Dublin's Electricity Supply - The Years before the ESB

'The Corporation of Dublin, through their Electric Lighting Committee, having successfully completed their supply to the first area to be lighted, and being now prepared to deliver current to those citizens desirous of installing the Electric Light in their houses, etc. consider it a duty to themselves and the public to lay before the latter such information as may demonstrate clearly the advantages accruing to consumers, and the conditions upon which they will be supplied. Owing to the great interest displayed by our citizens in this enterprise it is considered that a short history of the undertaking would command attention and be read with pleasure'.

It was 1892, just 90 years ago and eleven years after the world's first supply of electricity was made available to the public in Godalming in England. It was also 36 years before the ESB came on the scene. Dublin Corporation had just opened its first electricity generating station to supply the Electric Light. The quotation comes from an introductory booklet for intending consumers.

Our story starts 60 years earlier. In 1831 Faraday had established the theory by which electricity could be generated by mechanical means. After some 20 years it was being used for lighting in the form of the carbon arc whose brilliant output was being put to good use in lighthouses. In 1877, Jablochkoff's 'electric candle' — two carbon rods placed side by side — led to the first large scale installations of arc lighting for public buildings. In the late 1870's, however, the future of these powerful light sources seemed to lie only in illuminating large areas such as factories, docks or even floodlit football matches. Even the experts agreed that there seemed to be no likelihood of applying electric power to light the humble house.

When a Select Committee of Parliament investigated 'Lighting by Electricity' in 1879, Sir William Siemens was only one of several distinguished witnesses who advocated electric light for public places but discouraged the idea of the 'subdivided light' as being probably uneconomic. The main problem was to get away from the concept of the carbon arc lamp in order to produce larger numbers of smaller independent lights suitable for domestic use.

A solution was ultimately found, almost simultaneously in the US and Britain, by Edison and Swan respectively. It was the incandescent lamp, — demonstrated in Newcastle in December 1878. This breakthrough was to signal the beginning of the growth in public electricity supplies. An electric light source, which was suitable for small scale applications, was now available.

Godalming

Like most towns at that time, Godalming in Surrey used gas lighting in the streets and private houses. The local gas manufacturing company naturally had a monopoly on its supply and the price charged to customers usually met with their displeasure. Nationally, gas was regarded as a mixed blessing. While accepting the benefits brought by gas lighting people continuously grumbled about its price as well as charges based on meters which were often faulty. Installations regularly leaked toxic gas and not infrequently blew up. Lighting by electricity seemed to signal the end of this era and bring about advent of a safer, cheaper and more brilliant age.

In the late summer of 1881, Godalming Borough Council was faced with the prospect of renewing its contract with the local gas company for the supply of gas for its street lighting. The idea was planted in the minds of some councillors that the new-fangled electric light should be considered. A suitable river was available to which a waterwheel could be harnessed and by the end of September 1881 the system was ready for its first demonstration. Supply was made available to private consumers as well as for

An early illustration showing what the newly-invented electric light could do for the Victorian interior.

streetlighting. Godalming thus has the distinction of being the first town to have a public electricity supply though it did revert temporarily to gas in 1884 due to technical problems with the generating equipment.

Back to Dublin

The concern engendered in monopolistic gas companies which, for many years, had the supply of energy 'sown-up', by the spectre of a new competitor appearing on the horizon was understandable. Even local authorities seemed to have been somewhat powerless in their handling of the powerful gas companies. A quotation from 1892 —

'For many years Municipal Bodies have had brought before them in a forcible manner the error that was originally committed in entrusting the supply of water and gas for their citizens to private companies. These powers, taking the form of unending monopolies for the companies to whom they were granted, the ratepayers have had to pay such prices for the supply as yield large profits to the companies, who, being free from competition are not always so willing to study the interests of the consumer as would be the case if competition existed, or, if the supply were vested in the hands of the citizens themselves.'

