Report 1927-28***, p.34.

[35] The traction supply was for the Bournemouth Corporation trams working in Poole and Christchurch. Inside the county borough boundaries, the Bournemouth trams were served by their own independent power station.

(cont'd)

UNDERTAKING	*SYSTEM*	*GENERATING CAPACITY kW*	*PER CAPITA CONSUMPTION kWh*
Companies			
Abingdon ES Co.	AC	-	77.0
Alton District E Co.	AC/DC	300	170.5
Amesbury El & G Supply Co.	DC	147	92.0
Ascot District G & E Co.	AC/DC	500	71.8
Blandford Forum & Dist ESCo.	AC	-	96.9
Bognor G & E Co.	AC/DC	503	171.0
Bournemouth & Poole E S Co.	AC/DC	-	141.9
Brentford ES Co.	AC	-	304.3
Burford El&P Co.	AC/DC	23	69.8
Chipping Norton ES Co.	DC	23.5	58.0
Cirencester ES Co.	AC	-	69.9
Cookham & District ES Co.	AC	-	83.3
Downton El Co.	AC	188	103.7
Egham & Staines Es Co.	AC	-	161.1
Farnham G & E Co.	AC	480	139.5
Gosport & Alverstoke E Co.	DC	-	46.8
Isle Of Wight El&P Co:	AC	9,000	81.3
Lymington El&P Co.	AC/DC	650	58.4
Metropolitan ES Co.	AC/DC	--	-
Mid-Southern Dist Utility Co.	AC/DC	2,215	64.3
Milford-On-Sea ES Co.	AC	-	28.9
Milton & Barton-On-Sea ES Co.	AC	-	56.1
Newbury[a]	AC/DC	1.000	90.8
Oxford E Co.	AC	-	425.3
Petersfield El&P Co.	AC	-	280.6
Ringwood ES Co.	AC	145	56.1
Salisbury Ep &S Co.	AC/DC	2,980	90.8
Slough & Datchet Es Co.	AC/DC	2,200	174.1
Thames Valley Es Co.	AC	-	51.7
Tisbury Es Co.	AC	-	21.8
Uxbridge & District Es Co.	AC	4,350	320.7
Wantage Es Co.	AC	-	32.5
Wessex Electricity Co.	AC/DC	2,487	79.6
West Hampshire E Co.	AC	-	33.7
West Wilts El&P Co.	AC	-	228,8
Whitchurch (Hants) Gas Co.	AC	-	72.2
Wilton Es Co.	AC	-	68.0
Windsor Ei Co	AC/DC	-	137.2
Woodstock & Dist El Distrib Co.	AC	-	61.1
Wycombe (Borough) El&P Co.	AC/DC	3,600	160.8
Yeovil El&P Co.	DC	795	93.8
Yorktown (Camberley) & Dist G&E Co.	AC	-	63.8

Notes: [a]Urban Electric Supply Co.

Source: Electricity Commissioners, ***Engineering and Financial Statistics 1935/36***

Electrification and extension of supply areas were given a new impetus following the Weir Report (1925),[36] the Electricity (Supply) Act 1926 and the formation of the Central Electricity Board in 1927. Even before the detailed regional plans for the National Grid were announced, there was a quickening of interest in the formation of new companies and applications for Special Orders. Over the next decade almost all the empty areas of the map were covered by new or extended supply areas.

New local authority undertakings after 1925/26 (Table 4) were Calne Borough (population 3,463 in 1931) in 1926 and Portland Urban District (population 12,019) in 1930. Bulk supply in Calne was provided by the Harris bacon factory and Portland drew its supply from Weymouth. Oxford Corporation bought out the private company system in 1931, Reading followed in 1934, and Brentwood and Chiswick acquired the Chiswick company in 1935. None of these local authorities was able to extend their supply areas by this time. Oxford's acquisition only covered the area of the city defined in 1889; the later boundary extension of 1928 remained with the Oxford Electric Company.[37] The very profitable sales to Morris Motors in Cowley continued with the company.

Fourteen new companies were authorised by Special Orders granted between 1924 and 1928. Some such as Downton served only a parish; others like the West Hampshire company covered an extensive area. Most were new formations but some such as Burford were well established non-statutory companies now "legitimised."

The new companies were as follows:

1. *Alton (1925)
2. Andover (1924)
3. Amesbury (1925)
4. *Burford (1927)
5. Downton (1929)
6. Midhurst (1927)
7. *Milton & Barton-on-Sea (1928)
8. *Petersfield (1926)
9. Thames Valley (1926)
10. Tisbury (1928)
11. *West Hampshire (1928)
12. *Whitchurch (Hants) (1928)
13. *Wilton (1928)
14. *Woodstock (1928)

[36] Ministry of Transport***, Report of the Committee appointed to review the National Problem of the Supply of Electrical Energy*** (London: HMSO, 1927), 39 pp.

[37] The controversial and expensive acquisition of part of the Oxford Electric Company by the City was described by R.H.S. Crossman, "Oxford Electric", ***The New Statesman and Nation***, 5 March 1938, pp.337-8. See also ***Victoria County History. Oxfordshire***, Vol.4 (!979), pp.356-57. A private bill to authorise the transfer of the 1924 Electricity Special Order from Wessex Electricity was rejected by the House of Lords in 1938.

The companies marked * all survived to nationalisation; the others were taken over by Wessex Electricity or the Mid Southern Utility Co.

Wessex Electricity, created by special Act in 1927, was a very different type of company with powers of bulk supply over a very wide area (over 1,000 square miles) and with a 50-year franchise. By 1931 the company had begun developing a network of 11kv lines across a broad swathe of territory.[38]

Transmission lines supported by tall steel towers became the most visible effect of state intervention as they appeared In the landscape during the early 1930s. Construction of a national grid was authorised by the Electricity (Supply) Act 1926. Plans were prepared by the Electricity Commissioners and consulting engineers for implementation by the Central Electricity Board.[39] The South West England and South Wales Electricity Scheme was adopted by the CEB in June 1930, tenders were advertised, contracts made, and construction work began.

In the Southern region, a series of 132kv lines were built: from Reading to Portsmouth, Southampton and Dorchester to Exeter in the south, and from Reading to Oxford, Swindon and Bristol in the north (Figure 3). The national grid was designed to connect "selected" power stations. These were generally the largest and most efficient generating plants which also had some potential for expansion. Three stations in the South were on the selected list in 1934: Portsmouth, Southampton and Swindon. A proposed large power station at Fawley was deferred. Later "special agreement stations" were added to include Basingstoke, Kingston (Isle of Wight), Oxford, Reading and Weymouth.

