

# British Electricity Supply Industry: Part one

## The growth of the UK Electricity Grid

### (Leading to the establishment of Area control centres and National control)

In 1882, Edison's Electric Light Company set up Holborn Viaduct power station (Direct Current generation). The world's first public steam-driven coal power station, it was colloquially known as the 'Edison Electric Light Station'. Its location was chosen so as to utilise the gas ducts and sewer. The wires crossed underneath the viaduct and ran up to Newgate Street, as Edison didn't have a licence to dig up the streets.

There is a story that as the ducts couldn't cross St Martins le Grand, he ran cables up the side of a pub (the Holborn Tavern) that ran overhead across the square to the HQ of the General Post Office. With all the flammable paper, the GPO was keen to use electric light rather than gas or candles! However, the head of the GPO and Edison had a professional animosity which had to be resolved first.

Edison went back to New York and opened Pearl Street Generating station in September 1882 followed by other DC stations dotted across the Big Apple. He also started the New York Steam Company to use the excess heat. Holborn Viaduct power station closed in 1884 due to limited expansion because they couldn't dig up the streets. New York went to Alternating Current generation (AC) for long distance in-feed (Niagara - Westinghouse and Tesla) from 1890. Big rectifiers at the city end were installed, however their last public DC supply was 'spiked' in 1981.

In the late 1880s Sir Coutts Lindsay\* installed a small generating unit, and the new incandescent light bulbs, in his Grosvenor Gallery in Bond Street. The neighbours were impressed and asked if he could add some more plant as they would take 'the entire spare current'. He hired Sebastian Ziani de Ferranti who realised a big solution was needed.

Ferranti proposed using giant steam driven alternators (10000HP) at Deptford, down the river, to enable large volume coal supply and cooling. He then proposed using AC cables at the (unheard of) voltage of 10kV to run along the huge viaduct of the London and Greenwich Railway to London Bridge, and then Charing Cross; thus the London Electricity Supply Corporation was born (LESCO). Ferranti could only manufacture cable in 20' lengths so there were 8,000 joints; only 15 of which were initially faulty...

However, LESCO had to apply to the Board of Trade for a block licence to dig the streets for distribution. The Board however ruled that competition was paramount and that customers should be able to choose their supply type (AC or DC) etc. This favoured a lot of inefficient small stations and nearly sunk LESCO, as the customers were initially reticent to select it. However, common sense prevailed, and customers came back 'in their droves'. Deptford grew rapidly (it even had to be taken out of service in early 1906 for complete replanting). (The sending end voltage at Deptford had to be raised to 11kV to maintain 10kV at the west end. 11kV is still in use today as 'second level' distribution).

Now, by the early 1920's we had over 50 different combinations of AC/DC, voltage and frequency in the Capital alone – you couldn't move across London and be sure you could take your appliances with you.

Running five light bulbs cost a labouring wage and the GB demand was only about the same as that of Manhattan!

In 1925 Lord Weir chaired a committee that proposed the creation of the Central Electricity Board (CEB) to link the UK's most efficient power stations with consumers via a 'national gridiron'.

The United Kingdom Central Electricity Board was set up under The Electricity (Supply) Act 1926 to standardise the nation's electricity supply. At that time, the industry consisted of more than 600 electricity supply companies and local authority undertakings, and different areas operated at different voltages and frequencies (including DC in some places). The Board's first chairman was Andrew Duncan.  
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The CEB co-existed with the Electricity Commissioners, an industry regulator responsible to the Ministry of Transport but ceased to exist when the grid was Nationalised by the Electricity Act 1947 and taken over by the British Electricity Authority.

The CEB established the UK's first synchronised AC grid, running at 132kV and 50Hz, which by 1933 was a series of regional grids with auxiliary interconnection for emergency use covering most of the Country. The 150 major stations connected to it were to be operated in strict cost order, regardless of ownership with the net result the level of excess plant plummeted, prices dropped dramatically and demand rocketed. These regional grids were set up near large industrial conurbations and on major GPO telecommunication routes, namely Glasgow, Newcastle, Manchester, Leeds, Birmingham, London (Thames), Bristol and co-ordinated centrally by National Grid Control.

*\*Sir Coutts Lindsay 2<sup>nd</sup> Baronet (1824 -1913) Renowned British artist and water colourist.*

*\*\*Sir Andrew Rae Duncan GBE (1888-1952) was a British businessman who was brought into the Government during the Second World War, serving twice as both President of the Board of Trade and Minister of Supply.*

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