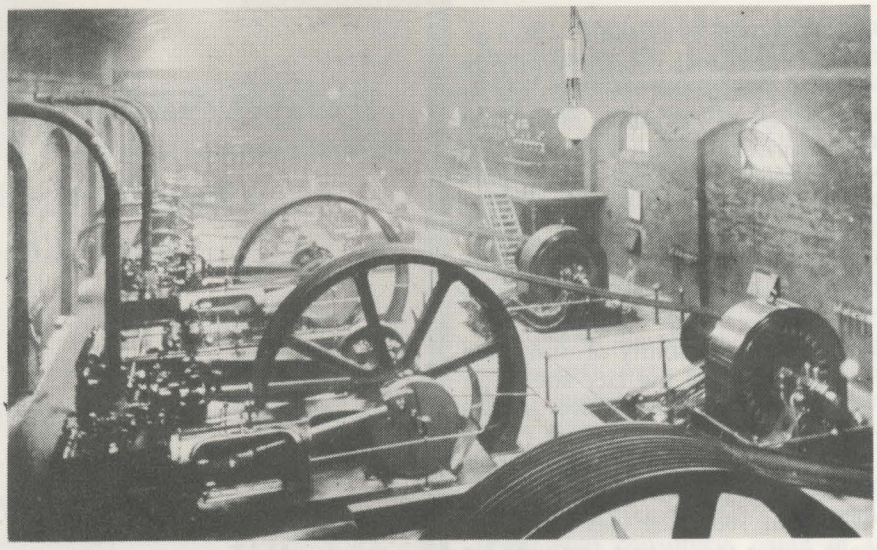
In 1880, a private company — the Dublin Electric Light Company built a generating station in Schoolhouse Lane, off Kildare Street. The following year the Corporation gave permission to the company to experiment with lighting some streets including Stephens Green and Nassau St. The Gas Company, forthwith applied for permission to light Grafton St. but found the Electric Light Company already erecting lights at either end of the street. A compromise solution was reached the results of which showed that electric light outshone its long-established rival. The Corporation, however, turned down an application by the company to open the streets to lay cables supplying public and domestic lighting.

In 1882 the first Electric Lighting Act was passed by Parliament in London. This vested in the Board of Trade power to grant licences and provisional orders to municipalities and private companies for the opening up of streets etc. to lay mains for electricity supply. The Act gave municipalities who undertook electricity supply themselves a monopoly with no time limit. However it only allowed private companies a period of 21 years (later extended to 42 years) at the end of which the municipalities were empowered to acquire the private undertaking at the then value of the works and plant.

When the time limit for private companies was extended to 42 years in 1883 the attraction of getting involved in the supply of electricity proved very strong and many companies both in Dublin and around the country came into existence. Many gas companies also applied for provisional orders after the passing of the 1882 Act, but 'it was early decided by Parliament that it was not politic to permit the two methods to be vested in the same company, who would probably strangle one for the sake of the other'. The applications by gas companies were refused.

While electricity became to be synonymous with 'the light' street lighting using gas was well established long before the arrival of electricity. Piped gas was used for the first time for street lighting in London in 1810. Three companies in Dublin supplied gas for lighting. They were the Oil Gas Company, the Gas Company and the Hibernian Gas Company. When they merged in 1866 to become the Alliance and Dublin Consumers Gas Company they were already supplying about 3,000 lamps in Dublin's streets.

Electric light appeared for the first time in 1860 in the form of an arc lamp outside 'The Freeman's Journal' in Princes Street.



An early picture of the interior of Dublin's Fleet St. power station built in 1892 to supply the city with electricity.

One of the first municipal bodies in these islands which decided to undertake electricity supply themselves was the Corporation of Bradford. In 1889 it erected a Central Electricity Supply Station. Bradford was already being supplied with the cheapest gas in the UK — from the corporation-owned gas works.

In Dublin the Corporation were aware of the importance of having electric lighting undertakings under their own guidance but they waited for further technical developments before they moved. They were encouraged in their decision by their successful construction of the Vartry Water Works which remained under their own control and 'gave Dublin one of the purest and best supplies of water in the kingdom'.

The Corporation set up a 'Special committee re Electric Lighting' which submitted its final report on August 2 1889. This committee considered the various options open to the Corporation in relation to providing a supply of electricity for the centre city.

'That there is a demand for the light has been shown not only by the answers received by Councillor Robinson in reply to an enquiry on the subject but also by the evidence brought forward by the Alliance Gas Company at the recent enquiry in Dublin. The question of the relative cost of gas light and electric light is affected by the necessity for renewal of the incandescent lamps, which are at present expensive patents; but, even including these renewals the Electric Lighting Committee of Leeds Corporation consider the cost equal to that of gas at 3s 3d per 1,000 cubic feet. This is exclusive of the greater advantages atten-

dant on lighting by electricity — such as, greater illuminating power, freedom from deleterious atmosphere, cleanliness and the avoiding of injury to gilding, to soft goods and to various mercantile wares, at present unavoidable in places where gas is used'.
— Committee report August 2, 1889.