Building the transmission lines could be controversial as he CEB found in the New Forest. The original proposal had been to construct the line through the centre of the Forest but this had to be modified by 1931 to take a northern route avoiding most of the land within the Forest limits. In spite of strong opposition from many groups voiced at a public inquiry at Winchester in September 1932, followed by months of indecision by the government, the 132kv line was built.[40] A celebration of the erection of the last pylon was held at Braemore on 5 September 1933.[41]

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[38] Unlike the other companies, Wessex Electricity was part of a large international venture of the Utilities Power & Light Corporation based in the United States. A British subsidiary, the Greater London and Counties Trust, had been established in 1925 and within three years had acquired control of Edmundson's, the Wessex company and other smaller entities. See: W.J. Hausman, P. Hertner and M. Wilkins, ***Global Electrification: Multinational enterprise and international finance in the history of light and power 1878-2007*** (New York: Cambridge University Press, 2008), pp.181-182. A full-page advertisement in ***The Times***, "Faraday Number", 21 September 1931, p.iv, included a detailed map of the Greater London and Counties Trust holdings.

[39] ***Tenth Annual Report of the Electricity Commissioners 1929-1930*** (London: HMSO, 1931), p.14.

[40] Bill Luckin, ***Questions of Power: Electricity and the environment in inter-war Britain*** (Manchester University Press, 1990). The New Forest conflict is covered in Chapter 6, pp.109-114.

[41] ***The Times***, 6 September 1933, p.6A.

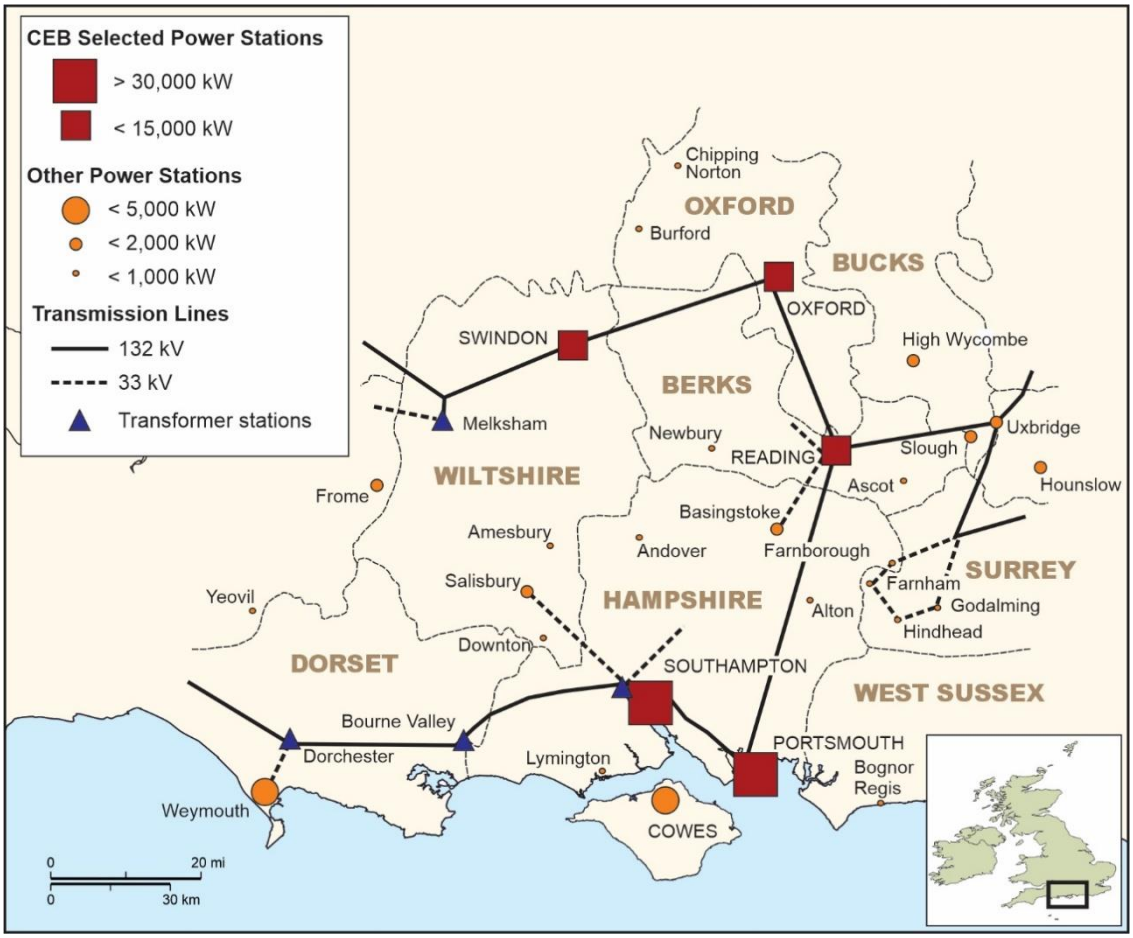

Figure 3 SOUTHERN ENGLAND NATIONAL GRID 1935-36.

When trading began on 1 January 1935, the grid had added a new layer to the complex of undertakings which operated the electricity supply system. The Bristol grid control office of the CEB now managed the flows of power on the transmission lines and directed the hour-to-hour operation of the selected power stations. These stations, such as the one in Portsmouth, remained in the ownership and management of the Corporation but the daily operation was now directed from Bristol. Planning for the future became increasingly centralised, particularly from London.

Two examples illustrate the direct effects of the new grid supply in the region. In June 1935 the Bournemouth & Poole Co. closed its Bourne Valley station and purchased all its supply from the Central Electricity Board (about 41m kWh in the first year). The power station (11,000kW capacity) which had generated at 100Hz was obsolete and the limited site had no potential for any new power development. In the Portsmouth area, grid supply facilitated the electrification of the Woking-Guildford-Portsmouth line of the Southern Railway opened for public service on

4 July 1937. Power for the line south from Liss was drawn from the CEB Wymering transformer station and converted to DC at seven trackside substations.[42]

Table 4 and Figure 3 show the situation in 1935/36 when 62 undertakings were in operation. Over the previous decade many changes had taken place. One significant shift was the decline in the number of wholly DC systems (from 35 to 6) while the AC systems increased from 10 to 30. The number of combined AC/DC systems had expanded from 14 to 26. Frequency standardisation at 50Hz was now complete. The cost of converting Ealing and the Bournemouth & Poole undertakings was one of the expenses of the national grid.

Interconnection between undertakings, which had been minimal in the early 1920s, was now normal practice. The Electricity Commissioners, as part of their mandate for reorganising generation, had encouraged bulk supply agreements between neighbouring undertakings so that small stations could be closed. Such agreements would be a benefit for the later grid system, reducing the number of transformer stations. Portsmouth Corporation made agreements with Chichester and Fareham (1924/25), Midhurst and Petersfield (1928/29). Southampton made agreements to supply the West Hampshire Company (1928/29) and Winchester (1929/30).[43] In the late 1920s the Electricity Commissioners supported plans of the Isle of Wight Company to reorganize supply in the island from a new power station at East Cowes.[44] As a result of these arrangements, many smaller systems were linked up with a large power station and old, inefficient plant such as Winchester could be shut down.[45] By 1935/36 only a few of the more isolated places such as Amesbury and Chipping Norton were still generating all their requirements. Most places which had retained capacity were taking bulk supply from elsewhere. Heston & Isleworth UD which had generated 88 percent of its requirements in 1925/26 now generated only 2 percent, a figure covering peak seasonal demands.

Generating technology emphasised economies of scale with larger units. Southampton had a turbine unit of 15,000kW and the Portsmouth station had two 10,000kW machines. New power stations brought major reductions in coal consumption. In the Isle of Wight Cowes station consumed only 1.91 lbs of coal for each kilowatt hour generated compared with 4.28 lbs at Newport and 6.09 lbs at Ventnor ten years earlier. Hydraulic power on the River Avon, with generation at Salisbury (30kW), Downton (85kW) and Ringwood (70kW), made a small contribution to local electricity supply.

Rationalisation of generation and interconnections of undertakings all contributed to reducing the cost of electricity. Other factors such as the growth of radio broadcasting and lower prices for small appliances helped to boost electricity consumption. By 1935/36 there were 31 places

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[42] G.T. Moody, ***Southern Electric*** (London: Ian Allan, 1957), p.65.

[43] The dates are taken from the Electricity Commissioners ***Annual Reports***.

[44] Ian Sherfield, ***Electric Wight: An illustrated history of the Isle of Wight electricity supply*** (Newport: Buckbury Publishing, 2012), pp.25-35.

[45] The closure of Winchester power station, after the town was connected to the grid, led to claims for compensation by 15 employees who suffered loss of employment or lower wages. Under the provisions of the 1919 and 1926 legislation, a Hearing was held and the Referee awarded the sum of £3,865 in respect of the claimants. ***Seventeenth Annual Report of the Electricity Commissioners 1936-37*** (London HMSO, 1937), p.117.

in the region with per capita consumption levels above 100kWh, ranging from the Oxford Electric Co. at 425.3kWh (the effect of sales to Morris Motors) to the small Downton undertaking at 103.7kWh. Places with little industrial load still tended to lag behind.

The growth of electrification, especially in the lighting segment, may be illustrated by the case of Portsmouth. Total electricity sales grew from 12.3m kWh in 1925/26 to 66.88m kWh a decade later. The lighting segment which included domestic uses expanded from 7.59m kWh to 48.89m kWh. There was a corresponding increase in the number of consumers from 16,716 to 65,809. Over the decade per capita consumption in Portsmouth rose from 41.9kWh to 212.6kWh.[46]

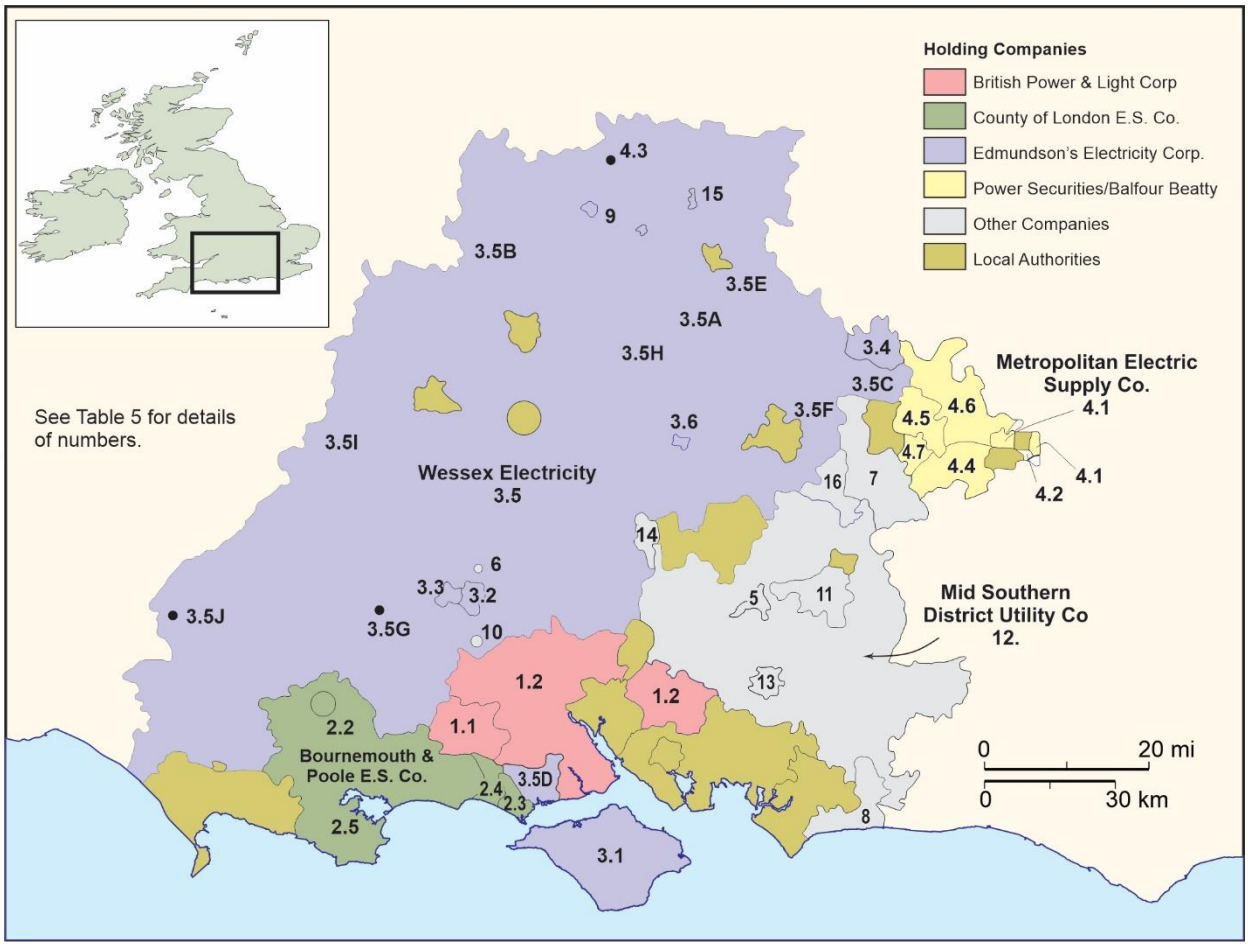

Figure 4 ELECTRICITY HOLDING COMPANIES 1934-35.

[46] The data are derived from the ***Engineering and Financial Statistics*** for 1935-36 and 1925-26.

Table 5 SOUTHERN AREA: CORPORATE STRUCTURE OF ELECTRICITY HOLDING COMPANIES 1934/35.