It had been established in 1887 that the falls on the Liffey at Islandbridge could produce some 60 horse-power. The committee considered the possibility of using this to light some of the city streets. It was found that this power would suffice to light the whole of Upper and Lower O'Connell St., Westmoreland and Grafton Streets. When, in 1888, the Gas Company gave notice that it was applying for an order for electric lighting purposes because of a demand from private house-owners the Special Committee realized that the demand was greater than they had envisaged.

They also realized that the site at Islandbridge would be too small to cater for the greatly increased potential demand so a decision was made to erect a station in a central situation close to a coal supply. The committee had visited all the Central Electricity Stations in the UK to check on progress in the field. It also decided that 'an alternating current distributed at high tension and transformed into a suitable low tension current for the consumers' houses was the system best adapted to the demand likely to be met with in Dublin'.

This proved to be a far-sighted decision. Many of the supply companies in business in Britain at that time were supplying direct current from batteries and accumulators. In fact there was quite a heated debate in progress between the advocates of direct current from accumulators and alternating current from alternators. However, the majority were in favour of the alternating system.

A New Era

The central station to supply Dublin city-centre was built at Fleet Street — on the site of the existing Dublin City DO Garage and service Repair workshops. The engine room, boiler house and coal store occupied an area 125 feet long by 110 wide. Four boilers were installed capable of supplying steam for 1200 h.p. Six generating sets were installed, three each for public and private lighting purposes.

Two large man-holes were constructed at the corners of Fleet Street and Westmoreland Street as the first step in the distribution system. Three and four-inch cast iron pipes were laid to carry the cables. A distributing voltage of 2000V had been adopted. Separate transformers were provided in large premises while smaller consumers were fed from transformers supplying several houses. Street lighting lamp-posts were provided at frequent intervals along the street and these carried 1000 candle-power arc-lamps.

Supply from this station was first given in September 1892. Applications from consumers came in so rapidly that in the winter of 1893 additional plant had to be installed. Further additions were made from time to time up to 1899 when the total capacity of the Fleet Street works reached 900kW.

In 1898 the old system of house-to-house transformers was abandoned and the general distribution to the public was handled from five sub-stations which reduced the voltage from 2000 to 200.

The capacity of the Fleet Street station was at this time being stretched. In view of the rapidly increasing demand the Corporation decided to erect a new station on a site at Pigeon House Fort which had been taken over from the war office.

At the same time it was decided to adopt the three-phase system of generation and distribution of supply. Dublin, in fact, was the first city to adopt this new system.

Pigeon House

The erection of the new station began in 1901 and was completed two years later. It had a total capacity of 3,000kW and generated electricity at 5,000V. When Pigeon House was completed the now obsolete Fleet St. works became a distribution centre. Twenty new substations around the city were fed from this point.

The rate of growth was phenomenol. In January 1903 the maximum demand on the old Fleet Street station was 763kW. One year later, in January 1904, the demand on the Pigeon House reached 1,600kW. By 1907 it was almost 3,000kW which necessitated constant additions to both the generation and distribution capacity.

Two other municipalities in the Dublin area, ie Pembroke and

Signs of the times

The Lighting Committee have had under consideration during some weeks past the question of the annual painting of the Street Gas Lamps of the city. The practise in former years has been to have the lamps painted by the auxiliary lamplighters, the total cost being estimated by the inspector at 6¼d. per lamp viz. 3d for material and 3¼d. for labour. The Painters Society of the City have, on more than one occasion, approached the council with a view to securing the work for the regular tradesmen of the city but the matter has been postponed.

The Committee have this year gone into the question of cost (1) of painting the lamps by auxiliary lamplighters; (2) of painting the lamps by regular tradesmen to be employed by the committee; (3) of giving the entire work to outside contractors.

They engaged a regular painter for a trial, and obtained tenders from contractors and they are therefore in a position to give the following comparison of cost:—

By auxiliary lamplighters ..... 6¼d. per lamp
By regular tradesmen ..... 9d. per lamp
By contractors..... 2s. per lamp

— 18 June 1901.