British Power & Light Corporation	1.1 Ringwood ES Co. 1.2 West Hampshire E Co.
County of London Electric Supply Co.	2.1 Bournemouth & Poole E S Co. 2.2 Blandford Forum & District ES Co. 2.3 Milford-on-Sea ES Co. 2.4 Milton & Barton-on-Sea ES Co. 2.5 Swanage G & E Co.
Edmundson's Electricity Corporation Ltd	3.1 Isle of Wight EL&P Co. 3.2 Salisbury EP&S Co. 3.3 Wilton ES Co. 3.4 Wycombe (Borough) EL&P Co. 3.5 Wessex Electricity Co. A Abingdon ES Co. B Cirencester ES Co. C Cookham & District ES Co. D Lymington EL&P Co. E Oxford E Co. F Thames Valley ES Co. G Tisbury ES Co. H Wantage ES Co. I West Wilts EL&P Co. J Yeovil EL&P Co. 3.6 Urban ES Co. Newbury
Power Securities	4.1 Metropolitan ES Co. 4.2 Brentford ES Co. 4.3 Chipping Norton ES Co. 4.4 Egham & Staines ES Co. 4.5 Slough & Datchet ES Co. 4.6 Uxbridge & District ES Co. 4.7 Windsor EI Co
Other companies	5 Alton District E Co. 6 Amesbury EL & G Supply Co. 7 Ascot District G & E Co. 8 Bognor G & E Co. 9 Burford EL&P Co. 10 Downton EL Co. 11 Farnham G & E Co. 12 Mid-Southern Dist Utility Co. 13 Petersfield EL&P Co. 14 Whitchurch (Hants) Gas Co. 15 Woodstock & Dist E Distrib Co. 16 Yorktown (Camberley) & Dist G&E Co.

Source: Political and Economic Planning, ***Report on the Supply of Electricity in Great Britain*** (London: PEP, 1936), pp.140-141.

Many features of the "electric revolution" showed in the western suburbs of London. The population of Heston & Isleworth doubled between 1925/26 and 1935/36 while electricity sales rose from 3.02m kWh to 39.'22m kWh. New prestige factories[47] especially along the Great West Road created a very strong demand for power, sales of which grew from 16.0m kWh to 23.84m kWh.AS a result of this industrial demand, per capita consumption in the borough rose from 64.8kWh in 1925/26 to 404.4kWh ten years later.

While the creation of new areas appeared to be making an even more fragmented map, much of the new development was controlled by holding companies which provided a new form of integration. Figure 4 and Table 5 show the situation in 1934/35 when several organisations had a dominant position.

Edmundson's Electricity Corporation which had established several local undertakings by 1912 was revived by an American takeover in 1928 and began a series of new acquisitions including Wessex Electricity which covered a very extensive zone with many subsidiaries.

Other holding companies in the region included Power Securities/Balfour Beatty which owned the Metropolitan Power Supply Co. covering all the western London suburbs. The County of London Electric Supply Co. owned Bournemouth & Poole and various subsidiaries. The British Power & Light Corporation, a new creation, held the franchise for Ringwood and West Hampshire.

Twelve companies remained outside the larger national groups. The largest in area was the Mid Southern District utility company formed in 1930/31 from the earlier Aldershot Gas, Water and District Lighting Company and had subsequently taken over small companies in Godalming, Hindhead and Midhurst.

Although state intervention had begun to rationalise electricity generation, the efforts of the Electricity Commissioners to reduce the very large numbers of distributors were unsuccessful. The McGowan Report published in May 1936[48] and the subsequent government proposals were strongly opposed by many sections of the electricity supply industry. A recommendation in the McGowan Report, that all undertakings with annual sales of less than 10 million kWh should be amalgamated, was particularly controversial. Only seven of the 20 local authorities were above this limit and many small towns objected to the idea of amalgamation with large companies. The government's Outline of Proposals published in April 1937[49] but the continued opposition and more pressing issues of the time meant that reorganisation of distribution was set aside.

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[47] See: "The electrification of a biscuit factory", ***The Engineer***, Vol. 155, 1933, pp.271-272. The three transformers for the incoming power had a capacity of 1,500kW.

[48] Ministry of Transport, ***Report of the Committee on Electricity Distribution***, May 1936 (London: HMSO, 1936). The report noted that there were no fewer than 635 separate authorised undertakings in Great Britain in 1934, comprising the Central Electricity Board, 3 Joint Electricity Authorities, 5 Joint Boards, 373 Local Authorities and 253 Companies and persons.

[49] Ministry of Transport, ***Electricity Distribution: Outline of Proposals*** (London: HMSO, 1937).

Edmundson's Electricity Corporation took note of these moves toward amalgamation and reduced the number of small subsidiaries in the Wessex company territory. The spatial organisation of the late 1930s remained essentially unchanged until nationalisation.

Table 6 lists the various undertakings that were consolidated between 1911 and 1948. Acton was the only local authority to merge with a company. The resistance of local authorities to any loss of independence was a powerful force against all pressures for amalgamation.

Between 1935/46 and 1948 a few of the smaller power stations were closed. These included Alton, Amesbury, Bognor, Burford, Chipping Norton, Chiswick, Maidenhead and Slough & Datchet.

Private generation during the interwar period was generally retreating as public suppliers could offer more attractive tariffs, but there were exceptions especially in outer London. Southampton Corporation began supplying the docks in 1923 with an initial capacity of 3,500kW (about 20 percent of its total generating capacity).[50] By the end of the decade, in addition to the increasing demand from the port, the Southern Railway closed its obsolete generating facilities at the Eastleigh workshop and took a bulk supply from the Corporation. The Great Western Railway followed a similar pattern in Swindon and by 1930 its workshops were taking nearly two thirds of the output of the new Corporation power station.[51]

Table 6 SOUTHERN AREA CONSOLIDATIONS TO 1948.

Undertaking	***Years in Operation***	***New Owner***
Acton Ud	1905-1911	Metropolitan ES Co.
Wareham	1923-1928	Bournemouth & Poole Co.
Hindhead	1900-1928	Mid Southern
Godalming	1912-1930	Mid Southern
Midhurst	1929-1931	Mid Southern
Frome	1904-1931	Wessex Electricity
Sherborne	1923-1931	Wessex Electricity
Wallingford	1924-1931	Wessex Electricity
Whitchurch & Pangbourne	1903-1931	Wessex Electricity
Swanage	1914-1933	Bournemouth & Poole Co.
Cowes	1903-1933	Isle of Wight EL&P Co.
Newport	1901-1933	Isle of Wight EL&P Co.
Ryde	1903-1933	Isle of Wight EL&P Co.
Sandown	1901-1933	Isle of Wight EL&P Co.
Ventnor	1899-1933	Isle of Wight EL&P Co.
Andover	1927-1933	Wessex Electricity
Malmesbury	1924-1933	Wessex Electricity
Tetbury	1924-1933	Wessex Electricity
Warminister	1923-1933	Wessex Electricity
Bourton-On-The-Water	1927-1934	Wessex Electricity
Gosport & Alverstoke	1907-1936	Portsmouth Corporation
Abingdon	1913-1937	Wessex Electricity

[50] Institution of Mechanical Engineers, ***Proceedings***. Southampton meeting 1928, p.564.
[51] Institution of Mechanical Engineers, ***Proceedings***. Bristol meeting, 1930, p.925.

(cont'd)

Cirencester	1912-1937	Wessex Electricity
Cookham	1908-1937	Wessex Electricity
Lymington	1900-1937	Wessex Electricity
Newbury	1905-1937	Wessex Electricity
Oxford Co.	1924-1937	Wessex Electricity
Thames Valley	1926-1937	Wessex Electricity
Tisbury	1928-1937	Wessex Electricity
West Wilts	1925-1937	Wessex Electricity
Yeovil	1923-1937	Wessex Electricity
Chepping Norton	1912-1944	Wessex Electricity
Amesbury	1922-1945	Wessex Electricity
Downton	1929-1945	Wessex Electricity
Municipal Takeover of Company Undertaking		
Fareham UD	1896	
Southampton CB	1896	
Winchester MB	1911	
Witney UD	1912	
Chichester MB	1922	
Oxford CB	1931[1]	
Reading CB	1934	
High Wycombe (as Chepping Wycombe)	1939	

Note: [1] Only part of Oxford Electricity Supply Co. in city area of 1889.

In Slough the 2,000kW power station built in 1918/19 for the Army's central vehicle depot had become a core asset in the development of the industrial estate. This power station was extended in the 1920s and again between 1933 and 1938 when new units totalling 16,800kW were added.[52] A reinforced concrete cooling tower, one of the first in southern England, was completed in 1934.[53] If the industrial sales of the trading estate had been supplied by the local Slough & Datchett company, the per capita sales of the area would have been very much higher than 174.1kWh per capita in 1935/36.

The new Hoover vacuum cleaner factory in Perivale near the northern limits of Ealing found benefits in generating most of its power and lighting needs with only a limited connection with the public mains.[54] Film studios, a growing new industry in western London, were heavy users of power for lighting and air conditioning.[55] The rebuilt Ealing Studios had a generating capacity of 950kW in 1932 and the new Denham studio complex opened in 1936 had a capacity of 4,500kW (about the same size as the Uxbridge power station).[56] All these studios used diesel engines as prime movers.

[52] Political and Economic Planning, ***Location of Industry*** (London, PEP, 1939) p.107.
[53] The general growth of Slough Estates is covered in Michael Cassell, ***Long Lease!*** (London: Pencorp Books, c1993).
[54] "The Hoover factory at Perivale," ***The Engineer*** Vol. 155, 1933, p.521.
[55] Patricia Warren, ***British film studios: an illustrated history*** (London: Batsford, 1995).
[56] "The film studios at Ealing", ***The Engineer***, Vol,153, 1932, pp.122-124; "A film studio power station" (Denham), ***The Engineer***, Vol.161, 1936, p.497.

III Nationalisation

After three decades of discussion the whole organisation of electricity was restructured following the Electricity Act 1947. From 1 April 1948, the Southern Electricity Board took over the distribution assets of 22 local authorities and 26 companies (Figure 1). The generating stations and the transmission lines of the Central Electricity Board were transferred to the British Electricity Authority.

Electricity Distribution

The SEB was responsible for integrating the 48 undertakings. Systems had to be standardised and the multiplicity of tariffs reduced. For administrative purposes, the Board area was subdivided four sub-areas and 38 districts.[57] Initially the districts tended to reflect the pre-nationalisation company and municipal areas. The gas works and distribution systems of the six "composite companies" in the SEB are were transferred to the Southern Gas Board on 1 May 1949.[58]

Figure 5 shows the geographical organisation in 1957 when there were four sub-areas and 22 districts. One notable feature is the network of 113 service centres where consumers could pay their bills and purchase appliances.[59] These service centres were an important and profitable part of the Board's business.

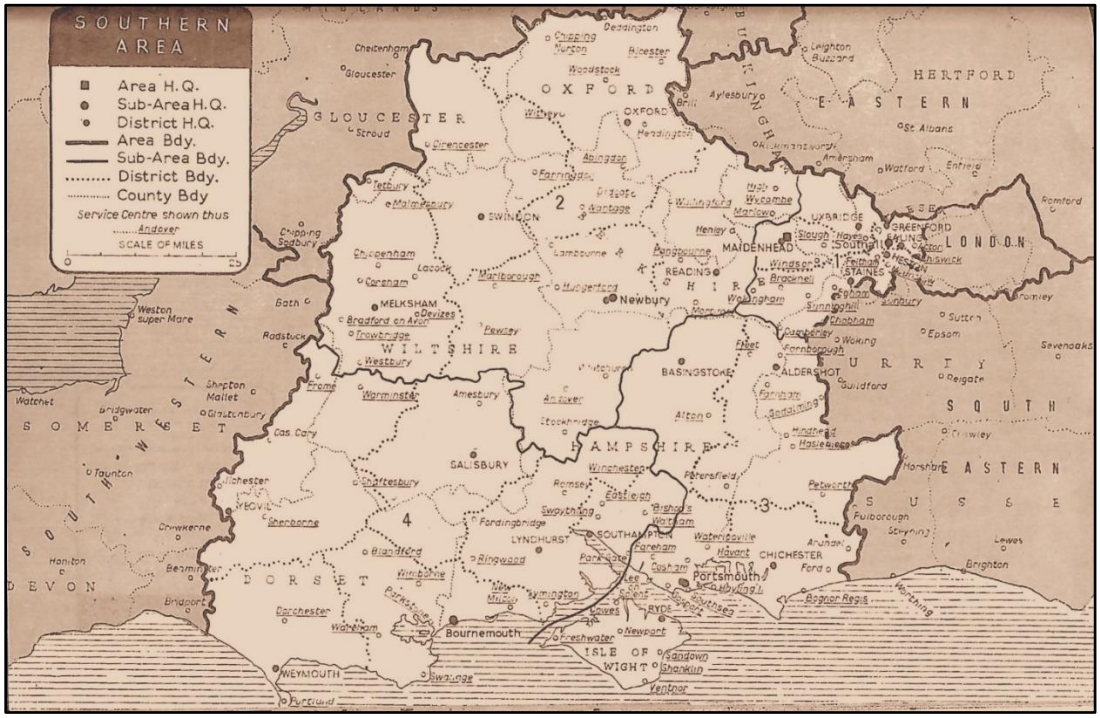

Figure 5

[57] Southern Electricity Board, ***First Annual Report 1948-49*** (HMSO 1949). Parliamentary Paper Session 1948-49, HC 339.
[58] The Electricity Act 1947, Schedule II, Part II listed 12 composite gas and electricity companies.
[59] ***Electricity Supply Handbook 1958*** (London: Electrical Times, 1958), pp.86-91.

Most parts of the Southern region enjoyed an economic boom after World War II. Slough, for example, which had grown in population from 20,285 in 1921 to 52,590 in 1939, expanded to 66,439 in 1951 and 80,503 in 1961. The New Town being developed at Bracknell had only 5,143 residents in 1951 but had risen to 20,380 a decade later. These developments along with suburban expansion throughout the region all contributed to the rising demand for domestic electricity supply.

Industrial power demands were particularly strong with major new load centres at Heathrow Airport (1946-) and the Esso petroleum refinery at Fawley (1951). The Ministry of Supply and its successor, the UK Atomic Energy Authority was a large consumer at the new establishments at Harwell, Aldermaston and Burghfield. Other military-industrial establishments around Aldershot also contributed to the growing demand for power.