DUBLIN ELECTRICITY WORKS.

Staff List.

NAME	POSITION	SALARY
A.—GENERATING DEPARTMENT		
G. Archer ...	Chief Assistant ...	£225 per annum
V. Crosby ..	Mechanical Engineer	£175 per annum
J. E. Newman ...	Shift Engineer ...	£130 per annum
J. M. Harbinson ...	Shift Engineer ...	£117 per annum
W. P. Croly ...	Switchboard Attdt. ...	£78 per annum
E. S. M'Swiggan ...	Switchboard Attdt. ...	£78 per annum
W. L. Reilly ...	Switchboard Attdt. ...	£52 per annum
E. Allan ...	Improver ...	£39 per annum
J. Murray ...	Foreman Driver ...	6s. 4d. per day
T. Kavanagh ...	Driver ...	4s. 8d. per day
E. Walsh ...	Driver ...	4s. 8d. per day
P. Hoey ...	Driver ...	4s. 8d. per day
T. O'Brien ...	Greaser ...	4s. 8d. per day
J. Byrne ...	Greaser ...	4s. 8d. per day
J. Kennedy ...	Greaser ...	4s. 8d. per day
J. Jones ...	Greaser ...	4s. 8d. per day
J. Henshaw ...	Stoker ...	4s. 8d. per day

Rathmines had by this time also established their own electricity works. The Pembroke works were located at South Lotts Road while the Rathmines ones were based in the present ESB meter and test premises. When the Pigeon House was well established these took power in bulk from that station and distributed it locally.

The Electric light was now well and truly established.

Spreading the Message

The selling of the new product — electric light — was pursued with vigour and with a missionary zeal. From the outset the health aspects were stressed with no holds barred. Quote from 1892:

'From a health point of view no second opinion can exist as to the advantages to be derived by the consumers of electric light over those who use its rivals. All forms of illumination in which combustion takes place, abstract from the atmosphere an alarmingly large proportion of its oxygen and add to the admosphere gases which are very deleterious and injurious to life. A single gas burner, burning five cubic feet of gas hourly consumes as much oxygen as several adult persons. From this it follows that in a small sitting room, we will say, with a few such burners alight at one time, the oxygen in the atmosphere is being consumed at the same rate as if many persons in addition to those actually using the room were all breathing the air at the same time — such a fact requires no comment; in addition to this, the gases added to the atmosphere through the consumption of coal gas are directly injurious, and induce depression etc'.

In 1899 Pembroke Township Commissioners published a guide to the Electric Light, its advantages, conditions and cost. Its introduction

The Incandescent Electric Light.

It may unhesitatingly be claimed that, by the use of this Light, the whole of the disadvantages connected with lighting by gas, oil or candles can be avoided, the Electric Light being almost a perfect light, standing the test of:—

Purity, Steadiness,
Cleanliness, Beauty,
Coolness, Safety,
Convenience.

on electric light echoes the respected values of the times.

In 1911 the Dublin Electrical Exhibition was held in the Mansion House. Extracts from the souvenir catalogue (on pages 10/11) illustrate the progress made in the development of electric appliances at that stage. Already kettles, vacuum cleaners, curling tongs, coffee makers, irons, shaving water heaters, mincers, sewing machines and fans were available to those who decided to 'get in the Electric'.

An Electricity Showroom was opened at 39 Grafton Street in response to criticism that the Electricity Department of the Corporation lacked selling expertise. This showroom was fully equipped to demonstrate the range of home comforts which could be achieved through electricity. By the early and mid 1920s no house was considered modern unless it had electric light but the public were only beginning to realize the advantages of using electricity for other purposes around the house.

On the industrial front the number of users of Corporation electricity steadily grew. Many of the larger plants, particularly those which required steam for their process, had their own electricity generating plant. By 1928, however, some 75 per cent of the total power used came from the Municipal Electricity Works. Power users began to realize that private power plants could not compete with public supply Most of the original industrial users are now big ESB consumers — Jacobs, Irish Independent, Jamesons, Dollards, Clerys etc.

It was 46 years after the first public electricity supply became available in the UK and 35 years after Dubliners had their first 'taste' of a new clean and safe source of light.