Over the decade 1948/9-1958/9, total sales of electricity in the SEB area grew from 2,338m kWh to 6,255m kWh. The number of consumers expanded from 916,764 to 1,345,855 over the same period. Distribution line construction was a major feature of the Board's work and the staff increased from 10,557 in March 1949 to 12,621 a decade later.

The work of standardizing systems was still continuing in 1959. Although the number of consumers with only DC supply had been reduced from 40,832 in 1949 to 11,089 in 1959, the number of consumers with non-standard voltages actually increased (from 163,089 in 1949 to 181,385 in 1959).

Electricity Generation and Transmission

The Southern Division of the British Electricity Authority covered the same area as the SEB. It was an amalgamation of the 132kv transmission system developed by the Central Electricity Board and the power stations previously owned by the companies and local authorities. The main tasks from 1948 were to integrate the various generating stations and their workforces, to modernise and standardise operations, and to expand capacity to meet the rapidly growing demand.

Table 7 shows the 26 power stations in the new organisation. They varied in size from large turbine-powered stations at the top to small diesel-engined and hydro units at the bottom. A comparison with Table 4 shows that most of the growth in capacity after 1935/36 had been concentrated at three selected stations—Portsmouth, Southampton and Swindon. One new station at Earley, Reading had been built from 1941-2 to cope with wartime demand. Earley was the only power station owned by the Central Electricity Board; management was contracted to Edmundson's Electricity.[60]

Within a decade, most of the objectives planned in the late 1940s had been fulfilled. Many small stations had been closed, extensions at Portsmouth (30,000kW, 1952) and Cowes (25,000kW, 1955) completed, and two large new stations commissioned at Poole (1950-59) and Marchwood (1955-59). The Marchwood station was the first to be completely designed by the

[60] "Earley Power Station", ***The Engineer*** Vol.175, 1945, p.154.

BEA and although planned for coal began with oil firing. Aluminium cladding was used to cover the steel frames of the boiler and turbine houses. This power station was regarded by one architectural critic as "among the most impressive in Europe."[61] It was a complete contrast to the earlier station at Poole, one of the "brick cathedrals" partly inspired by the Battersea station, an architectural icon of the 1930s.

During the 1950s, Portsmouth and Poole generating stations were served by a fleet of British Electricity Authority colliers. Two of the vessels, "Pompey Power" and "Pompey Light" had been ordered by Portsmouth Corporation in 1947 to ensure a regular coal supply to Gunwharf Road. The other ships, all named after variants of Poole, had been ordered by Coastwise Colliers Ltd and intended to serve the power stations of the County of London Electricity Supply Co.[62]

Table 7 BRITISH ELECTRICITY AUTHORITY POWER STATIONS IN THE SOUTHERN DIVISION 1948/49.

Power Station	***Capacity kW***	***Type[1]***
Earley	120,000	S
Portsmouth	110,000	S
Southampton	88,000	S
Swindon	35,000	S
Oxford	22,500	S
Reading	14,100	S
Cowes	13,000	S
Hounslow	5,650	S
Uxbridge	5,204	S
Weymouth	5,250	S
High Wycombe	3,607	S
Salisbury	3,100	S
Basingstoke	2,910	I
Frome	2,350	S
Farnborough	875	I
Hindhead	660	I
Yeovil	660	I
Newbury	570	I
Lymington	560	I
Ascot	480	I
Farnham	300	I
Andover	215	I
Godalming	200	!
Downton	150	I, H
Ringwood	147	I, H
Windsor	135	I
	435,683	

Notes: 1. S – Steam; H – Hydro-electric, I – Internal combustion (diesel).
Source: Compiled from BEA, ***Annual Report 1948-49***, Appendix 15.

[61] G.E. Kidder Smith, ***The new architecture of Europe*** (London: Prentice-Hall International, 1961), pp.58-59.
[62] D.R. Chesterton and R.S. Fenton, **Gas and Electricity Colliers** (Kendal: World Ship Society, 1984), pp.89-91.

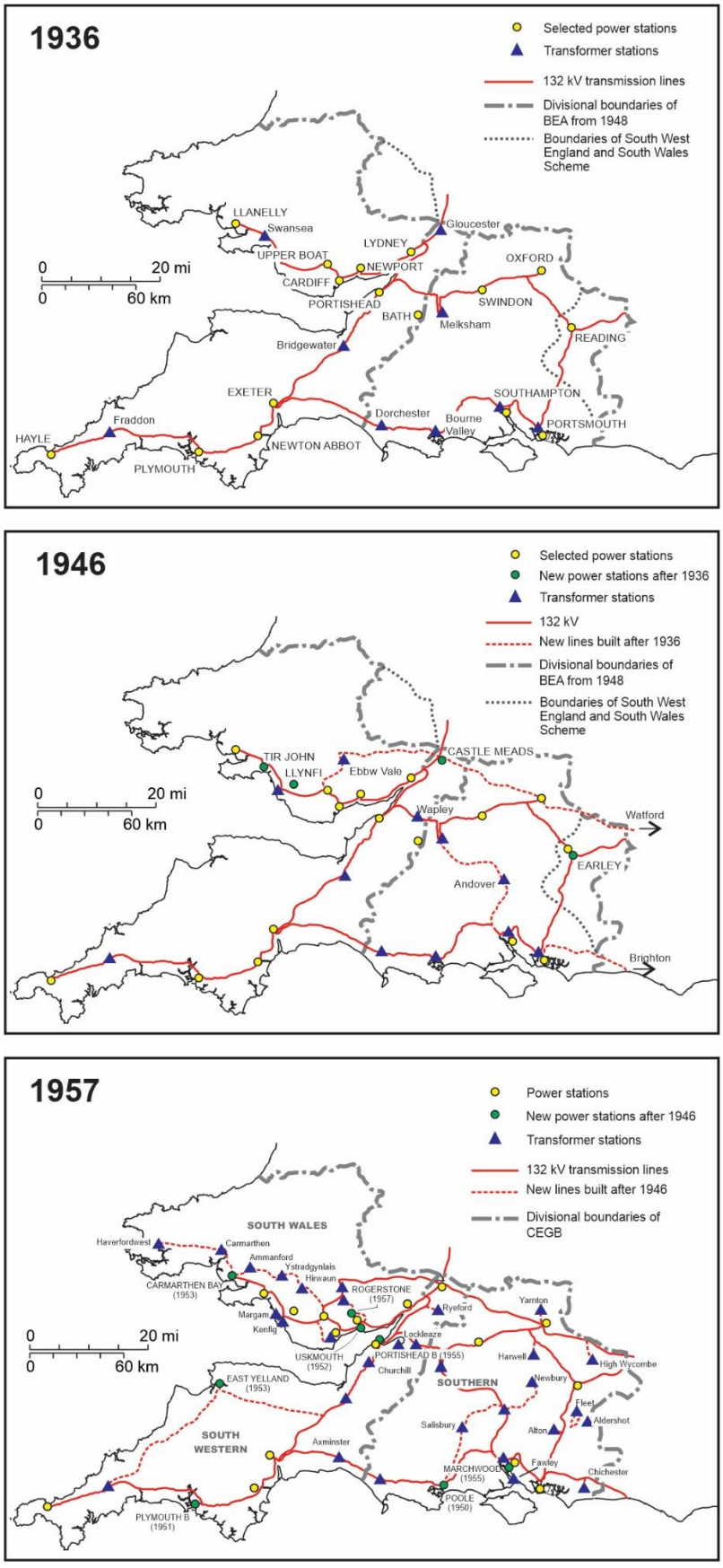

Figure 6 EVOLUTION OF THE GRID 1935, 1946, 1957.