1907

Peat Bogs seen as source of electricity 70 years ago

– greater potential than Niagara

In 1907 a prospectus was issued for the setting up of a public company called the Dublin and Central Ireland Electricity Undertaking whose business was to comprise:

1. The supply of cheap electricity in bulk to local authorities for house to house lighting and power.
2. Supply a cheap power for driving mills and factories.
3. Cheap electricity for tramways, light railways and canal traffic.
4. The supply of cheap power for electrification of the railways throughout the district.
5. The supply of cheap electrical power for driving sewage pumping, drainage and reclamation of bog lands, water supply and other purposes.
6. The supply of cheap electricity for electro-chemical and electro metallurigical works.
7. The sale of by-products obtained in working the gas producers, such as sulphate of ammonia, products of tar etc.

The promoters proposed a radical answer to the question of electricity supplies at the time by the use of gas-driven engines to generate cheap electricity. The gas was to be produced by the gasification of peat at a central power station near Robertstown in Co. Kildare.

The idea of using the vast areas of peat was based on experience in Germany where the process had proven successful.

Basically it was proposed to transport sod peat from the bogs, to a central station. There, the peat containing up to 50 per cent moisture would be processed to produce gas. This would be used in internal combustion engines driving electricity generators. There were a number of attractions in the scheme according to the promoters:—

- The gas producers and engines could be installed in units of 2,000 h.p. as demand increased.
- The superiority of the internal combustion engine in terms of efficiency compared to steam meant that for every penny spent on fuel over four times as much power could be obtained from the peat/gas cycle as against coal-fired steam plant.
- Power could be supplied in bulk to Dublin Corporation cheaper than their fuel cost alone using coal.
- The establishment of the plant would lead to the development of industrial areas nearby through the availability of cheap power.
- The sale of a by-product — sulphate of ammonia — would cover the cost of fuel.

At that time all electricity undertakings were located close to their consumers. Long distance transmission of power was still in its infancy. This did not deter the promoters of the Robertstown plant. They intended supplying an area between Dublin and the Shannon, southwards to Athy. They pointed out that in the east of France there were already 700 miles of overhead lines with voltages ranging from 200 to 26,500. They illustrated the contribution this made to local development with the fact that about 4,000 silk looms were electrically-operated in the region, mostly by small-scale peasant proprietors.

The Company argued that the centralization of the electricity generating processes at one station with transforming substations would lead to economies in capital outlay on land and in terms of staffing as well as economies to be expected from the 'diversity factor' when all areas were interconnected.

'It is unnecessary to enlarge upon the advantages of the proposed scheme in the impulse it would give to the industrial interests of the districts. Similar results may be confidently expected to follow as in the case of Niagara and other like undertakings in England and abroad, but in even greater proportion, owing to the adoption of more up-to-date methods, the natural resources of the country in the peat bogs and the greatly reduced cost of production. Manufacturers of all kinds, especially chemical industries would be attracted to the district'.

The promoters of the project gave some interesting examples of costings. They quoted the costs which applied to similar installations in Germany where the gas producers consumed only two pounds of fuel of 25 per cent moisture per horse-power per hour. The digging and delivery of the peat in small heaps alongside the gas producers was said to have cost only two shillings (10p) per ton. Perhaps the most interesting feature of the costings was that of the valuable by-products of the gasification cycle.

Samples of peat were analysed by an eminent chemist in Liverpool. This showed that every ton of dry peat contained, as a by-product 85 lbs of sulphate of ammonia. It was claimed that only one-and-a-half lbs of peat would be required to produce one effective horse-power. The net profit from the sale of the by-products was calculated to produce 4s 6d (23p) per ton of peat — sufficient to pay the total cost of digging, drying and gasifying the peat. In other words 'the gas for the gas engines will be obtained free of cost'.

The promoters compared the reserves of power which were available from the peat bogs as being far superior to the Niagara Falls station (which had recently opened in the US) 'in facility of application, economy of capital outlay and economy of working'.

PROSPECT would like to hear from staff — present or past — who know anything further about this proposed venture.

Other cities and towns

While this article concentrated on the background to the supply of electricity to Dublin, the other cities and towns of Ireland must not be forgotten. PROSPECT would like to hear from readers who have information on the bringinf of electricity to the other cities and towns before the days of the ESB.