The original grid transmission system had been extended during the war (Figure 6). A new line from Watford to South Wales connected with the region at Oxford. Portsmouth was linked to Brighton and power demand in the military zone of Wiltshire was reinforced by a 132kv line from the Newbury substation to Melksham with a transformer station at Andover. A submarine cable (33kv) was laid under the Solent in 1943 to provide additional supply to the Isle of Wight. Further cables were laid after the war.[63]

In the 1950s. Salisbury and Newbury were connected to the 132kv grid. The rising demand for industrial power can be seen in the provision of new lines and transformer stations to Farley, Fleet, Aldershot, High Wycombe, Harwell and Yarnton, on the northern outskirts of Oxford.

As the last units were being installed at Marchwood and Poole in 1958/59, much larger machines were now in service at new stations in the coalfield area of the East Midlands.[64] Plans made earlier for a more integrated national system were now taking shape—much larger coal-fired stations, new generating technology in the form of nuclear reactors and high-capacity 275kv Supergrid (later raised to 400kv).

Melksham became an important switching and transformer station on the Supergrid and was linked northwards to the Midlands, eastwards across the Berkshire Downs to West Waeybridge with a branch to Fleet near Aldershot and with planned extensions to South Wales and to Exeter via a nuclear station at Hinckley Point.

Table 8 CENTRAL ELECTRICITY GENERATING BOARD POWER STATIONS IN THE SOUTHERN DIVISION 1958/59.

Power Station	***Capacity kW***	***Type[1]***
Marchwood	420,000	S(O)
Poole	330,000	S
Portsmouth	140,000	S
Earley	120,000	S
Southampton	88,000	S
Cowes	38,000	S
Swindon	35,000	S
Oxford	17,300	S
Reading	10,700	S
Weymouth	4,650	S
Uxbridge	4,160	S
Hounslow	4,150	S, I
High Wycombe	3,960	S
Newbury	2,550	I
Basingstoke	2,460	I
Frome	2,350	S
Ringwood	147	I, H
Downton	117	I, H
	1,226,444	

Notes: 1. S – Steam; S(O)-- Steam oil-fired; H – Hydro-electric, I – Internal combustion (largely diesel).
Source: Compiled from CEGB, ***Annual Report 1958-59***, Appendix 1.

[63] Ian Sherfield, ***Electric Wight*** (2012), pp.40-44.
[64] Castle Donington had 100,000kW units from 1956 and the first 200,000kW turbine was installed at High Marnham in 1959.

Although no commercial nuclear stations were built in the region, a site at Hamstead, near Yarmouth on the Isle of Wight, had been considered as a possibility.[65] Winfrith Heath, Dorset was chosen by the UK Atomic Energy Authority as the site for a research centre for work on experimental reactors. The first reactor was completed in late 1959 on the 1,300-acre site.

During the first decade of operation the Southern Division built two new power stations and raised generating capacity from 435,688kW to 1,226,444kW (Table 8). The transmission line capacity was raised from ?? to 893 route miles, of which 137 route miles were part of the 275kv Supergrid. Over the period the numbers employed rose from 1,918 to 3,062.

From January 1958, when the Central Electricity Generating Board took over from the Central Electricity Authority, there were changes in the administrative structure. A new South Western Region was established incorporating the Southern, South Western and South Wales Divisions. Under the new arrangements the regional director in Bristol became responsible for the higher-order planning and administration of 43 power stations, 1,768 miles of transmission lines and 8,979 employees. The divisional offices in High Street, Portsmouth[66] not only lost some administrative roles but design work was transferred to new project groups outside the region.

Summary

Table 9 shows various indicators of the growth of electrification from 1900. Of the 17 undertakings in that year only four were local authorities, a point that illustrates the importance of private companies in the region. The number of undertakings grew rapidly to 1925/26 and peaked a decade later. Power stations show a peak number in 1925/26 and gradual consolidation thereafter.

Table 9 SUMMARY OF DEVELOPMENT IN THE SOUTHERN AREA.

	Number of Undertakings[1]	***Local Authority Undertakings***	***Number of Power Stations***	***Generating Capacity (kW)***	***Per Capita Consumption (kWh)***
1900	17	4	17	..	.. (4)[2]
1912	39	11	36	..	.. (36)
1925/6	59	15	32	95,510	44 (133)
1935/6	62	20	32	179,525	201 (374)
1948/9	..	..	26	435,683	601 (821)
1958/9	-	..	19	1,226,444	1,543 (1,765)[3]

Notes:

[1] Excludes all non-statutory undertakings.

[2] Great Britain 1900-1948/9 from Leslie Hannah, ***Electricity Before Nationalisation: a study of the electricity supply industry in Britain to 1948*** (London: Macmillan, 1979), pp.427-8.

[3] Calculated from data in Electricity Council, ***Handbook of Electrical Supply Statistics 1977***, p. 63 and census returns.

[65] Ian Sherfield, ***Electric Wight*** (2012), p.47.

[66] The building previously used as offices by the Corporation Electricity Department was known as The Governor's House, High Street. Until the 1880s it had been the official residence of the military governor of Portsmouth. The 1860 (Old Portsmouth) project. See: historyinportsmouth.co.uk

A sense of the rapid growth of demand from the mid-1920s is illustrated by the two final columns in the table. Economies of scale are reflected in the increasing size of power stations. The largest station in the region in 1925/26 at Southampton had an installed capacity of 18,760kW. A decade later the station had ben extended to 44,137kW and doubled again in 1937/38. No further growth took place in Southampton as the site was restricted by the growth of the new docks. Portsmouth took over as the largest station but was quickly overtaken by newer stations at Earley, Poole and Marchwood.

Per capita consumption in the Southern region (with Great Britain in parentheses) shows substantial rates of growth. Without large power-consuming industries, however, the region always lagged below national levels. Only Uxbridge (279.4kWh per capita) exceeded the national average in 1925/26 and a decade later only Heston & Isleworth (404kWh) and Oxford Electric (425kWh) were above the national average.

Electrification was a much slower process than the enthusiastic promoters of the 1880s expected. Much effort and expenditure were needed to create viable electricity undertakings in the larger urban centres. This point of viability was reached about 1900 but extending the benefits of electricity over wider areas took much longer and universal electricity was probably not achieved until the 1950s.

Note on Sources

For the period before state intervention, Garcke's ***Manual of Electricity Undertakings***, first published in 1896, is the indispensable source. This annual volume lists all municipal and company electricity and tramway systems in comprehensive detail. Technical information on the generating and distribution systems is noted for each undertaking, as well as statistics on sales, revenue and expenditure. There are also full details of personnel and company directors. Garcke also covers many of the non-statutory companies which were often significant in rural areas.

The contents of the ***Annual Reports*** of the Electricity Commissioners (1st, 1920-21 – 23rd, 1947-48) highlight the role of state intervention during this period and reflect the power of the Electricity (Supply) Act 1919. Under this legislation all power station and transmission line construction required consent of the Commissioners. Loans for local authority electricity undertakings, extensions of areas and transfers of ownership all required approval from London. Even the payment of subscriptions to associations such as the British Electrical Development Association and the Incorporated Municipal Electrical Association had to have the Commissioners' consent. The detailed supervision of expenditure also included the purchase of proceedings of conferences or meetings and the expenses of members and officers attending such meetings.

The ***Engineering and Financial Statistics***, also published by the Electricity Commissioners, were equally detailed. Local authorities and companies are separately listed with detailed tabulations of generating equipment, fuel consumption, output as well as sales (by type). Such data provide effective evidence on the scale and depth of electrification. The financial statistics cover revenue, expenditure and capital investment.

The Electricity Commissioners also published more specialised reports on plans for integrating local systems which formed the basis for the 132kv grid developed from 1927. All the publications of the Electricity Commissioners were issued under the authority of the Minister of Transport.[67] They were, however, Non-Parliamentary Publications of HMSO and consequently were not always acquired by libraries at the time.

The Annual Reports of the Central Electricity Board from 1929 to 1947 contain, especially in the earlier years, comprehensive details of the progress of constructing the transmission grid. CEB reports were privately published and are rare items in library collections.

After nationalisation, details of the electricity supply industry become more accessible, although in some points less comprehensive. For the generating and transmission sector, the Annual Reports and Accounts of the British Electricity Authority (1948-1954), Central Electricity Authority (1955-57)[68] and the Central Electricity Generating Board (1958-1989) contain useful data. These reports were all published as House of Commons sessional papers until 1971-72. Thereafter they were no longer published by HMSO and became increasingly glossy in appearance and content. From 1964 many details, previously available in the Annual Reports were published in the CEGB ***Statistical Yearbook***. This was not published by HMSO and is comparatively rare.

The Southern Electricity Board annual reports and accounts were also published as House of Commons sessional papers until 1971-72. After this time the reports were no longer published by HMSO. In May 1981 the SEB opened a museum in the former power station at Christchurch, a building that had retained much of the original equipment. Although closed to the public in 2012, the building and contents are not at risk. Some of the archival material has been digitised and is available on the Scottish and Southern Electricity website (sseheritage.org)[69]

From 1958-59 the Electricity Council, created to provide more linkages and coordination beyond the national and regional bodies, also published annual reports and statistical compilations. The ***Handbook of Electricity Supply Statistics*** published at intervals between 1966 and 1989, includes helpful summaries. ***Electricity Supply in Great Britain: A Chronology***, also published in various editions, is especially useful for details of legislation and major events, especially technical changes from Michael Faraday's fundamental discoveries of 1831.

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[67] See ***Annual catalogues of British government publications 1920-1970*** (Bishop's Stortford: Chadwyck-Healey. 1974).

[68] The change of title from British Electricity Authority resulted from the formation of the autonomous South of Scotland Electricity Board from 1 April 1955.

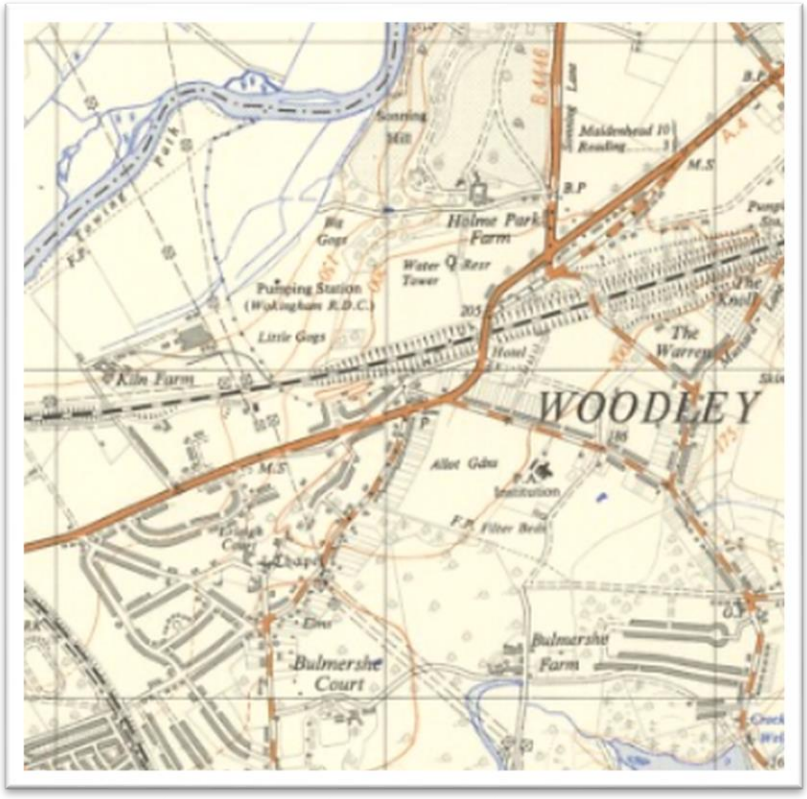
[69] The SSE archive has 1,690 items including copes of the SEB house magazine from 1949 to 1988 and the annual reports from 1948/9 to 1997/8. The variety of other items such as Edmundson's Monthly (1905-1912) suggests the rich potential of the stored material. A detailed history of Edmundson's and Wessex Electricity is a project for a future researcher.

In the postwar period the ***Electricity Supply Handbook*** (published annually by the ***Electrical Times*** from 1947) is a very useful compendium of facts, figures and personnel in the industry. The detailed maps of the grid system are especially important. Like many annual reference works of its type, these volumes are quite scarce.

Two collections have materials relevant to electrification in Southern England:

In Manchester, the Museum of Science and Industry has the records of the former Electricity Council. These include reports of the Electricity Commissioners, the Central Electricity Board, all of the organisations after 1948, as well as a set of Garcke's ***Manual.***

In Bristol, the Western Power Electricity Historical Society has a museum and extensive archival collection. The Society began in 1994 when employees of the former SWEB began salvaging records of all the former undertakings in the region. A set of Garcke's ***Manual*** is a valuable part of the collection for research beyond the South West. The Society has been very active in publishing articles of wide interest and has a particularly effective and comprehensive website at www.wpehs.org.uk



EARLEY POWER STATION

A wartime emergency station built alongside an existing grid substation on the outskirts of Reading. It was the only power station built and owned by the Central Electricity Board. The first turbine unit entered service in December 1942 and the full capacity of 120,000kW was completed in 1946.

Ordnance Survey, 1:25,000 series, Sheet SU 77, 1951 (National Library of Scotland).